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08 July 2022

Jamie Schwartz—Remedial Project Manager
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VIA EMAIL

Reference: West Lake Landfill OU-3

Subject: Submittal of Revised *2020 Annual Hydrogeologic and Site Characterization Report* with Modifications

Dear Ms. Schwartz:

ERM Consulting & Engineering, Inc., on behalf of Bridgeton Landfill, LLC, Cotter Corporation (N.S.L.), and the United States Department of Energy (collectively the OU-3 Respondents), is pleased to submit the revised *2020 Annual Hydrogeologic and Site Characterization Report* for Operable Unit 3 (OU-3) of the West Lake Landfill Superfund Site located in Bridgeton, Missouri. This report has been revised following approval with modifications from United States Environmental Protection Agency (USEPA) received on 24 June 2022.

Modifications to this final revision of the *2020 Annual Hydrogeologic and Site Characterization Report* are limited to those explicitly described in the 24 June 2022 USEPA letter except as follows: (1) a reference to the 24 June 2022 USEPA modifications is included in the introduction, (2) the number of analytes on page 11 has been stated as “approximately 350” in order to more accurately represent the analyte count, and (3) the units for depth to water (DTW) on Table 3 have been corrected to state “ft btoc” (feet below top of casing).

The revised *2020 Annual Hydrogeologic and Site Characterization Report* is being submitted electronically and is available for download from the project Sharepoint site shared with USEPA via email on 8 July 2022. This deliverable is being submitted in accordance with the requirements of Section IX, Paragraph 51 of the West Landfill OU-3 Administrative Settlement Agreement and Order on Consent (CERCLA-07-2018-0259). The *Annual Hydrogeologic and Site Characterization Report* was prepared in accordance with the USEPA approved Remedial Investigation/Feasibility Study Work Plan.

If you have any questions or encounter any issues downloading the documents, please contact Alice Sandzén at (603) 667-0682.

Yours sincerely,

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West Lake Operable Unit 3

2020 Annual Hydrogeologic and Site Characterization Report

1 March 2021, Revised 8 July 2022

Project No.: 0579381

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Signature Page

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West Lake Landfill Operable Unit 3

2020 Annual Hydrogeologic and Site Characterization Report

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Acronyms and Abbreviations

Name	Description
µg/L	Micrograms per liter
bgs	Below ground surface
COPC	Constituent of potential concern
CSM	Conceptual site model
ERM	ERM Consulting & Engineering, Inc.
Feezor	Feezor Engineering, Inc.
FSP	Field Sampling Plan
LCS	Leachate collection sump
MCL	Maximum contaminant level
MDNR	Missouri Department of Natural Resources
NMR	Nuclear magnetic resonance
NTU	Nephelometric Turbidity Units
OU-3	Operable Unit 3
OU-3 Respondents	Bridgeton Landfill, LLC, Cotter Corporation (N.S.L.), and the United States Department of Energy
pCi/L	Picocuries per liter
Q2	Second quarter
Q3	Third quarter
Q4	Fourth quarter
RI/FS	Remedial Investigation/Feasibility Study
RSL	Regional screening level
Site	West Lake Landfill
USEPA	United States Environmental Protection Agency

1. INTRODUCTION

ERM Consulting & Engineering, Inc. (ERM) has prepared this Annual Hydrogeologic and Site Characterization Report on behalf of Bridgeton Landfill, LLC, Cotter Corporation (N.S.L.), and the United States Department of Energy (collectively, "OU-3 Respondents"), to summarize Remedial Investigation/Feasibility Study (RI/FS) data collected during the calendar year 2020 (July through December), and provide an updated conceptual site model (CSM) for West Lake Landfill (Site) Operable Unit 3 (OU-3). This work was completed according to the *Remedial Investigation/Feasibility Study Work Plan*, *Field Sampling Plan* (FSP), and *Quality Assurance Project Plan* for Site-wide groundwater and the Technical Memos approved by the United States Environmental Protection Agency (USEPA) (ERM 2020a). This report also records any deviations from the FSP (ERM 2020a). This report has been prepared in accordance with the *RI/FS Work Plan* submitted to the USEPA on 3 December 2020. This report was originally submitted on 1 March 2021 and was subsequently revised in response to USEPA comments received 1 December 2021 and modifications received 24 June 2022.

2. STATUS OF TASKS COMPLETED OR IN PROGRESS

2.1 Well Inventory and Maintenance

ERM submitted a *Well Inventory Summary Report* on 16 November 2020 (ERM 2020b) documenting well maintenance, repair, and sediment removal activities that were performed by Feezor Engineering, Inc. of Chatham, Illinois (Feezor); the report included the following recommendations (monitoring well locations discussed in this section are shown on Figure 1):

- Abandon the two obstructed monitoring wells (I-4 and PZ-112-AS) that could not be repaired.
- Abandon the four poorly constructed monitoring wells with elevated turbidity (D-85, I-68 and MW-104)[1] or bentonite in the well screen (PZ-102-SS).
- Abandon the four low-yield monitoring wells (MW-103,[1] PZ-204-SS, [2] PZ-302-AS, and S-53) that are not screened in groundwater transport zones.
- Redevelop four monitoring wells (PZ-209-SD, PZ-210-SD, PZ-212-SD, and PZ-212-SS) to remove additional sediment and determine if these wells were properly constructed. If additional redevelopment activities are not able to remove sediment from a well screen or significantly reduce turbidity values, then it can be inferred that that well was not properly constructed and thus, that well should be abandoned.

Following submission of the *Well Inventory Summary Report*, Feezor oversaw redevelopment of PZ-209-SD, PZ-210-SD, PZ-212-SD, and PZ-212-SS by drilling subcontractor, Roberts Environmental Drilling, Inc. of Millstadt, Illinois on 22 and 23 December 2020. During well development, natural recharge rates were not sufficient to attain the well development objectives defined in the FSP. A minimum of three well casing volumes could not be removed at any of the locations due to excessive drawdown; approximately one well casing volume was removed from each location. Turbidity did not stabilize to below 10 Nephelometric Turbidity Units (NTUs)[3] for any of the four wells, and purge water remained "cloudy"

[1] MW-103 and MW-104 were not installed by the landfill and are not located on landfill property. Abandonment of these locations would be pending coordination with landowners and legal access.

[2] As PZ-204-SS is required for the Landfill Gas Corrective Action Plan, abandoning PZ-204-SS would require Missouri Department of Natural Resources approval.

[3] Two turbidity meters have been used at the Site, both of which measure turbidity to equivalent levels of accuracy and range, but report the data in different units. The HACH® 2100Q portable turbidimeter measures turbidity in NTUs using a white light, whereas

throughout the duration of pumping. No significant change was observed between total depth measurements taken before and after well development; however, none of the four wells have more than 10 percent well screen occlusion. Therefore, these four wells were incorporated into the first quarter sampling event in 2021. ERM will review data from these locations following sampling and may make a recommendation for additional redevelopment or abandonment, if warranted.

ERM no longer recommends abandonment of D-85 and I-68, as groundwater samples were successfully collected from these wells in accordance with the FSP during the fourth quarter (Q4) of 2020 sampling event. Both D-85 and I-68 were installed with a gravel filter pack (instead of the typical sand filter pack), which may allow fine-grained material from the formation to enter the sample and impact sample quality, especially for analysis of metals. Historically, both locations had elevated turbidity results (up to 1,000 NTUs at I-68 in 2004 and up to 526.3 NTUs at D-85 in 2013); however, it appears that these elevated turbidity values may have been attributable to the historical sampling method, as acceptable turbidity values were achieved using low-flow sampling methods during the Q4 2020 sampling event. ERM also no longer recommends abandonment of PZ-302-AS, which was identified as a low-yield well that historically goes dry during sampling. Generally, excessive drawdown should be avoided to the extent practical so that the sample collected represents formation groundwater, and so that all aliquots of the sample can be collected over a short time period for consistency and to avoid introducing bias. Although this location went dry during the Q4 2020 sampling event, it was able to be sampled by returning to the well over a period of 24 hours to fill the remaining sample bottles after allowing the well to recharge multiple times, consistent with the approved FSP. A *Revised Well Inventory Summary Report* was submitted to USEPA on 5 April 2021 to modify recommendations for the OU-3 well network based on comments received from USEPA on 5 March 2021 along with the findings of field efforts described above[4].

In addition to the well inventory activities, Feezor inspected the eight existing leachate collection sump (LCS) locations at the Site in December 2020; LCS locations are shown on Figure 2. Additional information about the status of each LCS as of December 2021 was provided by Bridgeton Landfill and is summarized below.

North Quarry LCS:

- LCS-5A: operational and able to be sampled.
- LCS-5B: operational, but does not have a sampling port. This location was unable to be sampled in 2020 and in 2021, but may be sampled in the future with engineering modifications.
- LCS-6B: operational, but pumps intermittently. This location was unable to be sampled in 2020 and in 2021, but may be sampled in the future with engineering modifications.

South Quarry LCS:

- LCS-3D: operational and able to be sampled.
- LCS-1D, 2D, and LCS-4B: not operational.
- LCS-4C: not a completed location (was abandoned in place).

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the YSI ProDSS measures turbidity in Formazin Nephelometric Units using an infrared light source. The two units of measurement are interchangeable and both are considered adequate for project data quality objectives.

[4] An *Addendum to the Revised Well Inventory Summary Report* was submitted to USEPA on 29 July 2021 to provide an update on well inventory activities completed at wells installed by Missouri Department of Natural Resources (MDNR) and to submit revised data tables previously submitted as Appendices E and G. An *Update to Addendum to the Revised Well Inventory Summary Report* was submitted to USEPA on 15 October 2021 to provide an update on sediment removal activities at MO-2-SD. Well inventory activities conducted in 2021 will be summarized in the 2021 Annual Report.

As noted above, LCS-5B and LCS-6B were not able to be sampled in 2020 or in 2021. With assistance from Bridgeton Landfill, the OU-3 Respondents are evaluating modifications to the LCS infrastructure to enable sample collection from these locations in the future. With the exception of LCS-3D, LCS in the South Quarry of the Bridgeton Landfill are not operational due a heat-producing subsurface reaction within the Bridgeton Landfill South Quarry, which adversely affected LCS installed in this landfill. These conditions are described in the July 2018 *Work Plan – South Quarry Subsurface Assessment Actions & Leachate Collection Sump (LCS) Installations* (Feezor 2018) and include "significant settlement of the surface topography and subsurface temperatures (at depths ranging from 40 to more than 200 feet below the surface) in excess of 200° F." Feezor (2018) describes settlement and temperature conditions that must be met before the South Quarry LCS can safely be replaced. As documented in the most recently submitted November 2021 *Annual Report: South Quarry Subsurface Conditions Monitoring For LCS Installations* (Feezor 2021), as of the end of 2020, subsurface conditions in the South Quarry would "likely impart a higher degree of potential risk to human health during installations of Temperature Monitoring Probes or leachate collection sumps"; thus, conditions must improve before the LCS in the South Quarry can be replaced.

2.2 High-Resolution Site Characterization

2.2.1 Initial Nuclear Magnetic Resonance Logging in Existing Wells

ERM completed initial nuclear magnetic resonance (NMR) logging in existing wells at the Site between 3 and 9 November 2020. Table 2-1 below summarizes the initial NMR logging activities completed in 2020 and Figure 3 shows the monitoring well locations where NMR logging was completed; NMR logs are provided as Appendix A. Existing wells that were logged were selected based on the following factors.

- Original borehole diameter: if the borehole diameter was greater than the NMR sampling diameter (i.e., the range within which the two sensitive shells of the NMR tool collect data), the well could not be logged because the NMR tool would only log data from within the well's annular materials and not the geologic formation.
- Well depth: we targeted deep wells so that the maximum vertical extent of the geologic unit of interest could be investigated.
- Historical data: at the request of USEPA and USGS, we logged certain wells in areas of interest based on historical groundwater monitoring data.
- Access: wells had to be accessible with the NMR logging equipment.
- Location: we targeted geographic areas where potential data gaps may occur following the new well installation program.

All existing wells that were logged with NMR in 2020 were also logged using natural gamma, spectral gamma, and induction methods during the subsequent 2021 well installation program.

During data acquisition, the NMR hydrogeologic logs were compared to the corresponding geologic boring logs and the two datasets were found to be generally consistent (i.e., higher-permeability zones generally corresponded to zones of coarser-grained soil and lower-permeability zones generally corresponded to zones of finer-grained soil).

Upon completion of logging, Vista Clara, the tool manufacturer, reviewed the NMR field data for quality, and provided post-processing recommendations. Final post-processing NMR data logs, including Vista Clara's recommendations are provided in Appendix B.

Table 2-1: NMR Locations

NMR Location	Depth of Survey (feet bgs)	Depth of Well (feet bgs)	Notes
PZ-109-SS	119.0	135.5	Obstruction (likely a metallic centralizer) prevented logging the bottom 15 feet of the well.
PZ-106-SD	198.2	200.59	
PZ-101-SS	152.8	156.42*	
PZ-104-SD	192.4	245	Obstruction (likely a metallic centralizer) prevented logging the bottom 52 feet of the well.
D-85	73.1	82	Not logged to total depth due to vertical deviation of the well casing.
D-12	143.5	143.7	
D-93	109.3	112	
D-13	18.0	133	Tool became stuck at approximately 18 feet bgs; therefore, this well was not logged.
D-6	104.7	106.5	
D-87	108.3	111	
PZ-100-KS	374.4	383.8	Not logged to total depth due to vertical deviation of the well casing.
MW-1204	199.8	223.5	Obstruction (likely a joint in the PVC casing at the top of the well screen) prevented logging the bottom 24 feet of the well. For safety reasons, data acquisition was conducted at a faster rate, which reduced the vertical data resolution.

bgs = below ground surface

**The boring and well construction log for this location list a total depth of 140 feet; however due to landfill activities surrounding the well after well construction that modified ground surface elevation, the total depth measured in the field is now 156.42 feet.*

While initial NMR logging was completed in late 2020 and preliminary results were discussed with various stakeholders, a comprehensive evaluation of the NMR data relative to other Site geologic data was not completed until 2021. Results of NMR data evaluation for the existing wells will be included in the *2021 Annual Hydrogeologic and Site Characterization Report*.

The following deviations from the FSP occurred during the NMR logging program in 2020.

- D-13: an obstruction prevented the tool from advancing down the well. Well survey activities identified some deformation of the PVC casing at this location and a smaller sized bladder pump is utilized at this location.
- PZ-109-SS and PZ-104-SD: obstructions prevented ERM from logging the bottom 15 feet and 52 feet, respectively, of these wells. ERM was still able to log the majority of the vertical sequence at those locations.
- D-85 and PZ-100-KS: vertical deviations of the well casings prevented ERM from logging the full depth of these wells.
- D-83: scheduled to be logged, but could not be accessed by the logging truck. NMR data will be collected at new adjacent well MW-401 in 2021.

The NMR tool used is approximately 6 feet long with a diameter of 1.75 inches. When operating in a 2-inch outer diameter well casing, there is little tolerance for variance in well construction. Minor physical obstructions, such as a joint where two pieces of PVC join, can prevent the tool from advancing down the well and the presence of metal stabilizers can cause the tool to magnetically stick inside the casing. Additionally, if the well was constructed with a small degree of deviation from vertical, the tool can also get lodged in the well keeping it from reaching the total depth of the well. With the exception of D-13, the obstructions that prevented complete vertical logging with the NMR tool were not identified during the camera survey (e.g., a vertical deviation of the well casing is not something that video logging would detect). At certain locations noted above, the tool could not be lowered to the total depth of the well and there was no way to physically push the tool deeper. In the absence of other evidence of an obstruction, ERM assumed that the well had a significant enough deviation from vertical to inhibit the tool from passing. In all instances, ERM took every precaution to avoid getting a tool stuck in a well.

2.2.2 WATERLOO APS™

ERM started the WATERLOO APS™ program on 23 November 2020 with brush clearing and a Site walk. Private utilities were marked out on 30 November 2020, and on 1 December 2020, ERM and Cascade Remediation Services, LLC mobilized to the Site to begin vertical groundwater profiling activities using the WATERLOO APS™.

See Table 2-2 below, and attached Figure 3, for a summary of WATERLOO APS™ locations completed during 2020.

Table 2-2: Completed WATERLOO APS™ Borings

WATERLOO APS Location	Depth (feet bgs)	Number of Groundwater Samples Collected
APS-001	87.1	16
APS-002	83.5	13
APS-003	125	21
APS-004	100	17
APS-005	120	19

bgs = below ground surface

As shown in Table 2-2, total boring depths achieved were greater than the 70 feet indicated in the FSP, and in all but one case (i.e., APS-004[5]), the WATERLOO APS™ tooling effectively reached the top of bedrock (i.e., the tooling either refused at the top of bedrock or within 5 feet of bedrock, as later confirmed during advancement of collocated borings using rotosonic drilling techniques). Attached Table 1 includes a summary of the groundwater analytical results from WATERLOO APS™ borings, and attached Table 2 summarizes the associated quality control samples.[6]

The WATERLOO APS™ collected groundwater samples from about a 3-inch vertical sampling interval; therefore, the data collected using this tool are considered screening data that will be used to support design of monitoring well screen intervals. A Stage 1 validation, per the QAPP, was performed on all newly collected screening data to verify accuracy and completeness of the dataset prior to use. An internal review checklist was completed for each data set and any identified data quality issues were communicated to the project team. The field parameter data shown on the WATERLOO APS™ field logs

[5] For APS-004, a second boring collocated will be advanced using the WATERLOO APS™ in an attempt to collect the remaining groundwater samples between 100 feet bgs and the top of bedrock; this boring will be completed during 2021.

[6] Tables1 through 16 have been attached to this document, and not included in the text, as they are too large to fit in this document.

provided as Appendix C were used to determine when a representative groundwater sample can be collected, but were not used as a line of evidence for designing monitoring well screen intervals. Dissolved oxygen values are unreliable when oxidation-reduction potential values are very low and were therefore not used to evaluate aquifer geochemical conditions. Instead, laboratory analytical data for nitrate, dissolved manganese, dissolved iron, and sulfate were used to evaluate aquifer geochemical conditions. WATERLOO APS™ logs, including a subset of the field and analytical data collected using this tool, are included as Appendix D.

ERM noted the following deviations from the FSP during the WATERLOO APS™ program:

- The equipment blank samples have been named to correspond to the location of each sample (e.g., EB-APS-005-WQ-20201201) instead of incrementally (e.g., EB-001).
- WATERLOO APS™ tooling was lost in-ground at location APS-005 and abandoned in place in accordance with Missouri Geological Survey well code (Variance ID #6719).
- The maximum target depth for WATERLOO APS™ borings was 70 feet; however, all boreholes were advanced to greater depths and groundwater samples were collected at 5-foot vertical intervals down to the depth of boring refusal, which is a finer resolution than would have been achieved had groundwater samples been collected at greater depths using the rotosonic drill rig. Therefore, more groundwater samples were collected for laboratory analyses than had been proposed in the FSP.

2.3 Stilling Well Installation

Feezor installed stilling well SG-200 from 9 to 11 December 2020, and stilling well SG-400 on 21 December 2020. Surface water elevation data collection using data-logging pressure transducers was initiated at these two stilling wells on the final installation dates. Stilling well transducer data collected in 2020 were not able to be used to update the relationship between the Missouri River stage and groundwater and surface water bodies because the stilling wells were installed after the monthly gauging event was conducted on 7 December 2020.

As of the end of 2020, the OU-3 Respondents were still working to gain access to the remaining stilling well locations. See Figure 4 showing stilling well locations installed as of the end of 2020.

2.4 Monitoring Well Gauging

From July through December 2020, monthly gauging of the OU-3 well network was completed by Feezor; monthly gauging data are summarized in Table 4. ERM has been developing monthly groundwater potentiometric surface maps, which have been submitted to USEPA on a quarterly basis (ERM 2020c; ERM 2021). At the time of 2020 reporting, and as noted in the quarterly potentiometric surface map submittals, groundwater elevation data within the alluvium were plotted as a single hydrostratigraphic unit; therefore, the shallow, intermediate, and deep alluvium wells were combined into a single map and the lowest head value (presumed to be representative of the most transmissive interval within the alluvium) was used for contouring. During 2021, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the Site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress and will be discussed further in the 2021 Annual Hydrogeologic and Site Characterization Report.

Bedrock wells screened within the St. Louis and Salem Formations are arrayed around the perimeter of the former quarries (i.e., the Bridgeton Landfill); water levels in these wells may be affected by pumping of the leachate collection system and/or the effects of the subsurface reaction within the South Quarry (indicators include settlement rates and temperature, as described in Section 2.1); therefore, ERM did not

contour the St. Louis and Salem Formation groundwater elevation data. Potentiometric surface maps for July through December 2020 are shown on Figures 5a–5f, 6a–6f, and 7a–7f.

A map showing all locations that were pumping as of the end of 2020 is provided as Figure 2. Between July and December 2020, the leachate pretreatment plant treated 21,299,393[7] gallons—an average of 115,760 gallons per day, which included leachate and condensate from LCS and gas extraction wells. The groundwater flow system at the Site is likely affected by pumping and subsurface reaction conditions in Bridgeton Landfill; however, at the end of 2020, ERM had limited information about the leachate collection system or the subsurface reaction; evaluation of the leachate collection system and the effect of pumping, settlement, and temperature on groundwater elevation in alluvium and bedrock is ongoing and further evaluation will be provided in future reports as data become available.

In addition to groundwater potentiometric surface maps, temporal hydrographs were generated for third quarter (Q3) and Q4 of 2020 (Appendix E). These hydrographs were used to identify potentially anomalous data points. For example, if head values for multiple wells within a particular hydrostratigraphic unit decreased between two consecutive gauging events, but a head value for one well increased significantly between those same two events, then the second head value for that well would likely be deemed anomalous because the head values followed a different temporal trend compared to other values at the same well; however, if well groupings showed multiple trends with some wells oriented together, but different from neighboring wells, those data points were not considered outliers. Potentially anomalous data were not used to generate groundwater elevation contours; such values are noted on potentiometric surface map figures and indicated on hydrographs as shown in Appendix E.

To further evaluate the groundwater flow system and groundwater-surface water interactions, data-logging pressure transducers were installed in existing monitoring wells and newly installed stilling wells during November and December 2020, as shown on Figure 4 and summarized below.

Table 2-3: Summary of Transducer Installation Dates

Transducer Location	Installation Date
PZ-111-SS	9/25/2020
PZ-111-SD	9/25/2020
PZ-113-AD	9/25/2020
PZ-113-SS	9/25/2020
PZ-100-KS	9/25/2020
PZ-100-SD	9/25/2020
PZ-100-SS	9/25/2020
PZ-205-SS	9/25/2020
PZ-205-AS	9/25/2020
PZ-202-SS	10/6/2020
PZ-209-SS	10/6/2020
PZ-211-SD	10/6/2020
PZ-211-SS	10/6/2020

[7] Leachate pre-treatment plant volumes are operational field data that have not been verified or validated. These data represent volumes that came to the pre-treatment plant through the West Life Station and the LCS forcemain to TK-200. These values exclude potentially impacted stormwater volumes.

Transducer Location	Installation Date
S-8	10/16/2020
PZ-113-AS	10/16/2020
PZ-304-AI	10/27/2020
PZ-304-AS	10/27/2020
D-83	11/19/2020
D-93	11/19/2020
I-9	11/19/2020
I-62	11/19/2020
S-82	11/19/2020
SG-200	12/11/2020
SG-400	12/21/2020

ERM noted the following deviations from the FSP with respect to monitoring well gauging and transducer installation:

- MW-103 was proposed for transducer installation in the FSP, but was not instrumented with a pressure transducer because the OU-3 Respondents have not yet obtained legal access to this off-Site location; transducers were installed at nearby locations instead (existing wells PZ-304-AS and PZ-304-AI in October 2020, and new proposed well MW-306 in 2021).
- Monthly water levels should generally be measured first in wells which have the least amount of known contamination. Since OU-3 groundwater sampling did not occur until November/December 2020, the gauging order was not established in 2020, and will be established going forward in general accordance with the known contaminant distribution within the monitoring well network. PZ-303-AS was consistently gauged last in 2020 due to known groundwater impacts at this location.

Additionally, as noted in ERM's Q4 2020 potentiometric surface map submittal, top of casing elevations were initially switched for I-9 and D-93. Top of casing elevations have since been corrected and the affected potentiometric surface maps from Q3 2020 were resubmitted along with the Q4 2020 maps.

2.5 Monitoring Well and Leachate Collection Sump Sampling

ERM and Feezor conducted the Q4 2020 quarterly groundwater sampling event between 3 November and 8 December 2020. Figure 1 shows the monitoring wells and LCS locations that were sampled during the Q4 2020 sampling event. A summary of field parameters recorded at each location at the time of sampling is provided in Table 4.

In accordance with the FSP, Feezor collected samples from two LCS locations that had operational sampling ports, were safe to access, and that produced fluid (LCS-3D and LCS-5A). Samples could not be collected from six of the eight LCS locations in the OU-3 network as described in Section 2.1.

For low-yield monitoring wells, samples could not always be collected on the same day, and in some instances sample order was modified, in accordance with the FSP.

- The sample collection order was modified at PZ-205-AS due to low yield. Field parameters were stable at the time of sampling. The well recovered to a sufficient level so all samples were able to be collected on the same day.

- Sample collection order was modified at PZ-302-AS due to low yield. All field parameters were stable at the time of initial sampling, with the exception of turbidity. Feezor returned twice on the following day to collect all remaining samples.
- Sample collection order was modified at PZ-211-SD due to low yield. All field parameters were stable at the time of initial sampling. Feezor returned to collect all remaining samples within 48 hours, instead of 24 hours, to allow sufficient time for recharge.

During the Q4 2020 sampling event, elevated turbidity (greater than 10 Formazin Nephelometric Units)[3] was observed at six monitoring wells (D-85, I-67, PZ-100-SD, PZ-102-SS, PZ-106-SD, and PZ-302-AS). Based on a review of groundwater sampling logs, the groundwater sampling procedures were followed properly at all six wells. At five of the six wells, turbidity had stabilized to within the acceptable turbidity criterion at the time of sampling (three consecutive readings within 10 percent). The only well where turbidity was not stable at the time of sample collection was PZ-302-AS, which is a low yield well that went dry during the Q4 2020 sampling event, as previously described. Elevated turbidity may impact sample quality, especially for analysis of metals. However, because these samples were collected in accordance with the FSP and properly filtered for analysis of dissolved fractions, turbidity is not expected to have a significant impact on data quality or usability.

ERM noted the following deviations from the FSP during the Q4 2020 sampling event:

- Samples could not be collected from 13 of the 80 monitoring wells in the OU-3 network for the following reasons:
  - Required well redevelopment: PZ-209-SD, PZ-210-SD, PZ-212-SD, and PZ-212-SS.
  - Required legal access agreements: D-81, MO-3-SDR, MO-3-SS, MW-103, MW-104, PZ-208-SS, and S-8.
  - Wells were obstructed and could not be repaired: S-53 and PZ-112-AS.
- Drawdown did not stabilize to within 0.3 foot of the initial depth to water at the 26 monitoring wells listed below, despite maintaining flow rates within the acceptable range for low-flow sampling methods (i.e., less than 500 milliliters per minute). Attempts were made to control drawdown, including lowering pumping rates, without success. This indicates that these wells have low yields. With the exception of two shallow alluvium wells, all of the locations with drawdown issues are screened within bedrock. Not all bedrock wells at the Site exhibit low yields. Those wells that exhibit adequate yields to enable low-flow sampling with minimal drawdown intersect transmissive bedrock fractures that represent preferential groundwater flow paths within bedrock. Those wells that exhibit low yields (i.e., those listed below) intersect either low-transmissivity fractures or the bedrock matrix, neither of which represent preferential groundwater flow paths within bedrock. In 2021, ERM will further assess the bedrock monitoring well network to evaluate the potential relationship between well yield and groundwater quality to determine if low-yield wells provide representative groundwater quality data.
  - Drawdown did not stabilize but well did not go dry: PZ-100-KS, PZ-100-SD, PZ-100-SS, PZ-101-SS, PZ-102R-SS, PZ-102-SS, PZ-103-SS, PZ-104-SS, PZ-105-SS, PZ-106-KS, PZ-106-SD, PZ-106-SS, PZ-107-SS, PZ-109-SS, PZ-111-SD, PZ-113-SS, PZ-116-SS, PZ-210-SS, PZ-201A-SS, PZ-204-SS, PZ-205-SS, PZ-206-SS, and PZ-211-SS.
  - Drawdown did not stabilize and well went dry: PZ-205-AS, PZ-211-SD, and PZ-302-AS.
- Dissolved oxygen was not within the stabilization criterion defined by the FSP (within 10 percent over three consecutive readings, for readings above 0.5 milligrams per liter) at the time of sampling at eight monitoring wells listed below because field staff were utilizing an outdated version of the

groundwater sampling log, which listed the dissolved oxygen stabilization criterion from the previous FSP (within 0.3 milligrams per liter over three consecutive readings). The groundwater sampling log was corrected prior to the Q1 2021 groundwater sampling event.

- Dissolved oxygen not within FSP stabilization criteria at time of sampling: D-83, D-87, PZ-106-SS, PZ-114-AS, PZ-116-SS, PZ-201A-SS, PZ-205-AS, and PZ-206-SS.

- Equipment blank EB-004 was collected on 20 November 2020 for all required analytes, except for geochemical parameters due to a miscommunication. The geochemical parameters for EB-004 were subsequently collected on 23 November 2020. No primary samples were taken in between the two sets of equipment blank samples and the equipment was not used at any locations in between the collection of the two samples.
- A YSI ProPlus with separate HACH® 2100Q portable turbidimeter and T-valve fitting was used instead of YSI ProDSS for a subset of wells, due to issues with the YSI ProDSS turbidity reliability. Both devices have equivalent accuracy and range, but measure turbidity in different units. The HACH® 2100Q portable turbidimeter measures turbidity in NTUs using a white light, whereas the YSI ProDSS measures turbidity in Formazin Nephelometric Units using an infrared light source. The two units of measurement are interchangeable and both are considered adequate for project data quality objectives.
- Groundwater sampling was stopped on 16 November 2020 due to a positive COVID-19 test for a person who was in contact with the groundwater sampling team. Groundwater sampling resumed on 20 November 2020.
- Similar to gauging, groundwater samples should be collected first in wells which have the least amount of known contamination. The sample collection order will be established going forward in general accordance with the known contaminant distribution within the monitoring well network.

2.5.1 Results Summary

Validated radiochemistry analytical data from Q4 2020 are provided in Table 5a. Table 5b shows the historical maximum activity for wells where historical data collected from May 1986 to May 2017 were available, for reference. All other validated analytical data from Q4 2020 are provided in Tables 6 through 12. Validated field quality control blank sample data are provided in Tables 13 through 16. Validation reports are provided as Appendix F.

The attached tables include highlighting to identify results that are greater than maximum contaminant levels (MCLs) and/or regional screening levels (RSLs), both of which are used here for comparison purposes only. For some analytes, the laboratory reporting limit in the USEPA-approved QAPP is higher than the MCL or RSL. As specified in the QAPP, the RSLs are used to answer the principal study questions related to the presence and distribution of constituents of potential concern (COPCs). MCLs are also provided for information purposes as specified in the Statement of Work. The attached tables also include any relevant validation qualifiers. Section 2.5.2 includes additional discussion related to analytical data quality for the Q4 2020 sampling event.

ERM created statistical summaries and generated box and whisker plots for the validated data, which are provided in Appendix G. The statistical summaries (Appendix G) include all analytes that were detected at concentrations above the laboratory reporting limit in at least one sample and are separated by total and dissolved fractions. Box and whisker plots are provided for all analytes that were detected at concentrations above the laboratory reporting limit in at least five samples to show the Site-wide range of detected values for these analytes. For analytes with established MCLs and/or RSLs, the MCLs and RSLs are also shown on the box and whisker plots for comparison purposes only. These statistical summaries and plots are included to provide quick comparisons of analytes against one another and

against published screening values (RSLs/MCLs) when available. Additional statistical analysis of the data, as specified in Section 4.3.2 of the QAPP, will be completed when all RI data have been collected.

Approximately 350 analytes are evaluated as part of the OU-3 RI/FS; nine contaminants, listed alphabetically, were selected to show on plan view maps for alluvium and bedrock groundwater (Figures 8 through 16):

- Arsenic
- Benzene
- cis-1-2-dichloroethene
- 1,4-dioxane
- 2-methylnaphthalene
- Radium 226/228
- 1,2,4-trimethylbenzene
- Uranium
- Vinyl chloride

The short list of analytes was selected to represent visually on figures while the RI is in progress, since approximately 350 analytes are assessed as part of the RI and showing all analytes on figures would not be practical. All analytes will be carried through formal ecological and human health risk assessments after all RI data are collected.

2.5.2 Data Quality Summary

The laboratory met the reporting limits in the project QAPP with some minor exceptions. In most cases these elevated reporting limits were due to high concentrations of other target analytes and/or matrix interferences. Other variances in reporting limits for extractable methods were due to variances in initial sample volume used for extraction. In some cases, lower sample volumes resulted in reporting limits slightly higher than the QAPP reporting limits. Field teams have been instructed to fill all sample bottles completely to maximize sample volume and minimize the variability in method reporting limits. Laboratory decisions that impact the method reporting limit of a result are made on an individual per-sample, per-quarter basis to achieve the best sensitivity during every sampling event. Results between the method detection limit and the method reporting limit are reported as detected estimated (J-flagged) to provide some additional sensitivity. Non-detect radiochemistry results that did not meet the required project detection limit are identified in the validation reports and were qualified as “UJ” per Multi-Agency Radiological Laboratory Analytical Protocols guidance (USEPA 2004). We will continue to monitor laboratory reporting limits closely during all sampling events.

In accordance with the QAPP, sample results were rejected during validation if there were serious deficiencies in meeting QC criteria and the presence or absence of the analyte in the sample could not be verified. Rejected values have been flagged with an “R” qualifier and included in the summary tables. Rejected data have not been (and will not be) used to meet the objectives of the Remedial Investigation/Feasibility Study or other data interpretation purposes. A total of seven 1,4-dioxane results, 36 acetonitrile results, three cyanide results, and one isobutyl alcohol result were flagged as rejected. The rejection rate complies with the 95 percent completeness objective detailed in the QAPP. We expect to generate useable data for these compounds at these locations in future quarterly sampling events. We will continue to closely review rejected data and consider alternative analytical methods as needed if the project data quality objectives are routinely not being met.

Additional notes related to analytical data quality for the Q4 2020 sampling event are detailed below:

- As mentioned above, seven non-detected 1,4-dioxane results were rejected during validation in Q4 2020. Six of those results were rejected due to laboratory control spike recoveries of less than 30 percent in three analytical batches, and one rejection was due to a matrix spike recovery of less than 20 percent. In addition to these rejections, over 30 percent of the 1,4-dioxane results were qualified as estimated due to calibration exceedances. While Pace Indianapolis does have NELAC/TNI accreditation for 1,4-dioxane analyzed by USEPA Method 8260C for non-potable water, they previously did not report this analyte frequently enough to establish statistical limits, therefore default limits are being used until enough data has been analyzed to establish statistical limits. In 2021, we proposed changing the 1,4-dioxane analytical method to USEPA Method 8260C-SIM to achieve better analytical performance as well as a lower reporting limit closer to project RSLs. This proposed change was approved by USEPA and implemented starting with the Q3 2021 sampling event.
- None of the radiochemistry data were rejected during validation; however low activities of thorium and uranium isotopes were routinely detected in equipment, field, and filter blanks during Q4. Associated sample data was conservatively qualified as estimated with a potential high bias (J+). These qualifiers will be considered appropriately during future data assessments. If uranium and thorium continue to be detected in field blank samples during future groundwater monitoring events, ERM will assess potential sources of these detections.
- A data revision was needed for one total polychlorinated biphenyls (PCBs) result because the laboratory analyst failed to mark the total PCB result as non-detect when all individual mixtures in the sample were below the method detection limit. The error was not found until data analysis was performed in support of Tech Memo 18. While recalculations are not performed during the Stage 2B validation, the data review team has been instructed to verify that detections and non-detections for total results are consistent with the individual associated results contributing to the total value. All Q4 2020 was thoroughly reviewed and no other results were impacted.
- A data revision was needed for two total xylene results due to incorrect laboratory blank results. One laboratory blank had detections for both m,p-xylene and o-xylene, however, the corresponding total xylene result was reported as non-detect. The laboratory had previously corrected the error in the Level 4 reports, but failed to provide the corresponding updated Level 2 summary packages and EDDs to ERM, resulting in incorrect data in the ERM database and incorrect QC summary forms used for data validation. Revised data are submitted by the laboratory using auto data loading workflows that are part of ERM's standard data management practices. Each revised EDD is traceable by the EDD file name, which is required to be unique, as well as a record in the st_edd_batch table that identifies when data was submitted, who submitted the data, and the EDD file name. When manual edits are made to data in the project database, the change and the data manager who made the change is documented in a remark field.

A revision was needed for all non-radiochemistry data validation reports due to inaccurate ICV data provided by Pace for USEPA Methods 8260C and 8270C. This error was due to Pace deviating from their standard reporting procedures in order to accommodate a request by ERM to provide Contract Laboratory Program "Form 7s" with percent difference and relative response factor values for gas chromatography–mass spectrometry methods. These ICV Form 7s are not part of Pace's standard Level 4 deliverable (since the applicable USEPA methods and laboratory standard operating procedures only have percent recovery criteria). Pace did not thoroughly review the new report outputs or implement appropriate quality control checks around the new procedures. While investigating anomalies identified during validation in the 2021 Q1 data, ERM discovered that the percent difference values on the ICV Form 7s were inconsistent with the ICV percent recovery summaries and raw data provided. ERM re-evaluated the ICV data using only the standard percent recovery forms and identified missing target

compounds from these forms that were present in the inaccurate ICV Form 7s. Pace issued revised Level 4 reports to include these missing compounds (there were no changes needed to any of the data provided in the Level 2 summary data packages). Pace has since reverted to their standard reporting procedures with established quality assurance protocols to prevent future errors. No data were rejected as a result of the ICV changes.

2.6 Vapor Intrusion Investigation

On 10 December 2020, ERM completed an initial reconnaissance visit of the Engineering, Scale House, Pump House, and Pretreatment Office Buildings to evaluate building construction and material storage considerations for the vapor intrusion evaluation; reconnaissance of the Asphalt Plant Building was not conducted during December because a legal access agreement had not yet been obtained. The attached Building Inspection Report (Appendix H) provides details on the buildings surveyed, and ERM's vapor intrusion sampling plan for each building. In accordance with the RI/FS field schedule, vapor intrusion sampling will be conducted on a quarterly basis in 2021.

2.7 Off-Site Well Inventory

Feezor prepared an *Off-Site Water Supply Well Inventory Report*, which was submitted to USEPA on 16 November 2020 as Appendix A of ERM's *Well Inventory Summary Report* (ERM 2020b). Feezor's off-Site well inventory identified supply wells that were outside of the Site's property boundary, but were within the preliminary groundwater modeling domain for OU-3. Feezor searched Environmental Data Resources Radius Map Reports, and the Missouri Department of Natural Resources Well Information Management System. Feezor also evaluated local public water service and water well regulations to assess the likelihood for private supply wells in the area.

3. CONCEPTUAL SITE MODEL UPDATE

Limited data were collected in 2020; therefore, there are no significant changes to the CSM presented in the *RI/FS Work Plan*. No new monitoring wells were installed or sampled during 2020. Modifications of the CSM based on additional information received and data collected throughout 2021 are not included in this report and will be addressed in the 2021 annual report.

3.1 Geology and Hydrogeology

Based on the six monthly groundwater level monitoring events conducted in 2020 (Figures 5a–f, 6a–f, and 7a–f), groundwater generally flows from east to west in the alluvium and from upland areas in the south to the north in bedrock. In the alluvium, hydraulic gradients across the Site are quite small (less than 0.0005 ft/ft). The groundwater elevation data indicate that the orientation of the hydraulic gradient beneath the Site is generally to the west from July through September, is relatively flat in October and November, and is to the west-northwest in December. These changes in orientation of the hydraulic gradient appear to be related with seasonal changes in the Missouri River level, which appears to affect groundwater elevations, with the highest surface water and groundwater levels generally occurring in July and the lowest in January.

Landfills are characterized by the waste types, composition and depositional methods employed in their development. These variables yield a heterogeneous mass that further evolves as the wastes age, decomposition and chemical reactions advance, and the physical parameters of the landfill change. These heterogeneities are further enhanced by differences in landfill closure configuration, surface topography, and cover materials, which jointly create localized changes in hydraulic gradients, including

the formation of hydraulic mounds and depressions. The hydraulic flow regime may additionally be altered by the effectiveness of any extraction system. These localized effects are interior to the Site, and may not be locally consistent with the regional hydraulic gradient, which is to the west/northwest.

Additionally, local differences in stratigraphy (e.g., one alluvial monitoring well screened in higher permeability sand/gravel and an adjacent alluvial monitoring well screened in lower permeability material) may create apparent changes in the hydraulic gradient if monitoring wells used for contouring are not screened within the same type of material. ERM is in the process of evaluating the boring logs for all existing monitoring wells installed at the Site to evaluate potential stratigraphic variability on groundwater elevations.

As of the end of 2020, there are a number of data gaps that need to be filled, including:

- Review of stratigraphic variability in existing wells on groundwater elevations;
- Collection of surface water elevation data from water bodies that border the Site to the west, north, and east;
- Evaluation of the engineered water body west of the Site, including its operation, depth, and construction details;
- Additional temporal evaluation of regional river stage data;
- Installation of additional bedrock and alluvium monitoring wells (as of the end of 2020, the bedrock well network at the Site was limited to the area immediately surrounding the North and South Quarries of Bridgeton Landfill); and,
- Additional evaluation of pumping within Bridgeton Landfill, including the leachate collection system and other subsurface liquid extraction systems present at the Site.

Because of these data gaps, the groundwater flow direction CSM is preliminary and subject to change as additional data become available. The CSM for groundwater flow will be updated on an ongoing basis as more data are collected throughout the RI.

Preliminary interpretation of NMR data confirms that the alluvium consists primarily of coarse-grained soil with total porosity generally ranging between 20 and 40 percent in saturated intervals. Up to 20 percent clay and capillary bound porosity was observed in intervals where fine-grained soil is present. Hydraulic conductivity values in alluvium range between 10^{-1} feet per day in fine-grained intervals to 10^{3} feet per day in coarse-grained sediments.

Limestone bedrock typically exhibited lower total porosity (matrix porosity) and hydraulic conductivity than alluvium. Total porosity generally ranged from less than 5 percent to 40 percent in intervals described as being fractured, exhibiting vuggy porosity, or characterized as arenaceous limestone. In those intervals, mobile porosity generally ranged between 5 and 15 percent with the remainder being clay or capillary bound porosity. Hydraulic conductivity in bedrock ranged between 10^{-7} and 10^{-1} feet per day.

The hydraulic conductivity ranges provided above were measured by NMR logging of existing monitoring wells and calculated using both the Schlumberger-Doll Research equation (SDR) and the sum-of-echoes (SOE). The NMR tool directly measures total porosity and the distribution of mobile porosity versus capillary-bound and clay-bound porosity, and provides estimates of pore-size distribution. Based on these porosity and pore-size distribution measurements, the two industry-accepted algorithms are applied to estimate hydraulic conductivity (these algorithms are described in the tool user manual provided included with the FSP). In unconsolidated materials, the SOE algorithm is most appropriate, whereas in bedrock, the SDR is most appropriate. The NMR processing software applies both algorithms and provides a vertical profile of hydraulic conductivity for each algorithm on the NMR log generated. The measured hydraulic conductivity values over the depth of each boring are shown on the NMR logs in Appendix A

and distribution of NMR hydraulic conductivity with depth for existing wells are provided as a summary table with Appendix A.

Consistent with the existing CSM, the lower 50 to 70 feet of the St. Louis Formation and upper Salem formation, as well as the Warsaw Formation, were observed as having reduced mobile porosity and hydraulic conductivity values relative to the shallower portion of the St. Louis Formation. NMR logs are included as Appendix A.

3.2 Vertical Profiling in Groundwater

WATERLOO APS™ groundwater analytical results are generally consistent with Q4 2020 groundwater analytical data from nearby monitoring wells, where comparable data are available. Table 17b presents the analytical results from WATERLOO APS™ sampling together with Q4 2020 data from nearby monitoring wells, when available. The following monitoring wells have corresponding WATERLOO APS™ samples:

- PZ-302-AS (screened 12.2 to 22.0 feet below ground surface [bgs]) compares with APS-001 (15.0 to 15.1 and 19.0 to 19.1 feet bgs);
- PZ-302-AI (screened 32.6 to 42.4 feet bgs) compares with APS-001 (35.0 to 35.1 and 40.0 to 40.1 feet bgs);
- PZ-303-AS (screened 16 to 25.8 feet bgs) compares with APS-002 (25.0 to 25.1 feet bgs);
- PZ-304-AS (screened 17.1 to 26.9 feet bgs) compares with APS-003 (23.1 to 23.2 feet bgs);
- S-82 (screened 15.5 to 25.5 feet bgs) compares with APS-005 (23.9 to 24 feet bgs);
- I-9 (screened 43.1 to 53.1 feet bgs) compares with APS-005 (44.0 to 44.1 and 49.1 to 49.2 feet bgs); and
- D-93 (screened 92 to 112 feet bgs) compares with APS-005 (94.0 to 94.1, 99.0-99.1, 104.0-104.1, and 109.0 to 109.1 feet bgs).

Groundwater samples collected from monitoring wells represent flow-weighted averages across long (5 to 20 feet) screened intervals whereas samples collected from WATERLOO APS™ points are collected from a discrete 0.1-foot interval. Because of this difference in sample scale, results of samples collected from each type of sampler are not expected to be exactly comparable. The presence of particular analytes, however, is generally consistent between the two types of samples. In most WATERLOO APS™ samples (excepting those corresponding to monitoring well PZ-302-AI), all analytes detected above laboratory reporting limits were also detected in monitoring well samples with the following exceptions:

- Methylene chloride in APS-002 (25.0 25.1 feet bgs) was detected at 1.2 micrograms per liter (µg/L), which is just above the reporting limit of 1.0 µg/L, but was not detected in the corresponding monitoring well sample from PZ-303-AS; and
- Toluene in APS-005 (109 109.1 feet bgs) was detected at 1.1 µg/L, which is just above the reporting limit of 1.0 µg/L, but was not detected in the corresponding monitoring well sample from D-93.

The presence of these low-level analyte concentrations in discrete-interval WATERLOO APS™ samples and absence of these same analytes in corresponding monitoring well samples makes sense given that the monitoring well samples represent a flow-weighted average across a much-larger sample interval (i.e., if these analytes are only present over a short vertical interval within the alluvial aquifer, then averaging of groundwater across the entire monitoring well screen interval will result in dilution of these analytes to concentrations below the laboratory method detection limit).

In APS-001, for samples collected at depths comparable to monitoring well PZ-302-AI (APS-001 35.0 to 35.1 and 40.0 40.1 feet bgs), multiple analytes were detected in WATERLOO APS™ samples that were not detected in the monitoring well. Monitoring well PZ-302-AI is approximately 50 feet from APS-001 so these differences may be related to spatial variability in groundwater concentrations and will be further investigated during the RI. In contrast, monitoring well PZ-302-AS is only 27 feet from APS-001 and the results in the WATERLOO APS™ sample detections were similar to the monitoring well sample detections.

The high-resolution groundwater quality data collected from the WATERLOO APS™ borings along the southwestern Site boundary (APS-001 through APS-005; Figure 3) indicate the presence of low concentrations of volatile organic compounds, and variability in chloride and barium concentrations between borings and at different depths (Table 1; Appendix D). In boring APS-001 (closest to Bridgeton Landfill South Quarry), for example, chloride concentrations in deep samples (greater than 75 feet below ground surface) were two orders of magnitude greater than concentrations in shallower samples (less than 60 feet below ground surface), with increasing concentrations between 60 and 75 feet below ground surface. Barium concentrations and specific conductivity were also higher in samples with higher chloride concentrations. These parameters are potential tracers for leachate-impacted groundwater plumes that may be emanating from distinct sources at the Site. As additional WATERLOO APS™ data are collected, the existing CSM will be refined using potential leachate-impact tracers to assess flow pathways and the extent of impacts.

3.3 Groundwater Monitoring

The Q4 2020 groundwater monitoring event included only existing Site wells because no new monitoring wells were installed in 2020. Groundwater analytical results from this single sampling event do not change the CSM presented in the Work Plan. A summary of detected select contaminants in groundwater is provided below[8].

- Arsenic was detected in all alluvium monitoring wells and 32 of 35 bedrock monitoring wells (Figure 8). Concentrations were higher in the alluvium than in bedrock with the highest concentration of 257 µg/L in I-73 near the bedrock/alluvium interface west of the Bridgeton Landfill South Quarry. The highest bedrock concentration of 40.7 µg/L was measured in PZ-202-SS east of the Bridgeton Landfill South Quarry.
- Benzene is not ubiquitous in Site groundwater and was only detected in 13 of 31 and 6 of 35 samples in alluvium and bedrock groundwater, respectively. In alluvium groundwater, the highest concentration of 676 µg/L was measured in monitoring well PZ-205-AS near the alluvium/bedrock interface west of the Bridgeton Landfill South Quarry, with lower concentrations at the western Site boundary. In bedrock groundwater, the highest concentration of 319 µg/L was measured in monitoring well PZ-202-SS, east of the Bridgeton Landfill South Quarry.
- Cis-1,2-dichloroethene is not widespread in Site groundwater and was only detected in 7 of 31 alluvium samples; it was not detected in bedrock groundwater samples (Figure 10). All detected concentrations were below the RSL of 3.6 µg/L with the highest concentration of 1.4 µg/L measured in monitoring well S-10 in the northern portion of the Site.
- 1,4-dioxane is not widespread in Site groundwater and was only detected in 1 of 31 and 4 of 35 samples in alluvium and bedrock groundwater, respectively (Figure 11). The only detection in alluvium groundwater was in monitoring well I-73 near the alluvium/bedrock interface west of the Bridgeton Landfill South Quarry with a concentration of 2,230 µg/L. In bedrock groundwater, the

[8] For all contaminant plots and discussion, field duplicate (FD) samples were excluded and only the values of parent samples (N) were used.

highest concentration of 633 µg/L was measured in monitoring well PZ-103-SS, east of the Bridgeton Landfill South Quarry. The reporting limit for 1,4-dioxane was 100 µg/L for samples analyzed in 2020. A lower detection limit was used beginning in Q3 2021, which will allow additional assessment of the distribution of 1,4-dioxane in Site groundwater.

- 2-methylnaphthalene is not widespread in Site groundwater and was only detected in 6 of 31 and 1 of 35 samples in alluvium and bedrock groundwater, respectively (Figure 12). In alluvium groundwater, the highest concentration of 25.6 µg/L was measured in monitoring well PZ-303-AS along the western Site boundary. This was the only sample that exceeded the RSL of 3.6 µg/L. In bedrock groundwater, the only detection was at a concentration of 0.180 µg/L in monitoring well PZ-113-SS, on the northern boundary of Area 1.
- Radium isotopes were present in nearly all monitoring wells at the Site (Figure 13). Total radium-226/228 was detected above the laboratory reporting limit in 20 of 29 alluvium groundwater samples and in all bedrock groundwater samples. Radium activities in groundwater are generally higher in bedrock than in alluvium. The highest radium activity in alluvium groundwater was 9.30 picocuries per liter (pCi/L) measured in PZ-205-AS near the alluvium/bedrock interface west of the Bridgeton Landfill South Quarry. The highest radium activity in bedrock groundwater was 17.9 pCi/L in monitoring well PZ-111-SS near the alluvium/bedrock interface west of the Bridgeton Landfill South Quarry. Additional evaluation of radium isotopes relative to historical results is provided below.
- 1,2,4-trimethylbenzene is not widespread in Site groundwater and was only detected in 4 of 31 alluvium samples; it was not detected in bedrock groundwater samples (Figure 14). In alluvium groundwater, the highest concentration of 139 µg/L was measured in monitoring well PZ-303-AS along the western Site boundary, co-located with the observed 2-methylnaphthalene exceedance. Other wells with detectible concentrations of 1,2,4-trimethylbenzene are located along the southern portions of the Inactive Sanitary Landfill; this compound was not detected in wells on the northern portions of the Site.
- Uranium was present in nearly all monitoring wells at the Site (Figure 15). It was detected in 28 of 31 and 31 of 35 samples in alluvium and bedrock groundwater, respectively. In alluvium groundwater, the highest concentration of 10.7 µg/L was measured in monitoring well PZ-302-AI along the southwestern Site boundary. In bedrock groundwater, the highest concentration of 6.6 µg/L was measured in monitoring well PZ-111-KS, in deep bedrock west of the Bridgeton quarry.
- Vinyl chloride is not widespread in Site groundwater and was only detected in 2 of 31 alluvium samples; it was not detected in bedrock groundwater samples (Figure 16). The highest concentration of 2.50 µg/L was measured in monitoring well PZ-303-AS along the western Site boundary. This well also contained the highest 2-methylnaphthalene and 1,2-4-trimethylbenzene concentrations measured at the Site.

Radiochemistry results from monitoring well samples collected and analyzed during the Q4 2020 sampling event were consistent with the results of historical data from the same wells. The historical maximum radionuclide activities for each well, when available, together with the Q4 2020 results, are provided in Tables 5a and 5b. There are no historical radionuclide data available for monitoring wells D-89 and PZ-111-SS. Total radium-226/228 activities were not calculated for historical data. Due to differences in the handling of uncertainty and non-detect results in the historical data set, radium activities were assessed as individual isotopes for historical comparison rather than the sum of radium-226 and radium-228. Of the 63 monitoring wells sampled in Q4 2020, the radium-226 activity exceeded the historical maxima in only 17 wells. Twelve of these increases occurred in wells where the total radium-226/228 activity in Q4 2020 was below the MCL of 5 pCi/L. Only five monitoring wells (I-73, PZ-103-SS, PZ-107-SS, PZ-115-SS, and PZ-205-AS) had an increase in radium-226 activity and a total radium-226/228 activity above the MCL. Similarly, only 7 of the 63 monitoring wells sampled in Q4 2020 had

measured radium-228 activities exceeding the historical maximum for that well. Six of these wells (D-87, D-93, PZ-101-SS, PZ-107-SS, PZ-114-AS, and PZ-205-AS) also had a total radium-226/228 activity above the MCL in Q4 2020. Radium activities in all monitoring wells will be assessed over the course of the RI to determine if there are increasing trends at any locations.

Thorium-230 (the parent isotope of radium-226) and thorium-232 (the parent isotope of radium-228), activities in bedrock and alluvium are presented on Figures 17a and 17b, respectively, as they may correlate to potential radium sources. Thorium-230 is widespread in groundwater and activities are similar in alluvium and bedrock groundwater with a maximum activity of 0.562 pCi/L in alluvium (I-67) and 0.394 pCi/L in bedrock (PZ-103-SS). Thorium-232 activity is infrequently detected with only 4 alluvium groundwater and 8 bedrock groundwater samples above the laboratory's minimal reportable activity. The maximum throrium-232 activity in alluvium was 0.152 pCi/L (monitoring well D-83) and the maximum in bedrock was 0.092 pCi/L (monitoring well PZ-203-SS). Tritium activities in Site groundwater (Figure 18) vary over several orders of magnitude. The highest activities in bedrock (48,400 pCi/L in monitoring well PZ-205-AS) were located along the bedrock/alluvium interface west of the Bridgeton Landfill South Quarry with much lower activities to the west and north. In bedrock groundwater, the highest activity of 12,500 pCi/L was measured in monitoring well PZ-204-SS, south of the Bridgeton Landfill South Quarry.

Remedial investigation activities are ongoing, following the schedule outlined on Figure 8-1 of the FSP[9] and the conceptual site model will continue to be refined and updated as additional data are generated.

4. REFERENCES

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[9] ERM proposed changes to the Figure 8-1 field schedule in Technical Memos 2, 4, and 6. All schedule changes which were subsequently approved by USEPA.

TABLES

Table 1: WATERLOO APS Groundwater Analytical Results
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

Sample Location		APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-002	APS-002	APS-002	APS-002	APS-002	APS-002	APS-002	APS-002
Sample Depth (ft BGS)		15 - 15.1	19 - 19.1	25 - 25.1	30 - 30.1	35 - 35.1	40 - 40.1	45 - 45.1	50 - 50.1	55 - 55.1	60 - 60.1	65 - 65.1	70 - 70.1	75 - 75.1	80 - 80.1	85 - 85.1	87.1 - 87.2	25 - 25.1	30 - 30.1	33 - 33.1	40 - 40.1	45 - 45.1	50 - 50.1	55 - 55.1	60 - 60.1
Sample Type		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Sample Date		12-19-2020	12-19-2020	12-19-2020	12-19-2020	12-20-2020	12-20-2020	12-20-2020	12-20-2020	12-20-2020	12-20-2020	12-20-2020	12-21-2020	12-21-2020	12-21-2020	12-21-2020	12-21-2020	12-17-2020	12-17-2020	12-17-2020	12-17-2020	12-17-2020	12-17-2020	12-17-2020	12-17-2020
Analyte	**Unit**																								
Field Water Quality Parameters																									
Dissolved Oxygen, Field	ppm	**1.32**	**1.44**	**1.51**	**1.74**	**2.98**	**1.46**	**0.98**	**1.12**	**0.97**	**1.03**	**1.12**	**6.78**	**2.95**	**1.62**	**1.47**	**5**	**1.08**	**0.88**	**0.89**	**0.92**	**1.03**	**0.92**	**1.01**	**1.09**
Oxidation-Reduction Potential, Field	mV	**-88**	**-150**	**-146**	**-140**	**19**	**28**	**-91**	**-120**	**-158**	**-156**	**-144**	**-85**	**-96**	**-130**	**-148**	**-155**	**-57**	**-187**	**-205**	**-192**	**-196**	**-198**	**-199**	**-196**
pH, Field	SU	**6.01**	**6.05**	**6**	**6.12**	**6.7**	**5.91**	**6.1**	**6.17**	**6.14**	**6.09**	**5.96**	**6.22**	**5.82**	**5.9**	**5.96**	**6.23**	**6.3**	**6.42**	**6.51**	**6.41**	**6.4**	**6.35**	**6.44**	**6.4**
Specific Conductivity	uS/cm	**1,374**	**1,510**	**1,720**	**1,660**	**270**	**1,590**	**1,770**	**1,860**	**1,960**	**2,170**	**2,520**	**3,370**	**5,610**	**6,540**	**6,880**	**2,940**	**1,960**	**2,190**	**1,990**	**2,240**	**2,310**	**2,400**	**2,300**	**2,270**
Cumulative Volume Purged	ml	**600**	**700**	**800**	**700**	**600**	**900**	**900**	**700**	**800**	**900**	**900**	**900**	**900**	**1,000**	**800**	**600**	**1,000**	**1,000**	**1,000**	**1,000**	**900**	**800**	**1,200**	**800**
General Chemistry Parameters, Dissolved																									
Alkalinity, Total as CaCO3	mg/L	**572**	**593**	**764**	**864**	**753**	**793**	**830**	**814**	**948**	**942**	**933**	**1,010**	**1,020**	**987**	**1,520**	**744**	**787**	**719**	**740**	**676**	**717**	**752**	**696**	**696**
Bicarbonate Alkalinity as CaCO3	mg/L	**572**	**593**	**764**	**864**	**753**	**793**	**830**	**814**	**948**	**942**	**933**	**1,010**	**1,020**	**987**	**1,520**	**744**	**787**	**719**	**740**	**676**	**717**	**752**	**696**	**696**
Carbonate Alkalinity as CaCO3	mg/L	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Nitrate as N	mg/L	< 0.050 U	< 0.050 U	**0.44**	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U
Chloride	mg/L	**19.8**	**41.3**	**28.4**	**17.9**	**13.0**	**21.4**	**18.5**	**20.5**	**21.1**	**77.1**	**186**	**378**	**1,070**	**1,150**	**1,240**	**1,110**	**76.6**	**161**	**217**	**192**	**196**	**205**	**162**	**156**
Sulfate	mg/L	**1.1**	**0.24 J**	**2.9**	< 0.25 U	**2.8**	**0.71**	**8.3**	**14.0**	**5.0**	**23.9**	**3.7**	**0.23 J**	**0.17 J**	< 0.25 U	**0.25**	**0.27**	**0.28**	< 0.25 U	**0.32**	**37.7**	**42.4**	**42.6**	**80.4**	**84.4**
Metals, Dissolved																									
Barium	ug/L	**537**	**593**	**811**	**920**	**899**	**628**	**523**	**563**	**538**	**421**	**573**	**798**	**1,850**	**2,060**	**1,730**	**2,220**	**998**	**780**	**870**	**708**	**855**	**822**	**731**	**796**
Calcium	ug/L	**142,000**	**143,000**	**192,000**	**202,000**	**164,000**	**211,000**	**213,000**	**197,000**	**238,000**	**264,000**	**296,000**	**341,000**	**462,000**	**480,000**	**477,000**	**518,000**	**197,000**	**229,000**	**285,000**	**247,000**	**268,000**	**270,000**	**242,000**	**237,000**
Iron	ug/L	**89,900**	**57,100**	**30,700**	**5,500**	**1,030**	**35,000**	**5,920**	**65,900**	**37,000**	**17,300**	**41,200**	**47,200**	**105,000**	**118,000**	**81,500**	**64,800**	**71,300**	**60,900**	**39,200**	**43,200**	**42,600**	**31,900**	**40,800**	**35,700**
Magnesium	ug/L	**45,800**	**52,800**	**61,500**	**73,000**	**47,600**	**62,000**	**60,000**	**68,000**	**63,500**	**68,500**	**74,600**	**94,800**	**141,000**	**145,000**	**150,000**	**149,000**	**67,200**	**71,600**	**70,300**	**69,500**	**69,500**	**69,500**	**65,800**	**69,900**
Manganese	ug/L	**4,920**	**1,530**	**3,630**	**1,420**	**245**	**5,900**	**6,910**	**4,010**	**2,300**	**5,350**	**3,970**	**7,130**	**3,240**	**3,090**	**5,650**	**5,330**	**478**	**3,080**	**2,450**	**1,600**	**1,970**	**1,210**	**984**	**954**
Volatile Organic Compounds, Total																									
1,1-Dichloroethane	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.67 J**	< 1.0 U	**0.50 J**
1,1-Dichloroethene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**3.0**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	ug/L	< 25.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	**0.37 J**	< 5.0 U	**0.13 J**	**0.11 J**	< 5.0 U	< 5.0 U	< 5.0 U	**0.35 J**	**0.67 J**	**0.18 J**	< 5.0 U	**1.5 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dichlorobenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.0 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	ug/L	**1.9 J**	**1.4 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	**0.13 J**	**0.12 J**	< 5.0 U	< 5.0 U	< 5.0 U	**1.1 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,3-Dichlorobenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.3**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	ug/L	**5.9**	**3.2**	< 1.0 U	< 1.0 U	< 1.0 U	**1.0**	< 1.0 U	**11.8**	**9.8**	**0.43 J**	**0.31 J**	< 1.0 U	**3.9**	**4.8**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.27 J**	**0.69 J**	< 1.0 U
1,4-Dioxane	ug/L	< 500 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	**197**	**284**	**263**	**294**	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
2-Butanone	ug/L	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetone	ug/L	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	**5.9 J**	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acrylonitrile	ug/L	< 500 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Benzene	ug/L	**271**	**184**	**12.4**	**1.1**	**0.64 J**	**149**	**53.4**	**11.6**	**129**	**13.8**	**63.1**	**105**	**756**	**593**	**447**	**189**	**23.3**	**25.3**	**15.2**	**7.9**	**5.7**	**6.1**	< 1.0 U	**2.0**
Carbon disulfide	ug/L	< 25.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	**0.19 J**	**0.22 J**	**0.15 J**	< 5.0 U	**0.23 J**	**0.13 J**	**0.25 J**	**0.27 J**	**0.28 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	**0.26 J**	**0.29 J**	< 5.0 U
Chlorobenzene	ug/L	**70.7**	**40.8**	**172**	**0.49 J**	**142**	**297**	**326**	**173**	**296**	**56.0**	**63.9**	**9.0**	**64.2**	**59.1**	**35.6**	**6.4**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.48 J**
Chloroethane	ug/L	< 10.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Chloroform	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,2-Dichloroethene	ug/L	< 5.0 U	< 1.0 U	**0.53 J**	**1.1**	**0.47 J**	**0.37 J**	**0.97 J**	**0.72 J**	**1.7**	**1.1**	**1.2**	**0.46 J**	**0.30 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**18.1**	**23.7**	**16.6**	**9.3**	**10.6**
Cyclohexane	ug/L	< 100 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	**0.26 J,N2**	< 20.0 U,N2	**0.16 J,N2**	< 20.0 U,N2	**0.15 J,N2**	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	**4.1 J,N2**	**6.8 J,N2**	**3.9 J,N2**	**0.88 J,N2**	**1.4 J,N2**	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Ethyl ether	ug/L	**4.3 J**	**5.1 J**	**24.2**	**14.1 J**	**14.6 J**	**19.5 J**	**72.7**	**48.5**	**70.9**	**20.2**	**47.0**	**27.7**	**40.5**	**36.4**	**32.9**	**25.5**	**31.6**	**29.5**	**22.1**	**11.0 J**	**15.0 J**	**13.8 J**	**9.7 J**	**9.5 J**
Ethylbenzene	ug/L	< 5.0 U	< 1.0 U	**0.38 J**	< 1.0 U	**0.48 J**	**25.0**	**0.28 J**	**0.11 J**	**0.70 J**	< 1.0 U	**0.24 J**	< 1.0 U	**2.8**	**4.4**	**4.2**	**0.29 J**	**4.9**	**0.20 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isopropylbenzene (Cumene)	ug/L	**3.7 J**	**2.6**	**0.93 J**	< 1.0 U	< 1.0 U	**3.5**	**0.46 J**	**1.6**	**3.2**	< 1.0 U	**0.78 J**	< 1.0 U	**4.2**	**4.6**	**1.4**	< 1.0 U	**5.2**	**5.1**	**0.90 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
m,p-Xylenes	ug/L	< 10.0 U	< 2.0 U	**1.3 J**	< 2.0 U	< 2.0 U	**16.3**	**3.6**	**2.0**	**6.0**	< 2.0 U	**0.28 J**	< 2.0 U	**3.2**	**4.6**	**1.2 J**	< 2.0 U	**17.5**	**1.4 J**	**0.50 J**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Methyl tert-butyl ether	ug/L	< 20.0 U	< 4.0 U	**0.74 J**	< 4.0 U	**0.78 J**	**0.81 J**	**4.8**	**4.1**	**7.0**	**2.3 J**	**8.1**	**6.3**	**11.3**	**10.3**	**8.3**	**6.3**	**0.51 J**	**0.46 J**	**0.31 J**	**0.092 J**	**0.13 J**	**0.23 J**	< 4.0 U	< 4.0 U
Methylcyclohexane	ug/L	< 100 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	**0.65 J,N2**	**0.73 J,N2**	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
n-Butylbenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.2**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Propylbenzene	ug/L	< 5.0 U	**0.77 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.94 J**	**1.1**	**0.26 J**	< 1.0 U	**5.8**	**2.1**	**0.15 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Xylene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.31 J**	**15.7**	**0.36 J**	**0.87 J**	**0.53 J**	< 1.0 U	**0.27 J**	**0.077 J**	**9.8**	**13.5**	**2.9**	**0.19 J**	**4.1**	**0.14 J**	**0.089 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
sec-Butylbenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**2.0**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.99 J,L1**	< 1.0 U,L1	**0.19 J,L1**	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Toluene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**3.2**	**0.58 J**	**1.1**	**1.2**	**0.44 J**	**2.1**	**0.76 J**	**13.5**	**17.6**	**13.3**	**3.1**	**6.0**	**0.62 J**	**0.30 J**	**0.21 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,2-Dichloroethene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.13 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.53 J**	< 1.0 U	< 1.0 U
Trichloroethene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.26 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Vinyl chloride	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.26 J**	< 1.0 U	**0.46 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**12.6**	**9.8**	**4.7**	**1.5**	**1.3**
Xylene, Total	ug/L	< 15.0 U	**0.53 J**	**1.3 J**	< 3.0 U	**0.42 J**	**32.0**	**3.9**	**2.9 J**	**6.6**	**0.43 J**	**0.55 J**	**0.19 J**	**12.9**	**18.2**	**4.2**	**0.28 J**	**21.6**	**1.5 J**	**0.59 J**	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U

Notes:
ft BGS = feet below ground surface
ppm = parts per million
mV = millivolts
SU = standard units
uS/cm = microSiemens per centimeter
ml = milliliter
ug/L = micrograms per liter
Bold = Detected
This table shows VOCs that were detected in one or more WATERLOO APS samples.

Qualifier Definition:
D6 = The precision between the sample and sample duplicate exceeded laboratory control limits.
J = Estimated concentration.
L1 = Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
L2 = Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1 = Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6 = Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
N2 = The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply.

R1 = RPD value was outside control limits.
U = The analyte was analyzed for but was not detected at or above the referenced reporting limit.

Table 1: WATERLOO APS Groundwater Analytical Results
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

Sample Location		APS-001	APS-001	APS-002	APS-002	APS-002	APS-002	APS-002	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003
Sample Depth (ft BGS)		15 - 15.1	19 - 19.1	65 - 65.1	70 - 70.1	75 - 75.1	80 - 80.1	81 - 81.1	23.1 - 23.2	30 - 30.1	35.2 - 35.3	40 - 40.1	45 - 45.1	50 - 50.1	55 - 55.1	60 - 60.1	65 - 65.1	70 - 70.1	75 - 75.1	80 - 80.1	85 - 85.1	90 - 90.1	95 - 95.1	100 - 100.1	105 - 105.1
Sample Type		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Sample Date		12-19-2020	12-19-2020	12-17-2020	12-18-2020	12-18-2020	12-18-2020	12-18-2020	12-09-2020	12-09-2020	12-09-2020	12-14-2020	12-14-2020	12-14-2020	12-14-2020	12-14-2020	12-14-2020	12-14-2020	12-15-2020	12-15-2020	12-15-2020	12-15-2020	12-15-2020	12-15-2020	12-15-2020
Analyte	**Unit**																								
Field Water Quality Parameters																									
Dissolved Oxygen, Field	ppm	**1.32**	**1.44**	**1.49**	**1.14**	**1.92**	**1.71**	**2.29**	**0.84**	**0.48**	**2.98**	**0.93**	**1.08**	**1.14**	**1.21**	**1.23**	**2.13**	**1.31**	**1.18**	**1.31**	**1.41**	**1.32**	**3.67**	**3.09**	**1.57**
Oxidation-Reduction Potential, Field	mV	**-88**	**-150**	**-185**	**-144**	**-193**	**-192**	**-196**	**-178**	**-203**	**-190**	**-90**	**-151**	**-165**	**-175**	**-180**	**-187**	**-177**	**-68**	**-160**	**-174**	**-165**	**-170**	**-157**	**-160**
pH, Field	SU	**6.01**	**6.05**	**6.37**	**6.43**	**6.47**	**6.47**	**6.42**	**6.33**	**6.5**	**6.45**	**6.09**	**6.26**	**6.35**	**6.41**	**6.41**	**6.53**	**6.44**	**6.4**	**6.41**	**6.4**	**6.36**	**6.35**	**6.42**	**6.44**
Specific Conductivity	uS/cm	**1,374**	**1,510**	**2,150**	**2,370**	**2,160**	**2,180**	**2,000**	**3,690**	**2,980**	**2,770**	**2,550**	**2,480**	**2,600**	**2,570**	**2,690**	**2,750**	**2,810**	**2,360**	**2,310**	**2,380**	**2,270**	**2,350**	**2,270**	**2,350**
Cumulative Volume Purged	ml	**600**	**700**	**800**	**1,300**	**700**	**900**	**1,000**	**1,400**	**1,100**	**1,000**	**1,700**	**900**	**900**	**800**	**1,000**	**1,500**	**900**	**1,000**	**1,000**	**800**	**800**	**800**	**900**	**900**
General Chemistry Parameters, Dissolved																									
Alkalinity, Total as CaCO3	mg/L	**572**	**593**	**766**	**729**	**747**	**762**	**712**	**1,050**	**704**	**711**	**600**	**687**	**702**	**718**	**739**	**715**	**705**	**803**	**744**	**710**	**716**	**783**	**798**	**818**
Bicarbonate Alkalinity as CaCO3	mg/L	**572**	**593**	**766**	**729**	**747**	**762**	**712**	**1,050**	**704**	**711**	**600**	**687**	**702**	**718**	**739**	**715**	**705**	**803**	**744**	**710**	**716**	**783**	**798**	**818**
Carbonate Alkalinity as CaCO3	mg/L	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Nitrate as N	mg/L	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	**0.24**	**2.4**	**0.032 J**	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	**0.98**	< 0.050 U
Chloride	mg/L	**19.8**	**41.3**	**109**	**171**	**109**	**110**	**119**	**446**	**407**	**361**	**358**	**337**	**380**	**333**	**367**	**375**	**400**	**243**	**229**	**285**	**247**	**196**	**172**	**207**
Sulfate	mg/L	**1.1**	**0.24 J**	**69.2**	**63.0**	**96.3**	**74.1**	**70.4**	**0.20 J**	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	**0.23 J**	**4.3**	**1.1**	**0.34**	**4.3**	**5.9**	**9.3**	**0.87**	**1.4**	**5.4**	**8.4**	**3.9**
Metals, Dissolved																									
Barium	ug/L	**537**	**593**	**840**	**1,010**	**880**	**1,000**	**919**	**1,400**	**745**	**949**	**1,480**	**1,480**	**2,000**	**1,580**	**1,170**	**1,420**	**1,580**	**65.8**	**44.4**	**72.4**	**98.1**	**127**	**44.0**	**843**
Calcium	ug/L	**142,000**	**143,000**	**238,000**	**261,000**	**254,000**	**249,000**	**226,000**	**190,000**	**234,000**	**210,000**	**241,000**	**254,000**	**263,000**	**251,000**	**258,000**	**259,000**	**266,000**	**124,000**	**103,000**	**115,000**	**135,000**	**125,000**	**103,000**	**257,000**
Iron	ug/L	**89,900**	**57,100**	**37,800**	**47,100**	**37,500**	**42,100**	**43,000**	**46,800**	**51,200**	**42,100**	**30,500**	**22,700**	**22,400**	**18,200**	**19,900**	**23,200**	**24,800**	< 50.0 U	< 50.0 U	**2,930**	**1,880**	**506**	< 50.0 U	**13,500**
Magnesium	ug/L	**45,800**	**52,800**	**72,100**	**75,700**	**67,600**	**66,500**	**60,000**	**91,500**	**80,400**	**60,300**	**55,100**	**62,400**	**66,400**	**62,600**	**65,100**	**70,800**	**75,500**	**45,900**	**32,700**	**42,200**	**42,400**	**39,600**	**32,700**	**70,600**
Manganese	ug/L	**4,920**	**1,530**	**965**	**905**	**780**	**853**	**832**	**556**	**1,130**	**2,920**	**2,250**	**2,120**	**2,260**	**1,500**	**760**	**2,530**	**1,750**	**7.4**	< 5.0 U	**68.0**	**83.9**	**30.6**	< 5.0 U	**202**
Volatile Organic Compounds, Total																									
1,1-Dichloroethane	ug/L	< 5.0 U	< 1.0 U	**0.54 J**	**0.79 J**	**0.76 J**	**0.49 J**	**0.43 J**	**0.78 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.80 J**	**1.0**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	ug/L	< 25.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dichlorobenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	ug/L	**1.9 J**	**1.4 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,3-Dichlorobenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	ug/L	**5.9**	**3.2**	< 1.0 U	**0.34 J**	**0.38 J**	**0.36 J**	**0.42 J**	**1.4**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dioxane	ug/L	< 500 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	**398**	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U,L1	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U,L1
2-Butanone	ug/L	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetone	ug/L	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acrylonitrile	ug/L	< 500 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Benzene	ug/L	**271**	**184**	**3.4**	**5.9**	**1.0**	**0.45 J**	**0.37 J**	**11.2**	**4.6**	**5.2**	**1.5**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon disulfide	ug/L	< 25.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	**0.76 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Chlorobenzene	ug/L	**70.7**	**40.8**	**0.53 J**	**0.46 J**	< 1.0 U	< 1.0 U	< 1.0 U	**63.1**	**9.9**	**10.7**	**3.0**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroethane	ug/L	< 10.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	**4.6**	**3.0**	< 2.0 U	**3.3**	**5.4**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Chloroform	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,2-Dichloroethene	ug/L	< 5.0 U	< 1.0 U	**14.3**	**21.4**	**14.4**	**9.1**	**8.3**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.4**	**3.1**	**4.0**	**6.5**	**16.5**	**21.4**	**15.1**	**17.0**	**16.5**	**11.9**	**10.5**
Cyclohexane	ug/L	< 100 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	**1.9 J,N2**	**1.1 J,N2**	**1.2 J,N2**	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Ethyl ether	ug/L	**4.3 J**	**5.1 J**	**11.4 J**	**13.0 J**	**9.6 J**	**8.2 J**	**7.5 J**	**12.9 J**	**8.2 J**	**8.1 J**	**8.4 J**	**8.6 J**	**7.4 J**	**8.5 J**	**8.7 J**	**7.0 J**	**7.6 J**	**12.0 J**	**12.9 J**	**10.7 J**	**9.5 J**	**11.2 J**	**4.3 J**	**8.0 J**
Ethylbenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isopropylbenzene (Cumene)	ug/L	**3.7 J**	**2.6**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.26 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
m,p-Xylenes	ug/L	< 10.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	**0.30 J**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Methyl tert-butyl ether	ug/L	< 20.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	**0.50 J**	**0.24 J**	**0.26 J**	**0.22 J**	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U
Methylcyclohexane	ug/L	< 100 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	**0.16 J,N2**	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
n-Butylbenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Propylbenzene	ug/L	< 5.0 U	**0.77 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Xylene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.14 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
sec-Butylbenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1
Tetrachloroethene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Toluene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.20 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,2-Dichloroethene	ug/L	< 5.0 U	< 1.0 U	**0.49 J**	**0.58 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichloroethene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Vinyl chloride	ug/L	< 5.0 U	< 1.0 U	**1.8**	**5.1**	**2.6**	**1.1**	**0.97 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.3**	< 1.0 U	**2.0**	**2.3**	**2.5**	**3.1**	**6.2**	**5.9**	**2.7**	**2.3**	**4.9**	**1.7**	**2.3**
Xylene, Total	ug/L	< 15.0 U	**0.53 J**	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	**0.42 J**	< 3.0 U	< 3.0 U	**0.44 J**	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U

Notes:
ft BGS = feet below ground surface
ppm = parts per million
mV = millivolts
SU = standard units
uS/cm = microSiemens per centimeter
ml = milliliter
ug/L = micrograms per liter
Bold = Detected
This table shows VOCs that were detected in one or more WATERLOO APS samples.

Qualifier Definition:
D6 = The precision between the sample and sample duplicate exceeded laboratory control limits.
J = Estimated concentration.
L1 = Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
L2 = Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1 = Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6 = Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
N2 = The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply.

R1 = RPD value was outside control limits.
U = The analyte was analyzed for but was not detected at or above the referenced reporting limit.

Table 1: WATERLOO APS Groundwater Analytical Results
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

Sample Location		APS-001	APS-001	APS-003	APS-003	APS-003	APS-003	APS-004	APS-004	APS-004	APS-004	APS-004	APS-004	APS-004	APS-004	APS-004	APS-004	APS-004	APS-004	APS-004	APS-004	APS-004	APS-004	APS-005
Sample Depth (ft BGS)		15 - 15.1	19 - 19.1	113 - 113.1	117 - 117.1	121 - 121.1	125 - 125.1	20 - 20.1	25 - 25.1	30 - 30.1	35 - 35.1	40 - 40.1	45 - 45.1	50 - 50.1	55 - 55.1	60 - 60.1	65 - 65.1	70 - 70.1	75 - 75.1	80 - 80.1	85 - 85.1	90 - 90.1	95 - 95.1	100 - 100.1	23.9 - 24
Sample Type		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Sample Date		12-19-2020	12-19-2020	12-16-2020	12-16-2020	12-16-2020	12-16-2020	12-06-2020	12-06-2020	12-06-2020	12-06-2020	12-06-2020	12-07-2020	12-07-2020	12-07-2020	12-07-2020	12-07-2020	12-08-2020	12-08-2020	12-08-2020	12-08-2020	12-08-2020	12-09-2020	12-09-2020	12-01-2020
Analyte	**Unit**																								
Field Water Quality Parameters																									
Dissolved Oxygen, Field	ppm	**1.32**	**1.44**	**1.82**	**1.34**	**1.18**	**1.32**	**0.76**	**1.61**	**0.75**	**0.75**	**0.99**	**1.65**	**1.15**	**1.82**	**3.1**	**1.88**	**3.18**	**1.68**	**1.88**	**3.16**	**2.41**	**2.5**	**2.5**	**1.15**
Oxidation-Reduction Potential, Field	mV	**-88**	**-150**	**22**	**-100**	**-168**	**-170**	**-210**	**-186**	**-187**	**-197**	**-183**	**1**	**-177**	**0**	**0**	**-152**	**5**	**-105**	**-146**	**-126**	**-107**	**26**	**-61**	**-158**
pH, Field	SU	**6.01**	**6.05**	**6.46**	**6.45**	**6.53**	**6.45**	**6.86**	**6.71**	**6.67**	**6.64**	**6.62**	**6.67**	**6.52**	**6.84**	**6.89**	**6.46**	**6.89**	**6.5**	**6.46**	**6.43**	**6.52**	**6.6**	**6.48**	**6.27**
Specific Conductivity	uS/cm	**1,374**	**1,510**	**2,380**	**2,980**	**3,450**	**3,780**	**3,980**	**4,220**	**4,510**	**4,100**	**3,850**	**1,850**	**3,060**	**1,520**	**1,088**	**2,430**	**657**	**2,550**	**2,820**	**1,451**	**2,270**	**1,720**	**2,420**	**1,421**
Cumulative Volume Purged	ml	**600**	**700**	**500**	**1,000**	**1,000**	**1,000**	**1,500**	**700**	**1,000**	**1,000**	**900**	**800**	**1,200**	**100**	**100**	**700**	**500**	**600**	**600**	**500**	**500**	**550**	**500**	**800**
General Chemistry Parameters, Dissolved																									
Alkalinity, Total as CaCO3	mg/L	**572**	**593**	**982**	**958**	**1,060**	**1,160**	**1,430**	**1,550**	**1,620**	**1,350**	**1,160**	**843**	**908**	**892**	**855**	**831**	**833**	**873**	**925**	**971**	**1,010**	**982**	**1,080**	**779**
Bicarbonate Alkalinity as CaCO3	mg/L	**572**	**593**	**982**	**958**	**1,060**	**1,160**	**1,430**	**1,550**	**1,620**	**1,350**	**1,160**	**843**	**908**	**892**	**855**	**831**	**833**	**873**	**925**	**971**	**1,010**	**982**	**1,080**	**779**
Carbonate Alkalinity as CaCO3	mg/L	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Nitrate as N	mg/L	< 0.050 U	< 0.050 U	< 0.050 U	**0.24**	< 0.050 U	< 0.050 U	**0.058**	< 0.050 U	< 0.050 U	**0.93**	< 0.050 U	< 0.050 U	**0.034 J**	**0.063**	< 0.050 U	< 0.050 U	**0.042 J**	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	**0.077**	< 0.050 U	**0.048 J**
Chloride	mg/L	**19.8**	**41.3**	**362**	**342**	**430**	**520**	**254**	**265**	**275**	**393**	**463**	**328**	**368**	**242**	**233**	**245**	**247**	**289**	**342**	**421**	**381**	**407**	**467**	**7.1**
Sulfate	mg/L	**1.1**	**0.24 J**	**2.0**	**0.79**	**0.30**	**0.22 J**	**47.0**	**21.3**	**20.0**	**59.1**	**96.2**	**6.9**	**2.8**	**10.8**	**17.9**	**15.8**	**14.5**	**1.6**	**2.4**	**0.72**	**0.48**	**0.77**	**0.35**	**31.0**
Metals, Dissolved																									
Barium	ug/L	**537**	**593**	**1,590**	**1,310**	**1,650**	**1,900**	**856**	**535**	**757**	**1,930**	**2,670**	**1,250**	**1,020**	**677**	**532**	**559**	**757**	**1,070**	**1,250**	**1,640**	**1,660**	**1,370**	**1,930**	**347**
Calcium	ug/L	**142,000**	**143,000**	**289,000**	**292,000**	**304,000**	**329,000**	**109,000**	**74,100**	**70,300**	**197,000**	**334,000**	**244,000**	**316,000**	**306,000**	**297,000**	**281,000**	**276,000**	**279,000**	**287,000**	**276,000**	**282,000**	**275,000**	**287,000**	**191,000**
Iron	ug/L	**89,900**	**57,100**	**15,300**	**12,800**	**13,300**	**18,000**	**22,600**	**12,400**	**9,860**	**25,000**	**23,500**	**9,830**	**24,700**	**23,200**	**22,700**	**20,100**	**15,800**	**9,150**	**16,200**	**10,700**	**11,900**	**11,700**	**11,500**	**17,700**
Magnesium	ug/L	**45,800**	**52,800**	**77,100**	**75,600**	**80,500**	**88,200**	**91,100**	**91,800**	**94,600**	**92,300**	**85,800**	**79,100**	**76,500**	**72,300**	**72,400**	**70,800**	**71,200**	**76,400**	**79,000**	**76,200**	**77,800**	**73,600**	**82,100**	**70,200**
Manganese	ug/L	**4,920**	**1,530**	**380**	**232**	**278**	**460**	**373**	**105**	**158**	**933**	**960**	**874**	**462**	**601**	**462**	**331**	**554**	**201**	**300**	**269**	**256**	**378**	**377**	**4,950**
Volatile Organic Compounds, Total																									
1,1-Dichloroethane	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.87 J**	**1.2**	**2.1**	**1.2**	< 1.0 U	**0.71 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	ug/L	< 25.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dichlorobenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	ug/L	**1.9 J**	**1.4 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,3-Dichlorobenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	ug/L	**5.9**	**3.2**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**3.0**	**4.0**	< 1.0 U	**3.7**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dioxane	ug/L	< 500 U	< 100 U	< 100 U,L1	< 100 U,L1	< 100 U,L1	< 100 U,L1	< 100 U	< 100 U,L2	< 100 U,L2	< 100 U,L2	< 100 U,L2	< 100 U,L2	< 100 U,L2	< 100 U,L2	< 100 U,L2	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	**75.5 J**	< 100 U	< 100 U	< 100 U
2-Butanone	ug/L	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	**2.6 J**	< 20.0 U	< 20.0 U
Acetone	ug/L	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	**6.8 J**	< 20.0 U	< 20.0 U
Acrylonitrile	ug/L	< 500 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Benzene	ug/L	**271**	**184**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**3.6**	**4.0**	**6.1**	**5.4**	**5.6**	< 1.0 U	< 1.0 U	< 1.0 U	**0.41 J**	**0.46 J**	**0.40 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon disulfide	ug/L	< 25.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	**0.68 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Chlorobenzene	ug/L	**70.7**	**40.8**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**43.6**	**55.8**	**138**	**126**	**124**	**24.4**	**30.5**	**31.5**	**13.3**	**5.5**	**3.5**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroethane	ug/L	< 10.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Chloroform	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,2-Dichloroethene	ug/L	< 5.0 U	< 1.0 U	**5.2**	**2.3**	**5.2**	**0.64 J**	**1.4**	**1.5**	**2.3**	**1.5**	**1.8**	**3.5**	**7.0**	**12.2**	**16.7**	**34.1**	**27.4**	**8.7**	**18.6**	**4.8**	**5.1**	**8.6**	**2.9**	**1.7**
Cyclohexane	ug/L	< 100 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Ethyl ether	ug/L	**4.3 J**	**5.1 J**	**10.4 J**	**9.5 J**	**13.4 J**	**12.7 J**	**12.2 J**	**13.5 J**	**15.7 J**	**15.3 J**	**14.7 J**	**9.6 J**	**11.9 J**	**10.4 J**	**9.2 J**	**10.1 J**	**8.5 J**	**8.9 J**	**9.7 J**	**13.3 J**	**10.4 J**	**10.6 J**	**15.1 J**	**5.2 J**
Ethylbenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isopropylbenzene (Cumene)	ug/L	**3.7 J**	**2.6**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
m,p-Xylenes	ug/L	< 10.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	**0.50 J**	< 2.0 U	< 2.0 U
Methyl tert-butyl ether	ug/L	< 20.0 U	< 4.0 U	< 4.0 U	**0.33 J**	**0.35 J**	**0.34 J**	**0.23 J**	**0.23 J**	**0.33 J**	**0.30 J**	**0.34 J**	**0.19 J**	**0.24 J**	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	**0.24 J**	< 4.0 U	**0.29 J**	**0.30 J**	**0.29 J**	**0.37 J**	< 4.0 U
Methylcyclohexane	ug/L	< 100 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
n-Butylbenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Propylbenzene	ug/L	< 5.0 U	**0.77 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Xylene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
sec-Butylbenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Toluene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.69 J**	**0.53 J**	**0.33 J**	**0.47 J**	**0.30 J**	**0.31 J**	< 1.0 U	< 1.0 U	**4.3**	< 1.0 U	**0.47 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.59 J**	< 1.0 U	< 1.0 U
trans-1,2-Dichloroethene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichloroethene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Vinyl chloride	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.26 J**	**0.24 J**	**0.66 J**	**0.37 J**	< 1.0 U	< 1.0 U	**4.3**	**3.8**	**6.0**	**11.4**	**5.6**	**2.4**	**4.5**	**0.85 J**	**2.0**	**1.5**	**2.0**	< 1.0 U
Xylene, Total	ug/L	< 15.0 U	**0.53 J**	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	**0.66 J**	< 3.0 U	< 3.0 U

Notes:
ft BGS = feet below ground surface
ppm = parts per million
mV = millivolts
SU = standard units
uS/cm = microSiemens per centimeter
ml = milliliter
ug/L = micrograms per liter
Bold = Detected
This table shows VOCs that were detected in one or more WATERLOO APS samples.

Qualifier Definition:
D6 = The precision between the sample and sample duplicate exceeded laboratory control limits.
J = Estimated concentration.
L1 = Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
L2 = Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1 = Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6 = Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
N2 = The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply.

R1 = RPD value was outside control limits.
U = The analyte was analyzed for but was not detected at or above the referenced reporting limit.

Table 1: WATERLOO APS Groundwater Analytical Results
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

Sample Location		APS-001	APS-001	APS-005	APS-005	APS-005	APS-005	APS-005	APS-005	APS-005	APS-005	APS-005	APS-005	APS-005	APS-005	APS-005	APS-005	APS-005	APS-005	APS-005
Sample Depth (ft BGS)		15 - 15.1	19 - 19.1	29 - 29.1	34 - 34.1	39 - 39.1	44 - 44.1	49.1 - 49.2	54.1 - 54.2	58.9 - 59	64 - 64.1	69 - 69.1	73.9 - 74	79 - 79.1	83.9 - 84	89 - 89.1	94 - 94.1	99 - 99.1	104 - 104.1	109 - 109.1	114.5 - 114.6
Sample Type		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Sample Date		12-19-2020	12-19-2020	12-01-2020	12-03-2020	12-03-2020	12-03-2020	12-03-2020	12-03-2020	12-04-2020	12-04-2020	12-04-2020	12-04-2020	12-04-2020	12-05-2020	12-05-2020	12-05-2020	12-05-2020	12-05-2020	12-05-2020	12-06-2020
Analyte	**Unit**																				
Field Water Quality Parameters																					
Dissolved Oxygen, Field	ppm	**1.32**	**1.44**	**1.16**	**1.35**	**0.87**	**0.81**	**0.83**	**0.82**	**1.05**	**0.76**	**1.03**	**1.03**	**1.59**	**1.38**	**1.18**	**0.69**	**2.39**	**1.36**	**4.72**	**1.04**
Oxidation-Reduction Potential, Field	mV	**-88**	**-150**	**-140**	**-48**	**-199**	**-200**	**-196**	**-195**	**-198**	**-210**	**-196**	**-191**	**-188**	**-117**	**-189**	**-203**	**-166**	**-180**	**-152**	**-128**
pH, Field	SU	**6.01**	**6.05**	**6.12**	**6.23**	**6.44**	**6.45**	**6.46**	**6.46**	**6.51**	**6.56**	**6.48**	**6.52**	**6.46**	**6.55**	**6.49**	**6.58**	**6.55**	**6.59**	**6.56**	**6.62**
Specific Conductivity	uS/cm	**1,374**	**1,510**	**2,570**	**2,210**	**3,600**	**3,680**	**3,720**	**3,410**	**3,340**	**3,420**	**3,360**	**3,410**	**3,430**	**1,930**	**3,150**	**2,860**	**2,860**	**2,640**	**2,840**	**2,470**
Cumulative Volume Purged	ml	**600**	**700**	**600**	**600**	**1,000**	**1,000**	**1,000**	**1,000**	**800**	**800**	**800**	**800**	**700**	**1,000**	**1,200**	**1,400**	**1,000**	**1,000**	**900**	**1,500**
General Chemistry Parameters, Dissolved																					
Alkalinity, Total as CaCO3	mg/L	**572**	**593**	**846**	**966**	**1,020**	**1,010**	**1,050**	**1,080**	**1,090**	**1,090**	**1,000**	**964**	**983**	**785**	**896**	**763**	**926**	**859**	**983**	**911**
Bicarbonate Alkalinity as CaCO3	mg/L	**572**	**593**	**846**	**966**	**1,020**	**1,010**	**1,050**	**1,080**	**1,090**	**1,090**	**1,000**	**964**	**983**	**785**	**896**	**763**	**926**	**859**	**983**	**911**
Carbonate Alkalinity as CaCO3	mg/L	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Nitrate as N	mg/L	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	**0.095**	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	**0.048 J**	**0.15**
Chloride	mg/L	**19.8**	**41.3**	**310**	**522 M6,R1**	**462**	**474**	**512**	**375**	**345**	**367**	**400**	**452**	**422**	**297**	**373**	**303**	**306**	**283**	**374**	**326**
Sulfate	mg/L	**1.1**	**0.24 J**	**10.6**	**0.41**	**0.21 J**	**0.28**	**0.25 J**	**0.32**	< 0.25 U	< 0.25 U	< 0.25 U	**0.28**	< 0.25 U	**0.88**	**0.31**	**0.32**	**0.27**	**0.25**	**0.31**	**1.3**
Metals, Dissolved																					
Barium	ug/L	**537**	**593**	**581**	**1,090**	**1,600**	**1,470**	**1,940**	**2,280**	**2,010**	**2,040**	**1,860**	**1,820**	**1,900**	**1,550**	**1,900**	**2,090**	**2,080**	**1,880**	**2,300**	**2,020**
Calcium	ug/L	**142,000**	**143,000**	**271,000**	**295,000**	**326,000**	**311,000**	**321,000**	**263,000**	**255,000**	**265,000**	**284,000**	**290,000**	**295,000**	**227,000**	**261,000**	**230,000**	**237,000**	**229,000**	**244,000**	**226,000**
Iron	ug/L	**89,900**	**57,100**	**12,200**	**24,100**	**25,400**	**30,700**	**28,700**	**29,700**	**23,000**	**26,800**	**27,600**	**29,100**	**33,300**	**14,300**	**21,100**	**19,200**	**15,800**	**18,300**	**17,800**	**10,600**
Magnesium	ug/L	**45,800**	**52,800**	**90,800**	**92,900**	**87,800**	**84,600**	**87,800**	**73,200**	**70,400**	**71,100**	**76,900**	**78,000**	**74,900**	**58,700**	**70,800**	**66,200**	**68,200**	**65,600**	**70,100**	**65,100**
Manganese	ug/L	**4,920**	**1,530**	**4,450**	**2,690**	**1,880**	**1,140**	**958**	**639**	**484**	**532**	**588**	**641**	**760**	**483**	**305**	**223**	**221**	**263**	**288**	**256**
Volatile Organic Compounds, Total																					
1,1-Dichloroethane	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.3**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	ug/L	< 25.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dichlorobenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	ug/L	**1.9 J**	**1.4 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,3-Dichlorobenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	ug/L	**5.9**	**3.2**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dioxane	ug/L	< 500 U	< 100 U	< 100 U	< 100 U,L2,M0	< 100 U,L2	< 100 U,L2	< 100 U,L2	**198 D6,M1**	**217**	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U,L2	< 100 U,L2	< 100 U,L2	< 100 U,L2	< 100 U,L2	< 100 U,L2
2-Butanone	ug/L	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetone	ug/L	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acrylonitrile	ug/L	< 500 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Benzene	ug/L	**271**	**184**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.37 J**	**0.29 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon disulfide	ug/L	< 25.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	**0.64 J**	**0.67 J**	< 5.0 U	**0.68 J**	**0.74 J**	< 5.0 U	< 5.0 U	**0.66 J**	**0.59 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Chlorobenzene	ug/L	**70.7**	**40.8**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.7**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroethane	ug/L	< 10.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Chloroform	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,2-Dichloroethene	ug/L	< 5.0 U	< 1.0 U	**15.8**	**0.56 J**	< 1.0 U	**0.30 J**	**0.59 J**	< 1.0 U	< 1.0 U	**0.31 J**	< 1.0 U	< 1.0 U	**0.45 J**	**2.6**	**1.8**	**0.68 J**	**0.35 J**	< 1.0 U	**0.39 J**	**0.085 J**
Cyclohexane	ug/L	< 100 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Ethyl ether	ug/L	**4.3 J**	**5.1 J**	**47.6**	**15.8 J**	**16.0 J**	**14.7 J**	**14.7 J**	**28.0 D6**	**42.9**	**40.2**	**20.2**	**15.5 J**	**14.0 J**	**11.7 J**	**14.2 J**	**14.2 J**	**14.6 J**	**14.1 J**	**16.5 J**	**13.7 J**
Ethylbenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isopropylbenzene (Cumene)	ug/L	**3.7 J**	**2.6**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
m,p-Xylenes	ug/L	< 10.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	**0.17 J**	< 2.0 U	< 2.0 U	< 2.0 U	**0.18 J**	< 2.0 U
Methyl tert-butyl ether	ug/L	< 20.0 U	< 4.0 U	**0.76 J**	**0.30 J**	**0.29 J**	**0.28 J**	**0.31 J**	**0.31 J**	**0.36 J**	**0.37 J**	**0.27 J**	**0.30 J**	**0.28 J**	< 4.0 U	**0.31 J**	**0.28 J**	**0.25 J**	**0.22 J**	**0.32 J**	**0.29 J**
Methylcyclohexane	ug/L	< 100 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
n-Butylbenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Propylbenzene	ug/L	< 5.0 U	**0.77 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Xylene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
sec-Butylbenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1
Tetrachloroethene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Toluene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.22 J**	**0.21 J**	**0.25 J**	**0.19 J**	**1.1**	**0.31 J**
trans-1,2-Dichloroethene	ug/L	< 5.0 U	< 1.0 U	**1.0**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichloroethene	ug/L	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Vinyl chloride	ug/L	< 5.0 U	< 1.0 U	**0.73 J**	< 1.0 U	< 1.0 U	< 1.0 U	**0.58 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.71 J**	**1.6**	**0.41 J**	**0.70 J**	**0.83 J**	**0.69 J**	< 1.0 U
Xylene, Total	ug/L	< 15.0 U	**0.53 J**	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	**0.17 J**	< 3.0 U	< 3.0 U	< 3.0 U	**0.18 J**	< 3.0 U

Notes:
ft BGS = feet below ground surface
ppm = parts per million
mV = millivolts
SU = standard units
uS/cm = microSiemens per centimeter
ml = milliliter
ug/L = micrograms per liter
Bold = Detected
This table shows VOCs that were detected in one or more WATERLOO APS samples.

Qualifier Definition:
D6 = The precision between the sample and sample duplicate exceeded laboratory control limits.
J = Estimated concentration.
L1 = Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
L2 = Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1 = Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6 = Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
N2 = The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply.
R1 = RPD value was outside control limits.
U = The analyte was analyzed for but was not detected at or above the referenced reporting limit.

Table 2: WATERLOO APS Quality Control Sample Analytical Results
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

Sample Location		-	-	-	-	-	-	-	APS-005	APS-004	APS-003	APS-002	APS-001
Sample Depth (ft BGS)		-	-	-	-	-	-	-	-	-	-	-	-
Sample Type		TB	TB	TB	TB	TB	TB	TB	EB	EB	EB	EB	EB
Sample Date		12-14-2020	12-15-2020	12-16-2020	12-17-2020	12-18-2020	12-19-2020	12-21-2020	12-01-2020	12-06-2020	12-09-2020	12-16-2020	12-18-2020
Analyte	**Unit**												
General Chemistry Pameters, Dissolved													
Alkalinity, Total as CaCO3	mg/L								< 2.0 U	**4.2**	**1.2 J**	< 2.0 U	< 2.0 U
Bicarbonate Alkalinity as CaCO3	mg/L								< 2.0 U	**4.2**	**1.2 J**	< 2.0 U	< 2.0 U
Carbonate Alkalinity as CaCO3	mg/L								< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Nitrate as N	mg/L								< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	**0.36**
Chloride	mg/L								< 0.25 U	**1.3**	**0.32**	< 0.25 U	< 0.25 U
Sulfate	mg/L								< 0.25 U	**0.18 J**	< 0.25 U	< 0.25 U	< 0.25 U
Metals, Dissolved													
Barium	ug/L								**0.76 J**	**1.3 J**	**4.2 J**	**2.8 J**	**0.86 J**
Calcium	ug/L								< 500 U	< 500 U	**185 J**	**226 J**	< 500 U
Iron	ug/L								< 50.0 U	< 50.0 U	< 50.0 U	< 50.0 U	< 50.0 U
Magnesium	ug/L								**39.7 J**	< 500 U	< 500 U	**98.0 J**	< 500 U
Manganese	ug/L								**0.65 J**	< 5.0 U	**1.9 J**	< 5.0 U	**1.4 J**
Volatile Organic Compounds, Total													
1,1,1,2-Tetrachloroethane	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,1-Trichloroethane	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113)	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloropropene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichlorobenzene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichloropropane	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dibromo-3-chloropropane	ug/L	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
1,2-Dichlorobenzene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloropropane	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,3-Dichlorobenzene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3-Dichloropropane	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dioxane	ug/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U,L1	< 100 U
2,2-Dichloropropane	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Butanone	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
2-Hexanone	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
4-Chlorotoluene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Isopropyltoluene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Methyl-2-pentanone	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetone	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetonitrile	ug/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Acrolein	ug/L	< 20.0 U,L1	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U,L1	< 20.0 U	< 20.0 U,L2	< 20.0 U	< 20.0 U
Acrylonitrile	ug/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Allyl chloride	ug/L	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U	< 20.0 U	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U	< 20.0 U,L1	< 20.0 U	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1
Benzene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
beta-Chloroprene	ug/L	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2,L2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2
Bromobenzene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromodichloromethane	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromoform	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U

Notes are shown on page 2

Table 2: WATERLOO APS Quality Control Sample Analytical Results
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Sample Location		-	-	-	-	-	-	-	APS-005	APS-004	APS-003	APS-002	APS-001
Sample Depth (ft BGS)		-	-	-	-	-	-	-	-	-	-	-	-
Sample Type		TB	TB	TB	TB	TB	TB	TB	EB	EB	EB	EB	EB
Sample Date		12-14-2020	12-15-2020	12-16-2020	12-17-2020	12-18-2020	12-19-2020	12-21-2020	12-01-2020	12-06-2020	12-09-2020	12-16-2020	12-18-2020
Carbon disulfide	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon tetrachloride	ug/L	< 1.0 U,L1	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.29 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobromomethane	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroethane	ug/L	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Chloroform	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.61 J**	< 1.0 U	< 1.0 U	**0.38 J**
Chloromethane	ug/L	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
cis-1,2-Dichloroethene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.62 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,3-Dichloropropene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Cyclohexane	ug/L	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Dibromochloromethane	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dibromomethane	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichlorodifluoromethane (Freon 12)	ug/L	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Ethyl ether	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Ethyl methacrylate	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Ethylbenzene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Ethylene dibromide	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Hexachlorobutadiene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isobutyl alcohol	ug/L	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2
Isopropylbenzene (Cumene)	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
m,p-Xylenes	ug/L	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Methacrylonitrile	ug/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Methyl acetate	ug/L	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Methyl iodide	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Methyl methacrylate	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl tert-butyl ether	ug/L	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U
Methylcyclohexane	ug/L	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Methylene chloride	ug/L	< 5.0 U	**3.4 J**	< 5.0 U	**1.9 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Butylbenzene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Hexane	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Propylbenzene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Chlorotoluene (2-chlorotoluene)	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Xylene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Propionitrile	ug/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
sec-Butylbenzene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Styrene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	ug/L	< 1.0 U	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U,L1	< 1.0 U
Tetrachloroethene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Toluene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,2-Dichloroethene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-Dichloropropene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,4-Dichlorobutene	ug/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Trichloroethene	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichlorofluoromethane (Freon 11)	ug/L	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Vinyl acetate	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U,L2	< 20.0 U,L2	< 20.0 U,L2	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U,L2
Vinyl chloride	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Xylene, Total	ug/L	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U

Notes:
ft BGS = feet below ground surface
mg/L = milligrams per liter
ug/L = micrograms per liter
Bold = Detected

Laboratory Qualifiers:
J = Estimated concentration.
L1 = Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
L2 = Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
N2 = The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply.
U = The analyte was analyzed for but was not detected at or above the referenced reporting limit.

Table 3: Groundwater Gauging Data
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

Well Name	Geologic Interval	Measurement Date	Top of Casing Elevation (ft amsl)	DTW (ft btoc)	Water Level (ft amsl)
D-3	Deep Alluvium	12/07/2020	467.52	36.93	430.59
D-6	Deep Alluvium	12/07/2020	447.18	16.81	430.37
D-12	Deep Alluvium	12/07/2020	479.71	49.06	430.65
D-13	Deep Alluvium	12/07/2020	469.64	39.11	430.53
D-81	Deep Alluvium	12/07/2020	450.62	19.76	430.86
D-83	Deep Alluvium	12/07/2020	448.31	17.82	430.49
D-85	Deep Alluvium	12/07/2020	456.88	26.02	430.86
D-87	Deep Alluvium	12/07/2020	464.61	33.90	430.71
D-89	Intermediate Alluvium	12/07/2020	456.82	25.97	430.85
D-93	Deep Alluvium	12/07/2020	449.60	18.14	431.46
I-9	Intermediate Alluvium	12/07/2020	450.63	20.15	430.48
I-11	Intermediate Alluvium	12/07/2020	479.57	49.17	430.40
I-62	Intermediate Alluvium	12/07/2020	445.59	15.16	430.43
I-65	Intermediate Alluvium	12/07/2020	441.49	10.91	430.58
I-66	Intermediate Alluvium	12/07/2020	441.79	10.96	430.83
I-67	Intermediate Alluvium	12/07/2020	441.63	10.87	430.76
I-68	Intermediate Alluvium	12/07/2020	450.31	19.24	431.07
I-73	Intermediate Alluvium	12/07/2020	461.61	30.98	430.63
LR-100	Leachate Riser	12/07/2020	467.69	16.07	451.62
MW-103	Shallow Alluvium	12/07/2020	438.95	8.26	430.69
MW-104	Shallow Alluvium	12/07/2020	440.66	9.79	430.87
MW-1204	Salem Formation	12/07/2020	472.45	21.34	451.11
PZ-100-SS	St Louis Formation	12/07/2020	485.54	36.10	449.44
PZ-100-SD	Salem Formation	12/07/2020	485.48	36.32	449.16
PZ-100-KS	Keokuk Formation	12/07/2020	485.37	24.05	461.32
PZ-101-SS	St Louis Formation	12/07/2020	492.77	54.96	437.81
PZ-102R-SS	St Louis Formation	12/07/2020	488.17	28.55	459.62
PZ-102-SS	St Louis Formation	12/07/2020	483.58	26.25	457.33
PZ-103-SS	St Louis Formation	12/07/2020	483.26	22.81	460.45
PZ-104-SS	St Louis Formation	12/07/2020	483.28	24.04	459.24
PZ-104-SD	Salem Formation	12/07/2020	483.19	23.90	459.29
PZ-104-KS	Keokuk Formation	12/07/2020	483.59	16.79	466.80
PZ-105-SS	St Louis Formation	12/07/2020	483.21	23.81	459.40
PZ-106-SS	St Louis Formation	12/07/2020	462.41	19.13	443.28
PZ-106-SD	Salem Formation	12/07/2020	463.10	19.74	443.36
PZ-106-KS	Keokuk Formation	12/07/2020	463.99	2.74	461.25
PZ-107-SS	St Louis Formation	12/07/2020	464.20	33.21	430.99
PZ-109-SS	St Louis Formation	12/07/2020	459.86	33.34	426.52
PZ-111-SS	St Louis Formation	12/07/2020	464.11	33.29	430.82
PZ-111-SD	Salem Formation	12/07/2020	466.05	39.83	426.22
PZ-111-KS	Keokuk Formation	12/07/2020	465.38	7.31	458.07
PZ-113-AS	Shallow Alluvium	12/07/2020	461.12	30.48	430.64
PZ-113-AD	Deep Alluvium	12/07/2020	461.22	30.52	430.70
PZ-113-SS	St Louis Formation	12/07/2020	461.57	30.64	430.93
PZ-114-AS	Shallow Alluvium	12/07/2020	451.11	19.83	431.28
PZ-115-SS	St Louis Formation	12/07/2020	451.98	17.24	434.74
PZ-116-SS	St Louis Formation	12/07/2020	472.77	50.10	422.67

Table 3: Groundwater Gauging Data
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

Well Name	Geologic Interval	Measurement Date	Top of Casing Elevation (ft amsl)	DTW (ft btoc)	Water Level (ft amsl)
PZ-200-SS	St Louis Formation	12/07/2020	485.45	24.87	460.58
PZ-201A-SS	St Louis Formation	12/07/2020	480.00	27.20	452.80
PZ-202-SS	St Louis Formation	12/07/2020	480.90	11.74	469.16
PZ-203-SS	St Louis Formation	12/07/2020	485.94	26.52	459.42
PZ-204A-SS	St Louis Formation	12/07/2020	462.24	5.03	457.21
PZ-204-SS	St Louis Formation	12/07/2020	464.51	17.83	446.68
PZ-205-AS	Shallow Alluvium	12/07/2020	464.41	33.18	431.23
PZ-205-SS	St Louis Formation	12/07/2020	464.81	33.30	431.51
PZ-206-SS	St Louis Formation	12/07/2020	463.19	32.07	431.12
PZ-207-AS	Shallow Alluvium	12/07/2020	461.95	31.23	430.72
PZ-208-SS	St Louis Formation	12/07/2020	473.91	20.71	453.20
PZ-209-SS	St Louis Formation	12/07/2020	489.25	22.90	466.35
PZ-209-SD	Salem Formation	12/07/2020	489.16	23.89	465.27
PZ-210-SS	St Louis Formation	12/07/2020	486.49	27.15	459.34
PZ-210-SD	Salem Formation	12/07/2020	486.58	27.32	459.26
PZ-211-SS	St Louis Formation	12/07/2020	487.04	26.42	460.62
PZ-211-SD	Salem Formation	12/07/2020	486.99	23.50	463.49
PZ-212-SS	St Louis Formation	12/07/2020	482.43	13.44	468.99
PZ-212-SD	Salem Formation	12/07/2020	482.27	14.35	467.92
PZ-302-AS	Shallow Alluvium	12/07/2020	451.19	20.14	431.05
PZ-302-AI	Intermediate Alluvium	12/07/2020	450.87	20.00	430.87
PZ-303-AS	Shallow Alluvium	12/07/2020	453.13	22.10	431.03
PZ-304-AS	Shallow Alluvium	12/07/2020	453.35	22.70	430.65
PZ-304-AI	Intermediate Alluvium	12/07/2020	453.67	22.96	430.71
S-5	Shallow Alluvium	12/07/2020	465.27	34.20	431.07
S-8	Shallow Alluvium	12/07/2020	443.67	13.29	430.38
S-10	Shallow Alluvium	12/07/2020	479.84	49.40	430.44
S-53	Shallow Alluvium	12/07/2020	444.08	13.05	431.03
S-82	Shallow Alluvium	12/07/2020	449.62	19.30	430.32
S-84	Shallow Alluvium	12/07/2020	456.56	25.79	430.77

Notes:
ft amsl = feet above mean sea level=
ft btoc = feet below top of casing

Table 4: Summary of Field Water Quality Parameters—Q4 2020
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

	Sample Location	D-3	D-6	D-12	D-13	D-83	D-85	D-87	D-89
	Sample Date	11-20-2020	11-12-2020	11-12-2020	11-13-2020	11-16-2020	11-30-2020	11-20-2020	12-03-2020
Analyte	**Unit**								
Field Water Quality Parameters									
Temperature	deg C	**17.2**	**17**	**17.4**	**15.3**	**15.4**	**14.1**	**16.1**	**15.3**
Dissolved Oxygen	mg/L	**0.3**	**0.34**	**0.44**	**0.41**	**0.6**	**0.15**	**1.04**	**0.56**
Specific Conductance	uS/cm	**2,553**	**1,666**	**2,098**	**1,300**	**1,065**	**2,539**	**1,892**	**3,811**
pH	SU	**6.81**	**6.97**	**6.91**	**7.01**	**7.13**	**6.88**	**6.85**	**6.61**
Oxidation Reduction Potential	mV	**-117.7**	**-106.6**	**-84.7**	**-104.7**	**-108.5**	**-103.7**	**-97.9**	**-136.3**
Turbidity	FNU	**5.35**	**4.53**	**4.14**	**1.37**	**6.65**	**20.7**	**3.38**	**4.64**

Notes:

deg C = degrees Celcius

mg/L = milligrams per liter

uS/cm = microsiemens per centimeter

SU = standard units

mV = millivolts

FNU = Formazin Nephelometric Unit

For the Q4 2020 groundwater monitoring event, turbidity for samples collected at PZ-205-AS, PZ-205-SS, I-11, D-12, D-6, S-10, D-13, I-62, D-83, S-5, D-3, D-87, S-82, D-93, I-9, I-65, PZ-115-SS, I-68, D-85, I-73, PZ-302-AS, PZ-302-AI, PZ-207-AS, PZ-202-SS, PZ-304-AS, PZ-304-AI, LR-100, PZ-107-SS, PZ-103-SS, PZ-303-AS, PZ-201A-SS, PZ-204A-SS, and PZ-204-SS were analyzed using an instrument with a tungsten filament light source and were reported in Nephelometric Turbidity Units (NTU), which is equivalent to FNU.

Table 4: Summary of Field Water Quality Parameters—Q4 2020
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

	Sample Location	D-93	I-9	I-11	I-62	I-65	I-66	I-67	I-68
	Sample Date	11-23-2020	11-23-2020	11-12-2020	11-16-2020	11-24-2020	11-05-2020	11-10-2020	11-24-2020
Analyte	**Unit**								
Field Water Quality Parameters									
Temperature	deg C	**19.1**	**19.2**	**17.4**	**15.3**	**15**	**15.5**	**16.4**	**15.2**
Dissolved Oxygen	mg/L	**0.16**	**0.17**	**0.2**	**0.24**	**0.3**	**0.13**	**0.12**	**0.21**
Specific Conductance	uS/cm	**2,511**	**3,080**	**1,652**	**787**	**1,035**	**1,512**	**1,397**	**2,149**
pH	SU	**7**	**6.95**	**6.87**	**7.24**	**7.33**	**6.69**	**6.63**	**6.92**
Oxidation Reduction Potential	mV	**-111.9**	**-129.3**	**-97.8**	**-123.2**	**81.6**	**-16.6**	**-93.8**	**63.3**
Turbidity	FNU	**4.49**	**2.69**	**4.52**	**7.17**	**2.38**	**1.3**	**16.8**	**5.66**

Notes:

deg C = degrees Celcius

mg/L = milligrams per liter

uS/cm = microsiemens per centimeter

SU = standard units

mV = millivolts

FNU = Formazin Nephelometric Unit

For the Q4 2020 groundwater monitoring event, turbidity for samples collected at PZ-205-AS, PZ-205-SS, I-11, D-12, D-6, S-10, D-13, I-62, D-83, S-5, D-3, D-87, S-82, D-93, I-9, I-65, PZ-115-SS, I-68, D-85, I-73, PZ-302-AS, PZ-302-AI, PZ-207-AS, PZ-202-SS, PZ-304-AS, PZ-304-AI, LR-100, PZ-107-SS, PZ-103-SS, PZ-303-AS, PZ-201A-SS, PZ-204A-SS, and PZ-204-SS were analyzed using an instrument with a tungsten filament light source and were reported in Nephelometric Turbidity Units (NTU), which is equivalent to FNU.

Table 4: Summary of Field Water Quality Parameters—Q4 2020
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	Sample Location	I-73	LR-100	MW-1204	PZ-100-SS	PZ-100-SD	PZ-100-KS	PZ-101-SS	PZ-102R-SS
	Sample Date	11-30-2020	12-03-2020	11-06-2020	12-01-2020	12-01-2020	12-02-2020	11-12-2020	11-06-2020
Analyte	**Unit**								
Field Water Quality Parameters									
Temperature	deg C	**14.2**	**15**	**25.3**	**15.5**	**15.6**	**15.7**	**26**	**19.9**
Dissolved Oxygen	mg/L	**0.13**	**0.12**	**0.02**	**1.32**	**1.04**	**0.85**	**1.1**	**3.25**
Specific Conductance	uS/cm	**6,259**	**2,328**	**3,189**	**751**	**532**	**1,094**	**1,646**	**819**
pH	SU	**6.7**	**6.64**	**6.46**	**6.91**	**7.15**	**7.68**	**6.67**	**6.94**
Oxidation Reduction Potential	mV	**-112.4**	**-63.4**	**-108.3**	**116.9**	**-29.1**	**-124.5**	**-36.3**	**-35.5**
Turbidity	FNU	**3.27**	**3.09**	**2**	**3.57**	**43.51**	**4.52**	**3.34**	**3.75**

Notes:

deg C = degrees Celcius

mg/L = milligrams per liter

uS/cm = microsiemens per centimeter

SU = standard units

mV = millivolts

FNU = Formazin Nephelometric Unit

For the Q4 2020 groundwater monitoring event, turbidity for samples collected at PZ-205-AS, PZ-205-SS, I-11, D-12, D-6, S-10, D-13, I-62, D-83, S-5, D-3, D-87, S-82, D-93, I-9, I-65, PZ-115-SS, I-68, D-85, I-73, PZ-302-AS, PZ-302-AI, PZ-207-AS, PZ-202-SS, PZ-304-AS, PZ-304-AI, LR-100, PZ-107-SS, PZ-103-SS, PZ-303-AS, PZ-201A-SS, PZ-204A-SS, and PZ-204-SS were analyzed using an instrument with a tungsten filament light source and were reported in Nephelometric Turbidity Units (NTU), which is equivalent to FNU.

Table 4: Summary of Field Water Quality Parameters—Q4 2020
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Sample Location / Sample Date	Unit	PZ-102-SS 11-06-2020	PZ-103-SS 12-03-2020	PZ-104-SS 11-12-2020	PZ-104-SD 11-04-2020	PZ-104-KS 12-03-2020	PZ-105-SS 11-06-2020	PZ-106-SS 11-11-2020	PZ-106-SD 11-13-2020
Analyte									
Field Water Quality Parameters									
Temperature	deg C	**17.9**	**23.6**	**22.6**	**24.3**	**22.1**	**21**	**22.6**	**23.1**
Dissolved Oxygen	mg/L	**0.7**	**0.17**	**0.9**	**0.15**	**0.57**	**0.16**	**0.52**	**0.54**
Specific Conductance	uS/cm	**764**	**3,164**	**736**	**1,478**	**849**	**1,117**	**1,370**	**914**
pH	SU	**6.91**	**6.23**	**6.93**	**7.04**	**7.14**	**6.91**	**6.59**	**6.96**
Oxidation Reduction Potential	mV	**-88.6**	**-47.3**	**-51.8**	**-120.2**	**-125.9**	**-32.1**	**-61.8**	**-75.9**
Turbidity	FNU	**46.1**	**3**	**6.73**	**3.1**	**6.19**	**2.5**	**6.09**	**18.36**

Notes:

deg C = degrees Celcius

mg/L = milligrams per liter

uS/cm = microsiemens per centimeter

SU = standard units

mV = millivolts

FNU = Formazin Nephelometric Unit

For the Q4 2020 groundwater monitoring event, turbidity for samples collected at PZ-205-AS, PZ-205-SS, I-11, D-12, D-6, S-10, D-13, I-62, D-83, S-5, D-3, D-87, S-82, D-93, I-9, I-65, PZ-115-SS, I-68, D-85, I-73, PZ-302-AS, PZ-302-AI, PZ-207-AS, PZ-202-SS, PZ-304-AS, PZ-304-AI, LR-100, PZ-107-SS, PZ-103-SS, PZ-303-AS, PZ-201A-SS, PZ-204A-SS, and PZ-204-SS were analyzed using an instrument with a tungsten filament light source and were reported in Nephelometric Turbidity Units (NTU), which is equivalent to FNU.

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Sample Location / Sample Date		PZ-106-KS 11-13-2020	PZ-107-SS 12-03-2020	PZ-109-SS 11-10-2020	PZ-111-SS 11-09-2020	PZ-111-SD 11-09-2020	PZ-111-KS 11-09-2020	PZ-113-AS 11-04-2020	PZ-113-AD 11-05-2020
Analyte	**Unit**								
Field Water Quality Parameters									
Temperature	deg C	**22.3**	**17.5**	**21.4**	**17.3**	**19.8**	**18.5**	**17.8**	**17.7**
Dissolved Oxygen	mg/L	**0.51**	**0.28**	**1.74**	**0.2**	**1.35**	**0.3**	**0.53**	**0.59**
Specific Conductance	uS/cm	**728**	**2,961**	**800**	**2,688**	**824**	**1,607**	**1,309**	**2,095**
pH	SU	**7.26**	**6.59**	**6.86**	**6.38**	**6.97**	**7.98**	**6.6**	**6.85**
Oxidation Reduction Potential	mV	**-118.6**	**-61.2**	**7.7**	**-54**	**-97.8**	**-199.8**	**-81.4**	**-132.1**
Turbidity	FNU	**7.26**	**1.62**	**7.3**	**8.2**	**5**	**2.7**	**-3.38**	**4.51**

Notes:

deg C = degrees Celcius

mg/L = milligrams per liter

uS/cm = microsiemens per centimeter

SU = standard units

mV = millivolts

FNU = Formazin Nephelometric Unit

For the Q4 2020 groundwater monitoring event, turbidity for samples collected at PZ-205-AS, PZ-205-SS, I-11, D-12, D-6, S-10, D-13, I-62, D-83, S-5, D-3, D-87, S-82, D-93, I-9, I-65, PZ-115-SS, I-68, D-85, I-73, PZ-302-AS, PZ-302-AI, PZ-207-AS, PZ-202-SS, PZ-304-AS, PZ-304-AI, LR-100, PZ-107-SS, PZ-103-SS, PZ-303-AS, PZ-201A-SS, PZ-204A-SS, and PZ-204-SS were analyzed using an instrument with a tungsten filament light source and were reported in Nephelometric Turbidity Units (NTU), which is equivalent to FNU.

Table 4: Summary of Field Water Quality Parameters—Q4 2020
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Sample Location / Sample Date		PZ-113-SS 11-05-2020	PZ-114-AS 11-11-2020	PZ-115-SS 11-24-2020	PZ-116-SS 12-04-2020	PZ-200-SS 12-02-2020	PZ-201A-SS 12-04-2020	PZ-202-SS 12-02-2020	PZ-203-SS 11-16-2020
Analyte	**Unit**								
Field Water Quality Parameters									
Temperature	deg C	**18.5**	**15.5**	**15**	**23.7**	**16.6**	**15.9**	**15.2**	**15.6**
Dissolved Oxygen	mg/L	**0.81**	**0.64**	**0.18**	**0.96**	**0.68**	**2.54**	**0.1**	**0.8**
Specific Conductance	uS/cm	**521**	**2,430**	**2,667**	**580**	**2,356**	**779**	**5,488**	**761**
pH	SU	**7.38**	**6.38**	**6.61**	**7.34**	**6.44**	**7.07**	**6.39**	**7.05**
Oxidation Reduction Potential	mV	**-72.2**	**-129.1**	**-20.6**	**-81.1**	**-26.5**	**110.8**	**-60.4**	**-90.4**
Turbidity	FNU	**3.69**	**1.5**	**1.42**	**6.27**	**6.28**	**1.93**	**3.72**	**3.46**

Notes:

deg C = degrees Celcius

mg/L = milligrams per liter

uS/cm = microsiemens per centimeter

SU = standard units

mV = millivolts

FNU = Formazin Nephelometric Unit

For the Q4 2020 groundwater monitoring event, turbidity for samples collected at PZ-205-AS, PZ-205-SS, I-11, D-12, D-6, S-10, D-13, I-62, D-83, S-5, D-3, D-87, S-82, D-93, I-9, I-65, PZ-115-SS, I-68, D-85, I-73, PZ-302-AS, PZ-302-AI, PZ-207-AS, PZ-202-SS, PZ-304-AS, PZ-304-AI, LR-100, PZ-107-SS, PZ-103-SS, PZ-303-AS, PZ-201A-SS, PZ-204A-SS, and PZ-204-SS were analyzed using an instrument with a tungsten filament light source and were reported in Nephelometric Turbidity Units (NTU), which is equivalent to FNU.

Table 4: Summary of Field Water Quality Parameters—Q4 2020
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Sample Location / Sample Date		PZ-204A-SS 12-04-2020	PZ-204-SS 12-04-2020	PZ-205-AS 11-11-2020	PZ-205-SS 11-11-2020	PZ-206-SS 11-10-2020	PZ-207-AS 12-01-2020	PZ-209-SS 11-04-2020	PZ-210-SS 11-03-2020
Analyte	**Unit**								
Field Water Quality Parameters									
Temperature	deg C	**16.2**	**16.1**	**17.9**	**20.4**	**19.4**	**15.5**	**14.5**	**17.8**
Dissolved Oxygen	mg/L	**0.1**	**0.21**	**0.43**	**2.98**	**0.57**	**0.07**	**0.15**	**0.55**
Specific Conductance	uS/cm	**3,865**	**771**	**7,683**	**943**	**1,196**	**2,902**	**667**	**858**
pH	SU	**6.48**	**7.2**	**6.49**	**7.06**	**6.83**	**6.41**	**7.18**	**7.08**
Oxidation Reduction Potential	mV	**-52.7**	**-29.2**	**-83.9**	**53.9**	**-52.6**	**-66.2**	**-81.2**	**-140.5**
Turbidity	FNU	**4.76**	**1.97**	**8.52**	**6.05**	**9.4**	**1.39**	**8.5**	**0.86**

Notes:

deg C = degrees Celcius

mg/L = milligrams per liter

uS/cm = microsiemens per centimeter

SU = standard units

mV = millivolts

FNU = Formazin Nephelometric Unit

For the Q4 2020 groundwater monitoring event, turbidity for samples collected at PZ-205-AS, PZ-205-SS, I-11, D-12, D-6, S-10, D-13, I-62, D-83, S-5, D-3, D-87, S-82, D-93, I-9, I-65, PZ-115-SS, I-68, D-85, I-73, PZ-302-AS, PZ-302-AI, PZ-207-AS, PZ-202-SS, PZ-304-AS, PZ-304-AI, LR-100, PZ-107-SS, PZ-103-SS, PZ-303-AS, PZ-201A-SS, PZ-204A-SS, and PZ-204-SS were analyzed using an instrument with a tungsten filament light source and were reported in Nephelometric Turbidity Units (NTU), which is equivalent to FNU.

Table 4: Summary of Field Water Quality Parameters—Q4 2020
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Sample Location / Sample Date		PZ-211-SS 12-04-2020	PZ-211-SD 11-03-2020	PZ-211-SD 11-05-2020	PZ-302-AS 11-30-2020	PZ-302-AI 12-01-2020	PZ-303-AS 12-04-2020	PZ-304-AS 12-02-2020	PZ-304-AI 12-02-2020
Analyte	**Unit**								
Field Water Quality Parameters									
Temperature	deg C	**14.6**	**15.4**	**15.1**	**13.9**	**14.3**	**15.5**	**16.1**	**165**
Dissolved Oxygen	mg/L	**1.11**	**4.67**	**7.39**	**0.15**	**0.24**	**0.09**	**0.1**	**0.33**
Specific Conductance	uS/cm	**592**	**862**	**874**	**1,455**	**1,561**	**1,847**	**3,299**	**2,490**
pH	SU	**7.25**	**7.09**	**7.04**	**6.42**	**6.38**	**6.59**	**6.63**	**6.75**
Oxidation Reduction Potential	mV	**-65.1**	**110.3**	**162.9**	**-81.8**	**-3.2**	**-98.3**	**-105.1**	**-83.1**
Turbidity	FNU	**2.68**	**1.5**	**3**	**47.7**	**2.04**	**9.36**	**3.41**	**5.06**

Notes:

deg C = degrees Celcius

mg/L = milligrams per liter

uS/cm = microsiemens per centimeter

SU = standard units

mV = millivolts

FNU = Formazin Nephelometric Unit

For the Q4 2020 groundwater monitoring event, turbidity for samples collected at PZ-205-AS, PZ-205-SS, I-11, D-12, D-6, S-10, D-13, I-62, D-83, S-5, D-3, D-87, S-82, D-93, I-9, I-65, PZ-115-SS, I-68, D-85, I-73, PZ-302-AS, PZ-302-AI, PZ-207-AS, PZ-202-SS, PZ-304-AS, PZ-304-AI, LR-100, PZ-107-SS, PZ-103-SS, PZ-303-AS, PZ-201A-SS, PZ-204A-SS, and PZ-204-SS were analyzed using an instrument with a tungsten filament light source and were reported in Nephelometric Turbidity Units (NTU), which is equivalent to FNU.

Table 4: Summary of Field Water Quality Parameters—Q4 2020
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	Sample Location	S-5	S-10	S-82	S-84
	Sample Date	11-20-2020	11-13-2020	11-23-2020	11-10-2020
Analyte	**Unit**				
Field Water Quality Parameters					
Temperature	deg C	**17**	**16.7**	**18.5**	**16**
Dissolved Oxygen	mg/L	**0.15**	**0.1**	**0.14**	**0.12**
Specific Conductance	uS/cm	**4,937**	**3,540**	**2,836**	**1,178**
pH	SU	**6.9**	**6.52**	**6.97**	**6.67**
Oxidation Reduction Potential	mV	**-140.2**	**-113.3**	**-134.5**	**-131.2**
Turbidity	FNU	**2.5**	**3.86**	**3.96**	**8.2**

Notes:

deg C = degrees Celcius

mg/L = milligrams per liter

uS/cm = microsiemens per centimeter

SU = standard units

mV = millivolts

FNU = Formazin Nephelometric Unit

For the Q4 2020 groundwater monitoring event, turbidity for samples collected at PZ-205-AS, PZ-205-SS, I-11, D-12, D-6, S-10, D-13, I-62, D-83, S-5, D-3, D-87, S-82, D-93, I-9, I-65, PZ-115-SS, I-68, D-85, I-73, PZ-302-AS, PZ-302-AI, PZ-207-AS, PZ-202-SS, PZ-304-AS, PZ-304-AI, LR-100, PZ-107-SS, PZ-103-SS, PZ-303-AS, PZ-201A-SS, PZ-204A-SS, and PZ-204-SS were analyzed using an instrument with a tungsten filament light source and were reported in Nephelometric Turbidity Units (NTU), which is equivalent to FNU.

Table 5a: 2020 Validated Radiochemistry Results
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		Sample Location	D-3	D-6	D-12	D-13	D-83	D-85
		Sample Depth (ft BGS)	96.5 - 106.5	96.5 - 106.5	133.7 - 143.7	123 - 133	77 - 97	62 - 82
		Sample Type	N	N	N	N	N	N
		Sample Date	11-20-2020	11-12-2020	11-12-2020	11-13-2020	11-16-2020	11-30-2020
Analyte	Unit	USEPA Primary MCL						
Radiochemistry, Dissolved								
Radium-226	pCi/L	5	**1.94 ± 0.730 (0.596)**	**2.75 ± 0.880 (0.449)**	**0.598 ± 0.377 (0.162)**	0.0765 ± 0.450 (0.919) U	**2.22 ± 1.01 (1.03)**	0.605 ± 0.579 (0.881) U
Radium-228	pCi/L	5	**5.65 ± 1.29 (0.910)**	**4.34 ± 1.05 (0.899)**	**2.45 ± 0.899 (1.33)**	**1.31 ± 0.561 (0.918)**	**1.85 ± 0.594 (0.802)**	0.754 ± 0.472 (0.893) U
Radium-226/228	pCi/L	5	**7.59 ± 2.02 (1.51)**	**7.09 ± 1.93 (1.35)**	**3.05 ± 1.28 (1.49)**	1.39 ± 1.01 (1.84) U	**4.07 ± 1.60 (1.83)**	1.36 ± 1.05 (1.77) U
Thorium-228	pCi/L	15	0.038 ± 0.113 (0.253) U	0.060 ± 0.139 (0.302) U	0.011 ± 0.089 (0.212) U	**0.219 ± 0.143 (0.215)**	0.058 ± 0.112 (0.236) U	-0.011 ± 0.100 (0.266) U
Thorium-230	pCi/L	15	**0.246 ± 0.139 (0.138)**	0.006 ± 0.077 (0.136) U	0 ± 0.052 (0.037) U	**0.193 ± 0.106 (0.094)**	**0.233 ± 0.128 (0.117)**	**0.220 ± 0.134 (0.054)**
Thorium-232	pCi/L	15	0.096 ± 0.086 (0.112) U	-0.022 ± 0.077 (0.155) U	0 ± 0.052 (0.037) U	0.013 ± 0.051 (0.094) U	**0.087 ± 0.073 (0.042)**	-0.007 ± 0.074 (0.109) U
Uranium-234	pCi/L	NE	**0.212 ± 0.126 (0.132) J+**	**0.508 ± 0.233 (0.175) J+**	**0.563 ± 0.215 (0.117) J+**	**0.370 ± 0.157 (0.121) J+**	0.093 ± 0.087 (0.132) U	**0.231 ± 0.123 (0.110) J+**
Uranium-235	pCi/L	NE	**0.222 ± 0.140 (0.115) J+**	**0.292 ± 0.194 (0.166) J+**	**0.300 ± 0.169 (0.062) J+**	**0.145 ± 0.105 (0.082) J+**	0.094 ± 0.091 (0.120) U	**0.104 ± 0.092 (0.104) J+**
Uranium-238	pCi/L	NE	**0.138 ± 0.097 (0.088)**	**0.304 ± 0.178 (0.165)**	**0.247 ± 0.135 (0.048)**	**0.254 ± 0.128 (0.107)**	0.071 ± 0.070 (0.098) U	0.042 ± 0.060 (0.110) U
Radiochemistry, Total								
Radium-226	pCi/L	5	**2.41 ± 0.851 (0.697) J+**	**1.33 ± 0.809 (0.952)**	0.174 ± 0.483 (0.937) U	0.511 ± 0.581 (0.917) U	**1.05 ± 0.597 (0.702) J+**	**0.777 ± 0.543 (0.656)**
Radium-228	pCi/L	5	**3.07 ± 0.863 (1.00)**	**4.36 ± 1.20 (1.45)**	1.65 ± 0.993 (1.84) U	**2.11 ± 0.806 (1.28)**	**2.27 ± 0.674 (0.824)**	**2.72 ± 0.906 (1.23)**
Radium-226/228	pCi/L	5	**5.48 ± 1.71 (1.70) J+**	**5.69 ± 2.01 (2.40)**	1.82 ± 1.48 (2.78) U	**2.62 ± 1.39 (2.20)**	**3.32 ± 1.27 (1.53) J+**	**3.50 ± 1.45 (1.89)**
Thorium-228	pCi/L	15	0.118 ± 0.137 (0.256) U	0.054 ± 0.103 (0.215) U	0.067 ± 0.124 (0.258) U	**0.226 ± 0.143 (0.214)**	0.007 ± 0.103 (0.252) U	0.119 ± 0.144 (0.277) U
Thorium-230	pCi/L	15	**0.249 ± 0.139 (0.116) J+**	-0.006 ± 0.062 (0.091) U	**0.282 ± 0.136 (0.098)**	**0.199 ± 0.105 (0.089)**	**0.254 ± 0.134 (0.046)**	**0.427 ± 0.173 (0.085) J+**
Thorium-232	pCi/L	15	0.083 ± 0.083 (0.116) U	-0.006 ± 0.062 (0.091) U	0.009 ± 0.055 (0.081) U	0.025 ± 0.048 (0.033) U	**0.152 ± 0.102 (0.046)**	0.056 ± 0.062 (0.085) U
Uranium-234	pCi/L	NE	**0.147 ± 0.097 (0.095) J+**	**0.347 ± 0.177 (0.115)**	**0.447 ± 0.172 (0.095)**	**0.300 ± 0.144 (0.131)**	**0.151 ± 0.096 (0.041)**	**0.713 ± 0.229 (0.041) J+**
Uranium-235	pCi/L	NE	0.073 ± 0.086 (0.141) U	**0.212 ± 0.157 (0.150) J+**	**0.056 ± 0.071 (0.051) J+**	**0.149 ± 0.110 (0.105) J+**	**0.086 ± 0.082 (0.053) J+**	0.051 ± 0.075 (0.054) U
Uranium-238	pCi/L	NE	0.069 ± 0.066 (0.079) U	**0.355 ± 0.177 (0.057) J+**	0.047 ± 0.058 (0.095) U	**0.176 ± 0.103 (0.040) J+**	**0.045 ± 0.057 (0.041) J+**	0.105 ± 0.087 (0.114) U
Tritium	pCi/L	20000	25.1 ± 149 (260) U	**301 ± 162 (248)**	**1148 ± 246 (249)**	-50.0 ± 138 (247) U	37.9 ± 151 (262) U	-5.00 ± 144 (253) U

Table 5a: 2020 Validated Radiochemistry Results
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		Sample Location	D-87	D-89	D-93	I-9	I-11	I-62
		Sample Depth (ft BGS)	91 - 111	33 - 48	92 - 112	43.1 - 53.1	80.5 - 90.5	34 - 44
		Sample Type	N	N	N	N	N	N
		Sample Date	11-20-2020	12-03-2020	11-23-2020	11-23-2020	11-12-2020	11-16-2020
Analyte	Unit	USEPA Primary MCL						
Radiochemistry, Dissolved								
Radium-226	pCi/L	5	0.669 ± 0.519 (0.758) U	**2.34 ± 0.859 (0.682) J**	**1.65 ± 0.711 (0.774)**	**2.03 ± 0.801 (0.822)**	**0.627 ± 0.395 (0.170)**	0.174 ± 0.483 (0.938) U
Radium-228	pCi/L	5	**5.52 ± 1.23 (0.830)**	**2.66 ± 0.703 (0.674) J**	**4.43 ± 1.06 (0.803)**	**3.41 ± 0.883 (0.819)**	**2.00 ± 0.682 (0.991)**	0.461 ± 0.461 (0.956) U
Radium-226/228	pCi/L	5	**6.19 ± 1.75 (1.59)**	**5.00 ± 1.56 (1.36) J**	**6.08 ± 1.77 (1.58)**	**5.44 ± 1.68 (1.64)**	**2.63 ± 1.08 (1.16)**	0.635 ± 0.944 (1.89) U
Thorium-228	pCi/L	15	0.133 ± 0.149 (0.273) U	0.071 ± 0.115 (0.234) UJ	0.018 ± 0.099 (0.232) U	0.114 ± 0.147 (0.284) U	0.050 ± 0.116 (0.251) U	-0.039 ± 0.106 (0.257) U
Thorium-230	pCi/L	15	**0.211 ± 0.133 (0.109)**	**0.255 ± 0.144 (0.144) J**	**0.320 ± 0.150 (0.116)**	**0.417 ± 0.187 (0.148)**	**0.261 ± 0.142 (0.099)**	**0.232 ± 0.117 (0.113)**
Thorium-232	pCi/L	15	0.031 ± 0.075 (0.163) U	**0.049 ± 0.066 (0.047) J**	0.031 ± 0.058 (0.042) U	**0.173 ± 0.112 (0.048)**	-0.008 ± 0.068 (0.149) U	0.048 ± 0.053 (0.075) U
Uranium-234	pCi/L	NE	**0.367 ± 0.164 (0.130) J+**	**0.457 ± 0.189 (0.114) J**	**0.304 ± 0.140 (0.041) J+**	**0.336 ± 0.158 (0.110) J+**	**0.755 ± 0.233 (0.120) J+**	**0.337 ± 0.169 (0.150) J+**
Uranium-235	pCi/L	NE	0.003 ± 0.077 (0.056) U	0.047 ± 0.084 (0.060) UJ	**0.118 ± 0.096 (0.053) J+**	**0.144 ± 0.115 (0.119) J+**	**0.114 ± 0.093 (0.081) J+**	**0.157 ± 0.126 (0.130) J+**
Uranium-238	pCi/L	NE	0.083 ± 0.078 (0.105) U	**0.236 ± 0.129 (0.046) J**	**0.090 ± 0.074 (0.041)**	**0.154 ± 0.106 (0.110)**	**0.459 ± 0.174 (0.106)**	**0.200 ± 0.122 (0.049)**
Radiochemistry, Total								
Radium-226	pCi/L	5	**1.66 ± 0.804 (0.866) J+**	**2.73 ± 0.931 (0.744) J**	**1.25 ± 0.670 (0.733)**	**2.49 ± 0.891 (0.737)**	0.486 ± 0.453 (0.634) U	0.282 ± 0.400 (0.677) U
Radium-228	pCi/L	5	**2.53 ± 0.717 (0.838)**	**2.61 ± 0.719 (0.804) J**	**2.75 ± 0.821 (1.03)**	**3.02 ± 0.813 (0.888)**	**1.59 ± 0.570 (0.833)**	**1.03 ± 0.475 (0.809)**
Radium-226/228	pCi/L	5	**4.19 ± 1.52 (1.70) J+**	**5.34 ± 1.65 (1.55) J**	**4.00 ± 1.49 (1.76)**	**5.51 ± 1.70 (1.63)**	**2.08 ± 1.02 (1.47)**	1.31 ± 0.875 (1.49) U
Thorium-228	pCi/L	15	0.003 ± 0.102 (0.254) U	0.041 ± 0.124 (0.274) UJ	0.170 ± 0.143 (0.239) U	0.101 ± 0.130 (0.252) U	0.132 ± 0.142 (0.257) U	0.108 ± 0.126 (0.232) U
Thorium-230	pCi/L	15	**0.184 ± 0.121 (0.119) J+**	**0.201 ± 0.117 (0.099) J**	**0.262 ± 0.133 (0.043) J+**	**0.309 ± 0.150 (0.108) J+**	**0.275 ± 0.148 (0.120)**	**0.201 ± 0.113 (0.118)**
Thorium-232	pCi/L	15	0.075 ± 0.077 (0.098) U	0.002 ± 0.058 (0.110) UJ	**0.096 ± 0.078 (0.043)**	0.032 ± 0.061 (0.089) U	0.026 ± 0.068 (0.099) U	**0.039 ± 0.051 (0.035)**
Uranium-234	pCi/L	NE	**0.240 ± 0.134 (0.145) J+**	**0.521 ± 0.198 (0.107) J**	**0.208 ± 0.116 (0.098) J+**	**0.215 ± 0.126 (0.131) J+**	**0.890 ± 0.272 (0.142)**	**0.288 ± 0.214 (0.280)**
Uranium-235	pCi/L	NE	**0.059 ± 0.075 (0.054) J+**	**0.152 ± 0.113 (0.057) J**	**0.135 ± 0.102 (0.052) J+**	0.113 ± 0.100 (0.114) U	**0.181 ± 0.126 (0.114) J+**	0.082 ± 0.154 (0.253) U
Uranium-238	pCi/L	NE	**0.242 ± 0.129 (0.114)**	**0.190 ± 0.112 (0.044) J**	**0.151 ± 0.099 (0.098)**	**0.111 ± 0.084 (0.043)**	**0.536 ± 0.197 (0.043) J+**	0.103 ± 0.127 (0.208) U
Tritium	pCi/L	20000	-68.2 ± 146 (262) U	**11490 ± 1683 (726)**	15.2 ± 150 (262) U	-35.3 ± 147 (261) U	**412 ± 171 (247)**	15.2 ± 150 (262) U

Table 5a: 2020 Validated Radiochemistry Results
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		Sample Location	I-65	I-66	I-67	I-68	I-73
		Sample Depth (ft BGS)	26 - 36	26.9 - 36.9	25.4 - 35.4	21.2 - 31.2	43.2 - 46.2
		Sample Type	N	N	N	N	N
		Sample Date	11-24-2020	11-05-2020	11-10-2020	11-24-2020	11-30-2020
Analyte	Unit	USEPA Primary MCL					
Radiochemistry, Dissolved							
Radium-226	pCi/L	5	0.157 ± 0.259 (0.433) U	**0.779 ± 0.442 (0.537)**	0.181 ± 0.397 (0.718) U	-0.00859 ± 0.337 (0.629) U	**4.86 ± 1.45 (1.01)**
Radium-228	pCi/L	5	**0.864 ± 0.447 (0.788) J+**	**0.979 ± 0.491 (0.869)**	**1.06 ± 0.573 (1.03)**	**0.861 ± 0.459 (0.802) J+**	**3.57 ± 0.917 (0.913)**
Radium-226/228	pCi/L	5	1.02 ± 0.706 (1.22) U	**1.76 ± 0.933 (1.41)**	1.24 ± 0.970 (1.75) U	0.861 ± 0.796 (1.43) U	**8.43 ± 2.37 (1.92)**
Thorium-228	pCi/L	15	0.042 ± 0.115 (0.254) U	-0.025 ± 0.105 (0.277) U	0.043 ± 0.106 (0.233) U	0.023 ± 0.109 (0.252) U	0.031 ± 0.113 (0.256) U
Thorium-230	pCi/L	15	**0.323 ± 0.159 (0.117)**	0.011 ± 0.065 (0.095) U	0.046 ± 0.065 (0.095) U	**0.214 ± 0.128 (0.127)**	**0.178 ± 0.110 (0.045)**
Thorium-232	pCi/L	15	0.011 ± 0.066 (0.096) U	0 ± 0.065 (0.047) U	0.017 ± 0.065 (0.047) U	0.044 ± 0.064 (0.092) U	0.017 ± 0.062 (0.045) U
Uranium-234	pCi/L	NE	**0.933 ± 0.280 (0.108) J+**	**2.68 ± 0.549 (0.095) J+**	**0.817 ± 0.258 (0.121) J+**	**1.29 ± 0.334 (0.084) J+**	**0.361 ± 0.178 (0.145) J+**
Uranium-235	pCi/L	NE	**0.184 ± 0.129 (0.117) J+**	**0.236 ± 0.137 (0.103) J+**	**0.087 ± 0.085 (0.057) J+**	**0.195 ± 0.125 (0.054) J+**	0.133 ± 0.125 (0.167) U
Uranium-238	pCi/L	NE	**0.774 ± 0.252 (0.135)**	**1.79 ± 0.410 (0.095)**	**0.754 ± 0.243 (0.043)**	**0.796 ± 0.247 (0.101)**	0.088 ± 0.097 (0.159) U
Radiochemistry, Total							
Radium-226	pCi/L	5	0.0650 ± 0.459 (0.917) U	0.378 ± 0.373 (0.567) U	**0.682 ± 0.455 (0.565)**	0.653 ± 0.563 (0.837) U	**4.19 ± 1.16 (0.608)**
Radium-228	pCi/L	5	0.330 ± 0.499 (1.08) U	0.901 ± 0.581 (1.11) U	0.591 ± 0.511 (1.03) U	0.966 ± 0.695 (1.38) U	**4.05 ± 0.990 (0.893)**
Radium-226/228	pCi/L	5	0.395 ± 0.958 (2.00) U	1.28 ± 0.954 (1.68) U	1.27 ± 0.966 (1.60) U	1.62 ± 1.26 (2.22) U	**8.24 ± 2.15 (1.50)**
Thorium-228	pCi/L	15	0.090 ± 0.124 (0.242) U	0.036 ± 0.137 (0.307) U	0.038 ± 0.107 (0.237) U	0.010 ± 0.120 (0.294) U	0.191 ± 0.190 (0.346) U
Thorium-230	pCi/L	15	**0.244 ± 0.129 (0.044) J+**	0.009 ± 0.063 (0.139) U	**0.526 ± 0.198 (0.043)**	**0.243 ± 0.148 (0.115) J+**	**0.197 ± 0.130 (0.110) J+**
Thorium-232	pCi/L	15	0.043 ± 0.062 (0.090) U	0 ± 0.063 (0.045) U	0.032 ± 0.060 (0.043) U	0.027 ± 0.079 (0.138) U	0.033 ± 0.076 (0.054) U
Uranium-234	pCi/L	NE	**1.10 ± 0.314 (0.111) J+**	**2.44 ± 0.516 (0.081)**	**0.779 ± 0.247 (0.126)**	**1.39 ± 0.349 (0.111) J+**	**0.425 ± 0.187 (0.146) J+**
Uranium-235	pCi/L	NE	0.033 ± 0.082 (0.059) U	**0.128 ± 0.102 (0.106) J+**	**0.181 ± 0.121 (0.054) J+**	**0.104 ± 0.089 (0.052) J+**	**0.092 ± 0.091 (0.062) J+**
Uranium-238	pCi/L	NE	**0.811 ± 0.261 (0.126)**	**2.03 ± 0.452 (0.122) J+**	**0.795 ± 0.247 (0.085) J+**	**1.01 ± 0.283 (0.081)**	0.093 ± 0.088 (0.117) U
Tritium	pCi/L	20000	**271 ± 148 (225)**	42.7 ± 131 (227) U	159 ± 142 (232) U	7.53 ± 142 (248) U	**24110 ± 3173 (223)**

Table 5a: 2020 Validated Radiochemistry Results
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		Sample Location	LR-100	MW-1204	MW-1204	PZ-100-KS	PZ-100-SD	PZ-100-SS
		Sample Depth (ft BGS)	19.7 - 24.5	213.5 - 223.5	213.5 - 223.5	374 - 383.8	234.8 - 244.6	73.96 - 93.6
		Sample Type	N	N	FD	N	N	N
		Sample Date	12-03-2020	11-06-2020	11-06-2020	12-02-2020	12-01-2020	12-01-2020
Analyte	Unit	USEPA Primary MCL						
Radiochemistry, Dissolved								
Radium-226	pCi/L	5	0.517 ± 0.410 (0.534) U	**39.4 ± 5.43 (0.418)**	**47.2 ± 6.35 (0.803)**	0.330 ± 0.344 (0.486) U	**2.14 ± 0.752 (0.166)**	**2.05 ± 0.783 (0.648)**
Radium-228	pCi/L	5	0.377 ± 0.310 (0.608) U	**3.22 ± 0.893 (1.05)**	**3.11 ± 0.822 (0.857)**	0.0512 ± 0.346 (0.795) U	0.534 ± 0.396 (0.780) U	0.516 ± 0.374 (0.744) U
Radium-226/228	pCi/L	5	0.894 ± 0.720 (1.14) U	**42.6 ± 6.32 (1.47)**	**50.3 ± 7.17 (1.66)**	0.381 ± 0.690 (1.28) U	**2.67 ± 1.15 (0.946)**	**2.57 ± 1.16 (1.39)**
Thorium-228	pCi/L	15	0.085 ± 0.139 (0.282) U	0.173 ± 0.215 (0.397) U	0.123 ± 0.154 (0.290) U	-0.009 ± 0.124 (0.310) U	0.069 ± 0.137 (0.288) U	0 ± 0.125 (0.308) U
Thorium-230	pCi/L	15	**0.205 ± 0.126 (0.117)**	-0.013 ± 0.131 (0.192) U	-0.002 ± 0.087 (0.175) U	**0.201 ± 0.130 (0.125)**	**0.171 ± 0.112 (0.111)**	**0.376 ± 0.182 (0.145)**
Thorium-232	pCi/L	15	0.046 ± 0.066 (0.096) U	0 ± 0.131 (0.095) U	-0.008 ± 0.087 (0.128) U	0.050 ± 0.071 (0.103) U	0.075 ± 0.074 (0.094) U	0.114 ± 0.104 (0.145) U
Uranium-234	pCi/L	NE	0.121 ± 0.099 (0.127) U	**0.145 ± 0.106 (0.141) J+**	**0.470 ± 0.195 (0.128) J+**	**0.235 ± 0.129 (0.118) J+**	**1.09 ± 0.355 (0.127) J+**	**3.93 ± 0.777 (0.131) J+**
Uranium-235	pCi/L	NE	0.053 ± 0.083 (0.060) U	0.102 ± 0.096 (0.128) U	0.083 ± 0.091 (0.125) U	0.020 ± 0.077 (0.055) U	**0.170 ± 0.149 (0.166)**	**0.422 ± 0.204 (0.124)**
Uranium-238	pCi/L	NE	**0.095 ± 0.083 (0.093)**	**0.107 ± 0.085 (0.098)**	**0.203 ± 0.123 (0.096)**	0.061 ± 0.072 (0.118) U	**0.408 ± 0.203 (0.127)**	**1.71 ± 0.425 (0.131)**
Radiochemistry, Total								
Radium-226	pCi/L	5	**0.699 ± 0.489 (0.590)**	**36.5 ± 5.06 (0.587)**	**42.2 ± 5.68 (0.379)**	0.139 ± 0.511 (0.983) U	**1.90 ± 0.734 (0.465)**	**2.27 ± 0.888 (0.679)**
Radium-228	pCi/L	5	**1.47 ± 0.559 (0.874)**	**3.20 ± 0.920 (1.10)**	**3.81 ± 0.953 (0.860)**	0.866 ± 0.928 (1.95) U	0.579 ± 0.376 (0.700) U	1.25 ± 0.824 (1.59) U
Radium-226/228	pCi/L	5	**2.17 ± 1.05 (1.46)**	**39.7 ± 5.98 (1.69)**	**46.0 ± 6.63 (1.24)**	1.01 ± 1.44 (2.93) U	**2.48 ± 1.11 (1.17)**	**3.52 ± 1.71 (2.27)**
Thorium-228	pCi/L	15	0.224 ± 0.162 (0.241) U	-0.026 ± 0.179 (0.495) UJ	-0.009 ± 0.109 (0.303) U	-0.077 ± 0.083 (0.265) U	-0.048 ± 0.093 (0.271) U	0.048 ± 0.102 (0.218) U
Thorium-230	pCi/L	15	**0.356 ± 0.170 (0.051) J+**	-0.014 ± 0.147 (0.215) U	-0.010 ± 0.100 (0.147) U	**0.308 ± 0.151 (0.110) J+**	**0.260 ± 0.138 (0.048) J+**	**0.309 ± 0.146 (0.087) J+**
Thorium-232	pCi/L	15	0.019 ± 0.071 (0.051) U	0 ± 0.147 (0.106) U	0 ± 0.100 (0.072) U	0.011 ± 0.062 (0.091) U	**0.083 ± 0.076 (0.048)**	0.042 ± 0.060 (0.087) U
Uranium-234	pCi/L	NE	**0.196 ± 0.122 (0.098) J+**	0.116 ± 0.094 (0.120) U	0.058 ± 0.077 (0.144) U	**0.203 ± 0.113 (0.095) J+**	**1.01 ± 0.294 (0.126) J+**	**3.60 ± 0.714 (0.090) J+**
Uranium-235	pCi/L	NE	0.065 ± 0.088 (0.128) U	0.076 ± 0.084 (0.114) U	0.064 ± 0.080 (0.131) U	**0.160 ± 0.112 (0.102) J+**	**0.339 ± 0.175 (0.115) J+**	**0.311 ± 0.166 (0.058) J+**
Uranium-238	pCi/L	NE	**0.053 ± 0.067 (0.048)**	0.074 ± 0.072 (0.088) U	0.063 ± 0.068 (0.100) U	0.090 ± 0.076 (0.092) U	**0.450 ± 0.181 (0.088) J+**	**1.10 ± 0.310 (0.090) J+**
Tritium	pCi/L	20000	-119 ± 161 (290) U	**4447 ± 647 (231) J+**	**4473 ± 649 (230) J+**	-75.7 ± 142 (256) U	-55.4 ± 142 (255) U	-131 ± 139 (255) U

Table 5a: 2020 Validated Radiochemistry Results
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		Sample Location	PZ-101-SS	PZ-102R-SS	PZ-102-SS	PZ-103-SS	PZ-103-SS	LCS-3D
		Sample Depth (ft BGS)	129.48 - 139.28	79.83 - 89.63	79.7 - 89.5	134.7 - 144.5	134.7 - 144.5	-
		Sample Type	N	N	N	N	FD	N
		Sample Date	11-12-2020	11-06-2020	11-06-2020	12-03-2020	12-03-2020	12-08-2020
Analyte	Unit	USEPA Primary MCL						
Radiochemistry, Dissolved								
Radium-226	pCi/L	5	**15.9 ± 2.75 (0.183)**	**2.19 ± 0.725 (0.385)**	**2.28 ± 0.810 (0.710)**	**5.03 ± 1.28 (0.930)**	**6.17 ± 1.39 (0.722)**	**13.2 ± 3.11 (0.392)**
Radium-228	pCi/L	5	**3.37 ± 0.941 (1.09)**	0.0962 ± 0.388 (0.877) U	0.759 ± 0.443 (0.806) U	**1.96 ± 0.578 (0.688)**	**2.14 ± 0.593 (0.613)**	**16.0 ± 3.37 (1.61)**
Radium-226/228	pCi/L	5	**19.3 ± 3.69 (1.27)**	**2.29 ± 1.11 (1.26)**	**3.04 ± 1.25 (1.52)**	**6.99 ± 1.86 (1.62)**	**8.31 ± 1.98 (1.34)**	**29.2 ± 6.48 (2.00)**
Thorium-228	pCi/L	15	0.152 ± 0.151 (0.259) U	0.096 ± 0.125 (0.231) U	0.015 ± 0.106 (0.251) U	0.049 ± 0.136 (0.302) U	0.223 ± 0.172 (0.278) U	0.378 ± 0.667 (1.29) UJ
Thorium-230	pCi/L	15	**0.169 ± 0.120 (0.057)**	0.006 ± 0.083 (0.147) U	-0.012 ± 0.062 (0.109) U	**0.193 ± 0.132 (0.109)**	**0.356 ± 0.167 (0.049)**	**1.00 ± 0.559 (0.203) J+**
Thorium-232	pCi/L	15	0.014 ± 0.079 (0.116) U	0 ± 0.083 (0.060) U	0 ± 0.062 (0.044) U	-0.003 ± 0.080 (0.092) U	0.018 ± 0.069 (0.049) U	**0.241 ± 0.309 (0.203)**
Uranium-234	pCi/L	NE	**0.463 ± 0.177 (0.118) J+**	**0.836 ± 0.254 (0.084) J+**	**0.342 ± 0.164 (0.099) J+**	**0.382 ± 0.160 (0.083) J+**	**0.432 ± 0.185 (0.097) J+**	**1.10 ± 0.833 (0.826) J+**
Uranium-235	pCi/L	NE	**0.171 ± 0.116 (0.102)**	0.088 ± 0.087 (0.109) U	0.030 ± 0.088 (0.156) U	0.091 ± 0.088 (0.108) U	0.021 ± 0.087 (0.097) U	-0.137 ± 0.714 (1.26) UJ
Uranium-238	pCi/L	NE	**0.137 ± 0.091 (0.078)**	**0.495 ± 0.187 (0.101)**	0.097 ± 0.098 (0.155) U	**0.200 ± 0.115 (0.100)**	**0.176 ± 0.120 (0.134)**	0.134 ± 0.547 (1.10) UJ
Radiochemistry, Total								
Radium-226	pCi/L	5	**10.7 ± 2.29 (1.10)**	**1.98 ± 0.848 (0.822)**	**2.70 ± 0.809 (0.464)**	**3.60 ± 0.975 (0.401)**	**3.80 ± 1.13 (0.786)**	**9.10 ± 2.98 (0.601) J-**
Radium-228	pCi/L	5	**2.05 ± 0.769 (1.20)**	0.619 ± 0.514 (1.03) U	0.805 ± 0.474 (0.881) U	**1.96 ± 0.612 (0.795)**	**2.70 ± 0.765 (0.893)**	**15.6 ± 3.73 (3.40)**
Radium-226/228	pCi/L	5	**12.8 ± 3.06 (2.30)**	**2.60 ± 1.36 (1.85)**	**3.51 ± 1.28 (1.35)**	**5.56 ± 1.59 (1.20)**	**6.50 ± 1.90 (1.68)**	**24.7 ± 6.71 (4.00) J-**
Thorium-228	pCi/L	15	0.067 ± 0.119 (0.246) U	0.132 ± 0.130 (0.228) U	0.007 ± 0.086 (0.214) U	0.046 ± 0.113 (0.246) U	0.122 ± 0.140 (0.263) U	0.371 ± 0.582 (1.18) UJ
Thorium-230	pCi/L	15	**0.187 ± 0.110 (0.042)**	-0.015 ± 0.061 (0.117) U	-0.006 ± 0.060 (0.087) U	**0.394 ± 0.172 (0.110) J+**	0.084 ± 0.079 (0.106) U	**0.543 ± 0.415 (0.409)**
Thorium-232	pCi/L	15	0.010 ± 0.059 (0.086) U	0.010 ± 0.061 (0.091) U	0.032 ± 0.060 (0.043) U	0.001 ± 0.062 (0.075) U	0.010 ± 0.060 (0.087) U	0.202 ± 0.282 (0.495) UJ
Uranium-234	pCi/L	NE	**0.329 ± 0.146 (0.097)**	**1.09 ± 0.292 (0.101)**	**0.196 ± 0.121 (0.124)**	**0.487 ± 0.193 (0.123) J+**	**0.337 ± 0.164 (0.133) J+**	**1.50 ± 0.688 (0.469)**
Uranium-235	pCi/L	NE	0.138 ± 0.112 (0.143) U	**0.219 ± 0.128 (0.049) J+**	0.043 ± 0.081 (0.058) U	**0.186 ± 0.126 (0.058) J+**	**0.207 ± 0.139 (0.062) J+**	**0.407 ± 0.384 (0.249)**
Uranium-238	pCi/L	NE	**0.154 ± 0.097 (0.080)**	**0.525 ± 0.185 (0.077)**	**0.247 ± 0.130 (0.045)**	0.115 ± 0.095 (0.123) U	**0.194 ± 0.118 (0.048)**	**0.859 ± 0.499 (0.191)**
Tritium	pCi/L	20000	**4454 ± 649 (248)**	7.52 ± 130 (229) U	0 ± 131 (231) U	**5240 ± 754 (289)**	**5036 ± 729 (290)**	**79820 ± 10510 (961)**

Table 5a: 2020 Validated Radiochemistry Results
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Sample Location			LCS-3D	PZ-104-KS	LCS-5A	PZ-104-SD	PZ-104-SS	PZ-105-SS
Sample Depth (ft BGS)			-	397.37 - 407.17	145 - 295	235.2 - 245	134.5 - 144.3	138.5 - 148.3
Sample Type			FD	N	N	N	N	N
Sample Date			12-08-2020	12-03-2020	12-08-2020	11-04-2020	11-12-2020	11-06-2020
Analyte	Unit	USEPA Primary MCL						
Radiochemistry, Dissolved								
Radium-226	pCi/L	5	**11.3 ± 2.97 (0.443)**	-0.130 ± 0.442 (0.978) U	**6.43 ± 1.39 (0.568)**	**3.10 ± 0.751 (0.437) J+**	**1.23 ± 0.570 (0.175)**	**0.996 ± 0.563 (0.631)**
Radium-228	pCi/L	5	**16.5 ± 3.43 (1.66)**	**1.09 ± 0.437 (0.683)**	**2.76 ± 0.847 (1.06)**	**1.95 ± 0.634 (0.888)**	**1.68 ± 0.777 (1.33)**	0.661 ± 0.458 (0.891) U
Radium-226/228	pCi/L	5	**27.8 ± 6.40 (2.10)**	1.09 ± 0.879 (1.66) U	**9.19 ± 2.24 (1.63)**	**5.05 ± 1.39 (1.33) J+**	**2.91 ± 1.35 (1.51)**	**1.66 ± 1.02 (1.52)**
Thorium-228	pCi/L	15	0.463 ± 0.841 (1.75) UJ	0.009 ± 0.111 (0.271) U	0.132 ± 0.167 (0.315) U	-0.027 ± 0.099 (0.263) U	0.039 ± 0.097 (0.214) U	-0.084 ± 0.092 (0.296) U
Thorium-230	pCi/L	15	**1.32 ± 0.746 (0.275) J+**	**0.131 ± 0.101 (0.100)**	0.144 ± 0.137 (0.205) U	0.016 ± 0.061 (0.044) U	-0.006 ± 0.063 (0.092) U	0.038 ± 0.071 (0.051) U
Thorium-232	pCi/L	15	0.493 ± 0.487 (0.675) UJ	0 ± 0.069 (0.049) U	0.043 ± 0.093 (0.127) U	0.009 ± 0.061 (0.044) U	0 ± 0.063 (0.045) U	-0.014 ± 0.071 (0.126) U
Uranium-234	pCi/L	NE	**1.57 ± 0.891 (0.940) J+**	**0.350 ± 0.151 (0.096) J+**	0.068 ± 0.100 (0.150) U	**0.249 ± 0.134 (0.128) J+**	**1.68 ± 0.428 (0.102) J+**	**1.36 ± 0.361 (0.127) J+**
Uranium-235	pCi/L	NE	**0.823 ± 0.670 (0.372)**	**0.110 ± 0.094 (0.103)**	-0.025 ± 0.130 (0.229) U	**0.187 ± 0.129 (0.134) J+**	**0.340 ± 0.187 (0.133)**	**0.152 ± 0.116 (0.060) J+**
Uranium-238	pCi/L	NE	**0.420 ± 0.417 (0.285)**	**0.163 ± 0.102 (0.093)**	-0.002 ± 0.099 (0.199) U	**0.130 ± 0.092 (0.085)**	**0.861 ± 0.280 (0.102)**	**0.610 ± 0.222 (0.127)**
Radiochemistry, Total								
Radium-226	pCi/L	5	**8.71 ± 2.85 (0.576) J-**	0.0640 ± 0.292 (0.471) U	**4.66 ± 1.29 (0.824) J-**	**1.43 ± 0.627 (0.532)**	0.663 ± 0.620 (0.879) U	**1.86 ± 0.671 (0.392)**
Radium-228	pCi/L	5	**12.8 ± 3.35 (3.45)**	0.854 ± 0.474 (0.869) U	**2.14 ± 0.727 (1.09)**	0.796 ± 0.505 (0.959) U	0.558 ± 0.500 (1.02) U	0.482 ± 0.474 (0.978) U
Radium-226/228	pCi/L	5	**21.5 ± 6.20 (4.03) J-**	0.918 ± 0.766 (1.34) U	**6.80 ± 2.02 (1.91) J-**	**2.23 ± 1.13 (1.49)**	1.22 ± 1.12 (1.90) U	**2.34 ± 1.15 (1.37)**
Thorium-228	pCi/L	15	0.703 ± 0.660 (1.16) UJ	0.091 ± 0.138 (0.278) U	0.034 ± 0.124 (0.281) U	0.060 ± 0.135 (0.289) U	**0.283 ± 0.164 (0.202)**	-0.015 ± 0.100 (0.266) U
Thorium-230	pCi/L	15	**0.951 ± 0.554 (0.483)**	**0.306 ± 0.150 (0.106) J+**	**0.237 ± 0.134 (0.098) J+**	-0.001 ± 0.060 (0.120) U	-0.006 ± 0.065 (0.094) U	-0.014 ± 0.071 (0.126) U
Thorium-232	pCi/L	15	0.378 ± 0.345 (0.400) U	**0.050 ± 0.063 (0.045)**	0.058 ± 0.072 (0.118) U	0.010 ± 0.060 (0.087) U	-0.006 ± 0.065 (0.094) U	-0.007 ± 0.071 (0.104) U
Uranium-234	pCi/L	NE	**1.74 ± 0.710 (0.419)**	**0.513 ± 0.183 (0.092) J+**	0.112 ± 0.115 (0.164) U	0.128 ± 0.112 (0.173) U	**1.23 ± 0.337 (0.112)**	**1.05 ± 0.279 (0.100)**
Uranium-235	pCi/L	NE	**1.07 ± 0.603 (0.223)**	**0.151 ± 0.108 (0.099) J+**	0 ± 0.121 (0.087) U	0.073 ± 0.091 (0.149) U	**0.159 ± 0.122 (0.121) J+**	**0.121 ± 0.095 (0.100) J+**
Uranium-238	pCi/L	NE	0.355 ± 0.345 (0.522) UJ	**0.175 ± 0.103 (0.092) J+**	0.049 ± 0.093 (0.067) U	0.079 ± 0.077 (0.094) U	**0.920 ± 0.280 (0.066)**	**0.558 ± 0.190 (0.100) J+**
Tritium	pCi/L	20000	**81030 ± 10700 (1069)**	-286 ± 155 (289) U	**7516 ± 1043 (289) J**	**865 ± 208 (228)**	96.1 ± 148 (250) U	**333 ± 155 (229) J+**

Table 5a: 2020 Validated Radiochemistry Results
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Sample Location			PZ-106-KS	PZ-106-SD	PZ-106-SD	PZ-106-SS	PZ-107-SS	PZ-109-SS
Sample Depth (ft BGS)			363.75 - 373.57	190.79 - 200.59	190.79 - 200.59	155.3 - 165.1	92.6 - 102.4	125.7 - 135.5
Sample Type			N	N	FD	N	N	N
Sample Date			11-13-2020	11-13-2020	11-13-2020	11-11-2020	12-03-2020	11-10-2020
Analyte	Unit	USEPA Primary MCL						
Radiochemistry, Dissolved								
Radium-226	pCi/L	5	0.482 ± 0.501 (0.746) U	**1.56 ± 0.916 (1.10)**	0.663 ± 0.673 (1.02) U	**7.33 ± 1.62 (0.486)**	**11.1 ± 2.03 (0.604)**	**1.42 ± 0.568 (0.373)**
Radium-228	pCi/L	5	0.723 ± 0.443 (0.843) U	**1.38 ± 0.495 (0.723)**	**0.873 ± 0.439 (0.762)**	**1.74 ± 0.699 (1.13)**	**4.73 ± 1.11 (0.860)**	**0.999 ± 0.509 (0.894)**
Radium-226/228	pCi/L	5	1.21 ± 0.944 (1.59) U	**2.94 ± 1.41 (1.82)**	1.54 ± 1.11 (1.78) U	**9.07 ± 2.32 (1.62)**	**15.8 ± 3.14 (1.46)**	**2.42 ± 1.08 (1.27)**
Thorium-228	pCi/L	15	-0.032 ± 0.128 (0.304) U	0.132 ± 0.128 (0.225) U	0.054 ± 0.112 (0.227) U	0.038 ± 0.101 (0.225) U	0.166 ± 0.144 (0.237) U	0.028 ± 0.107 (0.244) U
Thorium-230	pCi/L	15	**0.147 ± 0.105 (0.133)**	**0.332 ± 0.140 (0.093)**	**0.122 ± 0.092 (0.121)**	**0.197 ± 0.122 (0.050)**	**0.164 ± 0.115 (0.119)**	0 ± 0.061 (0.044) U
Thorium-232	pCi/L	15	0.021 ± 0.057 (0.089) U	0.019 ± 0.050 (0.076) U	-0.013 ± 0.052 (0.097) U	-0.007 ± 0.069 (0.101) U	0.031 ± 0.068 (0.049) U	0.016 ± 0.061 (0.044) U
Uranium-234	pCi/L	NE	**1.81 ± 0.421 (0.101) J+**	**0.346 ± 0.161 (0.141) J+**	**0.434 ± 0.178 (0.106) J+**	**1.01 ± 0.287 (0.042) J+**	**0.430 ± 0.190 (0.124) J+**	**0.465 ± 0.176 (0.095) J+**
Uranium-235	pCi/L	NE	**0.369 ± 0.178 (0.109)**	**0.205 ± 0.135 (0.127)**	**0.305 ± 0.170 (0.157)**	**0.204 ± 0.130 (0.055) J+**	0.040 ± 0.092 (0.134) U	0.068 ± 0.075 (0.103) U
Uranium-238	pCi/L	NE	**0.567 ± 0.202 (0.101)**	**0.161 ± 0.106 (0.105)**	**0.141 ± 0.098 (0.087)**	**0.313 ± 0.145 (0.042)**	0.081 ± 0.085 (0.121) U	**0.245 ± 0.123 (0.079)**
Radiochemistry, Total								
Radium-226	pCi/L	5	0.0849 ± 0.388 (0.789) U	**1.23 ± 0.676 (0.779) J+**	**1.63 ± 0.991 (1.28)**	**10.0 ± 2.06 (0.850)**	**8.91 ± 1.77 (0.163)**	**1.04 ± 0.517 (0.531)**
Radium-228	pCi/L	5	0.728 ± 0.522 (1.02) U	0.527 ± 0.448 (0.902) U	0.549 ± 0.592 (1.23) U	1.45 ± 0.804 (1.51) U	**4.36 ± 1.03 (0.863)**	0.597 ± 0.511 (1.02) U
Radium-226/228	pCi/L	5	0.813 ± 0.910 (1.81) U	**1.76 ± 1.12 (1.68) J+**	2.18 ± 1.58 (2.51) U	**11.5 ± 2.86 (2.36)**	**13.3 ± 2.80 (1.03)**	**1.64 ± 1.03 (1.55)**
Thorium-228	pCi/L	15	0.069 ± 0.117 (0.232) U	0.066 ± 0.104 (0.204) U	0.043 ± 0.108 (0.227) U	0.027 ± 0.118 (0.272) U	0.161 ± 0.147 (0.256) U	0.048 ± 0.113 (0.244) U
Thorium-230	pCi/L	15	**0.238 ± 0.122 (0.118) J+**	**0.148 ± 0.092 (0.099) J+**	**0.198 ± 0.111 (0.110) J+**	**0.310 ± 0.151 (0.047)**	**0.211 ± 0.126 (0.125) J+**	0.021 ± 0.057 (0.084) U
Thorium-232	pCi/L	15	**0.051 ± 0.051 (0.035)**	**0.048 ± 0.047 (0.032)**	**0.101 ± 0.073 (0.036)**	0.045 ± 0.065 (0.095) U	**0.066 ± 0.066 (0.045)**	0.015 ± 0.057 (0.041) U
Uranium-234	pCi/L	NE	**1.63 ± 0.379 (0.114) J+**	**0.271 ± 0.134 (0.099) J+**	**0.316 ± 0.142 (0.040) J+**	**0.651 ± 0.221 (0.103)**	**0.536 ± 0.192 (0.097) J+**	**0.525 ± 0.189 (0.095)**
Uranium-235	pCi/L	NE	**0.138 ± 0.103 (0.099) J+**	**0.136 ± 0.102 (0.053) J+**	**0.090 ± 0.083 (0.052) J+**	**0.243 ± 0.142 (0.055) J+**	0.045 ± 0.072 (0.051) U	**0.105 ± 0.092 (0.103) J+**
Uranium-238	pCi/L	NE	**0.483 ± 0.175 (0.037) J+**	**0.167 ± 0.105 (0.099) J+**	**0.257 ± 0.127 (0.040) J+**	**0.274 ± 0.137 (0.103) J+**	**0.135 ± 0.093 (0.097)**	**0.176 ± 0.105 (0.095)**
Tritium	pCi/L	20000	0 ± 142 (250) U	**745 ± 202 (247)**	**1189 ± 251 (250)**	**914 ± 221 (249)**	**2152 ± 373 (289)**	12.6 ± 132 (231) U

Table 5a: 2020 Validated Radiochemistry Results
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		Sample Location	PZ-109-SS	PZ-111-KS	PZ-111-SD	PZ-111-SS	PZ-113-AD	PZ-113-AD
		Sample Depth (ft BGS)	125.7 - 135.5	357.15 - 366.96	199.4 - 209.2	105.5 - 115.5	98.6 - 108.4	98.6 - 108.4
		Sample Type	FD	N	N	N	N	FD
		Sample Date	11-10-2020	11-09-2020	11-09-2020	11-09-2020	11-05-2020	11-05-2020
Analyte	Unit	USEPA Primary MCL						
Radiochemistry, Dissolved								
Radium-226	pCi/L	5	**0.821 ± 0.502 (0.616)**	**0.475 ± 0.334 (0.161)**	**1.09 ± 0.463 (0.128)**	**14.7 ± 2.50 (0.429)**	**1.33 ± 0.578 (0.569)**	**1.37 ± 0.580 (0.525)**
Radium-228	pCi/L	5	**1.51 ± 0.622 (1.01)**	0.180 ± 0.413 (0.917) UJ	0.240 ± 0.433 (0.948) U	**3.48 ± 0.875 (0.783)**	**4.50 ± 1.05 (0.838)**	**4.08 ± 0.966 (0.850)**
Radium-226/228	pCi/L	5	**2.33 ± 1.12 (1.63)**	0.655 ± 0.747 (1.08) UJ	**1.33 ± 0.896 (1.08)**	**18.2 ± 3.38 (1.21)**	**5.83 ± 1.63 (1.41)**	**5.45 ± 1.55 (1.38)**
Thorium-228	pCi/L	15	-0.047 ± 0.121 (0.319) U	0.140 ± 0.141 (0.253) U	0.095 ± 0.141 (0.281) U	0.127 ± 0.160 (0.306) U	0.162 ± 0.179 (0.330) U	0.156 ± 0.136 (0.220) U
Thorium-230	pCi/L	15	-0.008 ± 0.066 (0.145) U	**0.311 ± 0.150 (0.108)**	0.115 ± 0.102 (0.145) U	**0.210 ± 0.139 (0.151)**	0.021 ± 0.079 (0.057) U	0.016 ± 0.066 (0.133) U
Thorium-232	pCi/L	15	0 ± 0.066 (0.047) U	0.016 ± 0.061 (0.044) U	0.035 ± 0.066 (0.047) U	0.020 ± 0.075 (0.054) U	-0.015 ± 0.079 (0.140) U	-0.006 ± 0.066 (0.097) U
Uranium-234	pCi/L	NE	**0.326 ± 0.144 (0.079) J+**	**6.07 ± 1.12 (0.175) J+**	**0.714 ± 0.231 (0.100) J+**	**0.395 ± 0.179 (0.153) J+**	**0.230 ± 0.143 (0.146) J+**	**0.217 ± 0.123 (0.114) J+**
Uranium-235	pCi/L	NE	0.069 ± 0.076 (0.104) U	**0.487 ± 0.224 (0.065)**	**0.191 ± 0.132 (0.149)**	0.101 ± 0.099 (0.123) U	0.025 ± 0.095 (0.068) U	0.016 ± 0.076 (0.111) U
Uranium-238	pCi/L	NE	**0.325 ± 0.148 (0.120)**	**2.09 ± 0.497 (0.138)**	**0.323 ± 0.146 (0.083)**	**0.294 ± 0.146 (0.046)**	**0.211 ± 0.137 (0.146)**	**0.226 ± 0.122 (0.085)**
Radiochemistry, Total								
Radium-226	pCi/L	5	**1.42 ± 0.567 (0.372)**	0.249 ± 0.569 (0.994) U	**1.59 ± 0.967 (1.29)**	**13.5 ± 2.49 (0.891)**	**1.28 ± 0.544 (0.151)**	**1.21 ± 0.565 (0.509)**
Radium-228	pCi/L	5	0.751 ± 0.593 (1.17) U	0.605 ± 0.467 (0.929) UJ	0.363 ± 0.426 (0.899) UJ	**4.43 ± 1.09 (1.02)**	**5.45 ± 1.30 (1.16) J+**	**4.67 ± 1.10 (0.874) J+**
Radium-226/228	pCi/L	5	**2.17 ± 1.16 (1.54)**	0.854 ± 1.04 (1.92) UJ	1.95 ± 1.39 (2.19) UJ	**17.9 ± 3.58 (1.91)**	**6.73 ± 1.84 (1.31) J+**	**5.88 ± 1.67 (1.38) J+**
Thorium-228	pCi/L	15	0.083 ± 0.112 (0.215) U	0.012 ± 0.125 (0.292) U	0.077 ± 0.123 (0.248) U	0.191 ± 0.148 (0.239) U	0.050 ± 0.136 (0.302) U	0.040 ± 0.099 (0.221) U
Thorium-230	pCi/L	15	0.004 ± 0.065 (0.130) U	**0.187 ± 0.118 (0.130)**	**0.245 ± 0.131 (0.105)**	**0.209 ± 0.117 (0.043)**	0.049 ± 0.081 (0.143) U	0.024 ± 0.073 (0.107) U
Thorium-232	pCi/L	15	0.011 ± 0.065 (0.095) U	0.025 ± 0.059 (0.089) U	-0.006 ± 0.060 (0.087) U	0.016 ± 0.060 (0.043) U	0.014 ± 0.081 (0.118) U	0 ± 0.073 (0.053) U
Uranium-234	pCi/L	NE	**0.553 ± 0.204 (0.116)**	**6.22 ± 1.13 (0.144)**	**0.617 ± 0.207 (0.120)**	**0.646 ± 0.224 (0.108)**	**0.244 ± 0.124 (0.104) J+**	**0.200 ± 0.130 (0.138)**
Uranium-235	pCi/L	NE	**0.114 ± 0.101 (0.114) J+**	**0.345 ± 0.184 (0.125) J+**	**0.111 ± 0.091 (0.081) J+**	**0.331 ± 0.174 (0.116) J+**	0.050 ± 0.068 (0.104) U	**0.135 ± 0.118 (0.131) J+**
Uranium-238	pCi/L	NE	**0.310 ± 0.146 (0.087)**	**2.60 ± 0.570 (0.096)**	**0.347 ± 0.150 (0.105)**	**0.507 ± 0.195 (0.108)**	**0.175 ± 0.105 (0.104) J+**	**0.148 ± 0.107 (0.101)**
Tritium	pCi/L	20000	32.7 ± 133 (230) U	-49.6 ± 137 (245) U	-25.3 ± 130 (231) U	**574 ± 179 (231) J+**	7.57 ± 130 (228) U	-7.53 ± 128 (227) U

Table 5a: 2020 Validated Radiochemistry Results
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Sample Location			PZ-113-AS	PZ-113-SS	PZ-114-AS	PZ-115-SS	PZ-115-SS	PZ-116-SS
Sample Depth (ft BGS)			28.9 - 38.7	148.57 - 158.37	19.9 - 29.7	74.68 - 84.48	74.68 - 84.48	151.4 - 161
Sample Type			N	N	N	N	FD	N
Sample Date			11-04-2020	11-05-2020	11-11-2020	11-24-2020	11-24-2020	12-04-2020
Analyte	Unit	USEPA Primary MCL						
Radiochemistry, Dissolved								
Radium-226	pCi/L	5	**0.577 ± 0.381 (0.458) J+**	**1.54 ± 0.736 (0.855)**	**0.999 ± 0.532 (0.459)**	**12.8 ± 2.06 (0.570)**	**11.9 ± 1.88 (0.526)**	**0.699 ± 0.467 (0.579)**
Radium-228	pCi/L	5	**1.13 ± 0.460 (0.734)**	0.502 ± 0.449 (0.916) U	**1.94 ± 0.756 (1.19)**	0.516 ± 0.374 (0.723) U	**0.877 ± 0.460 (0.812) J+**	0.232 ± 0.353 (0.762) U
Radium-226/228	pCi/L	5	**1.71 ± 0.841 (1.19) J+**	**2.04 ± 1.19 (1.77)**	**2.94 ± 1.29 (1.65)**	**13.3 ± 2.43 (1.29)**	**12.8 ± 2.34 (1.34) J+**	0.931 ± 0.820 (1.34) U
Thorium-228	pCi/L	15	0.072 ± 0.116 (0.235) U	0.030 ± 0.088 (0.200) U	0.098 ± 0.135 (0.264) U	0.051 ± 0.122 (0.263) U	0.073 ± 0.112 (0.224) U	0.105 ± 0.117 (0.209) U
Thorium-230	pCi/L	15	-0.011 ± 0.060 (0.106) U	0.010 ± 0.059 (0.087) U	**0.231 ± 0.137 (0.143)**	**0.288 ± 0.147 (0.123)**	**0.256 ± 0.133 (0.045)**	**0.455 ± 0.190 (0.114)**
Thorium-232	pCi/L	15	-0.011 ± 0.060 (0.106) U	0.016 ± 0.060 (0.043) U	0.036 ± 0.066 (0.116) U	0.011 ± 0.061 (0.123) U	0.027 ± 0.063 (0.091) U	0.063 ± 0.069 (0.095) U
Uranium-234	pCi/L	NE	**1.28 ± 0.335 (0.103) J+**	**0.880 ± 0.268 (0.119) J+**	**0.652 ± 0.230 (0.095) J+**	**2.31 ± 0.493 (0.096) J+**	**2.07 ± 0.480 (0.128) J+**	**4.20 ± 0.785 (0.097) J+**
Uranium-235	pCi/L	NE	**0.154 ± 0.115 (0.111)**	**0.137 ± 0.110 (0.114)**	**0.420 ± 0.201 (0.061) J+**	**0.201 ± 0.127 (0.107) J+**	**0.236 ± 0.149 (0.122) J+**	**0.207 ± 0.127 (0.052) J+**
Uranium-238	pCi/L	NE	**0.716 ± 0.233 (0.103)**	**0.469 ± 0.184 (0.087)**	**0.143 ± 0.105 (0.115)**	**1.39 ± 0.344 (0.039)**	**1.33 ± 0.356 (0.128)**	**1.04 ± 0.287 (0.097)**
Radiochemistry, Total								
Radium-226	pCi/L	5	0.597 ± 0.469 (0.652) U	**1.60 ± 0.675 (0.677)**	**0.933 ± 0.470 (0.158)**	**14.0 ± 2.54 (0.649)**	**13.2 ± 2.41 (0.499)**	0.0616 ± 0.436 (0.869) U
Radium-228	pCi/L	5	0.655 ± 0.422 (0.804) U	**1.63 ± 0.661 (1.05) J+**	**1.23 ± 0.622 (1.09)**	1.03 ± 0.788 (1.59) U	**0.903 ± 0.397 (0.629)**	-0.137 ± 0.559 (1.34) U
Radium-226/228	pCi/L	5	1.25 ± 0.891 (1.46) U	**3.23 ± 1.34 (1.73) J+**	**2.16 ± 1.09 (1.25)**	**15.0 ± 3.33 (2.24)**	**14.1 ± 2.81 (1.13)**	0.0616 ± 0.995 (2.21) U
Thorium-228	pCi/L	15	0.085 ± 0.116 (0.225) U	0.066 ± 0.103 (0.206) U	0.039 ± 0.111 (0.246) U	0.028 ± 0.103 (0.236) U	-0.060 ± 0.114 (0.313) U	0.028 ± 0.131 (0.298) U
Thorium-230	pCi/L	15	-0.006 ± 0.060 (0.088) U	0.005 ± 0.074 (0.130) U	**0.238 ± 0.132 (0.111)**	**0.327 ± 0.157 (0.094) J+**	**0.282 ± 0.146 (0.095) J+**	**0.264 ± 0.140 (0.109) J+**
Thorium-232	pCi/L	15	-0.011 ± 0.060 (0.107) U	0 ± 0.074 (0.053) U	0.021 ± 0.063 (0.111) U	-0.006 ± 0.064 (0.094) U	0.022 ± 0.065 (0.095) U	0.036 ± 0.064 (0.120) U
Uranium-234	pCi/L	NE	**1.66 ± 0.400 (0.086)**	**0.903 ± 0.284 (0.117)**	**0.352 ± 0.171 (0.148)**	**2.44 ± 0.510 (0.078) J+**	**2.12 ± 0.464 (0.080) J+**	**4.68 ± 0.888 (0.092) J+**
Uranium-235	pCi/L	NE	**0.192 ± 0.126 (0.056) J+**	**0.176 ± 0.131 (0.126) J+**	**0.283 ± 0.164 (0.063) J+**	**0.264 ± 0.147 (0.123) J+**	**0.236 ± 0.136 (0.052) J+**	**0.182 ± 0.128 (0.092)**
Uranium-238	pCi/L	NE	**0.936 ± 0.277 (0.113)**	**0.474 ± 0.197 (0.133)**	0.077 ± 0.081 (0.119) U	**1.14 ± 0.302 (0.094)**	**1.35 ± 0.339 (0.080)**	**1.07 ± 0.309 (0.127)**
Tritium	pCi/L	20000	**257 ± 148 (228)**	12.6 ± 130 (228) U	64.5 ± 143 (245) U	**283 ± 148 (225)**	25.0 ± 142 (247) U	-75.8 ± 162 (289) U

Table 5a: 2020 Validated Radiochemistry Results
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		Sample Location	PZ-200-SS	PZ-201A-SS	PZ-202-SS	PZ-203-SS	PZ-204A-SS	PZ-204-SS
		Sample Depth (ft BGS)	9.62 - 97.64	80 - 89.8	40.2 - 89.1	99.6 - 109.4	79.5 - 89.1	10.95 - 89.35
		Sample Type	N	N	N	N	N	N
		Sample Date	12-02-2020	12-04-2020	12-02-2020	11-16-2020	12-04-2020	12-04-2020
Analyte	Unit	USEPA Primary MCL						
Radiochemistry, Dissolved								
Radium-226	pCi/L	5	**0.879 ± 0.536 (0.631)**	0.190 ± 0.570 (1.06) U	**2.72 ± 0.914 (0.666)**	**2.16 ± 1.08 (1.11)**	0.537 ± 0.460 (0.623) U	0.483 ± 0.560 (0.904) U
Radium-228	pCi/L	5	**1.89 ± 0.697 (1.06)**	0.619 ± 0.390 (0.738) U	**1.93 ± 0.645 (0.938)**	0.462 ± 0.452 (0.929) U	0.588 ± 0.639 (1.35) U	0.149 ± 0.424 (0.946) U
Radium-226/228	pCi/L	5	**2.77 ± 1.23 (1.69)**	0.809 ± 0.960 (1.80) U	**4.65 ± 1.56 (1.60)**	**2.62 ± 1.53 (2.04)**	1.13 ± 1.10 (1.97) U	0.632 ± 0.984 (1.85) U
Thorium-228	pCi/L	15	0.011 ± 0.134 (0.327) U	0.101 ± 0.137 (0.266) U	0.111 ± 0.133 (0.247) U	0.035 ± 0.112 (0.241) U	0.076 ± 0.125 (0.254) U	-0.070 ± 0.081 (0.262) U
Thorium-230	pCi/L	15	**0.137 ± 0.114 (0.121)**	**0.203 ± 0.127 (0.096)**	**0.234 ± 0.139 (0.124)**	**0.255 ± 0.130 (0.106)**	**0.191 ± 0.120 (0.098)**	**0.396 ± 0.173 (0.047)**
Thorium-232	pCi/L	15	0.022 ± 0.083 (0.060) U	0.017 ± 0.071 (0.081) U	0 ± 0.070 (0.051) U	0.095 ± 0.082 (0.106) U	0.018 ± 0.067 (0.048) U	0.017 ± 0.065 (0.047) U
Uranium-234	pCi/L	NE	**0.633 ± 0.221 (0.120) J+**	**2.09 ± 0.471 (0.118) J+**	**0.438 ± 0.174 (0.100) J+**	**1.80 ± 0.438 (0.153) J+**	**1.68 ± 0.402 (0.103) J+**	**1.77 ± 0.424 (0.121) J+**
Uranium-235	pCi/L	NE	**0.155 ± 0.113 (0.056)**	**0.126 ± 0.101 (0.055)**	**0.180 ± 0.120 (0.053) J+**	**0.243 ± 0.152 (0.123)**	**0.162 ± 0.118 (0.111) J+**	**0.208 ± 0.133 (0.057) J+**
Uranium-238	pCi/L	NE	**0.390 ± 0.166 (0.087)**	**1.39 ± 0.355 (0.042)**	**0.121 ± 0.085 (0.041)**	**0.291 ± 0.145 (0.046)**	**1.20 ± 0.321 (0.103)**	**1.25 ± 0.335 (0.121)**
Radiochemistry, Total								
Radium-226	pCi/L	5	**0.850 ± 0.595 (0.718)**	0.0697 ± 0.410 (0.837) U	**1.70 ± 0.726 (0.704)**	**1.66 ± 0.787 (0.778) J+**	**1.07 ± 0.538 (0.181)**	0.330 ± 0.307 (0.405) U
Radium-228	pCi/L	5	**5.95 ± 1.49 (1.32)**	0.0398 ± 0.613 (1.42) U	**1.38 ± 0.744 (1.34)**	0.348 ± 0.425 (0.899) U	**1.40 ± 0.677 (1.18)**	**0.862 ± 0.473 (0.862)**
Radium-226/228	pCi/L	5	**6.80 ± 2.09 (2.04)**	0.110 ± 1.02 (2.26) U	**3.08 ± 1.47 (2.04)**	**2.01 ± 1.21 (1.68) J+**	**2.47 ± 1.22 (1.36)**	1.19 ± 0.780 (1.27) U
Thorium-228	pCi/L	15	-0.012 ± 0.116 (0.292) U	0.077 ± 0.112 (0.223) U	0.007 ± 0.110 (0.266) U	0.100 ± 0.124 (0.231) U	0.068 ± 0.117 (0.239) U	-0.034 ± 0.105 (0.282) U
Thorium-230	pCi/L	15	**0.159 ± 0.111 (0.112) J+**	**0.134 ± 0.095 (0.100) J+**	**0.287 ± 0.150 (0.130) J+**	**0.336 ± 0.143 (0.096) J+**	**0.291 ± 0.152 (0.051) J+**	**0.227 ± 0.131 (0.114) J+**
Thorium-232	pCi/L	15	0.035 ± 0.066 (0.047) U	0.029 ± 0.057 (0.068) U	**0.052 ± 0.065 (0.047)**	**0.092 ± 0.070 (0.036)**	0.026 ± 0.071 (0.051) U	0.028 ± 0.065 (0.094) U
Uranium-234	pCi/L	NE	**0.655 ± 0.212 (0.077) J+**	**2.11 ± 0.462 (0.096) J+**	**0.235 ± 0.126 (0.101) J+**	**1.22 ± 0.332 (0.109) J+**	**1.96 ± 0.493 (0.137) J+**	**1.62 ± 0.380 (0.093) J+**
Uranium-235	pCi/L	NE	**0.181 ± 0.119 (0.101) J+**	**0.106 ± 0.092 (0.103)**	**0.099 ± 0.088 (0.054) J+**	**0.142 ± 0.114 (0.118) J+**	**0.259 ± 0.172 (0.147)**	0.067 ± 0.074 (0.101) U
Uranium-238	pCi/L	NE	**0.281 ± 0.130 (0.038) J+**	**1.25 ± 0.320 (0.079)**	**0.107 ± 0.080 (0.041)**	**0.267 ± 0.139 (0.109) J+**	**1.38 ± 0.393 (0.133)**	**0.960 ± 0.269 (0.091)**
Tritium	pCi/L	20000	12.6 ± 146 (256) U	-253 ± 156 (289) U	**12020 ± 1618 (256)**	50.6 ± 139 (239) U	-35.3 ± 140 (249) U	**12540 ± 1686 (289)**

Table 5a: 2020 Validated Radiochemistry Results
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Sample Location			PZ-205-AS	PZ-205-SS	PZ-206-SS	PZ-207-AS	PZ-209-SS	PZ-210-SS
Sample Depth (ft BGS)			38.55 - 48.35	88.57 - 98.37	115 - 124.8	34.9 - 39.7	140 - 150	138 - 148
Sample Type			N	N	N	N	N	N
Sample Date			11-11-2020	11-11-2020	11-10-2020	12-01-2020	11-04-2020	11-03-2020
Analyte	Unit	USEPA Primary MCL						
Radiochemistry, Dissolved								
Radium-226	pCi/L	5	**6.34 ± 1.89 (0.337)**	**1.60 ± 0.655 (0.174)**	**0.884 ± 0.430 (0.342)**	0.442 ± 0.350 (0.456) U	**0.952 ± 0.505 (0.578) J+**	**0.733 ± 0.376 (0.397) J+**
Radium-228	pCi/L	5	**4.15 ± 1.07 (1.08)**	1.05 ± 0.693 (1.34) U	0.988 ± 0.609 (1.15) U	0.524 ± 0.482 (0.986) U	**0.848 ± 0.425 (0.750)**	0.678 ± 0.428 (0.809) U
Radium-226/228	pCi/L	5	**10.5 ± 2.96 (1.42)**	**2.65 ± 1.35 (1.51)**	**1.87 ± 1.04 (1.49)**	0.966 ± 0.832 (1.44) U	**1.80 ± 0.930 (1.33) J+**	**1.41 ± 0.804 (1.21) J+**
Thorium-228	pCi/L	15	0.251 ± 0.261 (0.465) UJ	0.059 ± 0.122 (0.260) U	-0.012 ± 0.081 (0.221) U	-0.025 ± 0.114 (0.294) U	0.012 ± 0.123 (0.290) U	0.110 ± 0.124 (0.226) U
Thorium-230	pCi/L	15	**0.154 ± 0.125 (0.069)**	**0.325 ± 0.160 (0.117)**	-0.027 ± 0.064 (0.146) U	**0.263 ± 0.139 (0.094)**	0.005 ± 0.062 (0.110) U	-0.008 ± 0.065 (0.144) U
Thorium-232	pCi/L	15	0.013 ± 0.101 (0.154) U	-0.013 ± 0.066 (0.117) U	0 ± 0.064 (0.046) U	**0.096 ± 0.081 (0.046)**	0 ± 0.062 (0.045) U	0 ± 0.065 (0.047) U
Uranium-234	pCi/L	NE	**0.503 ± 0.218 (0.059) J+**	**0.745 ± 0.239 (0.126) J+**	**0.653 ± 0.251 (0.178) J+**	**0.602 ± 0.249 (0.165) J+**	**1.15 ± 0.320 (0.109) J+**	**0.212 ± 0.118 (0.077) J+**
Uranium-235	pCi/L	NE	**0.193 ± 0.148 (0.076)**	**0.315 ± 0.164 (0.109)**	**0.583 ± 0.261 (0.173)**	0.122 ± 0.130 (0.190) U	0.096 ± 0.095 (0.118) U	**0.090 ± 0.085 (0.056)**
Uranium-238	pCi/L	NE	0.162 ± 0.129 (0.163) U	**0.416 ± 0.167 (0.041)**	**0.394 ± 0.189 (0.150)**	0.067 ± 0.097 (0.182) U	**0.325 ± 0.153 (0.090)**	**0.183 ± 0.111 (0.086)**
Radiochemistry, Total								
Radium-226	pCi/L	5	**4.51 ± 1.67 (0.394)**	**1.48 ± 0.742 (0.841)**	**1.66 ± 0.673 (0.624)**	0.540 ± 0.399 (0.540) U	**0.775 ± 0.456 (0.548)**	**0.743 ± 0.416 (0.431) J+**
Radium-228	pCi/L	5	**4.79 ± 1.53 (2.05)**	0.791 ± 0.654 (1.31) U	1.10 ± 0.624 (1.14) U	**1.89 ± 0.636 (0.849)**	0.214 ± 0.420 (0.922) U	**1.44 ± 0.604 (0.996) J+**
Radium-226/228	pCi/L	5	**9.30 ± 3.20 (2.44)**	**2.27 ± 1.40 (2.15)**	**2.76 ± 1.30 (1.76)**	**2.43 ± 1.04 (1.39)**	0.989 ± 0.876 (1.47) U	**2.18 ± 1.02 (1.43) J+**
Thorium-228	pCi/L	15	0.294 ± 0.302 (0.526) UJ	0.105 ± 0.141 (0.275) U	0.061 ± 0.082 (0.152) U	0.087 ± 0.128 (0.254) U	0.101 ± 0.102 (0.165) U	0.008 ± 0.109 (0.266) U
Thorium-230	pCi/L	15	**0.264 ± 0.197 (0.199)**	**0.364 ± 0.170 (0.118) J+**	-0.011 ± 0.059 (0.105) U	**0.252 ± 0.140 (0.117) J+**	**0.068 ± 0.068 (0.046)**	0.077 ± 0.082 (0.120) U
Thorium-232	pCi/L	15	0.001 ± 0.131 (0.307) U	0 ± 0.066 (0.048) U	0.010 ± 0.059 (0.087) U	0.064 ± 0.071 (0.097) U	-0.012 ± 0.064 (0.113) U	-0.013 ± 0.068 (0.120) U
Uranium-234	pCi/L	NE	**0.401 ± 0.173 (0.093)**	**0.819 ± 0.253 (0.135) J+**	**0.521 ± 0.217 (0.132)**	**0.245 ± 0.150 (0.162) J+**	**0.969 ± 0.291 (0.157)**	**0.464 ± 0.198 (0.157)**
Uranium-235	pCi/L	NE	**0.331 ± 0.177 (0.121) J+**	**0.135 ± 0.109 (0.122) J+**	**0.255 ± 0.168 (0.142) J+**	**0.153 ± 0.125 (0.069) J+**	**0.065 ± 0.081 (0.058) J+**	0.083 ± 0.092 (0.126) U
Uranium-238	pCi/L	NE	**0.123 ± 0.097 (0.112)**	**0.411 ± 0.168 (0.100) J+**	**0.314 ± 0.162 (0.054)**	0.123 ± 0.105 (0.130) U	**0.554 ± 0.206 (0.091) J+**	**0.335 ± 0.160 (0.097)**
Tritium	pCi/L	20000	**48360 ± 6404 (639)**	2.52 ± 142 (249) U	**1116 ± 236 (231) J+**	**371 ± 171 (254)**	-82.5 ± 123 (226) U	**378 ± 158 (228)**

Table 5a: 2020 Validated Radiochemistry Results
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Sample Location			PZ-211-SD	PZ-211-SD	PZ-211-SS	PZ-302-AI	PZ-302-AS	PZ-302-AS
Sample Depth (ft BGS)			237 - 247	237 - 247	137 - 147	32.6 - 42.4	12.2 - 22	12.2 - 22
Sample Type			N	N	N	N	N	N
Sample Date			11-03-2020	11-05-2020	12-04-2020	12-01-2020	11-30-2020	12-01-2020
Analyte	Unit	USEPA Primary MCL						
Radiochemistry, Dissolved								
Radium-226	pCi/L	5	**0.759 ± 0.425 (0.489) J+**		**1.04 ± 0.535 (0.449)**	0.569 ± 0.451 (0.613) U		**1.09 ± 0.555 (0.534)**
Radium-228	pCi/L	5	**1.03 ± 0.496 (0.863)**		0.215 ± 0.470 (1.04) U	0.208 ± 0.417 (0.917) U		0.766 ± 0.440 (0.811) U
Radium-226/228	pCi/L	5	**1.79 ± 0.921 (1.35) J+**		1.26 ± 1.01 (1.49) U	0.777 ± 0.868 (1.53) U		**1.86 ± 0.995 (1.35)**
Thorium-228	pCi/L	15	-0.061 ± 0.074 (0.229) U		0.032 ± 0.097 (0.220) U	0.002 ± 0.121 (0.295) U		0.041 ± 0.106 (0.234) U
Thorium-230	pCi/L	15	0.014 ± 0.053 (0.038) U		**0.188 ± 0.118 (0.111)**	**0.326 ± 0.166 (0.139)**		**0.286 ± 0.145 (0.047)**
Thorium-232	pCi/L	15	0 ± 0.053 (0.038) U		0.033 ± 0.063 (0.045) U	0.072 ± 0.085 (0.139) U		**0.098 ± 0.086 (0.096)**
Uranium-234	pCi/L	NE	**2.36 ± 0.511 (0.103) J+**		**1.36 ± 0.349 (0.103) J+**	**4.44 ± 0.827 (0.100) J+**		**0.648 ± 0.248 (0.056) J+**
Uranium-235	pCi/L	NE	**0.174 ± 0.122 (0.111) J+**		**0.178 ± 0.121 (0.055)**	**0.211 ± 0.133 (0.112) J+**		0.054 ± 0.103 (0.074) U
Uranium-238	pCi/L	NE	**1.09 ± 0.301 (0.103)**		**0.497 ± 0.187 (0.042)**	**3.47 ± 0.678 (0.041)**		**0.248 ± 0.154 (0.157)**
Radiochemistry, Total								
Radium-226	pCi/L	5	**0.721 ± 0.419 (0.446) J+**		**0.800 ± 0.462 (0.181)**	0.383 ± 0.503 (0.837) U		0.305 ± 0.433 (0.733) U
Radium-228	pCi/L	5	0.0832 ± 0.458 (1.04) U		0.548 ± 0.445 (0.889) U	0.531 ± 0.420 (0.834) U		**0.925 ± 0.477 (0.838)**
Radium-226/228	pCi/L	5	0.804 ± 0.877 (1.49) U		**1.35 ± 0.907 (1.07)**	0.914 ± 0.923 (1.67) U		1.23 ± 0.910 (1.57) U
Thorium-228	pCi/L	15	-0.080 ± 0.104 (0.302) U		0.129 ± 0.143 (0.265) U	0.018 ± 0.104 (0.248) U		-0.013 ± 0.115 (0.285) U
Thorium-230	pCi/L	15	-0.001 ± 0.062 (0.125) U		**0.318 ± 0.158 (0.130) J+**	**0.316 ± 0.158 (0.099) J+**		**0.464 ± 0.183 (0.087) J+**
Thorium-232	pCi/L	15	0.027 ± 0.063 (0.091) U		**0.086 ± 0.077 (0.047)**	0.084 ± 0.081 (0.099) U		**0.121 ± 0.090 (0.087)**
Uranium-234	pCi/L	NE	**1.87 ± 0.466 (0.127)**		**1.17 ± 0.313 (0.084) J+**	**4.45 ± 0.823 (0.081) J+**		**0.366 ± 0.163 (0.128) J+**
Uranium-235	pCi/L	NE	**0.314 ± 0.183 (0.137) J+**		**0.112 ± 0.098 (0.109)**	**0.335 ± 0.169 (0.127) J+**		**0.180 ± 0.128 (0.135) J+**
Uranium-238	pCi/L	NE	**1.25 ± 0.356 (0.105) J+**		**0.408 ± 0.168 (0.101)**	**2.93 ± 0.593 (0.098)**		**0.206 ± 0.119 (0.103)**
Tritium	pCi/L	20000		**544 ± 174 (227)**	-20.2 ± 164 (289) U	108 ± 151 (254) U	**233 ± 157 (248)**	

Table 5a: 2020 Validated Radiochemistry Results
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		Sample Location	PZ-303-AS	PZ-304-AI	PZ-304-AS	S-5	S-5
		Sample Depth (ft BGS)	16 - 25.8	39 - 48.8	17.1 - 26.9	30 - 40	30 - 40
		Sample Type	N	N	N	N	FD
		Sample Date	12-04-2020	12-02-2020	12-02-2020	11-20-2020	11-20-2020
Analyte	Unit	USEPA Primary MCL					
Radiochemistry, Dissolved							
Radium-226	pCi/L	5	0.437 ± 0.444 (0.671) U	**0.625 ± 0.437 (0.527)**	**0.548 ± 0.377 (0.403)**	0.562 ± 0.523 (0.816) U	0.492 ± 0.446 (0.657) UJ
Radium-228	pCi/L	5	0.376 ± 0.584 (1.27) U	**1.38 ± 0.530 (0.802)**	**1.16 ± 0.521 (0.876)**	**1.18 ± 0.547 (0.907)**	**1.42 ± 0.607 (0.978) J**
Radium-226/228	pCi/L	5	0.813 ± 1.03 (1.94) U	**2.01 ± 0.967 (1.33)**	**1.71 ± 0.898 (1.28)**	**1.74 ± 1.07 (1.72)**	**1.91 ± 1.05 (1.64) J**
Thorium-228	pCi/L	15	0.117 ± 0.125 (0.223) U	0.109 ± 0.116 (0.206) U	0.101 ± 0.116 (0.209) U	0.039 ± 0.122 (0.272) U	0.188 ± 0.160 (0.272) UJ
Thorium-230	pCi/L	15	**0.261 ± 0.138 (0.047)**	**0.300 ± 0.144 (0.044)**	**0.332 ± 0.160 (0.115)**	**0.328 ± 0.161 (0.117)**	**0.253 ± 0.142 (0.141) J**
Thorium-232	pCi/L	15	0 ± 0.066 (0.047) U	**0.049 ± 0.062 (0.044)**	**0.132 ± 0.098 (0.095)**	**0.070 ± 0.070 (0.048)**	**0.068 ± 0.068 (0.046) J**
Uranium-234	pCi/L	NE	**0.312 ± 0.145 (0.111) J+**	**0.498 ± 0.180 (0.091) J+**	0.081 ± 0.086 (0.127) U	**0.197 ± 0.124 (0.139) J+**	**0.194 ± 0.117 (0.106) J**
Uranium-235	pCi/L	NE	**0.135 ± 0.102 (0.052) J+**	**0.119 ± 0.095 (0.099) J+**	0.062 ± 0.094 (0.137) U	0.085 ± 0.086 (0.094) U	0.097 ± 0.094 (0.115) UJ
Uranium-238	pCi/L	NE	0.012 ± 0.055 (0.081) U	**0.169 ± 0.101 (0.091)**	0.064 ± 0.078 (0.124) U	0.047 ± 0.067 (0.122) U	0.100 ± 0.086 (0.106) UJ
Radiochemistry, Total							
Radium-226	pCi/L	5	**0.881 ± 0.504 (0.463)**	0.972 ± 0.738 (1.08) U	**1.22 ± 0.668 (0.770)**	**0.765 ± 0.492 (0.514) J**	0.346 ± 0.505 (0.790) UJ
Radium-228	pCi/L	5	0.864 ± 0.525 (0.990) U	**2.58 ± 0.991 (1.52)**	**1.80 ± 0.770 (1.26)**	-0.0381 ± 0.522 (1.21) UJ	**1.76 ± 0.671 (1.03) J**
Radium-226/228	pCi/L	5	**1.75 ± 1.03 (1.45)**	**3.55 ± 1.73 (2.60)**	**3.02 ± 1.44 (2.03)**	0.765 ± 1.01 (1.72) UJ	**2.11 ± 1.18 (1.82) J**
Thorium-228	pCi/L	15	0.119 ± 0.162 (0.312) U	0.022 ± 0.126 (0.289) U	0.044 ± 0.144 (0.320) U	-0.040 ± 0.148 (0.378) UJ	-0.073 ± 0.157 (0.448) UJ
Thorium-230	pCi/L	15	0.138 ± 0.128 (0.171) U	**0.509 ± 0.195 (0.089) J+**	**0.295 ± 0.156 (0.123) J+**	**0.333 ± 0.179 (0.170) J**	**0.347 ± 0.212 (0.192) J**
Thorium-232	pCi/L	15	-0.009 ± 0.096 (0.141) U	-0.006 ± 0.061 (0.089) U	0.101 ± 0.090 (0.104) U	0.056 ± 0.078 (0.116) UJ	0.076 ± 0.109 (0.158) UJ
Uranium-234	pCi/L	NE	**0.361 ± 0.164 (0.094) J+**	**0.423 ± 0.187 (0.103) J+**	**0.261 ± 0.136 (0.122) J+**	**0.160 ± 0.119 (0.156) J**	**0.147 ± 0.111 (0.142) J**
Uranium-235	pCi/L	NE	**0.155 ± 0.121 (0.122)**	-0.009 ± 0.092 (0.134) U	0.054 ± 0.077 (0.112) U	-0.003 ± 0.086 (0.125) UJ	0.102 ± 0.099 (0.123) UJ
Uranium-238	pCi/L	NE	**0.153 ± 0.103 (0.046)**	**0.124 ± 0.100 (0.103)**	0.041 ± 0.059 (0.085) U	**0.157 ± 0.105 (0.047) J**	**0.053 ± 0.065 (0.046) J**
Tritium	pCi/L	20000	-260 ± 156 (289) U	**373 ± 172 (256)**	**467 ± 180 (256)**	146 ± 158 (261) U	90.9 ± 154 (262) U

Table 5a: 2020 Validated Radiochemistry Results
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

		Sample Location	S-10	S-82	S-84
		Sample Depth (ft BGS)	32 - 52	15.5 - 25.5	20.9 - 30.9
		Sample Type	N	N	N
		Sample Date	11-13-2020	11-23-2020	11-10-2020
Analyte	**Unit**	**USEPA Primary MCL**			
Radiochemistry, Dissolved					
Radium-226	pCi/L	5	0.140 ± 0.389 (0.755) U	**1.83 ± 0.786 (0.800)**	0.152 ± 0.498 (0.921) U
Radium-228	pCi/L	5	-0.159 ± 0.504 (1.22) U	**3.00 ± 0.827 (0.870)**	0.698 ± 0.460 (0.883) U
Radium-226/228	pCi/L	5	0.140 ± 0.893 (1.98) U	**4.83 ± 1.61 (1.67)**	0.850 ± 0.958 (1.80) U
Thorium-228	pCi/L	15	0.356 ± 0.284 (0.453) UJ	-0.018 ± 0.118 (0.296) U	0.060 ± 0.122 (0.259) U
Thorium-230	pCi/L	15	**0.278 ± 0.188 (0.173)**	**0.312 ± 0.154 (0.114)**	0.005 ± 0.069 (0.122) U
Thorium-232	pCi/L	15	-0.026 ± 0.115 (0.266) U	0.062 ± 0.069 (0.094) U	-0.007 ± 0.069 (0.101) U
Uranium-234	pCi/L	NE	**0.770 ± 0.344 (0.094) J**	**0.891 ± 0.285 (0.050) J+**	**0.299 ± 0.142 (0.111) J+**
Uranium-235	pCi/L	NE	0.090 ± 0.192 (0.123) UJ	**0.152 ± 0.121 (0.066) J+**	**0.165 ± 0.117 (0.111) J+**
Uranium-238	pCi/L	NE	0.168 ± 0.200 (0.331) UJ	**0.826 ± 0.276 (0.140)**	**0.171 ± 0.107 (0.111)**
Radiochemistry, Total					
Radium-226	pCi/L	5	0.0507 ± 0.330 (0.665) U	0.567 ± 0.537 (0.750) U	**0.597 ± 0.398 (0.494)**
Radium-228	pCi/L	5	-0.0659 ± 0.347 (0.820) U	**1.37 ± 0.563 (0.924)**	**1.18 ± 0.607 (1.07) J+**
Radium-226/228	pCi/L	5	0.0507 ± 0.677 (1.49) U	**1.94 ± 1.10 (1.67)**	**1.78 ± 1.01 (1.56) J+**
Thorium-228	pCi/L	15	0.163 ± 0.251 (0.487) UJ	0.109 ± 0.129 (0.236) U	0.098 ± 0.151 (0.303) U
Thorium-230	pCi/L	15	**0.415 ± 0.241 (0.221)**	**0.305 ± 0.158 (0.053) J+**	0.003 ± 0.075 (0.132) U
Thorium-232	pCi/L	15	0.041 ± 0.120 (0.180) U	0.103 ± 0.093 (0.107) U	0 ± 0.075 (0.054) U
Uranium-234	pCi/L	NE	**0.580 ± 0.212 (0.133)**	**0.894 ± 0.254 (0.075) J+**	**0.344 ± 0.168 (0.104)**
Uranium-235	pCi/L	NE	**0.441 ± 0.201 (0.115) J+**	0.076 ± 0.077 (0.098) U	0.155 ± 0.132 (0.164) U
Uranium-238	pCi/L	NE	**0.300 ± 0.145 (0.088) J+**	**0.590 ± 0.198 (0.091)**	0.064 ± 0.088 (0.163) U
Tritium	pCi/L	20000	**1119 ± 243 (250)**	-17.5 ± 147 (259) U	**240 ± 148 (231) J+**

Notes:
USEPA Primary MCL = USEPA National Primary Drinking Water Regulation (May 2009).
USEPA RSL TAPWATER THQ0.1 = RSL TAPWATER (TR=1E-06, THQ=0.1) May 2021, adapted for West Lake QAPP
Bold = Detected
Blue Font = Exceeds USEPA Primary MCL
NE = Not Established
NA = Not Available
Radiochemistry data is shown in the following format: activity ± total uncertainty (minimum detectable concentration) qualifiers

Qualifier Definition
J = Estimated concentration.
J+ = The result is an estimated concentration, but may be biased high.
J- = The result is an estimated concentration, but may be biased low.
U = The analyte was analyzed for but was not detected at or above the referenced reporting limit.
UJ = The analyte was analyzed for, but was not detected. The reporting limit is approximate and may be inaccurate or imprecise.

Table 5b: Historical Maximum Concentration in Radiochemistry Data
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

Sample Location			D-3	D-6	D-12	D-13	D-83	D-85	D-87	D-93	I-9	I-11	I-62	I-65	I-66	I-67	I-68	I-73	LR-100	MW-1204	PZ-100-KS	PZ-100-SD	PZ-100-SS	PZ-101-SS	PZ-102R-SS	PZ-102-SS
Analyte	Unit	USEPA Primary MCL																								
Radiochemistry, Dissolved																										
Radium-226	pCi/L	5	**3.72**	**3.09**	**2.38**	**1.26**	**4.04**	**1.651**	**2.26**	**3.08**	**2.38**	**1.43**	**0.56**	**0.3**	**0.39**	**0.553**	**0.81**	**3.05**	**0.831**	**68.4**	**0.33**	**2.69**	**3.949**	**28.875**	**3.624**	**4.58**
Radium-228	pCi/L	5	**6.72**	**5.62**	**8.44**	**5.34**	**5.01**	**4.8**	**4.67**	**4.18**	**5.061**	**3.47**	**2.033**	< 48.27	**1.42**	**4.1**	**3.462**	**5.8**	**2.36**	**8.65**	**0.96**	**2.18**	**3.99**	**3.13**	**2.25**	**2.35**
Thorium-228	pCi/L	15	**0.27**	**0.32**	**0.31**	**6.96**	**0.17**	< 2.53	< 0.36	**6.48**	**8.01**	**0.22**	< 0.52	< 0.32	< 1.84	< 1.72	< 0.91	**0.14**	< 0.39	**0.193**	< 0.19	< 0.303	< 0.296	**0.27**	< 0.22	**0.1**
Thorium-230	pCi/L	15	**2.69**	**0.99**	**5.08**	**0.98**	**0.95**	**4.66**	**0.89**	**2.69**	**0.5**	**0.69**	**1.43**	**0.67**	**1.09**	**0.55**	**0.52**	**0.57**	**0.41**	**8.52**	**0.32**	**0.91**	**1.105**	**0.342**	**0.351**	**0.681**
Thorium-232	pCi/L	15	**0**	**0.012**	**1.25**	**0.22**	**0.22**	< 2.48	< 0.19	**0.09**	< 0.74	< 0.17	**0.1**	< 0.2	< 1.96	**0.1**	**0.1**	**0.17**	< 0.37	**7.6**	< 0.18	< 0.26	< 0.216	**0.109**	**0.0237**	< 0.154
Uranium-234	pCi/L	NE	**2.47**	**1.61**	**0.46**	**0.57**	**0.73**	**1.05**	**0.49**	**0.49**	**2.89**	**1.45**	**0.71**	**1.16**	**14**	**1.03**	**2.58**	**1.321**	**0.38**	**0.692**	**0.19**	**0.44**	**12.7**	**1.331**	**5.54**	**5.84**
Uranium-235	pCi/L	NE	< 105.8	**0.24**	**0.28**	**0.27**	< 58.4	**0.36**	**0.31**	< 66.79	**0.1**	**0.43**	**0.16**	**0.33**	**0.2**	**0.34**	**0.26**	**0.36**	**0.31**	**0.264**	**0.07**	< 0.17	**0.26**	**0.0363**	**0.72**	**0.98**
Uranium-238	pCi/L	NE	**1.4**	**0.73**	**0.26**	**0.2**	**0.33**	**0.4**	**0.32**	**0.3**	**2.02**	**1.08**	**0.35**	**0.93**	**3.09**	**0.82**	**2.23**	**0.87**	**0.17**	**1.01**	**0.1**	**0.38**	**4.38**	**1.349**	**3.694**	**3.85**
Radiochemistry, Total																										
Radium-226	pCi/L	5	**4.174**	**3.394**	**0.96**	**1.41**	**3.4**	**9.67**	**2.52**	**3.28**	**2.35**	**1.44**	**0.831**	**1.4**	**0.57**	**1.1**	**3.34**	**4.47**	**0.735**	**41.3**	**0.55**	**2.98**	**4.6**	**23.66**	**3.25**	**9.93**
Radium-228	pCi/L	5	**6.05**	**5.89**	**2.59**	**4.49**	**5.53**	**6.95**	**3.99**	**4.79**	**4.482**	**3.555**	**1.85**	**2.733**	**1.59**	**1.44**	**3.69**	**5.5**	**1.93**	**11.04**	< 2.13	**2.98**	**3.94**	**3.676**	**1.865**	**7.98**
Thorium-228	pCi/L	15	**0.22**	**0.23**	**0.04**	**9.31**	**0.43**	**4.493**	**0.55**	**7.48**	**7.29**	**0.24**	**0.8**	**0.602**	**0.28**	**0.9**	**2.66**	**1.7**	< 0.28	**0.909**	**0.09**	**0.0466**	**0.0699**	**0.28**	**0.4**	**3.24**
Thorium-230	pCi/L	15	**0.36**	**0.71**	**0.57**	**4.25**	**1.24**	**7.84**	**1.63**	**0.78**	**1.54**	**1.18**	**1.63**	**1.89**	**0.97**	**9.9**	**4.14**	**6.7**	**0.55**	**0.747**	**0.39**	**1.05**	**0.17**	**0.572**	**0.605**	**3.03**
Thorium-232	pCi/L	15	**0.27**	**0.07**	**0.17**	**0.11**	**1**	**4.54**	**0.71**	**1.6**	< 0.6	< 0.41	**0.6**	**0.204**	< 2.24	**0.2**	**0.95**	**0.45**	< 0.18	**0.65**	< 0.44	< 0.175	**0.021**	< 0.197	**0.53**	**4.35**
Uranium-234	pCi/L	NE	**3.39**	**2.46**	**1.4**	**2.95**	**0.71**	**3.682**	**1.14**	**2.87**	**3.77**	**1.34**	**0.39**	**1.62**	**0.91**	**0.89**	**2.73**	**1.56**	**1.24**	**15.3**	**0.23**	**1.67**	**15.2**	**1**	**7.19**	**5.7**
Uranium-235	pCi/L	NE	< 40.8	< 52.89	**0.38**	**0.15**	< 73.92	**1.31**	**0.13**	< 50.15	< 75.67	**0.36**	**0.33**	**0.6**	**0.26**	**0.23**	**0.5**	**0.67**	**0.217**	**0.744**	< 0.41	**0.315**	**0.746**	**0.132**	**0.76**	**0.64**
Uranium-238	pCi/L	NE	**2.5**	**1.13**	**0.81**	**0.25**	**0.73**	**4.504**	**0.63**	**2.12**	**2.54**	**1.4**	**0.4**	**1.28**	**1.22**	**0.82**	**3.044**	**1.64**	**0.0801**	**6.9**	**0.06**	**1.35**	**6.39**	**0.967**	**4.18**	**5.09**
Tritium	pCi/L	20,000	**601**					**242**	**94.3**								**186**	**10,600**	**372**	**28,700**		< 565	< 563	**6,060**	**150**	

Notes and definitions are presented on Page 5

Table 5b: Historical Maximum Concentration in Radiochemistry Data
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

Sample Location			PZ-103-SS	LCS-3D	PZ-104-KS	LCS-5A	PZ-104-SD	PZ-104-SS	PZ-105-SS	PZ-106-KS	PZ-106-SD	PZ-106-SS	PZ-107-SS	PZ-109-SS	PZ-111-KS	PZ-111-SD	PZ-113-AD	PZ-113-AS	PZ-113-SS	PZ-114-AS	PZ-115-SS
Analyte	Unit	USEPA Primary MCL																			
Radiochemistry, Dissolved																					
Radium-226	pCi/L	5	**3.89**	**0.476**	**0.283**	**9.14**	**9.741**	**1.76**	**1.925**	**0.37**	**10.3**	**3.55**	**10.01**	**3.02**	**0.37**	**1.53**	**4.508**	**0.75**	**2.48**	**0.716**	**7.35**
Radium-228	pCi/L	5	**3.22**	**8.02**	< 2.362	**5.75**	**8.08**	**1.63**	**4.12**	**2.73**	**4.51**	**3.56**	**2.68**	**2.064**	< 1.612	**4.77**	**7.98**	**1.39**	**4.46**	**1.589**	**1.31**
Thorium-228	pCi/L	15	< 0.412		< 0.3	**0.102**	**0.22**	< 0.229	< 0.291	< 0.44	**0.0364**	**0.125**	**0.16**	< 0.43	< 0.2	< 0.582	**0.29**	**0.09**	**0.09**	< 0.93	< 0.396
Thorium-230	pCi/L	15	**0.09**		**0.24**	**1**	**1.19**	**2.04**	**0.977**	**0.29**	**0.409**	**0.44**	**0.47**	**0.13**	**0.49**	**0.45**	**0.576**	**1.07**	**0.281**	**2.67**	**0.428**
Thorium-232	pCi/L	15	**0.0346**		< 0.29	**0.158**	**0.0913**	< 0.323	**0.12**	< 0.27	**0.148**	< 0.27	**0.0537**	< 0.22	< 0.192	< 0.283	< 0.19	**0.12**	< 0.171	**0.95**	**0.07**
Uranium-234	pCi/L	NE	**1.05**		**0.56**	**3.07**	**1.2**	**2.26**	**3.065**	**2.344**	**1.27**	**1.94**	**1.88**	**1.431**	**8.334**	**0.43**	**1.361**	**1.43**	**2.22**	**2.86**	**4.18**
Uranium-235	pCi/L	NE	**0.14**		**0.3**	< 1.37	**0.109**	**0.17**	**0.55**	**0.25**	**0.64**	**0.62**	**0.24**	**0.13**	**0.99**	< 0.21	**0.615**	**0.18**	**0.12**	**0.14**	**0.33**
Uranium-238	pCi/L	NE	**0.74**		**0.29**	**3.9**	**0.97**	**2.84**	**1.883**	**0.83**	**0.422**	**0.963**	**1.43**	**0.961**	**3.47**	**0.344**	**0.33**	**1.34**	**1.21**	**2.44**	**2.19**
Radiochemistry, Total																					
Radium-226	pCi/L	5	**16.68**	**0.384**	**0.32**	**13.2**	**7.58**	**4.62**	**1.843**	**0.44**	**13.7**	**6.33**	**15.7**	**2.58**	**0.635**	**2.07**	**3.58**	**0.83**	**4.92**	**0.68**	**8.89**
Radium-228	pCi/L	5	**7.01**	< 9.25	**2.27**	**4.73**	**8.05**	**1.89**	**2.24**	**2.31**	**4.51**	**3.63**	**5.27**	**6.04**	**1.08**	**3.72**	**7.71**	**2.36**	**3.21**	**1.03**	**1.44**
Thorium-228	pCi/L	15	**2.96**	**1.06**	**0.1**	**1.29**	**0.0409**	**0.1**	**0.075**	< 0.19	**0.384**	**0.073**	**1.15**	< 0.31	**0.11**	**0.11**	**0.206**	**0.1**	**1.09**	**0.25**	**0.117**
Thorium-230	pCi/L	15	**6.03**	**5.03**	**0.24**	**4.66**	**1.98**	**2.04**	**0.45**	**0.54**	**1.392**	**0.906**	**1.66**	**0.17**	**0.42**	**0.546**	**1.09**	**1.65**	**2.37**	**2.3**	**0.753**
Thorium-232	pCi/L	15	**2.47**	**0.136**	< 0.19	**1.48**	**0.0979**	**0.047**	**0.089**	< 0.277	**0.177**	**0.0931**	**1.57**	< 0.19	**0.13**	**0.027**	**0.06**	**0.12**	**0.87**	**1.36**	< 0.233
Uranium-234	pCi/L	NE	**4.47**	**27.9**	**0.62**	**36.4**	**1.42**	**20**	**3.425**	**2.41**	**3.33**	**2.17**	**2.5**	**1.51**	**7.15**	**1.76**	**0.579**	**1.15**	**3.647**	**3.45**	**4.05**
Uranium-235	pCi/L	NE	**0.445**	**1.84**	**0.27**	**3.61**	**0.133**	**1.01**	**0.25**	**0.322**	**0.62**	**0.179**	**0.531**	**0.17**	**0.82**	**0.349**	< 0.623	**0.22**	**1.845**	**0.123**	**0.34**
Uranium-238	pCi/L	NE	**4.77**	**4.79**	**0.369**	**8.39**	**0.711**	**5.46**	**1.835**	**0.93**	**2.57**	**1.18**	**2.346**	**0.749**	**3.1**	**1.65**	< 1.17	**1.36**	**1.76**	**2.81**	**2.68**
Tritium	pCi/L	20,000	**369**		< 560	**12,300**	**2,860**	**339**	**285**		**25,900**	**4,760**	**2,540**	**224**		< 558	**527**	**167**	**188**	**265**	**323**

Notes and definitions are presented on Page 5

Table 5b: Historical Maximum Concentration in Radiochemistry Data
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

Sample Location			PZ-116-SS	PZ-200-SS	PZ-201A-SS	PZ-202-SS	PZ-203-SS	PZ-204A-SS	PZ-204-SS	PZ-205-AS	PZ-205-SS	PZ-206-SS	PZ-207-AS	PZ-209-SS	PZ-210-SS	PZ-211-SD	PZ-211-SS	PZ-302-AI	PZ-302-AS	PZ-303-AS	PZ-304-AI
Analyte	Unit	USEPA Primary MCL																			
Radiochemistry, Dissolved																					
Radium-226	pCi/L	5	**0.36**	**4.496**	**0.507**	**1.5**	**2**	**1.4**	**1.412**	**2.39**	**1.541**	**1.75**	**0.82**	**1.05**	**0.52**	**0.53**	**1.05**	**0.69**	**0.34**	**0.69**	**1.929**
Radium-228	pCi/L	5	**5.19**	**3.027**	**1.571**	**2.32**	**3.73**	**1.59**	< 1.576	**2.73**	**1.47**	**1.58**	**1.53**	**1.12**	< 1.46	**5.65**	< 1.05	**1.425**	**6.71**	**2.438**	**3.22**
Thorium-228	pCi/L	15	**0.12**	**0.107**	**0.0534**	**0.107**	< 0.239	< 0.296	< 0.296	< 0.308	**0.196**	**0.07**	< 0.17	< 0.16	< 0.2	**0.57**	< 0.24	< 0.226	< 0.17	< 0.35	**0.2**
Thorium-230	pCi/L	15	**0.392**	**0.557**	**0.207**	**1.06**	**0.74**	**1.35**	**0.55**	**0.803**	**1.233**	**0.4**	**0.24**	**0.32**	< 0.19	**0.95**	< 0.25	**0.57**	**0.26**	**0.35**	**0.372**
Thorium-232	pCi/L	15	**0.0432**	**0.13**	< 0.35	< 0.26	**0.0168**	**0.12**	< 0.22	**0.11**	**0.06**	**0.22**	< 0.19	< 0.11	< 0.14	**0.85**	< 0.19	**0.07**	< 0.17	< 0.3	< 0.168
Uranium-234	pCi/L	NE	**6.7**	**0.705**	**2.86**	**3.18**	**3.373**	**3.1**	**3.885**	**0.99**	**1.17**	**0.723**	**0.32**	**3.5**	**1.76**	**14.08**	**2.77**	**5.504**	**2.45**	**1.05**	**1.269**
Uranium-235	pCi/L	NE	**1.252**	**0.188**	**1.03**	**0.348**	**0.31**	**0.4**	**0.392**	**0.46**	**0.11**	**0.331**	**0.28**	< 0.24	**0.26**	**0.43**	< 0.22	**0.84**	**0.46**	**0.37**	< 0.394
Uranium-238	pCi/L	NE	**2.196**	**0.58**	**2.51**	**1.11**	**0.88**	**2.96**	**2.947**	**1.08**	**0.857**	**0.509**	< 0.23	**1.77**	**0.81**	**4.56**	**0.92**	**4.06**	**1.39**	**1.02**	**0.58**
Radiochemistry, Total																					
Radium-226	pCi/L	5	**0.83**	**4.938**	**2.71**	**2.66**	**2.31**	**2.61**	**1.35**	**5.09**	**1.734**	**2.3**	**1.12**	**1.14**	**0.61**	**22.71**	**1.21**	**1.082**	**1.88**	**1.38**	**1.64**
Radium-228	pCi/L	5	**0.968**	**5.17**	**1.71**	**2.614**	**2.35**	**3.53**	**1.16**	**5.66**	**2.38**	**1.63**	**2.498**	**1.81**	< 2.5	**25.8**	**1.3**	**2.222**	**2.47**	**3.822**	**4.837**
Thorium-228	pCi/L	15	< 0.271	**0.17**	**3.1**	**0.806**	**0.089**	**0.42**	**0.22**	**0.9**	**0.0355**	**0.15**	**0.12**	**0.0891**	**0.0496**	**6.82**	**0.216**	**0.12**	**1.06**	**1.03**	**0.1**
Thorium-230	pCi/L	15	**0.306**	**0.46**	**0.3**	**1.48**	**0.58**	**2.64**	**0.35**	**1.92**	**2.764**	**0.411**	**0.22**	< 0.3	**0.25**	**7.98**	**0.435**	**0.59**	**0.94**	**1.7**	**0.62**
Thorium-232	pCi/L	15	**0.0802**	**0.24**	**0.0959**	**0.899**	**0.125**	**0.18**	**0.22**	**0.79**	**0.0327**	**0.1**	< 0.292	**0.0457**	**0.15**	**7.11**	**0.278**	**0.15**	**0.73**	**0.69**	< 0.2
Uranium-234	pCi/L	NE	**6.46**	**0.96**	**5.91**	**2.41**	**4.114**	**9.78**	**3.806**	**1.66**	**1.04**	**0.685**	**0.18**	**4.34**	**1.97**	**26.42**	**3.17**	**5.022**	**6.22**	**0.91**	**2.707**
Uranium-235	pCi/L	NE	**0.435**	**0.589**	**1.25**	**0.284**	**0.233**	**0.769**	**0.44**	**0.511**	**0.16**	**0.23**	< 0.675	**0.27**	**0.13**	**1.99**	**0.47**	**0.73**	**0.62**	**0.37**	**0.49**
Uranium-238	pCi/L	NE	**2.48**	**0.8**	**3.88**	**1.7**	**0.553**	**4.55**	**2.47**	**1.22**	**0.876**	**0.49**	< 0.545	**1.65**	**0.68**	**23.27**	**1.3**	**3.574**	**4.59**	**0.89**	**1.546**
Tritium	pCi/L	20,000	**814**	**150**	**187**	**26,000**	**151**	**30,700**	< 386	**48,200**	**272**	**1,750**	**506**	< 383	**251**	**309**	**251**	**316**	**505**	**1,870**	**263**

Notes and definitions are presented on Page 5

Table 5b: Historical Maximum Concentration in Radiochemistry Data
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	Sample Location		PZ-304-AS	S-5	S-10	S-82	S-84
Analyte	Unit	USEPA Primary MCL					
Radiochemistry, Dissolved							
Radium-226	pCi/L	5	**1.68**	**1.295**	**0.45**	**1.33**	**0.67**
Radium-228	pCi/L	5	**2.462**	**4.01**	**1.39**	**6.08**	**4.58**
Thorium-228	pCi/L	15	< 0.434	**0.07**	**0.13**	**8.98**	**0.1**
Thorium-230	pCi/L	15	**0.64**	**2.79**	**0.58**	**1.04**	**0.45**
Thorium-232	pCi/L	15	**0.1**	< 1.58	< 3.94	< 0.62	< 0.432
Uranium-234	pCi/L	NE	**1.27**	**0.58**	**1.31**	**5.17**	**1.69**
Uranium-235	pCi/L	NE	< 1.19	< 118.4	**0.26**	**0.25**	**1**
Uranium-238	pCi/L	NE	< 0.76	**0.29**	**1.08**	**3.11**	**0.63**
Radiochemistry, Total							
Radium-226	pCi/L	5	**2.185**	**1.1**	**0.43**	**3.113**	**1.7**
Radium-228	pCi/L	5	**3.376**	**5.52**	**2.95**	**6.887**	**5.8**
Thorium-228	pCi/L	15	< 0.467	< 0.29	< 10.2	**7.99**	**0.87**
Thorium-230	pCi/L	15	**0.64**	**1.76**	**0.529**	**1.8**	**1.329**
Thorium-232	pCi/L	15	**0.15**	**0.18**	**0.18**	**0.3**	**1.1**
Uranium-234	pCi/L	NE	**0.85**	**0.991**	**1.28**	**4.48**	**1.33**
Uranium-235	pCi/L	NE	< 1.53	< 44.64	**0.38**	**0.18**	< 49
Uranium-238	pCi/L	NE	< 1.1	**0.35**	**0.95**	**2.49**	**1.32**
Tritium	pCi/L	20,000	**299**	**457**			**132**

Notes and definitions are presented on Page 5

Notes:
USEPA Primary MCL = USEPA National Primary Drinking Water Regulation (May 2009). MCLs are for combined radium 226/228 (5 pCi/L) and gross alpha excluding uranium (15 pCi/L). Radium-226 contributes to both the combined radium-226/288 and gross alpha; the lower of the two MCLs is shown in the table for comparison. There is a total Uranium MCL of 30 µg/L.
Bold = Detected
Blue Font = Exceeds USEPA Primary MCL
NE = Not Established
Due to the variability in uncertainty and MDCs for historical radiochemistry data, only activity is shown.
Historical maximum concentration for radiochemistry data collected between 1 May 1986 and 12 May 2017

Table 6: 2020 Validated Data for Gas, General Chemistry, and Herbicides
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

				Sample Location	D-3	D-6	D-12	D-13	D-83	D-85	D-87	D-89	D-93	I-9	I-11	I-62	I-65	I-66
				Sample Depth (ft BGS)	96.5-106.5	96.5-106.5	133.7-143.7	123-133	77-97	62-82	91-111	33-48	92-112	43.1-53.1	80.5-90.5	34-44	26-36	26.9-36.9
				Sample Date	11-20-2020	11-12-2020	11-12-2020	11-13-2020	11-16-2020	11-30-2020	11-20-2020	12-03-2020	11-23-2020	11-23-2020	11-12-2020	11-16-2020	11-24-2020	11-05-2020
				Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1														
Dissolved Permanent Gases, Total																		
Carbon dioxide	RSK-175	ug/L	NE	NE	**106,000**	**81,300**	**84,000**	**39,000**	**78,800**	**98,300**	**68,800**	**357,000**	**106,000**	**219,000**	**75,000**	**41,900**	**19,100**	**51,000**
Methane	RSK-175	ug/L	NE	NE	**5,200**	**1,900**	**460**	**27**	**43**	**310**	**260**	**24,000**	**1,100**	**16,000**	**190**	**150**	**650**	< 5.0 U
General Chemistry Parameters																		
Bromide	SW9056A	mg/L	NE	NE	**4.1**	**1.7**	**0.91**	**0.072**	**0.065**	**0.26**	**1.2**	**6.9**	**3.6**	**3.9**	**1.6**	< 0.050 U	**0.039 J**	**0.13**
Chloride	SW9056A	mg/L	NE	NE	**249**	**145**	**140**	**192**	**120**	**499 J+**	**201**	**1,120**	**247**	**332**	**163**	**52.8**	**116**	**208**
Fluoride	SW9056A	mg/L	4	0.08	**0.094 J**	**5.0**	**13.4**	**0.17**	**0.31**	**0.13**	**0.15**	**0.28**	**3.4**	**0.13**	**3.8**	**0.48**	**0.39**	**0.37**
Iodide	SW9056A	mg/L	NE	0.02	**0.26 J**	**0.15 J**	**0.15 J**	< 0.50 U	< 0.50 U	**0.084 J**	**0.15 J**	**3.8**	**0.53**	**0.47 J**	**0.21 J**	< 0.50 U	< 0.50 U	< 0.50 U
Sulfate	SW9056A	mg/L	NE	NE	**8.0**	< 0.25 U	**292**	**33.8**	**21.4**	**43.4**	**22.6**	**0.77**	**53.0**	< 0.25 U	**2.5**	**24.6**	**42.8**	**90.5**
Nitrate as N	9056A	mg/L	10	NE	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	**0.031 J**	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U
Nitrite as N	9056A	mg/L	1	NE	< 0.50 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U
Nitrite + Nitrate as N	E353.2	mg/L	NE	NE	**0.052 J**	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	**0.061 J**	< 1.0 U	**0.021 J**	< 0.10 U	< 0.10 U	< 0.10 U	**0.014 J**	< 0.10 U
Phosphorus	E365.1	mg/L	NE	NE	**0.67**	**0.42**	**0.28**	**0.42**	**0.44**	**0.40**	**0.41**	**0.77**	**0.51**	**0.84**	**0.26**	**0.30**	< 0.050 U	**0.067**
Chemical Oxygen Demand	E410.4	mg/L	NE	NE	**77.5**	**42.6**	**39.7**	**7.3 J**	**30.9**	**12.0**	**71.6**	**568**	**72.7**	**118**	**41.6**	**4.9 J**	< 10.0 U	**4.6 J**
Alkalinity, Total as CaCO3	SM2320B	mg/L	NE	NE	**936**	**694**	**737**	**345**	**317**	**422**	**648**	**1,600**	**920**	**1,200**	**637**	**304**	**327**	**459**
Bicarbonate Alkalinity as CaCO3	SM2320B	mg/L	NE	NE	**936**	**694**	**737**	**345**	**317**	**403**	**648**	**1,600**	**920**	**1,200**	**636**	**304**	**327**	**459**
Carbonate Alkalinity as CaCO3	SM2320B	mg/L	NE	NE	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	**19.2**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	**1.2 J**	< 2.0 U	< 2.0 U	< 2.0 U
Dissolved Solids, Total	SM2540C	mg/L	NE	NE	**1,230**	**926**	**1,440**	**724**	**502**	**1,380**	**1,010**	**3,340**	**1,430**	**1,670**	**830**	**434**	**564**	**918**
Total suspended solids	SM2540D	mg/L	NE	NE	**74**	**36**	**30**	**25**	**23**	**89**	**46**	**202**	**58**	**71**	**36**	**19**	< 2.6 U	**3**
pH, Lab	SM4500-H-B	pH units	NE	NE	**6.9 J**	**7.6 J**	**7.2 J**	**7.0 J**	**7.2 J**	**6.8 J**	**7.0 J**	**6.6 J**	**7.0 J**	**6.9 J**	**7.2 J**	**7.3 J**	**7.2 J**	**6.9 J**
Ammoniacal Nitrogen NH3N	SM4500-NH3G	mg/L	NE	NE	**48.7**	**5.9**	**2.0**	**0.13**	**22.7**	**2.5**	**12.0**	**111**	**7.2**	**17.1**	**14.3**	**0.32**	< 0.10 U	**0.23**
Sulfide	SM4500-S2-D	mg/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 UJ
Dissolved Organic Carbon	SM5310C	mg/L	NE	NE	**23.3**	**12.0**	**13.1**	**2.0**	**3.6**	**2.5 J**	**11.3**	**150**	**18.9**	**35.6**	**12.0**	**2.3**	**2.4**	**1.5**
Organic Carbon, Total	SM5310C	mg/L	NE	NE	**22.9**	**11.1**	**12.6**	**1.6**	**3.2**	**1.9 J**	**10.5**	**156**	**17.8**	**34.4**	**11.2**	**2.1**	**2.0**	**1.4**
Herbicides, Total																		
2,4,5-TP (Silvex)	SW8151A	ug/L	50	11	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 0.97 U	< 0.97 UJ	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 0.97 U	< 1.0 U	< 0.96 UJ
2,4-Dichlorophenoxyacetic acid	SW8151A	ug/L	70	17	< 1.0 U	< 1.0 UJ	< 1.0 UJ	**0.89 J**	< 0.97 U	< 0.97 UJ	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 0.97 U	< 1.0 U	< 0.96 U
Dinoseb	SW8151A	ug/L	7	1.5	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 U	< 0.97 U	< 0.97 UJ	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 0.97 U	< 1.0 U	< 0.96 U
Trichlorophenoxyacetic Acid, 2,4,5-	SW8151A	ug/L	NE	16	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 U	< 0.97 U	< 0.97 UJ	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 0.97 U	< 1.0 U	< 0.96 U

Notes and definitions are presented on Page 7

Table 6: 2020 Validated Data for Gas, General Chemistry, and Herbicides
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				Sample Location	I-67	I-68	I-73	LR-100	MW-1204	MW-1204	PZ-100-KS	PZ-100-SD	PZ-100-SS	PZ-101-SS	PZ-102R-SS	PZ-102-SS	PZ-103-SS
				Sample Depth (ft BGS)	25.4-35.4	21.2-31.2	43.2-46.2	19.7-24.5	213.5-223.5	213.5-223.5	374-383.8	234.8-244.6	73.96-93.6	129.48-139.28	79.83-89.63	79.7-89.5	134.7-144.5
				Sample Date	11-10-2020	11-24-2020	11-30-2020	12-03-2020	11-06-2020	11-06-2020	12-02-2020	12-01-2020	12-01-2020	11-12-2020	11-06-2020	11-06-2020	12-03-2020
				Sample Type	N	N	N	N	N	FD	N	N	N	N	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1													
Dissolved Permanent Gases, Total																	
Carbon dioxide	RSK-175	ug/L	NE	NE	**73,300**	**36,900**	**215,000**	**185,000**	**243,000**	**229,000**	**14,000**	**24,600**	**44,000**	**90,100**	**38,400**	**4,290**	**278,000**
Methane	RSK-175	ug/L	NE	NE	**17**	**9.0 J+**	**23,000**	**17,000**	**17,000**	**16,000**	**36 J+**	**23**	**12 J+**	**1,600**	**13 J+**	**3,900**	**25,000**
General Chemistry Parameters																	
Bromide	SW9056A	mg/L	NE	NE	**0.12**	**0.16**	**7.1**	**1.4**	**2.9**	**2.8**	**0.24**	< 0.050 U	< 0.050 U	**1.4**	**0.034 J**	< 0.050 U	**1.8**
Chloride	SW9056A	mg/L	NE	NE	**124**	**482**	**1,060**	**110**	**453**	**459**	**61.0**	**2.1**	**5.8**	**166**	**9.2**	**5.6**	**329**
Fluoride	SW9056A	mg/L	4	0.08	**0.20**	**0.17**	**0.16**	**0.13**	**1.8**	**1.8**	**5.7**	**2.2**	**0.63**	**1.6**	**0.57**	**0.42**	**0.61**
Iodide	SW9056A	mg/L	NE	0.02	< 0.50 U	< 0.50 U	**3.1**	**0.43 J**	**1.3**	**1.3**	< 0.50 U	< 0.50 U	< 0.50 U	**0.82**	< 0.50 U	< 0.50 U	**0.30 J**
Sulfate	SW9056A	mg/L	NE	NE	**107**	**61.8**	**0.34**	**0.25 J**	**0.21 J**	**0.30**	**37.0**	**11.5**	**36.1**	**1.6**	**61.5**	**11.4**	**0.69**
Nitrate as N	9056A	mg/L	10	NE	< 0.050 U	**0.86**	**0.020 J**	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	**0.11**	**0.089**	< 0.050 U	< 0.050 U	< 0.050 U	**0.015 J**
Nitrite as N	9056A	mg/L	1	NE	< 0.050 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.050 U	< 0.050 U	< 0.050 U	**0.037 J**	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.50 U
Nitrite + Nitrate as N	E353.2	mg/L	NE	NE	< 0.10 U	**0.96**	< 0.10 U	< 1.0 U	< 0.10 U	< 0.10 U	**0.017 J**	**0.12**	**0.12**	< 0.10 U	< 0.10 U	< 0.10 U	< 1.0 U
Phosphorus	E365.1	mg/L	NE	NE	**0.35**	**0.056 J+**	**3.4**	**0.34**	**0.072**	**0.077**	**0.037 J**	< 0.050 U	< 0.050 U	**0.063**	< 0.050 U	< 0.050 U	**0.24**
Chemical Oxygen Demand	E410.4	mg/L	NE	NE	**9.9 J**	**4.1 J**	**1,120**	**93.6**	**346**	**359**	**24.6**	**6.0 J**	**6.9 J**	**72.0**	**6.1 J**	**4.4 J**	**248**
Alkalinity, Total as CaCO3	SM2320B	mg/L	NE	NE	**397**	**335**	**1,120**	**1,030**	**1,080**	**1,070**	**494**	**322**	**384**	**673**	**405**	**422**	**869**
Bicarbonate Alkalinity as CaCO3	SM2320B	mg/L	NE	NE	**397**	**335**	**1,120**	**1,030**	**1,080**	**1,070**	**479**	**302**	**359**	**673**	**405**	**422**	**869**
Carbonate Alkalinity as CaCO3	SM2320B	mg/L	NE	NE	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	**15.0**	**20.6**	**25.4**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Dissolved Solids, Total	SM2540C	mg/L	NE	NE	**864**	**1,220**	**1,800**	**914**	**1,820**	**1,770**	**654**	**310**	**429**	**896**	**483**	**434**	**1,530**
Total suspended solids	SM2540D	mg/L	NE	NE	**34**	< 2.5 U	**43**	**36**	**32**	**29**	< 2.5 U	< 2.5 U	< 2.5 U	**3**	< 2.5 U	**2**	**36**
pH, Lab	SM4500-H-B	pH units	NE	NE	**6.8 J**	**6.8 J**	**6.7 J**	**6.7 J**	**6.6 J**	**6.6 J**	**7.7 J**	**7.3 J**	**7.5 J**	**7.8 J**	**7.2 J**	**7.1 J**	**6.5 J**
Ammoniacal Nitrogen NH3N	SM4500-NH3G	mg/L	NE	NE	**0.44**	< 0.10 U	**477**	**138**	**55.6**	**56.1**	**0.33**	**0.21**	< 0.10 U	**9.9**	< 0.10 U	**0.094 J**	**0.78**
Sulfide	SM4500-S2-D	mg/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.66 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.29 J-**	< 1.0 U
Dissolved Organic Carbon	SM5310C	mg/L	NE	NE	**4.5**	**1.8**	**542**	**27.7**	**100**	**100**	< 1.0 U	**1.2 J+**	< 1.0 U	**19.2**	< 1.0 U	**1.2 J+**	**62.4**
Organic Carbon, Total	SM5310C	mg/L	NE	NE	**4.0**	**1.4**	**286**	**28.3**	**101**	**101**	**0.34 J**	**0.69 J**	**0.44 J**	**19.2**	**0.69 J**	**0.55 J**	**72.7**
Herbicides, Total																	
2,4,5-TP (Silvex)	SW8151A	ug/L	50	11	< 1.0 UJ	< 1.0 U	< 0.96 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 0.96 UJ	< 0.99 UJ	< 0.98 UJ	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U
2,4-Dichlorophenoxyacetic acid	SW8151A	ug/L	70	17	< 1.0 U	< 1.0 U	< 0.96 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 0.96 UJ	< 0.99 U	< 0.98 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U
Dinoseb	SW8151A	ug/L	7	1.5	< 1.0 U	< 1.0 U	< 0.96 UJ	< 1.0 UJ	< 1.0 U	< 1.0 U	< 0.96 UJ	< 0.99 UJ	< 0.98 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 UJ
Trichlorophenoxyacetic Acid, 2,4,5-	SW8151A	ug/L	NE	16	< 1.0 UJ	< 1.0 U	< 0.96 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 0.96 UJ	< 0.99 UJ	< 0.98 UJ	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U

Notes and definitions are presented on Page 7

Table 6: 2020 Validated Data for Gas, General Chemistry, and Herbicides
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Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1	Sample Location / Sample Depth (ft BGS) / Sample Date / Sample Type: PZ-103-SS 134.7-144.5 12-03-2020 FD	LCS-3D - 12-08-2020 N	LCS-3D - 12-08-2020 FD	PZ-104-KS 397.37-407.17 12-03-2020 N	LCS-5A 145-295 12-08-2020 N	PZ-104-SD 235.2-245 11-04-2020 N	PZ-104-SS 134.5-144.3 11-12-2020 N	PZ-105-SS 138.5-148.3 11-06-2020 N	PZ-106-KS 363.75-373.57 11-13-2020 N	PZ-106-SD 190.79-200.59 11-13-2020 N	PZ-106-SD 190.79-200.59 11-13-2020 FD	PZ-106-SS 155.3-165.1 11-11-2020 N	PZ-107-SS 92.6-102.4 12-03-2020 N
Dissolved Permanent Gases, Total																	
Carbon dioxide	RSK-175	ug/L	NE	NE	**282,000**	**74,500**	**75,400**	**25,900**	**297,000**	**39,200**	**39,500**	**48,100**	**22,400**	**33,000**	**36,800**	**105,000**	**191,000**
Methane	RSK-175	ug/L	NE	NE	**22,000**	**760**	**840**	**180**	**7,000**	**9,400**	< 5.0 U	**9.8 J+**	**61**	**83**	**66**	**1,100**	**7,100**
General Chemistry Parameters																	
Bromide	SW9056A	mg/L	NE	NE	**1.8**	**47.6**	**49.9**	**0.12**	**6.8**	**0.59**	**0.032 J**	**0.20**	**0.058**	**0.20**	**0.19**	**0.61**	**3.3**
Chloride	SW9056A	mg/L	NE	NE	**316**	**8,480**	**7,760**	**62.4**	**1,210**	**150**	**3.8**	**90.3**	**13.3**	**73.4**	**72.7**	**101**	**472 J+**
Fluoride	SW9056A	mg/L	4	0.08	**0.61**	< 1.0 U	< 1.0 U	**1.8**	**0.72 J**	**1.0**	**0.79**	**0.57**	**3.0**	**1.3**	**1.3**	**1.8**	**0.49**
Iodide	SW9056A	mg/L	NE	0.02	**0.30 J**	**9.2**	**9.2**	< 0.50 U	**2.6 J**	**0.64**	< 0.50 U	< 0.50 U	< 0.50 U	**0.21 J**	**0.20 J**	**1.0**	**1.5**
Sulfate	SW9056A	mg/L	NE	NE	**0.56**	**195**	**199**	**30.8**	< 2.5 U	**40.7**	**32.3**	**55.0**	**11.2**	**66.7**	**66.5**	**26.3**	**17.0**
Nitrate as N	9056A	mg/L	10	NE	**0.016 J**	< 0.50 U	< 0.50 U	< 0.050 U	< 0.50 U	< 0.050 U	**0.082 J+**	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	**0.015 J**
Nitrite as N	9056A	mg/L	1	NE	< 0.50 U	**1.2**	**1.3**	< 0.050 U	< 0.50 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.50 U
Nitrite + Nitrate as N	E353.2	mg/L	NE	NE	< 1.0 U	< 5.0 UJ	< 5.0 UJ	< 0.10 U	< 0.40 UJ	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 UJ	< 0.10 U	< 0.10 U	< 0.10 U	< 1.0 UJ
Phosphorus	E365.1	mg/L	NE	NE	**0.26**	**0.39 J**	**0.29 J**	**0.042 J**	**0.96 J+**	**0.095**	< 0.050 U	**0.028 J**	< 0.050 U	**0.028 J**	< 0.050 U	**0.028 J**	**0.27**
Chemical Oxygen Demand	E410.4	mg/L	NE	NE	**229**	**42,000 J**	**47,600 J**	**5.0 J**	**757 J-**	**81.0**	< 10.0 U	**10.6**	< 10.0 U	**8.0 J**	**9.5 J**	**34.8**	**196**
Alkalinity, Total as CaCO3	SM2320B	mg/L	NE	NE	**871**	**3,700**	**3,740**	**329**	**1,900**	**465**	**392**	**400**	**371**	**376**	**388**	**521**	**909**
Bicarbonate Alkalinity as CaCO3	SM2320B	mg/L	NE	NE	**871**	**3,700**	**3,740**	**329**	**1,900**	**465**	**392**	**400**	**371**	**376**	**388**	**521**	**909**
Carbonate Alkalinity as CaCO3	SM2320B	mg/L	NE	NE	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Dissolved Solids, Total	SM2540C	mg/L	NE	NE	**1,480**	**32,300**	**32,800**	**423**	**3,190**	**716**	**401**	**608**	**368**	**555**	**562**	**702**	**1,600**
Total suspended solids	SM2540D	mg/L	NE	NE	**37**	**96**	**73**	< 2.5 U	**7**	**15**	< 2.5 U	**2**	< 2.5 U	**3**	< 2.5 U	**5**	**10**
pH, Lab	SM4500-H-B	pH units	NE	NE	**6.5 J**	**5.7 J**	**5.7 J**	**7.3 J**	**6.6 J**	**6.9 J**	**7.3 J**	**7.1 J**	**7.4 J**	**7.1 J**	**7.2 J**	**6.8 J**	**6.8 J**
Ammoniacal Nitrogen NH3N	SM4500-NH3G	mg/L	NE	NE	**0.78**	**686 J**	**661 J**	**0.22**	**258**	**21.3**	< 0.10 U	< 0.10 U	**0.13**	**1.4**	**1.4**	**0.65**	**28.4 J-**
Sulfide	SM4500-S2-D	mg/L	NE	NE	< 1.0 U	< 5.0 UJ	**0.18 J**	**0.064 J**	< 5.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	**0.046 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dissolved Organic Carbon	SM5310C	mg/L	NE	NE	**66.3**	**12,800 J**	**12,900 J**	< 1.0 U	**225 J-**	**22.6**	**1.1 J+**	**3.9**	< 1.0 U	**2.9 J+**	**2.8 J+**	**11.9**	**54.2**
Organic Carbon, Total	SM5310C	mg/L	NE	NE	**68.8**	**13,600 J**	**14,100 J**	**0.49 J**	**179**	**23.9**	**0.47 J**	**3.6**	< 1.0 U	**2.4**	**2.4**	**11.1**	**65.2**
Herbicides, Total																	
2,4,5-TP (Silvex)	SW8151A	ug/L	50	11	< 1.0 U	< 48.1 U	< 49.5 U	< 1.0 U	< 0.96 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 UJ	< 1.1 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 U
2,4-Dichlorophenoxyacetic acid	SW8151A	ug/L	70	17	< 1.0 U	< 48.1 UJ	< 49.5 UJ	< 1.0 U	< 0.96 UJ	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 UJ	< 1.1 UJ	< 1.0 UJ	< 1.0 U	< 1.0 U
Dinoseb	SW8151A	ug/L	7	1.5	< 1.0 UJ	< 48.1 UJ	< 49.5 UJ	< 1.0 UJ	< 0.96 UJ	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 UJ	< 1.1 UJ	< 1.0 UJ	< 1.0 U	< 1.0 UJ
Trichlorophenoxyacetic Acid, 2,4,5-	SW8151A	ug/L	NE	16	< 1.0 U	< 48.1 UJ	< 49.5 UJ	< 1.0 U	< 0.96 UJ	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 UJ	< 1.1 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 U

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Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1	Sample Location / Sample Depth (ft BGS) / Sample Date / Sample Type											
					PZ-109-SS 125.7-135.5 11-10-2020 N	PZ-109-SS 125.7-135.5 11-10-2020 FD	PZ-111-KS 357.15-366.96 11-09-2020 N	PZ-111-SD 199.4-209.2 11-09-2020 N	PZ-111-SS 105.5-115.5 11-09-2020 N	PZ-113-AD 98.6-108.4 11-05-2020 N	PZ-113-AD 98.6-108.4 11-05-2020 FD	PZ-113-AS 28.9-38.7 11-04-2020 N	PZ-113-SS 148.57-158.37 11-05-2020 N	PZ-114-AS 19.9-29.7 11-11-2020 N	PZ-115-SS 74.68-84.48 11-24-2020 N	PZ-115-SS 74.68-84.48 11-24-2020 FD	PZ-116-SS 151.4-161 12-04-2020 N
Dissolved Permanent Gases, Total																	
Carbon dioxide	RSK-175	ug/L	NE	NE	**30,200**	**31,600**	**3,460**	**35,900**	**134,000**	**111,000**	**112,000**	**90,600**	**11,200**	**248,000**	**135,000**	**130,000**	**9,670**
Methane	RSK-175	ug/L	NE	NE	< 5.0 U	< 5.0 U	**24**	**42**	**8,200**	**2,400**	**2,600**	**220**	**7.6 J+**	**13,000**	**8,300**	**8,200**	**21 J+**
General Chemistry Parameters																	
Bromide	SW9056A	mg/L	NE	NE	**0.048 J**	< 0.050 U	**0.54**	**0.090**	**12.9**	**4.3**	**4.3**	**1.1**	**0.070**	**0.32**	**0.56 J**	**0.78 J**	**0.036 J**
Chloride	SW9056A	mg/L	NE	NE	**4.5**	**4.7**	**143**	**10.7**	**577**	**352**	**358**	**114**	**11.7**	**491**	**505 J+**	**526**	**3.9**
Fluoride	SW9056A	mg/L	4	0.08	**2.6**	**2.6**	**14.9**	**2.3**	**0.47**	**0.20**	**0.18**	**0.27**	**3.0**	**0.18**	**0.37 J**	**0.54**	**2.8**
Iodide	SW9056A	mg/L	NE	0.02	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	**0.53**	**0.28 J**	**0.26 J**	**0.75**	< 0.50 U	**0.12 J**	**0.22 J**	**0.23 J**	< 0.50 U
Sulfate	SW9056A	mg/L	NE	NE	**24.4**	**24.5**	**71.0**	**47.6**	**17.7**	**20.5**	**20.7**	**5.8**	**20.3**	< 0.25 U	**1.7 J**	**2.7 J**	**25.8**
Nitrate as N	9056A	mg/L	10	NE	**0.10**	**0.10**	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 UJ	< 0.050 U	< 0.050 U
Nitrite as N	9056A	mg/L	1	NE	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.50 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.050 U
Nitrite + Nitrate as N	E353.2	mg/L	NE	NE	**0.14**	**0.13**	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	**0.018 J**	< 0.10 U	< 0.10 U
Phosphorus	E365.1	mg/L	NE	NE	**0.027 J**	**0.028 J**	< 0.050 U	< 0.050 U	**0.12**	**0.37**	**0.39**	**0.14**	< 0.050 U	**2.0 J-**	**0.27**	**0.23**	**0.060**
Chemical Oxygen Demand	E410.4	mg/L	NE	NE	< 10.0 U	< 10.0 U	< 10.0 U	**3.8 J**	**108**	**50.7**	**54.2**	**22.5**	< 10.0 U	**53.6 J-**	**27.2**	**25.1**	< 10.0 U
Alkalinity, Total as CaCO3	SM2320B	mg/L	NE	NE	**428**	**419**	**569**	**395**	**789**	**753**	**742**	**645**	**266**	**597**	**709**	**703**	**297**
Bicarbonate Alkalinity as CaCO3	SM2320B	mg/L	NE	NE	**428**	**419**	**557**	**395**	**789**	**753**	**742**	**645**	**266**	**597**	**709**	**703**	**283**
Carbonate Alkalinity as CaCO3	SM2320B	mg/L	NE	NE	< 2.0 U	< 2.0 U	**12.2**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	**13.8**
Dissolved Solids, Total	SM2540C	mg/L	NE	NE	**430**	**418**	**972**	**426**	**1,680**	**1,270**	**1,280**	**842**	**294**	**1,430**	**1,320**	**1,340**	**329**
Total suspended solids	SM2540D	mg/L	NE	NE	**2**	< 2.5 U	< 2.7 U	< 2.5 U	**5**	**66**	**65**	**15**	< 2.5 U	**92**	**4**	**7**	**3**
pH, Lab	SM4500-H-B	pH units	NE	NE	**7.2 J**	**7.2 J**	**8.1 J**	**7.2 J**	**6.8 J**	**6.9 J**	**7.0 J**	**6.9 J**	**7.4 J**	**6.6 J**	**6.7 J**	**6.7 J**	**7.6 J**
Ammoniacal Nitrogen NH3N	SM4500-NH3G	mg/L	NE	NE	< 0.10 U	< 0.10 U	**0.51**	**0.097 J**	**2.0**	**19.3**	**19.6**	**4.0**	< 0.10 U	**5.8**	**2.4**	**2.4**	**0.087 J**
Sulfide	SM4500-S2-D	mg/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.032 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U
Dissolved Organic Carbon	SM5310C	mg/L	NE	NE	**1.2 J+**	**1.1 J+**	< 1.0 U	**1.2 J+**	**34.3**	**17.4**	**17.4**	**6.9**	< 1.0 U	**7.7**	**45.7 J**	**9.1 J**	**0.88 J**
Organic Carbon, Total	SM5310C	mg/L	NE	NE	**0.87 J**	**0.87 J**	**0.53 J**	**0.69 J**	**34.5**	**14.8**	**15.4**	**6.7**	**0.60 J**	**7.2**	**8.3**	**8.3**	**0.54 J**
Herbicides, Total																	
2,4,5-TP (Silvex)	SW8151A	ug/L	50	11	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.1 UJ	< 1.0 U	< 1.0 UJ	< 0.96 UJ	< 1.0 UJ	< 1.0 U	< 1.0 U
2,4-Dichlorophenoxyacetic acid	SW8151A	ug/L	70	17	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.1 U	< 1.0 U	< 1.0 U	< 0.96 U	< 1.0 UJ	< 1.0 U	< 1.0 U
Dinoseb	SW8151A	ug/L	7	1.5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.1 U	< 1.0 U	< 1.0 U	< 0.96 U	< 1.0 UJ	< 1.0 U	< 1.0 UJ
Trichlorophenoxyacetic Acid, 2,4,5-	SW8151A	ug/L	NE	16	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.1 U	< 1.0 U	< 1.0 U	< 0.96 UJ	< 1.0 UJ	< 1.0 U	< 1.0 U

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Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1	Sample Location	PZ-200-SS	PZ-201A-SS	PZ-202-SS	PZ-203-SS	PZ-204A-SS	PZ-204-SS	PZ-205-AS	PZ-205-SS	PZ-206-SS	PZ-207-AS	PZ-209-SS	PZ-210-SS	PZ-211-SD	PZ-211-SD
					Sample Depth (ft BGS)	9.62-97.64	80-89.8	40.2-89.1	99.6-109.4	79.5-89.1	10.95-89.35	38.55-48.35	88.57-98.37	115-124.8	34.9-39.7	140-150	138-148	237-247	237-247
					Sample Date	12-02-2020	12-04-2020	12-02-2020	11-16-2020	12-04-2020	12-04-2020	11-11-2020	11-11-2020	11-10-2020	12-01-2020	11-04-2020	11-03-2020	11-03-2020	11-05-2020
					Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Dissolved Permanent Gases, Total																			
Carbon dioxide	RSK-175	ug/L	NE	NE		**67,700**	**18,000**	**635,000**	**55,200**	**126,000**	**23,500**	**84,900**	**35,800**	**55,600**	**314,000**	**17,800**	**49,700**	**29,200 J-**	NA
Methane	RSK-175	ug/L	NE	NE		**960**	< 5.0 U	**30,000**	**5,100**	**4,800**	**8.6 J+**	**24,000**	**11 J+**	**650**	**20,000**	**7.1 J+**	**3,500**	**9.7 J+**	NA
General Chemistry Parameters																			
Bromide	SW9056A	mg/L	NE	NE		**0.31**	< 0.050 U	**9.0**	**0.096**	**3.2**	< 0.050 U	**16.1**	**0.24**	**0.75**	**2.1**	< 0.050 U	**0.17**	NA	**0.23**
Chloride	SW9056A	mg/L	NE	NE		**615**	**5.3**	**1,360**	**16.8**	**908**	**5.5**	**2,780**	**32.9**	**111**	**243**	**3.0**	**31.4**	NA	**48.2**
Fluoride	SW9056A	mg/L	4	0.08		**0.059 J**	**0.33**	**0.22**	**0.52**	**0.15**	**0.42**	**0.21**	**0.39**	**1.8**	**0.071 J**	**1.9**	**0.65**	NA	**2.2**
Iodide	SW9056A	mg/L	NE	0.02		< 0.50 U	< 0.50 U	**2.6**	< 0.50 U	**0.83**	< 0.50 U	**6.9**	< 0.50 U	**0.30 J**	**0.22 J**	< 0.50 U	**0.089 J**	NA	< 0.50 U
Sulfate	SW9056A	mg/L	NE	NE		**71.7**	**64.0**	**0.80**	**46.1**	**200**	**24.5**	**0.33**	**54.4**	**43.9**	**0.13 J**	**22.5**	**6.8**	NA	**37.1**
Nitrate as N	9056A	mg/L	10	NE		**0.017 J**	**1.7**	**0.052**	< 0.050 U	< 0.050 U	**0.16**	< 0.050 U	**0.075 J+**	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	NA	**0.13**
Nitrite as N	9056A	mg/L	1	NE		< 0.50 U	< 0.050 U	< 0.50 U	< 0.050 U	< 0.50 U	< 0.050 U	< 0.50 U	< 0.050 U	< 0.050 U	< 0.50 U	< 0.050 U	< 0.050 U	NA	**0.017 J**
Nitrite + Nitrate as N	E353.2	mg/L	NE	NE		**0.023 J**	**1.7**	< 0.10 U	< 0.10 U	< 1.0 U	**0.19 J+**	< 0.40 U	< 0.10 U	< 0.10 U	**0.014 J-**	< 0.10 U	< 0.10 U	NA	**0.20**
Phosphorus	E365.1	mg/L	NE	NE		**0.19**	**0.11 J+**	**0.21**	< 0.050 U	**0.094**	**0.075**	**1.1**	< 0.050 U	**0.052**	**0.76**	**0.040 J**	**1.7**	NA	< 0.050 U
Chemical Oxygen Demand	E410.4	mg/L	NE	NE		**10.3**	< 10.0 UJ	**777**	**44.6**	**264**	< 10.0 U	**1,200**	< 10.0 U	**49.0**	**120 J+**	**5.0 J**	**33.2**	NA	**12.8**
Alkalinity, Total as CaCO3	SM2320B	mg/L	NE	NE		**464**	**342**	**960**	**386**	**598**	**392**	**974**	**365**	**499**	**1,140**	**365**	**456**	NA	**382**
Bicarbonate Alkalinity as CaCO3	SM2320B	mg/L	NE	NE		**464**	**331**	**960**	**386**	**598**	**368**	**974**	**365**	**499**	**1,140**	**365**	**456**	NA	**382**
Carbonate Alkalinity as CaCO3	SM2320B	mg/L	NE	NE		< 2.0 U	**11.2**	< 2.0 U	< 2.0 U	< 2.0 U	**23.2**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	NA	< 2.0 U
Dissolved Solids, Total	SM2540C	mg/L	NE	NE		**1,440**	**441**	**3,820**	**475**	**2,560**	**394**	**6,550**	**491**	**698**	**1,240**	**368**	**466**	NA	**477**
Total suspended solids	SM2540D	mg/L	NE	NE		**4**	< 2.7 U	**116**	< 2.5 U	**37**	< 2.5 U	**246**	< 2.5 U	**3**	**46**	**4**	**5**	NA	< 2.5 U
pH, Lab	SM4500-H-B	pH units	NE	NE		**6.6 J**	**7.5 J**	**6.4 J**	**7.2 J**	**6.6 J**	**7.4 J**	**6.5 J**	**7.4 J**	**7.0 J**	**6.6 J**	**7.2 J**	**7.5 J**	NA	**7.2 J**
Ammoniacal Nitrogen NH3N	SM4500-NH3G	mg/L	NE	NE		< 0.10 U	**0.038 J**	**0.79**	**0.075 J**	**0.60**	**0.040 J**	**44.3**	< 0.10 U	**0.22**	**93.7**	**0.22**	**14.1**	NA	< 0.10 U
Sulfide	SM4500-S2-D	mg/L	NE	NE		< 1.0 U	< 1.0 U	< 1.0 U	**0.058 J**	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	**0.047 J**	NA	< 1.0 U
Dissolved Organic Carbon	SM5310C	mg/L	NE	NE		**1.6 J+**	< 1.0 U	**224**	**15.3**	**74.1**	**0.86 J**	**402**	**1.1 J+**	**16.1**	**33.3**	**0.85 J**	**9.2**	NA	**4.2**
Organic Carbon, Total	SM5310C	mg/L	NE	NE		**0.95 J**	**0.51 J**	**244**	**15.0**	**73.6**	**0.50 J**	**366**	**0.65 J**	**15.3**	**37.2**	**0.56 J**	**9.0**	NA	**3.5**
Herbicides, Total																			
2,4,5-TP (Silvex)	SW8151A	ug/L	50	11		< 0.96 U	< 1.0 U	< 0.96 U	< 0.97 U	< 1.0 U	< 1.0 U	< 0.96 UJ	< 1.0 UJ	< 1.1 UJ	< 0.96 UJ	< 1.0 U	< 1.0 U	NA	< 0.95 UJ
2,4-Dichlorophenoxyacetic acid	SW8151A	ug/L	70	17		< 0.96 U	< 1.0 U	< 0.96 U	< 0.97 U	< 1.0 U	< 1.0 U	< 0.96 U	< 1.0 U	< 1.1 U	< 0.96 U	< 1.0 U	< 1.0 U	NA	< 0.95 U
Dinoseb	SW8151A	ug/L	7	1.5		< 0.96 U	< 1.0 UJ	< 0.96 U	< 0.97 U	< 1.0 UJ	< 1.0 UJ	< 0.96 U	< 1.0 U	< 1.1 U	< 0.96 UJ	< 1.0 U	< 1.0 U	NA	< 0.95 U
Trichlorophenoxyacetic Acid, 2,4,5-	SW8151A	ug/L	NE	16		< 0.96 U	< 1.0 U	< 0.96 U	< 0.97 U	< 1.0 U	< 1.0 U	< 0.96 UJ	< 1.0 UJ	< 1.1 UJ	< 0.96 UJ	< 1.0 U	< 1.0 U	NA	< 0.95 U

Notes and definitions are presented on Page 7

Table 6: 2020 Validated Data for Gas, General Chemistry, and Herbicides
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

				Sample Location	PZ-211-SS	PZ-302-AI	PZ-302-AS	PZ-302-AS	PZ-303-AS	PZ-304-AI	PZ-304-AS	S-5	S-5	S-10	S-82	S-84
				Sample Depth (ft BGS)	137-147	32.6-42.4	12.2-22	12.2-22	16-25.8	39-48.8	17.1-26.9	30-40	30-40	32-52	15.5-25.5	20.9-30.9
				Sample Date	12-04-2020	12-01-2020	11-30-2020	12-01-2020	12-04-2020	12-02-2020	12-02-2020	11-20-2020	11-20-2020	11-13-2020	11-23-2020	11-10-2020
				Sample Type	N	N	N	N	N	N	N	N	FD	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1												
Dissolved Permanent Gases, Total																
Carbon dioxide	RSK-175	ug/L	NE	NE	**13,400**	**268,000**	**210,000**	NA	**199,000**	**251,000**	**586,000**	**171,000**	**197,000**	**245,000**	**169,000**	**133,000**
Methane	RSK-175	ug/L	NE	NE	**6.4 J+**	**310**	**10,000**	NA	**23,000**	**7,000**	**21,000**	**13,000**	**13,000**	**2,800**	**2,200**	**1,800 J+**
General Chemistry Parameters																
Bromide	SW9056A	mg/L	NE	NE	< 0.050 U	**0.38**	**0.44**	NA	**2.4**	**3.1**	**2.1**	**9.9**	**9.8**	**2.6**	**2.9**	**0.20**
Chloride	SW9056A	mg/L	NE	NE	**4.9**	**37.9**	**40.8**	NA	**140**	**404**	**241 J-**	**356**	**357**	**223**	**224**	**41.9**
Fluoride	SW9056A	mg/L	4	0.08	**1.9**	**0.16**	**0.35**	NA	**0.15**	**0.26**	**0.46**	< 0.10 U	< 0.10 U	**5.5**	**0.33**	**0.24**
Iodide	SW9056A	mg/L	NE	0.02	< 0.50 U	**0.17 J**	**0.14 J**	NA	**0.57**	**0.58**	**0.45 J**	**0.24 J**	**0.29 J**	**0.40 J**	**0.44 J**	< 0.50 U
Sulfate	SW9056A	mg/L	NE	NE	**28.9**	**21.4**	**0.49**	NA	**0.16 J**	< 0.25 U	**0.24 J**	**0.13 J**	**0.14 J**	**862**	**12.2**	**87.0**
Nitrate as N	9056A	mg/L	10	NE	< 0.050 U	**0.028 J**	< 0.050 U	NA	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U	< 0.050 U
Nitrite as N	9056A	mg/L	1	NE	< 0.050 U	< 0.050 U	< 0.050 U	NA	< 0.050 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.050 UJ	< 0.50 U	< 0.050 U
Nitrite + Nitrate as N	E353.2	mg/L	NE	NE	< 0.10 U	**0.020 J**	< 0.10 U	NA	< 1.0 U	**0.029 J**	**0.023 J**	**0.049 J**	**0.047 J**	< 0.50 UJ	< 0.10 U	< 0.10 UJ
Phosphorus	E365.1	mg/L	NE	NE	**0.15**	**0.084 J+**	**1.9**	NA	**1.7**	**0.23**	**3.2**	**3.6**	**3.5**	**0.56**	**0.99**	**1.1 J+**
Chemical Oxygen Demand	E410.4	mg/L	NE	NE	< 10.0 U	**19.1**	**50.8**	NA	**160**	**68.4**	**205**	**383**	**419**	**72.0**	**83.1**	**25.9**
Alkalinity, Total as CaCO3	SM2320B	mg/L	NE	NE	**341**	**805**	**652**	NA	**728**	**715**	**1,370**	**2,100**	**1,970**	**601**	**1,180**	**498**
Bicarbonate Alkalinity as CaCO3	SM2320B	mg/L	NE	NE	**341**	**805**	**627**	NA	**728**	**715**	**1,370**	**2,100**	**1,970**	**601**	**1,180**	**498**
Carbonate Alkalinity as CaCO3	SM2320B	mg/L	NE	NE	< 2.0 U	< 2.0 U	**25.2**	NA	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Dissolved Solids, Total	SM2540C	mg/L	NE	NE	**354**	**914**	**756**	NA	**1,050**	**1,400**	**1,410**	**2,050**	**2,070**	**2,000**	**1,550**	**700**
Total suspended solids	SM2540D	mg/L	NE	NE	< 2.5 U	**6**	NA	**96**	**121**	**42**	**51**	**36**	**48**	**107**	**63**	**80**
pH, Lab	SM4500-H-B	pH units	NE	NE	**7.4 J**	**6.6 J**	**6.5 J**	NA	**6.6 J**	**6.8 J**	**6.7 J**	**7.3 J**	**7.1 J**	**6.5 J**	**6.9 J**	**6.7 J**
Ammoniacal Nitrogen NH3N	SM4500-NH3G	mg/L	NE	NE	**0.10**	**0.069 J**	**3.4**	NA	**0.37**	**4.3**	**150**	**238**	**240**	**48.2**	**13.1 J-**	**1.9**
Sulfide	SM4500-S2-D	mg/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U
Dissolved Organic Carbon	SM5310C	mg/L	NE	NE	< 1.0 U	**6.2**	**13.9**	NA	**30.5**	**19.8**	**52.7**	**99.6**	**97.0**	**18.7**	**26.5**	**7.5**
Organic Carbon, Total	SM5310C	mg/L	NE	NE	**0.36 J**	**5.2**	**12.8**	NA	**29.5**	**18.0**	**52.2**	**87.5**	**83.8**	**18.4**	**25.6**	**7.3**
Herbicides, Total																
2,4,5-TP (Silvex)	SW8151A	ug/L	50	11	< 1.0 U	< 0.99 UJ	NA	< 0.98 UJ	< 1.0 U	< 0.96 U	< 0.96 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ
2,4-Dichlorophenoxyacetic acid	SW8151A	ug/L	70	17	< 1.0 U	< 0.99 U	NA	< 0.98 U	< 1.0 U	< 0.96 U	< 0.96 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 U
Dinoseb	SW8151A	ug/L	7	1.5	< 1.0 UJ	< 0.99 UJ	NA	< 0.98 U	< 1.0 UJ	< 0.96 U	< 0.96 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 U
Trichlorophenoxyacetic Acid, 2,4,5-	SW8151A	ug/L	NE	16	< 1.0 U	< 0.99 UJ	NA	< 0.98 UJ	< 1.0 U	< 0.96 U	< 0.96 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ

Notes and definitions are presented on Page 7

Notes:

ft BGS = feet below ground surface

ug/L = micrograms per liter

mg/L = milligrams per liter

USEPA Primary MCL = USEPA National Primary Drinking Water Regulation (May 2009). MCLs are for combined radium 226/228 (5 pCi/L) and gross alpha excluding uranium (15 pCi/L). Radium-226 contributes to both the combined radium-226/288 and gross alpha; the lower of the two MCLs is shown in the table for comparison. There is a total Uranium MCL of 30 ug/L presented in the metals result tables.

USEPA RSL TAPWATER THQ0.1 = RSL TAPWATER (TR=1E-06, THQ=0.1) May 2021, adapted for West Lake QAPP

Bold = Detected

Blue Font = Exceeds USEPA Primary MCL

Orange Shaded = Detected value exceeds USEPA RSL TAPWATER THQ0.1

Gray Shaded = Compound not detected above the reporting detection limit but reporting detection limit exceeds USEPA RSL TAPWATER THQ0.1

NE = Not Established

NA = Not Available

For the 2020 4th quarter groundwater monitoring event, turbidity for samples PZ-205-AS-WG-20201111, PZ-205-SS-WG-20201111, I-11-WG-20201112, D-12-WG-20201112, D-6-WG-20201112, S-10-WG-20201113, D-13-WG-20201113, I-62-WG-20201116, D-83-WG-20201116, S-5-WG-20201120, D-3-WG-20201120, D-87-WG-20201120, S-82-WG-20201123, D-93-WG-20201123, I-9-WG-20201123, I-65-WG-20201124, PZ-115-SS-WG-20201124, I-68-WG-20201124, D-85-WG-20201130, I-73-WG-20201130, PZ-302-AS-WG-20201130, PZ-302-AI-WG-20201201, PZ-207-AS-WG-20201201, PZ-202-SS-WG-20201202, PZ-304-AS-WG-20201202, PZ-304-AI-WG-20201202, LR-100-WG-20201203, PZ-107-SS-WG-20201203, PZ-103-SS-WG-20201203, PZ-303-AS-WG-20201204, PZ-201A-SS-WG-20201204, PZ-204A-SS-WG-20201204, and PZ-204-SS-WG-20201204 were analyzed using an instrument with a tungsten filament light source. Turbidity measured using this method is typically reported in NTU.

Qualifier Definition

J = Estimated concentration.

J+ = The result is an estimated concentration, but may be biased high.

J- = The result is an estimated concentration, but may be biased low.

U = The analyte was analyzed for but was not detected at or above the referenced reporting limit.

UJ = The analyte was analyzed for, but was not detected. The reporting limit is approximate and may be inaccurate or imprecise.

Table 7: 2020 Validated Data for Total Metals
West Lake Landfill OU-3
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					Sample Location	D-3	D-6	D-12	D-13	D-83	D-85	D-87	D-89	D-93	I-9	I-11	I-62	I-65	I-66	I-67
					Sample Depth (ft BGS)	96.5-106.5	96.5-106.5	133.7-143.7	123-133	77-97	62-82	91-111	33-48	92-112	43.1-53.1	80.5-90.5	34-44	26-36	26.9-36.9	25.4-35.4
					Sample Date	11-20-2020	11-12-2020	11-12-2020	11-13-2020	11-16-2020	11-30-2020	11-20-2020	12-03-2020	11-23-2020	11-23-2020	11-12-2020	11-16-2020	11-24-2020	11-05-2020	11-10-2020
					Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1																
Metals, Total																				
Aluminum	SW6010B	ug/L	NE	2,000		< 200 U	< 200 U	**145 J**	< 200 U	< 200 U	**665**	< 200 U	**54.9 J**	**154 J**	< 200 U	< 200 U	**67.5 J**	< 200 U	< 200 U	**748**
Barium	SW6010B	ug/L	2,000	380		**2,460**	**1,260**	**862**	**653**	**942**	**1,590**	**1,180**	**1,810**	**1,130**	**2,260**	**808**	**383**	**189**	**181**	**296**
Boron	SW6010B	ug/L	NE	400		**1,210**	**767**	**763**	**139**	**260**	**202**	**887**	**1,780**	**1,470**	**2,430**	**905**	**105**	**148**	**525**	**224**
Calcium	SW6010B	ug/L	NE	NE		**191,000**	**188,000**	**316,000**	**147,000**	**71,700**	**230,000**	**186,000**	**487,000**	**270,000**	**286,000**	**153,000**	**106,000**	**102,000**	**201,000**	**198,000**
Cobalt	SW6010B	ug/L	NE	0.6		**2.2 J**	**1.4 J**	**1.8 J**	< 5.0 U	< 5.0 U	**2.9 J**	**0.98 J**	**17.5**	**3.1 J**	**3.0 J**	**1.4 J**	< 5.0 U	**2.2 J**	**4.2 J**	< 5.0 U
Hardness as CaCO3	SW6010B	ug/L	NE	NE		**750,000**	**659,000**	**991,000**	**502,000**	**284,000**	**815,000**	**672,000**	**1,970,000**	**947,000**	**1,070,000**	**602,000**	**349,000**	**304,000**	**571,000**	**634,000**
Iron	SW6010B	ug/L	NE	1,400		**37,600**	**14,300**	**12,200**	**12,200**	**10,100**	**43,100**	**23,400**	**87,900**	**20,400**	**47,200**	**15,900**	**7,650**	**58.2**	**1,500**	**11,800**
Lithium	SW6010B	ug/L	NE	4		**33.5**	**35.9**	**30.0**	**23.0**	**21.7**	**32.0**	**31.1**	**52.4**	**48.6**	**58.3**	**32.6**	**18.9 J**	< 20.0 U	**27.9**	**25.5**
Magnesium	SW6010B	ug/L	NE	NE		**66,100**	**45,800**	**49,200**	**32,600**	**25,400**	**58,300**	**50,000**	**184,000**	**66,300**	**87,500**	**53,300**	**20,600**	**11,800**	**16,600**	**33,900**
Manganese	SW6010B	ug/L	NE	43		**408**	**458**	**504**	**377**	**283**	**743**	**340**	**2,650**	**567**	**497**	**523**	**630**	**172**	**2,410**	**1,570**
Molybdenum	SW6010B	ug/L	NE	10		**0.74 J**	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	**1.2 J**	< 10.0 U	**3.6 J**	**0.69 J**	**1.8 J**	**1.0 J**	**3.1 J**	**5.4 J**	**3.0 J**	**3.0 J**
Nickel	SW6010B	ug/L	NE	39		**8.3 J**	**7.6 J**	**5.5 J**	**6.8 J**	< 10.0 U	**5.7 J**	**2.5 J**	**113**	**8.3 J**	**16.0**	**6.6 J**	< 10.0 U	**5.8 J**	**7.2 J**	< 10.0 U
Potassium	SW6010B	ug/L	NE	NE		**28,200**	**12,900**	**10,600**	**6,380**	**30,100**	**8,260**	**16,700**	**21,600**	**15,100**	**27,700**	**16,700**	**8,100**	**7,400**	**6,590**	**6,700**
Silicon	SW6010B	ug/L	NE	NE		**18,700**	**12,000**	**11,800**	**11,200**	**12,500**	**21,100**	**18,000**	**20,600**	**15,400**	**20,400**	**11,600**	**12,500**	**8,180**	**10,600**	**16,000**
Sodium	SW6010B	ug/L	NE	20,000		**191,000**	**112,000**	**128,000**	**76,400**	**56,400**	**188,000**	**121,000**	**378,000**	**191,000**	**227,000**	**106,000**	**27,500**	**105,000**	**123,000**	**68,400**
Strontium	SW6010B	ug/L	NE	1,200		**852**	**630**	**875**	**376**	**443**	**605**	**539**	**2,080**	**883**	**1,170**	**1,070**	**401**	**409**	**959**	**746**
Tin	SW6010B	ug/L	NE	1,200		**2.7 J**	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	**2.1 J**	**3.3 J**	**2.0 J**	**2.1 J**	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
Titanium	SW6010B	ug/L	NE	NE		< 10.0 U	< 10.0 U	**3.5 J**	< 10.0 U	< 10.0 U	**15.1**	< 10.0 U	**4.2 J**	**6.6 J**	< 10.0 U	< 10.0 U	**0.90 J**	**1.1 J**	< 10.0 U	**15.6**
Zinc	SW6010B	ug/L	NE	600		< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	**19.7 J**	**27.7**	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	**7.4 J**	< 20.0 U	< 20.0 U	< 20.0 U
Antimony	SW6020	ug/L	6	0.78		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.38 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.15 J**	< 1.0 U	< 1.0 U
Arsenic	SW6020	ug/L	10	0.052		**8.4**	**0.33 J**	**0.45 J**	**0.24 J**	**0.58 J**	**31.2**	**1.4**	**48.4**	**0.62 J**	**35.6**	**12.3**	**12.5**	**1.2**	**2.2**	**2.4**
Beryllium	SW6020	ug/L	4	2.5		< 0.20 U	**0.034 J**	**0.19 J**	< 0.20 U	< 0.20 U	**0.039 J**	< 0.20 U	**0.023 J**	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	**0.037 J**
Cadmium	SW6020	ug/L	5	0.92		< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	**0.12 J**	< 0.20 U	< 0.20 U
Chromium	SW6020	ug/L	100	NE		**0.91 J**	< 2.0 U	< 2.0 U	**0.24 J**	**0.31 J**	< 2.0 U	**0.24 J**	**6.3**	**0.68 J**	**0.93 J**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Chromium (VI)	SW7199	ug/L	100	0.035		< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U
Chromium (III)	CALC	ug/L	100	2,200		< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	**6.2 J**	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U
Copper	SW6020	ug/L	1,300	80		< 1.0 U	**0.59 J**	**1.0**	**0.46 J**	**0.56 J**	**1.7**	< 1.0 U	**1.4 J+**	< 1.0 U	**1.0 J+**	**0.48 J**	**0.44 J**	< 1.0 U	**0.45 J**	**2.1**
Lead	SW6020	ug/L	15	15		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.9**	< 1.0 U	**0.18 J**	**0.35 J**	**0.23 J**	< 1.0 U	**0.21 J**	**0.22 J**	< 1.0 U	**0.92 J**
Selenium	SW6020	ug/L	50	10		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.68 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.31 J**	< 1.0 U	< 1.0 U
Silver	SW6020	ug/L	NE	9.4		< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Thallium	SW6020	ug/L	2	0.02		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Thorium	SW6020	ug/L	NE	NE		< 1.0 U	< 1.0 U	**0.39 J**	**0.13 J**	**0.15 J**	**0.51 J**	< 1.0 U	< 1.0 U	**0.16 J**	< 1.0 U	**0.11 J**	**0.17 J**	< 1.0 U	< 1.0 U	**0.19 J**
Uranium	SW6020	ug/L	30	0.4		**0.14 J**	**0.20 J**	**0.29 J**	**0.093 J**	**0.047 J**	**0.23 J**	**0.23 J**	< 1.0 U	**0.39 J**	**0.17 J**	**1.4**	**0.34 J**	**2.0**	**6.8**	**2.4**
Vanadium	SW6020	ug/L	NE	8.6		**0.44 J**	**0.24 J**	**0.42 J**	< 1.0 U	**0.22 J**	**1.0**	**0.29 J**	**4.6**	**1.2**	**0.56 J**	**0.26 J**	**0.20 J**	**0.43 J**	< 1.0 U	**1.5**
Mercury	SW7470A	ug/L	2	0.063		< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
Cyanide CN-	SW9012A	ug/L	200	0.15		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	**2.9 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 UJ	< 5.0 U

Notes and definitions are presented on Page 7

Table 7: 2020 Validated Data for Total Metals
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				Sample Location	I-68	I-73	LR-100	MW-1204	MW-1204	PZ-100-KS	PZ-100-SD	PZ-100-SS	PZ-101-SS	PZ-102R-SS	PZ-102-SS	PZ-103-SS	PZ-103-SS	LCS-3D	LCS-3D
				Sample Depth (ft BGS)	21.2-31.2	43.2-46.2	19.7-24.5	213.5-223.5	213.5-223.5	374-383.8	234.8-244.6	73.96-93.6	129.48-139.28	79.83-89.63	79.7-89.5	134.7-144.5	134.7-144.5	-	-
				Sample Date	11-24-2020	11-30-2020	12-03-2020	11-06-2020	11-06-2020	12-02-2020	12-01-2020	12-01-2020	11-12-2020	11-06-2020	11-06-2020	12-03-2020	12-03-2020	12-08-2020	12-08-2020
				Sample Type	N	N	N	N	FD	N	N	N	N	N	N	N	FD	N	FD
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1															
Metals, Total																			
Aluminum	SW6010B	ug/L	NE	2,000	**51.1 J**	**58.3 J**	< 200 U	< 200 U	< 200 U	< 200 U	**187 J**	**107 J**	< 200 U	< 200 U	< 200 U	**122 J**	**130 J**	**868 J**	**894 J**
Barium	SW6010B	ug/L	2,000	380	**328**	**3,520**	**432**	**8,250**	**8,300**	**7.3 J**	**345**	**69.6**	**458**	**70.4**	**174**	**998**	**1,000**	**5,450 J**	**5,420**
Boron	SW6010B	ug/L	NE	400	**145**	**2,070**	**1,790**	**1,080**	**1,090**	**599**	**31.4 J**	**115**	**681**	**148**	**124**	**524**	**527**	**20,000 J**	**19,900**
Calcium	SW6010B	ug/L	NE	NE	**242,000**	**56,800**	**121,000**	**218,000**	**221,000**	**20,100**	**75,500**	**88,500**	**139,000**	**118,000**	**107,000**	**320,000**	**327,000**	**3,180,000 J**	**3,230,000**
Cobalt	SW6010B	ug/L	NE	0.6	**11.0**	**19.4**	**1.5 J**	**6.7**	**6.7**	< 5.0 U	< 5.0 U	< 5.0 U	**1.4 J**	< 5.0 U	< 5.0 U	< 5.0 U	**0.86 J**	**12.0 J**	**11.5 J**
Hardness as CaCO3	SW6010B	ug/L	NE	NE	**787,000**	**366,000**	**538,000**	**931,000**	**939,000**	**99,900**	**328,000**	**422,000**	**679,000**	**462,000**	**428,000**	**1,340,000**	**1,360,000**	**9,570,000 J**	**9,660,000**
Iron	SW6010B	ug/L	NE	1,400	**88.5**	**49,400**	**18,800**	**10,800**	**10,700**	**171**	**281**	**93.5**	**1,230**	**432**	**1,280**	**20,500**	**20,600**	**396,000 J**	**395,000**
Lithium	SW6010B	ug/L	NE	4	**23.8**	**161**	**23.7**	**48.4**	**48.4**	**136**	**11.4 J**	**44.1**	**37.8**	**51.5**	**52.4**	**64.2**	**62.6**	**497 J**	**498**
Magnesium	SW6010B	ug/L	NE	NE	**44,400**	**54,400**	**57,500**	**94,000**	**94,400**	**12,100**	**33,800**	**48,800**	**80,900**	**40,900**	**39,000**	**131,000**	**131,000**	**392,000 J**	**389,000**
Manganese	SW6010B	ug/L	NE	43	**3,660**	**227**	**191**	**350**	**351**	**16.9**	**106**	**6.8**	**62.3**	**7.7**	**118**	**926**	**926**	**40,700 J**	**40,300**
Molybdenum	SW6010B	ug/L	NE	10	**1.1 J**	**7.5 J**	**0.65 J**	< 10.0 U	< 10.0 U	< 10.0 U	**2.9 J**	**1.1 J**	**0.88 J**	**2.0 J**	< 10.0 U	< 10.0 U	< 10.0 U	**2.6 J**	**2.6 J**
Nickel	SW6010B	ug/L	NE	39	**20.9**	**419**	**14.2**	**8.6 J**	**8.6 J**	< 10.0 U	**4.5 J**	**9.1 J**	**11.4**	**2.0 J**	< 10.0 U	**54.6**	**55.0**	**31.3 J**	**32.8 J**
Potassium	SW6010B	ug/L	NE	NE	**4,610**	**221,000**	**67,500**	**29,400**	**29,200**	**5,090**	**2,460**	**2,520**	**12,700**	**2,980**	**2,540**	**7,410**	**7,540**	**524,000 J**	**526,000**
Silicon	SW6010B	ug/L	NE	NE	**12,000**	**4,920**	**10,600**	**10,300**	**10,600**	**4,170**	**6,360**	**6,070**	**13,200**	**8,080**	**7,770**	**20,800**	**21,000**	**49,500 J**	**48,800**
Sodium	SW6010B	ug/L	NE	20,000	**130,000**	**234,000**	**134,000**	**258,000**	**262,000**	**234,000**	**7,080**	**9,810**	**95,700**	**14,600**	**14,000**	**121,000**	**121,000**	**2,740,000 J**	**2,750,000**
Strontium	SW6010B	ug/L	NE	1,200	**630**	**1,310**	**502**	**2,440**	**2,450**	**2,920**	**399**	**1,460**	**2,100**	**1,480**	**806**	**7,420**	**7,480**	**19,600 J**	**19,400**
Tin	SW6010B	ug/L	NE	1,200	< 10.0 U	**68.9**	**3.7 J**	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	**2.0 J**	**1.7 J**	**29.6 J**	**31.0 J**
Titanium	SW6010B	ug/L	NE	NE	**1.1 J**	**11.5**	**0.94 J**	**1.0 J**	**1.6 J**	< 10.0 U	**4.5 J**	**1.6 J**	< 10.0 U	< 10.0 U	< 10.0 U	**2.0 J**	**2.1 J**	**7.8 J**	**9.9 J**
Zinc	SW6010B	ug/L	NE	600	< 20.0 U	**397**	< 20.0 U	< 20.0 U	< 20.0 U	**9.7 J**	**161**	**44.4**	**10.8 J**	**56.8**	**17.3 J**	**8.9 J**	**9.6 J**	**52.8 J**	**55.4 J**
Antimony	SW6020	ug/L	6	0.78	**0.35 J**	**0.37 J**	**0.17 J**	**0.12 J**	**0.13 J**	< 1.0 U	**0.33 J**	**0.44 J**	< 1.0 U	**0.10 J**	< 1.0 U	**0.16 J**	**0.17 J**	**2.9 J**	**3.1 J**
Arsenic	SW6020	ug/L	10	0.052	**0.72 J**	**257**	**1.5**	**3.0**	**3.0**	< 1.0 U	**1.2**	< 1.0 U	**10.8**	**0.70 J**	< 1.0 U	**3.7**	**3.5**	**278 J**	**278**
Beryllium	SW6020	ug/L	4	2.5	< 0.20 U	< 0.20 U	< 0.20 U	**0.068 J**	**0.071 J**	< 0.20 U	< 0.20 U	< 0.20 U	**0.033 J**	< 0.20 U	< 0.20 U	**0.095 J**	**0.098 J**	**0.42 J**	**0.48 J**
Cadmium	SW6020	ug/L	5	0.92	**0.81**	**0.92**	**0.025 J**	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	**0.026 J**	**0.052 J**	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 1.0 UJ	< 1.0 U
Chromium	SW6020	ug/L	100	NE	**0.20 J**	**19.1**	**1.1 J**	**8.5**	**8.9**	**0.24 J**	< 2.0 U	< 2.0 U	< 2.0 U	**0.28 J**	**0.25 J**	**2.3**	**2.1**	**86.7 J**	**85.1**
Chromium (VI)	SW7199	ug/L	100	0.035	< 0.100 U	**2.29**	**0.0637 J**	**0.291**	**0.109**	**0.0461 J**	< 0.100 U	< 0.100 U	**0.0683 J**	< 0.100 U	< 0.100 U	**0.105**	**0.0855 J**	< 10.0 U	< 10.0 U
Chromium (III)	CALC	ug/L	100	2,200	< 10 U	**17**	< 10 U	**8.2 J**	**8.8 J**	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	**87**	**85**
Copper	SW6020	ug/L	1,300	80	< 1.0 U	**1.7**	**1.3**	**1.4**	**1.5**	**0.25 J**	< 1.0 U	**2.2**	**0.78 J**	**1.3**	**0.44 J**	**1.1 J+**	< 1.0 U	**15.8 J**	**16.3**
Lead	SW6020	ug/L	15	15	**0.23 J**	**15.4**	**0.92 J**	< 1.0 U	< 1.0 U	< 1.0 U	**0.19 J**	**0.16 J**	< 1.0 U	< 1.0 U	< 1.0 U	**0.16 J**	**0.16 J**	**3.1 J**	**3.4 J**
Selenium	SW6020	ug/L	50	10	**1.7**	**0.64 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**4.8 J**	**4.3 J**
Silver	SW6020	ug/L	NE	9.4	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 UJ	< 2.5 U
Thallium	SW6020	ug/L	2	0.02	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 UJ	< 5.0 U
Thorium	SW6020	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.14 J**	**0.12 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.099 J**	< 5.0 UJ	< 5.0 U
Uranium	SW6020	ug/L	30	0.4	**3.1**	**0.010 J**	< 1.0 U	< 1.0 U	< 1.0 U	**0.093 J**	**1.3**	**4.1**	**0.22 J**	**1.9**	**0.24 J**	**0.19 J**	**0.19 J**	< 5.0 UJ	< 5.0 U
Vanadium	SW6020	ug/L	NE	8.6	**1.7**	**16.3**	**0.59 J**	**3.4**	**3.5**	< 1.0 U	**0.43 J**	**0.46 J**	**2.3**	< 1.0 U	< 1.0 U	**6.9**	**6.8**	**4.8 J**	**4.8 J**
Mercury	SW7470A	ug/L	2	0.063	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	**0.33 J**	**0.44 J**
Cyanide CN-	SW9012A	ug/L	200	0.15	**2.0 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	**13 J**	**5.5 J**

Notes and definitions are presented on Page 7

Table 7: 2020 Validated Data for Total Metals
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					Sample Location	PZ-104-KS	LCS-5A	PZ-104-SD	PZ-104-SS	PZ-105-SS	PZ-106-KS	PZ-106-SD	PZ-106-SD	PZ-106-SS	PZ-107-SS	PZ-109-SS	PZ-109-SS	PZ-111-KS	PZ-111-SD
					Sample Depth (ft BGS)	397.37-407.17	145-295	235.2-245	134.5-144.3	138.5-148.3	363.75-373.57	190.79-200.59	190.79-200.59	155.3-165.1	92.6-102.4	125.7-135.5	125.7-135.5	357.15-366.96	199.4-209.2
					Sample Date	12-03-2020	12-08-2020	11-04-2020	11-12-2020	11-06-2020	11-13-2020	11-13-2020	11-13-2020	11-11-2020	12-03-2020	11-10-2020	11-10-2020	11-09-2020	11-09-2020
					Sample Type	N	N	N	N	N	N	N	FD	N	N	N	FD	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1															
Metals, Total																			
Aluminum	SW6010B	ug/L	NE	2,000	< 200 U	< 200 U	**83.7 J**	< 200 U	< 200 U	**67.1 J**	**43.6 J**	**44.9 J**	< 200 U	< 200 U	< 200 U	< 200 U	**120 J**	< 200 U
Barium	SW6010B	ug/L	2,000	380	**126**	**1,570**	**487**	**97.0**	**266**	**41.4**	**140**	**139**	**944**	**950**	**56.8**	**57.9**	< 10.0 U	**105**
Boron	SW6010B	ug/L	NE	400	**130**	**3,980 J+**	**370**	**155**	**99.4 J**	**182**	< 100 U	< 100 U	**211**	**1,160**	**183**	**182**	**1,090**	**52.3 J**
Calcium	SW6010B	ug/L	NE	NE	**85,100**	**167,000**	**92,900**	**84,300**	**113,000**	**56,000**	**105,000**	**103,000**	**125,000**	**242,000**	**90,600**	**90,000**	**8,010**	**90,800**
Cobalt	SW6010B	ug/L	NE	0.6	< 5.0 U	**11.7**	**0.65 J**	**0.86 J**	**0.66 J**	< 5.0 U	< 5.0 U	< 5.0 U	**1.1 J**	**2.3 J**	< 5.0 U	< 5.0 U	**0.90 J**	< 5.0 U
Hardness as CaCO3	SW6010B	ug/L	NE	NE	**380,000**	**779,000**	**430,000**	**404,000**	**515,000**	**287,000**	**476,000**	**467,000**	**559,000**	**1,130,000**	**434,000**	**433,000**	**42,100**	**435,000**
Iron	SW6010B	ug/L	NE	1,400	**1,440**	**7,630**	**4,310**	**1,000**	**1,030**	**980**	**956**	**929**	**3,040**	**5,310**	**107 J+**	**114 J+**	**728**	**2,580**
Lithium	SW6010B	ug/L	NE	4	**31.8**	**68.8**	**17.7 J**	**36.5**	**19.0 J**	**44.5**	**20.4**	**22.3**	**41.6**	**49.2**	**22.3**	**23.6**	**199**	**12.2 J**
Magnesium	SW6010B	ug/L	NE	NE	**40,700**	**87,800**	**48,100**	**47,000**	**56,500**	**35,800**	**51,800**	**50,800**	**60,000**	**127,000**	**50,300**	**50,500**	**5,370**	**50,500**
Manganese	SW6010B	ug/L	NE	43	**17.7**	**232**	**96.7**	**28.4**	**291**	**5.6**	**41.2**	**38.9**	**21.7**	**94.7**	< 5.0 U	< 5.0 U	**8.2**	**9.3**
Molybdenum	SW6010B	ug/L	NE	10	**1.3 J**	**2.9 J**	**0.90 J**	**9.5 J**	**4.0 J**	< 10.0 U	**3.8 J**	**1.9 J**	**5.7 J**	**0.87 J**	**2.0 J**	**2.1 J**	**1.7 J**	**1.9 J**
Nickel	SW6010B	ug/L	NE	39	< 10.0 U	**39.2**	**20.3**	**4.9 J**	**10.9**	**5.9 J**	**1.9 J**	**2.8 J**	**7.4 J**	**41.1**	< 10.0 U	< 10.0 U	**2.1 J**	< 10.0 U
Potassium	SW6010B	ug/L	NE	NE	**2,050**	**139,000**	**12,500**	**2,190**	**2,240**	**1,940**	**3,260**	**3,140**	**4,720**	**15,900**	**3,630**	**3,430**	**6,690**	**1,650**
Silicon	SW6010B	ug/L	NE	NE	**4,430**	**26,500**	**11,400**	**10,500**	**14,200**	**3,840**	**7,620**	**8,300**	**8,150**	**16,900**	**5,040**	**5,080**	**4,270**	**6,960**
Sodium	SW6010B	ug/L	NE	20,000	**37,200**	**816,000**	**65,900**	**14,300**	**46,700**	**59,300**	**22,700**	**22,400**	**84,500**	**192,000**	**9,900**	**9,760**	**386,000**	**17,500**
Strontium	SW6010B	ug/L	NE	1,200	**2,960**	**1,510**	**631**	**1,010**	**847**	**5,170**	**1,430**	**1,420**	**1,040**	**1,470**	**3,020**	**3,030**	**1,550**	**1,120**
Tin	SW6010B	ug/L	NE	1,200	< 10.0 U	**3.1 J**	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	**1.8 J**	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
Titanium	SW6010B	ug/L	NE	NE	< 10.0 U	**8.1 J**	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	**1.5 J**	< 10.0 U	< 10.0 U	**1.2 J**	< 10.0 U
Zinc	SW6010B	ug/L	NE	600	< 20.0 U	< 20.0 U	**47.2**	**102**	**44.6**	**25.1**	**7.6 J**	**8.2 J**	**9.2 J**	< 20.0 U	**104**	**96.3**	**11.0 J**	< 20.0 U
Antimony	SW6020	ug/L	6	0.78	< 1.0 U	**0.75 J**	**0.11 J**	**0.13 J**	**0.12 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.24 J**	**0.20 J**	**0.19 J**	**0.12 J**	< 1.0 U
Arsenic	SW6020	ug/L	10	0.052	**0.41 J**	**20.1 J**	**14.1**	**2.0**	**0.79 J**	**1.6**	**0.78 J**	**0.83 J**	**1.1**	**5.0**	**0.74 J**	**0.71 J**	**2.4**	**3.3**
Beryllium	SW6020	ug/L	4	2.5	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	**0.025 J**	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
Cadmium	SW6020	ug/L	5	0.92	< 0.20 U	< 0.20 U	< 0.20 U	**0.025 J**	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	**0.025 J**	< 0.20 U	**0.17 J**	**0.14 J**	< 0.20 U	< 0.20 U
Chromium	SW6020	ug/L	100	NE	< 2.0 U	**18.1 J**	**3.3**	< 2.0 U	**0.73 J**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	**7.9**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Chromium (VI)	SW7199	ug/L	100	0.035	< 0.100 U	**0.129**	**0.229**	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	**0.0578 J**	**0.0974 J**	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U
Chromium (III)	CALC	ug/L	100	2,200	< 10 U	**18**	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	**7.8 J**	< 10 U	< 10 U	< 10 U	< 10 U
Copper	SW6020	ug/L	1,300	80	< 1.0 U	**4.9**	**6.7**	**17.0**	**2.5**	< 1.0 U	< 1.0 U	**1.2 J+**	**0.62 J**	< 1.0 U	**1.1**	**0.90 J**	**0.32 J**	**0.76 J**
Lead	SW6020	ug/L	15	15	**0.046 J**	**0.74 J**	**0.47 J**	**0.32 J**	< 1.0 U	**0.25 J**	< 1.0 U	< 1.0 U	< 1.0 U	**0.068 J**	< 1.0 U	< 1.0 U	**0.057 J**	**0.038 J**
Selenium	SW6020	ug/L	50	10	< 1.0 U	**0.44 J**	< 1.0 U	**0.45 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.41 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Silver	SW6020	ug/L	NE	9.4	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	**0.026 J**	< 0.50 U
Thallium	SW6020	ug/L	2	0.02	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Thorium	SW6020	ug/L	NE	NE	< 1.0 U	< 1.0 U	**0.079 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.40 J**	**0.12 J**
Uranium	SW6020	ug/L	30	0.4	< 1.0 U	< 1.0 U	**0.19 J**	**1.7**	**1.7**	**1.5**	< 1.0 U	< 1.0 U	**0.52 J**	**0.44 J**	**0.52 J**	**0.51 J**	**6.6**	**0.59 J**
Vanadium	SW6020	ug/L	NE	8.6	< 1.0 U	**5.6**	**2.7**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.55 J**	**9.5**	**0.21 J**	< 1.0 U	< 1.0 U	< 1.0 U
Mercury	SW7470A	ug/L	2	0.063	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
Cyanide CN-	SW9012A	ug/L	200	0.15	< 5.0 U	**2.2 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 R	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U

Notes and definitions are presented on Page 7

Table 7: 2020 Validated Data for Total Metals
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				Sample Location	PZ-111-SS	PZ-113-AD	PZ-113-AD	PZ-113-AS	PZ-113-SS	PZ-114-AS	PZ-115-SS	PZ-115-SS	PZ-116-SS	PZ-200-SS	PZ-201A-SS	PZ-202-SS	PZ-203-SS	PZ-204A-SS	PZ-204-SS
				Sample Depth (ft BGS)	105.5-115.5	98.6-108.4	98.6-108.4	28.9-38.7	148.57-158.37	19.9-29.7	74.68-84.48	74.68-84.48	151.4-161	9.62-97.64	80-89.8	40.2-89.1	99.6-109.4	79.5-89.1	10.95-89.35
				Sample Date	11-09-2020	11-05-2020	11-05-2020	11-04-2020	11-05-2020	11-11-2020	11-24-2020	11-24-2020	12-04-2020	12-02-2020	12-04-2020	12-02-2020	11-16-2020	12-04-2020	12-04-2020
				Sample Type	N	N	FD	N	N	N	N	FD	N	N	N	N	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1															
Metals, Total																			
Aluminum	SW6010B	ug/L	NE	2,000	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	**77.8 J**	< 200 U	< 200 U	< 200 U	< 200 U	**69.1 J**	< 200 U
Barium	SW6010B	ug/L	2,000	380	**655**	**1,540**	**1,550**	**900**	**184**	**996**	**514**	**506**	**108**	**607**	**123**	**2,800**	**111**	**493**	**174**
Boron	SW6010B	ug/L	NE	400	**620**	**883**	**880**	**289**	**37.9 J**	**246**	**469**	**458**	**421**	**44.4 J**	**38.4 J**	**402**	**140**	**404**	**82.2 J**
Calcium	SW6010B	ug/L	NE	NE	**220,000**	**192,000**	**197,000**	**188,000**	**57,000**	**219,000**	**225,000**	**224,000**	**52,700**	**276,000**	**94,600**	**491,000**	**101,000**	**350,000**	**73,600**
Cobalt	SW6010B	ug/L	NE	0.6	**2.9 J**	**1.3 J**	**1.5 J**	**9.6**	< 5.0 U	**1.4 J**	**28.5**	**27.5**	**0.66 J**	**14.0**	< 5.0 U	**2.9 J**	< 5.0 U	**5.8**	< 5.0 U
Hardness as CaCO3	SW6010B	ug/L	NE	NE	**1,000,000**	**743,000**	**758,000**	**672,000**	**263,000**	**770,000**	**984,000**	**973,000**	**284,000**	**1,230,000**	**431,000**	**2,100,000**	**445,000**	**1,360,000**	**391,000**
Iron	SW6010B	ug/L	NE	1,400	**2,160**	**28,100**	**28,500**	**7,350**	**210**	**68,300**	**3,360**	**3,320**	**114**	**3,480**	**156**	**50,300**	**1,960**	**14,800**	**173**
Lithium	SW6010B	ug/L	NE	4	**42.3**	**29.5**	**28.6**	**20.6**	**10.3 J**	**13.2 J**	**25.7**	**27.0**	**42.6**	**28.2**	< 20.0 U	**44.9**	**37.1**	**43.7**	**40.0**
Magnesium	SW6010B	ug/L	NE	NE	**110,000**	**64,000**	**64,600**	**49,400**	**29,400**	**54,400**	**102,000**	**100,000**	**37,000**	**131,000**	**47,300**	**213,000**	**47,000**	**119,000**	**50,200**
Manganese	SW6010B	ug/L	NE	43	**27.9**	**420**	**425**	**5,100**	**36.8**	**4,170**	**91.8**	**88.3**	**259**	**1,950**	**52.5**	**1,620**	**16.7**	**3,650**	**17.5**
Molybdenum	SW6010B	ug/L	NE	10	< 10.0 U	**1.7 J**	< 10.0 U	**1.9 J**	**16.1**	**0.86 J**	**0.72 J**	**0.52 J**	**3.4 J**	**1.8 J**	**2.2 J**	**0.65 J**	**1.8 J**	**3.2 J**	**2.1 J**
Nickel	SW6010B	ug/L	NE	39	**20.0**	**7.5 J**	**6.7 J**	**16.2**	**1.3 J**	< 10.0 U	**67.9**	**68.0**	**2.4 J**	**40.7**	< 10.0 U	**24.1**	**7.1 J**	**71.6**	< 10.0 U
Potassium	SW6010B	ug/L	NE	NE	**6,750**	**15,300**	**15,400**	**10,400**	**1,550**	**6,500**	**5,750**	**5,490**	**4,220**	**2,420**	**2,300**	**7,050**	**2,490**	**7,720**	**2,440**
Silicon	SW6010B	ug/L	NE	NE	**12,200**	**17,300**	**17,300**	**14,800**	**7,100**	**23,400**	**20,200**	**20,100**	**8,420**	**21,500**	**12,700**	**27,600**	**6,440**	**18,700**	**11,300**
Sodium	SW6010B	ug/L	NE	20,000	**235,000**	**178,000**	**177,000**	**55,700**	**20,400**	**203,000**	**213,000**	**207,000**	**23,400**	**48,100**	**12,400**	**381,000**	**10,300**	**284,000**	**22,000**
Strontium	SW6010B	ug/L	NE	1,200	**2,880**	**625**	**626**	**642**	**580**	**886**	**1,820**	**1,810**	**4,840**	**579**	**478**	**1,120**	**818**	**701**	**1,880**
Tin	SW6010B	ug/L	NE	1,200	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	**2.5 J**	< 10.0 U	**1.9 J**	< 10.0 U
Titanium	SW6010B	ug/L	NE	NE	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	**1.1 J**	**1.2 J**	**0.92 J**	**1.3 J**	< 10.0 U	**3.5 J**	< 10.0 U
Zinc	SW6010B	ug/L	NE	600	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	**78.7**	< 20.0 U	< 20.0 U	< 20.0 U	**39.8**
Antimony	SW6020	ug/L	6	0.78	**0.14 J**	**0.10 J**	**0.10 J**	**0.077 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.17 J**	**0.12 J**	< 1.0 U	**0.19 J**	**0.17 J**
Arsenic	SW6020	ug/L	10	0.052	**1.9**	**2.7**	**2.8**	**15.6**	**0.84 J**	**92.7**	**6.2**	**6.1**	**0.74 J**	**5.8**	**1.2**	**40.7**	**2.4**	**17.7**	**0.40 J**
Beryllium	SW6020	ug/L	4	2.5	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	**0.057 J**	< 0.20 U	**0.026 J**	< 0.20 U
Cadmium	SW6020	ug/L	5	0.92	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	**0.035 J**
Chromium	SW6020	ug/L	100	NE	< 2.0 U	**0.50 J**	**0.49 J**	**0.28 J**	**0.30 J**	< 2.0 U	**0.53 J**	**0.43 J**	< 2.0 U	**0.11 J**	**0.38 J**	**3.7**	< 2.0 U	**2.7**	< 2.0 U
Chromium (VI)	SW7199	ug/L	100	0.035	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	**0.152**	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	**0.117**	**0.0490 J**	< 0.100 U	**0.0780 J**	**0.0403 J**
Chromium (III)	CALC	ug/L	100	2,200	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U
Copper	SW6020	ug/L	1,300	80	**0.60 J**	**0.57 J**	**0.60 J**	**0.47 J**	**0.29 J**	**0.58 J**	**1.1 J+**	**1.1 J+**	**0.99 J**	**0.80 J**	**5.6**	**1.4**	< 1.0 U	**1.5**	**2.0**
Lead	SW6020	ug/L	15	15	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.14 J**	< 1.0 U	**0.28 J**	< 1.0 U	< 1.0 U	**0.090 J**	**0.16 J**
Selenium	SW6020	ug/L	50	10	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.61 J**	< 1.0 U	**0.56 J**	< 1.0 U
Silver	SW6020	ug/L	NE	9.4	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Thallium	SW6020	ug/L	2	0.02	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Thorium	SW6020	ug/L	NE	NE	**0.15 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Uranium	SW6020	ug/L	30	0.4	**0.60 J**	**0.13 J**	**0.12 J**	**2.6**	**1.2**	< 1.0 U	**4.2**	**4.4**	**2.7**	**0.87 J**	**3.9**	**0.14 J**	< 1.0 U	**4.2**	**2.6**
Vanadium	SW6020	ug/L	NE	8.6	**0.45 J**	**0.32 J**	**0.29 J**	**0.58 J**	< 1.0 U	**0.48 J**	**0.86 J**	**0.80 J**	**0.53 J**	**0.46 J**	< 1.0 U	**13.5**	**0.40 J**	**3.8**	**0.33 J**
Mercury	SW7470A	ug/L	2	0.063	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
Cyanide CN-	SW9012A	ug/L	200	0.15	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 R	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U

Notes and definitions are presented on Page 7

Table 7: 2020 Validated Data for Total Metals
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					Sample Location	PZ-205-AS	PZ-205-SS	PZ-206-SS	PZ-207-AS	PZ-209-SS	PZ-210-SS	PZ-211-SD	PZ-211-SD	PZ-211-SS	PZ-302-AI	PZ-302-AS	PZ-303-AS	PZ-304-AI	PZ-304-AS	S-5
					Sample Depth (ft BGS)	38.55-48.35	88.57-98.37	115-124.8	34.9-39.7	140-150	138-148	237-247	237-247	137-147	32.6-42.4	12.2-22	16-25.8	39-48.8	17.1-26.9	30-40
					Sample Date	11-11-2020	11-11-2020	11-10-2020	12-01-2020	11-04-2020	11-03-2020	11-03-2020	11-05-2020	12-04-2020	12-01-2020	11-30-2020	12-04-2020	12-02-2020	12-02-2020	11-20-2020
					Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1																
Metals, Total																				
Aluminum	SW6010B	ug/L	NE	2,000	**101 J**	< 200 U	< 200 U	< 200 U	**87.5 J**	< 200 U	< 200 U	NA	< 200 U	< 200 U	**619**	< 200 U	< 200 U	< 200 U	< 200 U
Barium	SW6010B	ug/L	2,000	380	**5,990**	**143**	**73.8**	**673**	**97.2**	**98.1**	**137**	NA	**56.3**	**512**	**446**	**694**	**1,450**	**2,740**	**647**
Boron	SW6010B	ug/L	NE	400	**2,800**	**58.1 J**	**168**	**1,140**	**264**	**128**	**100**	NA	**430**	**383**	**573**	**245**	**550**	**1,940**	**3,120**
Calcium	SW6010B	ug/L	NE	NE	**928,000**	**101,000**	**121,000**	**147,000**	**68,500**	**89,700**	**91,600**	NA	**65,800**	**221,000**	**171,000**	**246,000**	**260,000**	**66,200**	**67,800**
Cobalt	SW6010B	ug/L	NE	0.6	**10.4**	< 5.0 U	< 5.0 U	**2.9 J**	< 5.0 U	**0.75 J**	< 5.0 U	NA	**0.65 J**	**12.1**	**3.2 J**	**2.1 J**	**1.9 J**	**2.4 J**	**7.2**
Hardness as CaCO3	SW6010B	ug/L	NE	NE	**3,410,000**	**479,000**	**628,000**	**655,000**	**363,000**	**410,000**	**413,000**	NA	**339,000**	**780,000**	**670,000**	**864,000**	**947,000**	**412,000**	**462,000**
Iron	SW6010B	ug/L	NE	1,400	**92,800**	**348**	**2,710**	**22,800**	**765**	**1,460**	**133**	NA	**352**	**4,270**	**40,900**	**74,800**	**19,400**	**20,100**	**17,800**
Lithium	SW6010B	ug/L	NE	4	**100**	**22.6**	**36.3**	**24.1**	**38.4**	**22.6**	**25.4**	NA	**52.4**	**30.0**	< 20.0 U	**28.2**	**37.2**	**25.4**	**32.2**
Magnesium	SW6010B	ug/L	NE	NE	**265,000**	**55,100**	**79,300**	**69,700**	**46,600**	**45,200**	**44,800**	NA	**42,500**	**55,300**	**59,000**	**60,600**	**72,300**	**59,900**	**71,100**
Manganese	SW6010B	ug/L	NE	43	**1,250**	< 5.0 U	**54.4**	**77.7**	**37.4**	**86.5**	< 5.0 U	NA	**26.2**	**368**	**2,210**	**1,500**	**1,140**	**65.2**	**158**
Molybdenum	SW6010B	ug/L	NE	10	**0.61 J**	**2.3 J**	< 10.0 U	**0.70 J**	**5.5 J**	**1.8 J**	**28.3**	NA	**7.9 J**	**12.3**	**4.1 J**	**0.70 J**	**0.96 J**	**54.1**	**1.3 J**
Nickel	SW6010B	ug/L	NE	39	**21.8**	< 10.0 U	**2.3 J**	**12.5**	**2.7 J**	**4.1 J**	**3.4 J**	NA	**1.3 J**	**27.0**	**9.9 J**	**8.0 J**	**15.8**	**29.2**	**40.5**
Potassium	SW6010B	ug/L	NE	NE	**24,800**	**1,730**	**3,880**	**52,100**	**3,490**	**5,590**	**3,770**	NA	**3,950**	**7,920**	**7,500**	**4,460**	**10,700**	**128,000**	**235,000**
Silicon	SW6010B	ug/L	NE	NE	**15,200**	**9,510**	**7,460**	**18,200**	**5,850**	**9,220**	**6,750**	NA	**5,060**	**13,700**	**19,000**	**24,400**	**18,800**	**23,200**	**18,600**
Sodium	SW6010B	ug/L	NE	20,000	**673,000**	**14,800**	**22,200**	**214,000**	**10,800**	**30,600**	**50,600**	NA	**21,100**	**59,800**	**45,900**	**47,400**	**139,000**	**325,000**	**502,000**
Strontium	SW6010B	ug/L	NE	1,200	**5,170**	**482**	**4,680**	**790**	**4,790**	**1,480**	**1,410**	NA	**4,480**	**910**	**1,030**	**681**	**1,010**	**1,030**	**385**
Tin	SW6010B	ug/L	NE	1,200	**5.3 J**	< 10.0 U	< 10.0 U	**2.1 J**	< 10.0 U	< 10.0 U	< 10.0 U	NA	< 10.0 U	< 10.0 U	**1.9 J**	**2.0 J**	< 10.0 U	< 10.0 U	**18.6**
Titanium	SW6010B	ug/L	NE	NE	**8.1 J**	< 10.0 U	< 10.0 U	**1.1 J**	< 10.0 U	< 10.0 U	< 10.0 U	NA	< 10.0 U	< 10.0 U	**15.4**	< 10.0 U	< 10.0 U	**1.2 J**	**4.7 J**
Zinc	SW6010B	ug/L	NE	600	< 20.0 U	**26.2**	< 20.0 U	< 20.0 U	**12.4 J**	**19.6 J**	**39.8**	NA	**46.0**	< 20.0 U	**13.0 J**	< 20.0 U	< 20.0 U	< 20.0 U	**8.8 J**
Antimony	SW6020	ug/L	6	0.78	**0.55 J**	< 1.0 U	< 1.0 U	**0.17 J**	**0.080 J**	< 1.0 U	**0.58 J**	NA	< 1.0 U	< 1.0 U	**0.14 J**	**0.11 J**	< 1.0 U	**0.23 J**	**0.59 J**
Arsenic	SW6020	ug/L	10	0.052	**34.9**	**0.65 J**	**1.9**	**7.0**	**1.6**	**0.92 J**	**0.90 J**	NA	**1.6**	**2.6**	**99.9**	**71.2**	**0.82 J**	**249**	**11.9**
Beryllium	SW6020	ug/L	4	2.5	**0.025 J**	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	NA	< 0.20 U	< 0.20 U	**0.047 J**	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
Cadmium	SW6020	ug/L	5	0.92	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	NA	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	**0.28**
Chromium	SW6020	ug/L	100	NE	**7.9**	< 2.0 U	< 2.0 U	**1.7 J**	**0.85 J**	**0.74 J**	**0.23 J**	NA	**0.28 J**	**0.20 J**	**1.2 J**	< 2.0 U	**0.55 J**	**2.5**	**5.1**
Chromium (VI)	SW7199	ug/L	100	0.035	< 2.00 U	< 0.100 U	< 0.100 U	**0.0737 J**	< 0.100 U	< 0.100 U	< 0.100 U	NA	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	< 0.100 U	**0.117**	**0.182**
Chromium (III)	CALC	ug/L	100	2,200	**7.9 J**	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	NA	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U
Copper	SW6020	ug/L	1,300	80	**2.7**	**1.1**	**0.51 J**	< 1.0 U	**0.73 J**	**1.1 J+**	**1.1 J+**	NA	< 1.0 U	< 1.0 U	**1.9**	**0.76 J**	< 1.0 U	< 1.0 U	< 1.0 U
Lead	SW6020	ug/L	15	15	**0.42 J**	**0.054 J**	< 1.0 U	< 1.0 U	< 1.0 U	**0.040 J**	**0.091 J**	NA	< 1.0 U	< 1.0 U	**0.62 J**	**0.21 J**	< 1.0 U	**0.32 J**	**2.5**
Selenium	SW6020	ug/L	50	10	**0.72 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.45 J**	< 1.0 U	NA	< 1.0 U	< 1.0 U	**0.45 J**	**0.63 J**	< 1.0 U	**0.62 J**	**0.36 J**
Silver	SW6020	ug/L	NE	9.4	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	NA	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Thallium	SW6020	ug/L	2	0.02	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.048 J**	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Thorium	SW6020	ug/L	NE	NE	**0.18 J**	< 1.0 U	**0.11 J**	< 1.0 U	**0.066 J**	< 1.0 U	**0.12 J**	NA	< 1.0 U	< 1.0 U	**0.27 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Uranium	SW6020	ug/L	30	0.4	**0.041 J**	**0.83 J**	**0.17 J**	**0.016 J**	**0.96 J**	**0.28 J**	**3.3**	NA	**1.0**	**10.7**	**0.44 J**	**0.027 J**	**0.28 J**	**0.013 J**	< 1.0 U
Vanadium	SW6020	ug/L	NE	8.6	**6.0**	< 1.0 U	**0.26 J**	**1.3**	**0.15 J**	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	**2.6**	**1.4**	**0.64 J**	**4.6**	**2.3**
Mercury	SW7470A	ug/L	2	0.063	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	NA	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
Cyanide CN-	SW9012A	ug/L	200	0.15	**2.8 J-**	< 5.0 R	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	NA	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	**2.8 J**	**2.6 J-**

Notes and definitions are presented on Page 7

Table 7: 2020 Validated Data for Total Metals
West Lake Landfill OU-3
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					Sample Location	S-5	S-10	S-82	S-84
					Sample Depth (ft BGS)	30-40	32-52	15.5-25.5	20.9-30.9
					Sample Date	11-20-2020	11-13-2020	11-23-2020	11-10-2020
					Sample Type	FD	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1					
Metals, Total									
Aluminum	SW6010B	ug/L	NE	2,000		< 200 U	**960**	< 200 U	< 200 U
Barium	SW6010B	ug/L	2,000	380		**645**	**177 J**	**1,130**	**817**
Boron	SW6010B	ug/L	NE	400		**3,090**	**1,260**	**3,680**	**213**
Calcium	SW6010B	ug/L	NE	NE		**68,100**	**205,000**	**199,000**	**137,000**
Cobalt	SW6010B	ug/L	NE	0.6		**7.5**	**1.5 J**	**5.1**	**8.9**
Hardness as CaCO3	SW6010B	ug/L	NE	NE		**466,000**	**1,250,000**	**841,000**	**557,000**
Iron	SW6010B	ug/L	NE	1,400		**18,000**	**160,000**	**31,200**	**52,800**
Lithium	SW6010B	ug/L	NE	4		**30.9**	**62.1**	**55.8**	**19.6 J**
Magnesium	SW6010B	ug/L	NE	NE		**71,900**	**180,000**	**83,400**	**51,900**
Manganese	SW6010B	ug/L	NE	43		**159**	**8,350**	**1,510**	**388**
Molybdenum	SW6010B	ug/L	NE	10		**0.83 J**	< 10.0 U	**12.7**	**9.4 J**
Nickel	SW6010B	ug/L	NE	39		**40.0**	**15.2**	**22.9**	**12.7**
Potassium	SW6010B	ug/L	NE	NE		**234,000**	**47,100 J**	**21,100**	**4,780**
Silicon	SW6010B	ug/L	NE	NE		**17,300**	**20,400**	**20,000**	**24,400**
Sodium	SW6010B	ug/L	NE	20,000		**502,000**	**231,000**	**297,000**	**30,800**
Strontium	SW6010B	ug/L	NE	1,200		**383**	**1,140 J**	**1,350**	**622**
Tin	SW6010B	ug/L	NE	1,200		**17.6**	< 10.0 U	< 10.0 U	< 10.0 U
Titanium	SW6010B	ug/L	NE	NE		**5.3 J**	< 10.0 U	< 10.0 U	< 10.0 U
Zinc	SW6010B	ug/L	NE	600		**9.1 J**	< 20.0 U	< 20.0 U	< 20.0 U
Antimony	SW6020	ug/L	6	0.78		**0.58 J**	**0.11 J**	< 1.0 U	< 1.0 U
Arsenic	SW6020	ug/L	10	0.052		**11.7**	**51.0**	**214**	**395 J**
Beryllium	SW6020	ug/L	4	2.5		< 0.20 U	**0.68**	< 0.20 U	< 0.20 U
Cadmium	SW6020	ug/L	5	0.92		**0.26**	< 0.20 U	< 0.20 U	< 0.20 U
Chromium	SW6020	ug/L	100	NE		**5.4**	**1.2 J**	**0.70 J**	< 2.0 U
Chromium (VI)	SW7199	ug/L	100	0.035		**0.149**	**0.0905 J**	< 0.100 U	< 0.100 UJ
Chromium (III)	CALC	ug/L	100	2,200		**5.3 J**	< 10 U	< 10 U	< 10 U
Copper	SW6020	ug/L	1,300	80		< 1.0 U	**2.2**	< 1.0 U	**0.66 J**
Lead	SW6020	ug/L	15	15		**2.5**	< 1.0 U	**0.14 J**	< 1.0 U
Selenium	SW6020	ug/L	50	10		**0.38 J**	< 1.0 U	**0.39 J**	< 1.0 U
Silver	SW6020	ug/L	NE	9.4		< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Thallium	SW6020	ug/L	2	0.02		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Thorium	SW6020	ug/L	NE	NE		< 1.0 U	**0.18 J**	< 1.0 U	< 1.0 U
Uranium	SW6020	ug/L	30	0.4		< 1.0 U	**0.17 J**	**2.4**	**0.014 J**
Vanadium	SW6020	ug/L	NE	8.6		**2.4**	**4.1**	**0.80 J**	**0.40 J**
Mercury	SW7470A	ug/L	2	0.063		< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
Cyanide CN-	SW9012A	ug/L	200	0.15		**2.6 J**	< 5.0 UJ	< 5.0 U	< 5.0 U

Notes and definitions are presented on Page 7

Notes:

ft BGS = feet below ground surface

ug/L = micrograms per liter

mg/L = milligrams per liter

USEPA Primary MCL = USEPA National Primary Drinking Water Regulation (May 2009). MCLs are for combined radium 226/228 (5 pCi/L) and gross alpha excluding uranium (15 pCi/L). Radium-226 contributes to both the combined radium-226/288 and gross alpha; the lower of the two MCLs is shown in the table for comparison. There is a total Uranium MCL of 30 ug/L presented in the metals result tables.

USEPA RSL TAPWATER THQ0.1 = RSL TAPWATER (TR=1E-06, THQ=0.1) May 2021, adapted for West Lake QAPP

Bold = Detected

Blue Font = Exceeds USEPA Primary MCL

Orange Shaded = Detected value exceeds USEPA RSL TAPWATER THQ0.1

Gray Shaded = Compound not detected above the reporting detection limit but reporting detection limit exceeds USEPA RSL TAPWATER THQ0.1

NE = Not Established

NA = Not Available

For the 2020 4th quarter groundwater monitoring event, turbidity for samples PZ-205-AS-WG-20201111, PZ-205-SS-WG-20201111, I-11-WG-20201112, D-12-WG-20201112, D-6-WG-20201112, S-10-WG-20201113, D-13-WG-20201113, I-62-WG-20201116, D-83-WG-20201116, S-5-WG-20201120, D-3-WG-20201120, D-87-WG-20201120, S-82-WG-20201123, D-93-WG-20201123, I-9-WG-20201123, I-65-WG-20201124, PZ-115-SS-WG-20201124, I-68-WG-20201124, D-85-WG-20201130, I-73-WG-20201130, PZ-302-AS-WG-20201130, PZ-302-AI-WG-20201201, PZ-207-AS-WG-20201201, PZ-202-SS-WG-20201202, PZ-304-AS-WG-20201202, PZ-304-AI-WG-20201202, LR-100-WG-20201203, PZ-107-SS-WG-20201203, PZ-103-SS-WG-20201203, PZ-303-AS-WG-20201204, PZ-201A-SS-WG-20201204, PZ-204A-SS-WG-20201204, and PZ-204-SS-WG-20201204 were analyzed using an instrument with a tungsten filament light source. Turbidity measured using this method is typically reported in NTU.

Qualifier Definition

J = Estimated concentration.

J+ = The result is an estimated concentration, but may be biased high.

J- = The result is an estimated concentration, but may be biased low.

R = Rejected, data not usable.

U = The analyte was analyzed for but was not detected at or above the referenced reporting limit.

UJ = The analyte was analyzed for, but was not detected. The reporting limit is approximate and may be inaccurate or imprecise.

Table 8: 2020 Validated Data for Dissolved Metals
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

					Sample Location	D-3	D-6	D-12	D-13	D-83	D-85	D-87	D-89	D-93	I-9	I-11	I-62	I-65	I-66	I-67	I-68
					Sample Depth (ft BGS)	96.5-106.5	96.5-106.5	133.7-143.7	123-133	77-97	62-82	91-111	33-48	92-112	43.1-53.1	80.5-90.5	34-44	26-36	26.9-36.9	25.4-35.4	21.2-31.2
					Sample Date	11-20-2020	11-12-2020	11-12-2020	11-13-2020	11-16-2020	11-30-2020	11-20-2020	12-03-2020	11-23-2020	11-23-2020	11-12-2020	11-16-2020	11-24-2020	11-05-2020	11-10-2020	11-24-2020
					Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte	**Analytic Method**	**Unit**	**USEPA Primary MCL**	**USEPA RSL TAPWATER THQ0.1**																	
Metals, Dissolved																					
Antimony	SW6020	ug/L	6	0.78		**0.15 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.44 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.30 J**
Arsenic	SW6020	ug/L	10	0.052		**7.6**	**0.32 J**	**0.37 J**	**0.24 J**	**0.52 J**	**30.5**	**1.4**	**50.4**	**0.96 J**	**30.5**	**13.1**	**11.7**	**1.0**	**2.1**	**2.5**	**0.57 J**
Beryllium	SW6020	ug/L	4	2.5		< 0.20 U	**0.027 J**	**0.20**	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	**0.027 J**	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
Cadmium	SW6020	ug/L	5	0.92		< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	**0.099 J**	< 0.20 U	< 0.20 U	**0.74**
Chromium	SW6020	ug/L	100	NE		**0.75 J**	**0.48 J**	**0.56 J**	**0.20 J**	< 2.0 U	**0.26 J**	**0.26 J**	**9.3**	**0.50 J**	**1.0 J**	**0.62 J**	< 2.0 U	< 2.0 U	< 2.0 U	**0.39 J**	< 2.0 U
Copper	SW6020	ug/L	1,300	80		**1.2 J+**	< 1.0 U	**1.2 J+**	< 1.0 U	< 1.0 U	< 1.0 U	**1.1 J+**	**1.3**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.1 J+**
Lead	SW6020	ug/L	15	15		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Selenium	SW6020	ug/L	50	10		**0.34 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.52 J**	**0.33 J**	**0.45 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.3**
Silver	SW6020	ug/L	NE	9.4		< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Thallium	SW6020	ug/L	2	0.02		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Thorium	SW6020	ug/L	NE	NE		< 1.0 U	< 1.0 U	< 1.0 U	**0.14 J**	**0.16 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.11 J**	**0.16 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Uranium	SW6020	ug/L	30	0.4		**0.15 J**	**0.19 J**	**0.29 J**	**0.087 J**	**0.041 J**	**0.10 J**	**0.25 J**	**0.14 J**	**0.35 J**	**0.17 J**	**1.4**	**0.31 J**	**2.0**	**6.9**	**2.0**	**3.3**
Vanadium	SW6020	ug/L	NE	8.6		**0.36 J**	**0.25 J**	**0.36 J**	< 1.0 U	**0.16 J**	< 1.0 U	**0.26 J**	**6.1**	**0.87 J**	**0.59 J**	**0.22 J**	< 1.0 U	**0.29 J**	< 1.0 U	**0.40 J**	**1.6**
Aluminum	SW6010B	ug/L	NE	2,000		< 200 U	< 200 U	**142 J**	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U
Barium	SW6010B	ug/L	2,000	380		**2,360**	**1,280**	**870**	**644**	**954**	**1,550**	**1,140**	**1,880**	**1,150**	**2,220**	**787**	**379**	**182**	**177 J**	**304**	**318**
Boron	SW6010B	ug/L	NE	400		**1,130**	**731**	**738**	**139**	**266**	**198**	**842**	**2,230**	**1,440**	**2,330**	**855**	**108**	**140**	**517 J**	**214**	**135**
Calcium	SW6010B	ug/L	NE	NE		**180,000**	**179,000**	**314,000**	**145,000**	**73,000**	**237,000**	**175,000**	**457,000**	**269,000**	**282,000**	**145,000**	**104,000**	**97,700**	**200,000**	**184,000**	**244,000**
Cobalt	SW6010B	ug/L	NE	0.6		**1.8 J**	**1.3 J**	**1.2 J**	< 5.0 U	< 5.0 U	**2.1 J**	**0.88 J**	**19.4**	**2.8 J**	**2.4 J**	**1.7 J**	< 5.0 U	**0.52 J**	**4.0 J**	< 5.0 U	**8.1**
Iron	SW6010B	ug/L	NE	1,400		**34,700**	**14,000**	**11,600**	**11,700**	**9,960**	**40,000**	**21,900**	**87,000**	**19,100**	**44,500**	**15,300**	**7,020**	< 50.0 U	**1,300 J**	**10,800**	< 50.0 U
Lithium	SW6010B	ug/L	NE	4		**30.0**	**35.0**	**28.6**	**22.9**	**20.5**	**27.9**	**27.4**	**52.6**	**42.2**	**58.1**	**29.3**	**19.8 J**	**12.9 J**	**27.1**	**23.7**	**16.1 J**
Magnesium	SW6010B	ug/L	NE	NE		**63,200**	**46,000**	**50,300**	**31,800**	**25,600**	**58,100**	**48,200**	**187,000**	**64,500**	**84,300**	**53,600**	**20,100**	**11,400**	**16,600**	**31,400**	**44,100**
Manganese	SW6010B	ug/L	NE	43		**375**	**450**	**496**	**370**	**284**	**683**	**318**	**2,550**	**519**	**467**	**509**	**599**	**118**	**2,380 J**	**1,360**	**2,940**
Molybdenum	SW6010B	ug/L	NE	10		< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	**0.65 J**	< 10.0 U	**3.5 J**	< 10.0 U	**1.3 J**	< 10.0 U	**3.3 J**	**4.4 J**	**2.9 J**	< 10.0 U	**0.73 J**
Nickel	SW6010B	ug/L	NE	39		**8.7 J**	**7.7 J**	**5.4 J**	**5.8 J**	< 10.0 U	**4.1 J**	**2.6 J**	**116**	**8.8 J**	**14.7**	**6.4 J**	< 10.0 U	**5.1 J**	**6.9 J**	< 10.0 U	**19.6**
Potassium	SW6010B	ug/L	NE	NE		**26,100**	**13,400**	**11,000**	**6,110**	**30,500**	**7,760**	**15,600**	**29,500**	**14,200**	**25,900**	**17,000**	**8,070**	**6,970**	**6,570 J**	**7,100**	**4,250**
Silicon	SW6010B	ug/L	NE	NE		**17,500**	**12,300**	**12,200**	**12,000**	**13,900**	**19,500**	**17,300**	**27,700**	**15,300**	**20,900**	**11,400**	**13,200**	**7,770**	**10,600 J**	**13,400**	**11,900**
Sodium	SW6010B	ug/L	NE	20,000		**179,000**	**114,000**	**131,000**	**74,800**	**56,800**	**186,000**	**116,000**	**409,000**	**184,000**	**231,000**	**107,000**	**27,100**	**100,000**	**119,000 J**	**72,600**	**128,000**
Strontium	SW6010B	ug/L	NE	1,200		**817**	**631**	**881**	**369**	**447**	**596**	**516**	**2,170**	**863**	**1,140**	**1,030**	**403**	**400**	**944 J**	**743**	**626**
Tin	SW6010B	ug/L	NE	1,200		< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	**1.9 J**	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
Titanium	SW6010B	ug/L	NE	NE		< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	**5.0 J**	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
Zinc	SW6010B	ug/L	NE	600		< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	**10.9 J**	**18.8 J**	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	**5.9 J**
Mercury	SW7470A	ug/L	2	0.063		< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U

Notes and definitions are presented on Page 6

Table 8: 2020 Validated Data for Dissolved Metals
West Lake Landfill OU-3
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Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1	Sample Location / Sample Depth (ft BGS) / Sample Date / Sample Type: I-73 43.2-46.2 11-30-2020 N	LR-100 19.7-24.5 12-03-2020 N	MW-1204 213.5-223.5 11-06-2020 N	MW-1204 213.5-223.5 11-06-2020 FD	PZ-100-KS 374-383.8 12-02-2020 N	PZ-100-SD 234.8-244.6 12-01-2020 N	PZ-100-SS 73.96-93.6 12-01-2020 N	PZ-101-SS 129.48-139.28 11-12-2020 N	PZ-102R-SS 79.83-89.63 11-06-2020 N	PZ-102-SS 79.7-89.5 11-06-2020 N	PZ-103-SS 134.7-144.5 12-03-2020 N	PZ-103-SS 134.7-144.5 12-03-2020 FD	LCS-3D - 12-08-2020 N	LCS-3D - 12-08-2020 FD	PZ-104-KS 397.37-407.17 12-03-2020 N
Metals, Dissolved																			
Antimony	SW6020	ug/L	6	0.78	**0.36 J**	**0.18 J**	**0.12 J**	**0.14 J**	< 1.0 U	**0.31 J**	**1.3**	**0.10 J**	**0.11 J**	< 1.0 U	**0.15 J**	**0.14 J**	**2.8 J**	**3.1 J**	< 1.0 U
Arsenic	SW6020	ug/L	10	0.052	**283**	**1.5**	**3.5**	**3.4**	< 1.0 U	**0.98 J**	**0.20 J**	**10.1**	**0.53 J**	< 1.0 U	**2.6**	**2.4**	**272 J**	**243 J**	**0.45 J**
Beryllium	SW6020	ug/L	4	2.5	< 0.20 U	< 0.20 U	**0.057 J**	**0.066 J**	< 0.20 U	< 0.20 U	< 0.20 U	**0.035 J**	< 0.20 U	< 0.20 U	**0.076 J**	**0.070 J**	**0.42 J**	**0.42 J**	< 0.20 U
Cadmium	SW6020	ug/L	5	0.92	**0.19 J**	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	**0.023 J**	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 1.0 UJ	< 1.0 UJ	< 0.20 U
Chromium	SW6020	ug/L	100	NE	**18.8**	**1.3 J**	**11.0**	**10.7**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	**1.8 J**	**1.7 J**	**76.3 J**	**68.4 J**	< 2.0 U
Copper	SW6020	ug/L	1,300	80	**1.2 J+**	< 1.0 U	**1.5 J+**	**1.5 J+**	< 1.0 U	< 1.0 U	**3.2**	< 1.0 U	**1.1 J+**	< 1.0 U	< 1.0 U	**1.1 J+**	**6.9 J**	**6.7 J**	< 1.0 U
Lead	SW6020	ug/L	15	15	**2.9**	**0.12 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.038 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 UJ	< 5.0 UJ	< 1.0 U
Selenium	SW6020	ug/L	50	10	**0.79 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**4.6 J**	**3.5 J**	< 1.0 U
Silver	SW6020	ug/L	NE	9.4	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 2.5 UJ	< 2.5 UJ	< 0.50 U
Thallium	SW6020	ug/L	2	0.02	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 UJ	< 5.0 UJ	< 1.0 U
Thorium	SW6020	ug/L	NE	NE	< 1.0 U	< 1.0 U	**0.062 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 UJ	< 5.0 UJ	**0.14 J**
Uranium	SW6020	ug/L	30	0.4	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.094 J**	**1.2**	**4.1**	**0.22 J**	**1.8**	**0.23 J**	**0.40 J**	**0.38 J**	< 5.0 UJ	< 5.0 UJ	**0.30 J**
Vanadium	SW6020	ug/L	NE	8.6	**16.7**	**0.57 J**	**3.8**	**3.7**	< 1.0 U	< 1.0 U	**0.46 J**	**2.2**	< 1.0 U	< 1.0 U	**4.8**	**4.5**	**5.3 J**	**3.5 J**	< 1.0 U
Aluminum	SW6010B	ug/L	NE	2,000	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	**66.1 J**	< 200 U	< 200 U	< 200 U	< 200 U	**932 J**	**891 J**	< 200 U
Barium	SW6010B	ug/L	2,000	380	**3,230**	**433**	**8,330**	**8,190**	< 10.0 U	**331**	**68.7**	**463**	**70.4**	**176**	**863**	**851**	**5,940 J**	**5,770 J**	**118**
Boron	SW6010B	ug/L	NE	400	**2,040**	**1,860**	**1,140**	**1,130**	**620**	< 100 U	**128**	**658**	**146**	**123**	**434**	**433**	**20,200 J**	**19,500 J**	**139**
Calcium	SW6010B	ug/L	NE	NE	**50,800**	**118,000**	**216,000**	**221,000**	**20,100**	**75,000**	**90,500**	**132,000**	**118,000**	**108,000**	**288,000**	**287,000**	**3,420,000 J**	**3,300,000 J**	**81,900**
Cobalt	SW6010B	ug/L	NE	0.6	**22.5**	**2.0 J**	< 5.0 U	< 5.0 U	< 5.0 U	**0.61 J**	< 5.0 U	**0.70 J**	< 5.0 U	< 5.0 U	**0.69 J**	**1.0 J**	**16.5 J**	**16.4 J**	< 5.0 U
Iron	SW6010B	ug/L	NE	1,400	**44,700**	**18,600**	**12,200**	**12,200**	**132 J+**	**99.3 J+**	< 50.0 U	**1,140**	**278**	**1,220**	**16,400**	**16,200**	**436,000 J**	**396,000 J**	**1,260**
Lithium	SW6010B	ug/L	NE	4	**150**	**21.8**	**52.6**	**51.0**	**134**	**9.7 J**	**39.2**	**33.2**	**45.4**	**50.4**	**60.5**	**59.7**	**566 J**	**561 J**	**28.5**
Magnesium	SW6010B	ug/L	NE	NE	**54,400**	**58,000**	**94,800**	**95,800**	**12,300**	**34,400**	**50,900**	**83,900**	**40,800**	**39,000**	**119,000**	**118,000**	**420,000 J**	**408,000 J**	**40,800**
Manganese	SW6010B	ug/L	NE	43	**217**	**188**	**339**	**340**	**15.7**	**96.5**	< 5.0 U	**63.1**	**5.4**	**114**	**769**	**759**	**44,400 J**	**43,100 J**	**15.8**
Molybdenum	SW6010B	ug/L	NE	10	**5.9 J**	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	**2.8 J**	**1.0 J**	< 10.0 U	**1.5 J**	< 10.0 U	**0.50 J**	**0.78 J**	**2.9 J**	**2.5 J**	**1.1 J**
Nickel	SW6010B	ug/L	NE	39	**446**	**14.3**	**10.5**	**11.2**	< 10.0 U	**4.5 J**	**8.9 J**	**10.8**	**2.6 J**	< 10.0 U	**37.1**	**36.4**	**18.6 J**	**19.0 J**	< 10.0 U
Potassium	SW6010B	ug/L	NE	NE	**229,000**	**67,600**	**32,400**	**32,000**	**4,950**	**2,290**	**2,470**	**13,100**	**3,200**	**2,650**	**6,980**	**6,900**	**556,000 J**	**537,000 J**	**1,980**
Silicon	SW6010B	ug/L	NE	NE	**4,180**	**11,300**	**9,920**	**9,700**	**4,130**	**5,910**	**5,830**	**13,800**	**7,610**	**7,230**	**21,800**	**21,900**	**12,400 J**	**9,970 J**	**4,300**
Sodium	SW6010B	ug/L	NE	20,000	**230,000**	**134,000**	**262,000**	**273,000**	**227,000**	**6,760**	**10,100**	**98,100**	**14,600**	**14,000**	**95,300**	**93,700**	**2,910,000 J**	**2,820,000 J**	**36,300**
Strontium	SW6010B	ug/L	NE	1,200	**1,250**	**519**	**2,460**	**2,410**	**2,980**	**398**	**1,500**	**2,100**	**1,450**	**784**	**8,000**	**7,910**	**20,600 J**	**20,200 J**	**2,970**
Tin	SW6010B	ug/L	NE	1,200	**14.2**	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	**20.7 J**	**20.0 J**	< 10.0 U
Titanium	SW6010B	ug/L	NE	NE	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	**5.3 J**	**4.4 J**	< 10.0 U
Zinc	SW6010B	ug/L	NE	600	**181**	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	**169**	**79.4**	< 20.0 U	**53.3**	< 20.0 U	< 20.0 U	< 20.0 U	**15.0 J**	**13.6 J**	< 20.0 U
Mercury	SW7470A	ug/L	2	0.063	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	**0.42 J**	**0.51 J**	< 0.20 U

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Table 8: 2020 Validated Data for Dissolved Metals
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					Sample Location	LCS-5A	PZ-104-SD	PZ-104-SS	PZ-105-SS	PZ-106-KS	PZ-106-SD	PZ-106-SD	PZ-106-SS	PZ-107-SS	PZ-109-SS	PZ-109-SS	PZ-111-KS	PZ-111-SD	PZ-111-SS	PZ-113-AD
					Sample Depth (ft BGS)	145-295	235.2-245	134.5-144.3	138.5-148.3	363.75-373.57	190.79-200.59	190.79-200.59	155.3-165.1	92.6-102.4	125.7-135.5	125.7-135.5	357.15-366.96	199.4-209.2	105.5-115.5	98.6-108.4
					Sample Date	12-08-2020	11-04-2020	11-12-2020	11-06-2020	11-13-2020	11-13-2020	11-13-2020	11-11-2020	12-03-2020	11-10-2020	11-10-2020	11-09-2020	11-09-2020	11-09-2020	11-05-2020
					Sample Type	N	N	N	N	N	N	FD	N	N	N	FD	N	N	N	N
Analyte	**Analytic Method**	**Unit**	**USEPA Primary MCL**	**USEPA RSL TAPWATER THQ0.1**																
Metals, Dissolved																				
Antimony	SW6020	ug/L	6	0.78	**0.75 J**	**0.093 J**	**0.18 J**	**0.16 J**	< 1.0 U	**0.083 J**	< 1.0 U	< 1.0 U	**0.23 J**	**0.27 J**	**0.25 J**	< 1.0 U	< 1.0 U	**0.14 J**	**0.099 J**
Arsenic	SW6020	ug/L	10	0.052	**19.8**	**14.1**	**0.91 J**	**0.64 J**	**1.3**	**0.83 J**	**0.83 J**	**1.1**	**4.0**	**0.76 J**	**0.76 J**	**2.3**	**2.9**	**1.8**	**2.6**
Beryllium	SW6020	ug/L	4	2.5	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	**0.024 J**	**0.026 J**	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
Cadmium	SW6020	ug/L	5	0.92	< 0.20 U	< 0.20 U	**0.029 J**	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	**0.30**	**0.30**	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
Chromium	SW6020	ug/L	100	NE	**16.9**	**4.5**	< 2.0 U	**0.40 J**	< 2.0 U	< 2.0 U	< 2.0 U	**0.71 J**	**7.3 J**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Copper	SW6020	ug/L	1,300	80	< 1.0 U	< 1.0 U	**4.6**	**2.1**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.3**	**1.1 J+**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Lead	SW6020	ug/L	15	15	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Selenium	SW6020	ug/L	50	10	**0.51 J**	< 1.0 U	**0.65 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Silver	SW6020	ug/L	NE	9.4	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Thallium	SW6020	ug/L	2	0.02	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Thorium	SW6020	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.20 J**	**0.44 J**	**0.13 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.10 J**	< 1.0 U	< 1.0 U	< 1.0 U
Uranium	SW6020	ug/L	30	0.4	< 1.0 U	**0.14 J**	**1.8**	**2.0**	**1.4**	**0.067 J**	**0.055 J**	**0.60 J**	**0.42 J**	**0.52 J**	**0.50 J**	**6.6**	**0.63 J**	**0.58 J**	**0.12 J**
Vanadium	SW6020	ug/L	NE	8.6	**5.4**	**2.9**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.58 J**	**8.4**	**0.21 J**	**0.26 J**	< 1.0 U	< 1.0 U	**0.50 J**	**0.29 J**
Aluminum	SW6010B	ug/L	NE	2,000	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U
Barium	SW6010B	ug/L	2,000	380	**1,530**	**484**	**99.1**	**229**	**41.0**	**147**	**143**	**880**	**920**	**58.7**	**59.7**	< 10.0 U	**110**	**726**	**1,530**
Boron	SW6010B	ug/L	NE	400	**4,020**	**397**	**140**	**81.8 J**	**180**	**101**	**96.0 J**	**185**	**1,190**	**181**	**181**	**1,090**	< 100 U	**627**	**869**
Calcium	SW6010B	ug/L	NE	NE	**161,000**	**96,200**	**80,100**	**106,000**	**55,400**	**106,000**	**104,000**	**116,000**	**234,000**	**84,900**	**87,400**	**7,940**	**85,900**	**205,000**	**194,000**
Cobalt	SW6010B	ug/L	NE	0.6	**12.5**	**0.69 J**	**0.40 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	**2.7 J**	< 5.0 U	**0.81 J**	< 5.0 U	< 5.0 U	**2.2 J**	**1.5 J**
Iron	SW6010B	ug/L	NE	1,400	**7,330**	**3,970**	**132**	**642**	**772**	**777**	**753**	**2,720**	**5,050**	**70.8**	**90.2**	**535**	**1,790**	**2,190**	**27,600**
Lithium	SW6010B	ug/L	NE	4	**61.5**	**17.6 J**	**36.3**	**23.0**	**45.7**	**21.8**	**21.7**	**34.6**	**46.5**	**22.6**	**22.7**	**228**	**15.3 J**	**41.8**	**30.1**
Magnesium	SW6010B	ug/L	NE	NE	**86,900**	**49,600**	**48,700**	**54,500**	**34,500**	**51,800**	**51,200**	**58,100**	**127,000**	**48,000**	**49,300**	**5,070 J-**	**47,800 J-**	**104,000 J-**	**64,000**
Manganese	SW6010B	ug/L	NE	43	**219**	**108**	**10.2**	**138**	< 5.0 U	**33.8**	**33.2**	**20.9**	**93.6**	< 5.0 U	< 5.0 U	**6.1 J+**	**10.4**	**33.1**	**406**
Molybdenum	SW6010B	ug/L	NE	10	**2.0 J**	< 10.0 U	**11.4 J+**	**4.1 J**	< 10.0 U	**3.9 J**	**1.4 J**	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	**1.7 J**
Nickel	SW6010B	ug/L	NE	39	**36.5**	**22.0**	**5.4 J**	**10.2**	**3.8 J**	**2.8 J**	**2.5 J**	**7.8 J**	**38.1**	**2.2 J**	**3.0 J**	**3.4 J**	< 10.0 U	**21.9**	**7.2 J**
Potassium	SW6010B	ug/L	NE	NE	**130,000**	**11,900**	**2,460**	**2,170**	**1,870**	**3,320**	**3,250**	**4,840**	**16,000**	**3,580**	**3,570**	**7,460**	**2,140**	**7,800**	**15,000**
Silicon	SW6010B	ug/L	NE	NE	**27,200**	**11,200**	**9,930**	**12,000**	**3,890**	**7,940**	**8,080**	**7,360**	**18,400**	**4,810**	**4,890**	**3,950**	**6,540**	**11,200**	**16,100**
Sodium	SW6010B	ug/L	NE	20,000	**770,000**	**69,800**	**15,300**	**47,400**	**57,900**	**24,100**	**23,800**	**80,200**	**193,000**	**10,800**	**10,500**	**392,000**	**20,600**	**242,000**	**181,000**
Strontium	SW6010B	ug/L	NE	1,200	**1,490**	**634**	**1,020**	**798**	**5,120**	**1,500**	**1,460**	**1,030**	**1,490**	**3,010**	**3,010**	**1,580**	**1,140**	**2,910**	**620**
Tin	SW6010B	ug/L	NE	1,200	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
Titanium	SW6010B	ug/L	NE	NE	**7.2 J**	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
Zinc	SW6010B	ug/L	NE	600	< 20.0 U	< 20.0 U	**161**	**69.2**	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	**155**	**157**	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Mercury	SW7470A	ug/L	2	0.063	< 0.20 UJ	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U

Notes and definitions are presented on Page 6

Table 8: 2020 Validated Data for Dissolved Metals
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			Sample Location	PZ-113-AD	PZ-113-AS	PZ-113-SS	PZ-114-AS	PZ-115-SS	PZ-115-SS	PZ-116-SS	PZ-200-SS	PZ-201A-SS	PZ-202-SS	PZ-203-SS	PZ-204A-SS	PZ-204-SS	PZ-205-AS	PZ-205-SS
			Sample Depth (ft BGS)	98.6-108.4	28.9-38.7	148.57-158.37	19.9-29.7	74.68-84.48	74.68-84.48	151.4-161	9.62-97.64	80-89.8	40.2-89.1	99.6-109.4	79.5-89.1	10.95-89.35	38.55-48.35	88.57-98.37
			Sample Date	11-05-2020	11-04-2020	11-05-2020	11-11-2020	11-24-2020	11-24-2020	12-04-2020	12-02-2020	12-04-2020	12-02-2020	11-16-2020	12-04-2020	12-04-2020	11-11-2020	11-11-2020
			Sample Type	FD	N	N	N	N	FD	N	N	N	N	N	N	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1														
Metals, Dissolved																		
Antimony	SW6020	ug/L	6	0.78	**0.097 J**	**0.087 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.14 J**	< 1.0 U	**0.17 J**	**0.11 J**	< 1.0 U	**0.19 J**	**0.35 J**	**0.45 J**	< 1.0 U
Arsenic	SW6020	ug/L	10	0.052	**2.7**	**16.1**	**0.78 J**	**90.0**	**5.0**	**4.8**	**0.72 J**	**4.9**	**1.2**	**41.2**	**2.2**	**14.6**	**0.49 J**	**35.7**	**0.24 J**
Beryllium	SW6020	ug/L	4	2.5	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	**0.044 J**	< 0.20 U	**0.027 J**	< 0.20 U	< 0.20 U	< 0.20 U
Cadmium	SW6020	ug/L	5	0.92	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	**0.038 J**	< 0.20 U	< 0.20 U
Chromium	SW6020	ug/L	100	NE	< 2.0 U	< 2.0 U	< 2.0 U	**0.34 J**	**0.60 J**	**0.83 J**	**0.17 J**	< 2.0 U	< 2.0 U	**3.9**	**1.4 J**	**2.4**	**0.17 J**	**8.0**	< 2.0 U
Copper	SW6020	ug/L	1,300	80	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**6.4**	**1.3 J+**	< 1.0 U	< 1.0 U	**2.3**	**2.6**	**1.1 J+**
Lead	SW6020	ug/L	15	15	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Selenium	SW6020	ug/L	50	10	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.28 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.57 J**	< 1.0 U	**0.48 J**	< 1.0 U	**0.76 J**	< 1.0 U
Silver	SW6020	ug/L	NE	9.4	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Thallium	SW6020	ug/L	2	0.02	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Thorium	SW6020	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.052 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Uranium	SW6020	ug/L	30	0.4	**0.12 J**	**2.5**	**1.2**	**0.010 J**	**4.4**	**4.3**	**2.7**	**0.85 J**	**3.9**	**0.15 J**	**0.73 J**	**4.1**	**3.3**	**0.034 J**	**0.84 J**
Vanadium	SW6020	ug/L	NE	8.6	**0.29 J**	**0.54 J**	< 1.0 U	**0.42 J**	**0.67 J**	**0.68 J**	**0.47 J**	**0.45 J**	< 1.0 U	**14.6**	**0.36 J**	**3.6**	**0.56 J**	**6.1**	< 1.0 U
Aluminum	SW6010B	ug/L	NE	2,000	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U
Barium	SW6010B	ug/L	2,000	380	**1,550**	**911**	**182**	**1,060**	**476**	**466**	**107**	**584**	**113**	**2,720**	**110**	**451**	**171**	**6,310**	**152**
Boron	SW6010B	ug/L	NE	400	**874**	**291**	**37.9 J**	**245**	**434**	**422**	**431**	< 100 U	**48.1 J**	**414**	**137**	**439**	**100**	**2,690**	< 100 U
Calcium	SW6010B	ug/L	NE	NE	**196,000**	**190,000**	**57,000**	**216,000**	**214,000**	**207,000**	**52,400**	**272,000**	**87,800**	**489,000**	**99,700**	**359,000**	**71,600**	**891,000**	**96,900**
Cobalt	SW6010B	ug/L	NE	0.6	**1.8 J**	**9.8**	< 5.0 U	< 5.0 U	**26.2**	**25.6**	**0.80 J**	**14.2**	< 5.0 U	**4.2 J**	< 5.0 U	**3.1 J**	< 5.0 U	**4.2 J**	< 5.0 U
Iron	SW6010B	ug/L	NE	1,400	**28,100**	**7,320**	**159**	**65,400**	**2,760**	**2,740**	**76.9 J+**	**2,940**	< 50.0 U	**51,400**	**1,780**	**14,100**	< 50.0 U	**87,100**	**54.8**
Lithium	SW6010B	ug/L	NE	4	**28.8**	**22.0**	**11.3 J**	**13.4 J**	**21.4**	**22.3**	**35.8**	**26.1**	**11.4 J**	**42.2**	**36.5**	**36.6**	**33.1**	**111**	**20.4**
Magnesium	SW6010B	ug/L	NE	NE	**64,900**	**49,900**	**29,600**	**51,700**	**96,400**	**95,900**	**37,000**	**134,000**	**46,600**	**220,000**	**46,200**	**123,000**	**49,800**	**250,000**	**55,200**
Manganese	SW6010B	ug/L	NE	43	**413**	**5,160**	**34.5**	**4,050**	**84.8**	**85.8**	**236**	**1,950**	**8.5**	**1,610**	**16.0**	**3,760**	**6.6**	**1,190**	< 5.0 U
Molybdenum	SW6010B	ug/L	NE	10	< 10.0 U	**2.2 J**	**16.2**	< 10.0 U	< 10.0 U	< 10.0 U	**3.5 J**	**1.7 J**	**2.1 J**	< 10.0 U	**1.8 J**	**2.2 J**	**2.4 J**	< 10.0 U	< 10.0 U
Nickel	SW6010B	ug/L	NE	39	**7.1 J**	**16.4**	< 10.0 U	**2.5 J**	**64.2**	**63.5**	**2.0 J**	**38.9**	**1.4 J**	**23.4**	**7.0 J**	**68.0**	**2.2 J**	**24.7**	**2.2 J**
Potassium	SW6010B	ug/L	NE	NE	**15,300**	**10,600**	**1,580**	**7,280**	**5,090**	**5,070**	**4,170**	**2,270**	**2,290**	**7,000**	**2,410**	**7,910**	**2,750**	**29,000**	**1,920**
Silicon	SW6010B	ug/L	NE	NE	**16,100**	**14,400**	**7,000**	**22,700**	**19,200**	**19,200**	**8,330**	**21,400**	**13,200**	**27,700**	**7,090**	**20,900**	**10,900**	**7,560**	**8,890**
Sodium	SW6010B	ug/L	NE	20,000	**180,000**	**56,100**	**20,400**	**217,000**	**199,000**	**196,000**	**23,600**	**47,100**	**12,700**	**372,000**	**10,200**	**296,000**	**24,600**	**686,000**	**15,700**
Strontium	SW6010B	ug/L	NE	1,200	**628**	**651**	**576**	**913**	**1,770**	**1,730**	**4,820**	**586**	**466**	**1,140**	**819**	**727**	**2,290**	**5,100**	**492**
Tin	SW6010B	ug/L	NE	1,200	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	**2.5 J**	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
Titanium	SW6010B	ug/L	NE	NE	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	**1.3 J**	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
Zinc	SW6010B	ug/L	NE	600	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	**17.1 J**	**18.2 J**	< 20.0 U	< 20.0 U	**92.0**	< 20.0 U	< 20.0 U	< 20.0 U	**61.2**	< 20.0 U	**37.0**
Mercury	SW7470A	ug/L	2	0.063	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U

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Table 8: 2020 Validated Data for Dissolved Metals
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					Sample Location	PZ-206-SS	PZ-207-AS	PZ-209-SS	PZ-210-SS	PZ-211-SD	PZ-211-SS	PZ-302-AI	PZ-302-AS	PZ-303-AS	PZ-304-AI	PZ-304-AS	S-5	S-5	S-10	S-82	S-84
					Sample Depth (ft BGS)	115-124.8	34.9-39.7	140-150	138-148	237-247	137-147	32.6-42.4	12.2-22	16-25.8	39-48.8	17.1-26.9	30-40	30-40	32-52	15.5-25.5	20.9-30.9
					Sample Date	11-10-2020	12-01-2020	11-04-2020	11-03-2020	11-03-2020	12-04-2020	12-01-2020	11-30-2020	12-04-2020	12-02-2020	12-02-2020	11-20-2020	11-20-2020	11-13-2020	11-23-2020	11-10-2020
					Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1																	
Metals, Dissolved																					
Antimony	SW6020	ug/L	6	0.78	< 1.0 U	**0.18 J**	**0.081 J**	**0.11 J**	**0.55 J**	< 1.0 U	< 1.0 U	**0.12 J**	**0.13 J**	< 1.0 U	**0.24 J**	**0.57 J**	**0.54 J**	**0.17 J**	< 1.0 U	< 1.0 U
Arsenic	SW6020	ug/L	10	0.052	**1.5**	**12.0**	**1.3**	**0.71 J**	**0.62 J**	**1.6**	**2.7**	**92.5**	**72.5**	**0.74 J**	**252**	**11.6**	**11.0**	**51.1**	**193**	**417**
Beryllium	SW6020	ug/L	4	2.5	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	**0.60**	< 0.20 U	< 0.20 U
Cadmium	SW6020	ug/L	5	0.92	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	**0.14 J**	**0.14 J**	< 0.20 U	< 0.20 U	< 0.20 U
Chromium	SW6020	ug/L	100	NE	< 2.0 U	**1.7 J**	**0.26 J**	**0.76 J**	**0.27 J**	< 2.0 U	**0.18 J**	**0.67 J**	**0.35 J**	**0.60 J**	**2.4**	**4.5**	**4.5**	**1.2 J**	**0.71 J**	**0.37 J**
Copper	SW6020	ug/L	1,300	80	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**2.5**	< 1.0 U	< 1.0 U
Lead	SW6020	ug/L	15	15	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.10 J**	**0.11 J**	**0.043 J**	< 1.0 U	< 1.0 U
Selenium	SW6020	ug/L	50	10	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.56 J**	< 1.0 U	**0.42 J**	**0.69 J**	**0.50 J**	< 1.0 U	**0.43 J**	< 1.0 U
Silver	SW6020	ug/L	NE	9.4	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Thallium	SW6020	ug/L	2	0.02	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.045 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Thorium	SW6020	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	**0.19 J**	**0.11 J**	< 1.0 U	< 1.0 U	**0.11 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.23 J**	< 1.0 U	< 1.0 U
Uranium	SW6020	ug/L	30	0.4	**0.089 J**	**0.013 J**	**1.0**	**0.33 J**	**3.3**	**1.1**	**10.8**	**0.16 J**	**0.022 J**	**0.29 J**	**0.012 J**	< 1.0 U	< 1.0 U	**0.17 J**	**2.2**	**0.013 J**
Vanadium	SW6020	ug/L	NE	8.6	**0.24 J**	**1.5**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.97 J**	**1.3**	**0.57 J**	**4.3**	**1.9**	**1.9**	**3.5**	**0.59 J**	**0.40 J**
Aluminum	SW6010B	ug/L	NE	2,000	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	**812**	< 200 U	< 200 U
Barium	SW6010B	ug/L	2,000	380	**77.7**	**659**	**95.6**	**91.9**	**128**	**55.2**	**501**	**405**	**672**	**1,390**	**2,700**	**564**	**620**	**255**	**1,120**	**868**
Boron	SW6010B	ug/L	NE	400	**166**	**1,210**	**271**	**124**	**96.4 J**	**427**	**402**	**544**	**254**	**564**	**2,030**	**2,650**	**2,920**	**1,260**	**3,550**	**215**
Calcium	SW6010B	ug/L	NE	NE	**115,000**	**147,000**	**72,300**	**88,900**	**90,100**	**64,200**	**222,000**	**161,000**	**244,000**	**257,000**	**67,300**	**58,600**	**64,200**	**190,000**	**190,000**	**133,000**
Cobalt	SW6010B	ug/L	NE	0.6	**0.59 J**	**3.4 J**	**0.68 J**	< 5.0 U	< 5.0 U	< 5.0 U	**12.8**	**1.0 J**	**2.1 J**	**3.0 J**	**4.4 J**	**5.9**	**6.8**	**1.7 J**	**4.4 J**	**9.0**
Iron	SW6010B	ug/L	NE	1,400	**1,930**	**22,400**	**500**	**1,000**	< 50.0 U	**308**	**4,170**	**37,100**	**72,700**	**18,700**	**20,200**	**15,300**	**16,800**	**149,000**	**30,200**	**51,000**
Lithium	SW6010B	ug/L	NE	4	**36.6**	**23.5**	**39.2**	**21.8**	**24.6**	**47.8**	**24.2**	**11.8 J**	**21.3**	**35.8**	**22.7**	**25.0**	**24.7**	**61.2**	**46.4**	**19.8 J**
Magnesium	SW6010B	ug/L	NE	NE	**76,300**	**70,500**	**49,000**	**44,900**	**43,800**	**41,800**	**57,500**	**56,400**	**59,400**	**73,700**	**63,400**	**62,400**	**68,300**	**167,000**	**81,800**	**50,400**
Manganese	SW6010B	ug/L	NE	43	**44.4**	**75.9**	**39.2**	**87.7**	< 5.0 U	**24.1**	**377**	**2,140**	**1,450**	**1,140**	**66.4**	**134**	**146**	**7,640**	**1,380**	**380**
Molybdenum	SW6010B	ug/L	NE	10	< 10.0 U	< 10.0 U	**4.9 J**	**1.8 J**	**27.0**	**8.2 J**	**12.0**	< 10.0 U	< 10.0 U	**0.84 J**	**53.6**	< 10.0 U	**0.79 J**	< 10.0 U	**12.6**	**10.6 J+**
Nickel	SW6010B	ug/L	NE	39	**3.8 J**	**11.0**	**3.5 J**	**3.6 J**	**3.2 J**	**1.7 J**	**27.1**	**3.4 J**	**6.9 J**	**14.4**	**29.7**	**34.3**	**38.2**	**14.8**	**22.2**	**15.4**
Potassium	SW6010B	ug/L	NE	NE	**4,110**	**51,500**	**3,530**	**5,670**	**3,710**	**3,750**	**7,760**	**6,920**	**4,320**	**10,400**	**125,000**	**201,000**	**220,000**	**44,800**	**20,200**	**5,240**
Silicon	SW6010B	ug/L	NE	NE	**6,490**	**18,600**	**5,830**	**8,970**	**6,570**	**4,820**	**14,000**	**18,400**	**24,700**	**18,500**	**23,700**	**15,800**	**17,500**	**21,100**	**20,000**	**22,400**
Sodium	SW6010B	ug/L	NE	20,000	**22,600**	**215,000**	**11,000**	**29,100**	**49,200**	**20,400**	**59,900**	**44,300**	**47,300**	**137,000**	**317,000**	**435,000**	**477,000**	**216,000**	**293,000**	**33,100**
Strontium	SW6010B	ug/L	NE	1,200	**4,600**	**791**	**4,740**	**1,440**	**1,390**	**4,360**	**925**	**974**	**667**	**1,010**	**1,070**	**335**	**368**	**1,100**	**1,320**	**641**
Tin	SW6010B	ug/L	NE	1,200	< 10.0 U	< 10.0 U	**6.9 J**	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	**11.1**	**12.2**	< 10.0 U	< 10.0 U	< 10.0 U
Titanium	SW6010B	ug/L	NE	NE	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	**1.2 J**	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
Zinc	SW6010B	ug/L	NE	600	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	**38.0**	**45.2**	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Mercury	SW7470A	ug/L	2	0.063	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U

Notes and definitions are presented on Page 6

Notes:

ft BGS = feet below ground surface

ug/L = micrograms per liter

mg/L = milligrams per liter

USEPA Primary MCL = USEPA National Primary Drinking Water Regulation (May 2009). MCLs are for combined radium 226/228 (5 pCi/L) and gross alpha excluding uranium (15 pCi/L). Radium-226 contributes to both the combined radium-226/288 and gross alpha; the lower of the two MCLs is shown in the table for comparison. There is a total Uranium MCL of 30 ug/L presented in the metals result tables.

USEPA RSL TAPWATER THQ0.1 = RSL TAPWATER (TR=1E-06, THQ=0.1) May 2021, adapted for West Lake QAPP

Bold = Detected

Blue Font = Exceeds USEPA Primary MCL

Orange Shaded = Detected value exceeds USEPA RSL TAPWATER THQ0.1

Gray Shaded = Compound not detected above the reporting detection limit but reporting detection limit exceeds USEPA RSL TAPWATER THQ0.1

NE = Not Established

NA = Not Available

For the 2020 4th quarter groundwater monitoring event, turbidity for samples PZ-205-AS-WG-20201111, PZ-205-SS-WG-20201111, I-11-WG-20201112, D-12-WG-20201112, D-6-WG-20201112, S-10-WG-20201113, D-13-WG-20201113, I-62-WG-20201116, D-83-WG-20201116, S-5-WG-20201120, D-3-WG-20201120, D-87-WG-20201120, S-82-WG-20201123, D-93-WG-20201123, I-9-WG-20201123, I-65-WG-20201124, PZ-115-SS-WG-20201124, I-68-WG-20201124, D-85-WG-20201130, I-73-WG-20201130, PZ-302-AS-WG-20201130, PZ-302-AI-WG-20201201, PZ-207-AS-WG-20201201, PZ-202-SS-WG-20201202, PZ-304-AS-WG-20201202, PZ-304-AI-WG-20201202, LR-100-WG-20201203, PZ-107-SS-WG-20201203, PZ-103-SS-WG-20201203, PZ-303-AS-WG-20201204, PZ-201A-SS-WG-20201204, PZ-204A-SS-WG-20201204, and PZ-204-SS-WG-20201204 were analyzed using an instrument with a tungsten filament light source. Turbidity measured using this method is typically reported in NTU.

Qualifier Definition

J = Estimated concentration.

J+ = The result is an estimated concentration, but may be biased high.

J- = The result is an estimated concentration, but may be biased low.

U = The analyte was analyzed for but was not detected at or above the referenced reporting limit.

UJ = The analyte was analyzed for, but was not detected. The reporting limit is approximate and may be inaccurate or imprecise.

Table 9a: 2020 Validated Data for Semivolatile Organic Compounds
West Lake Landfill OU-3
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				Sample Location	D-3	D-6	D-12	D-13	D-83	D-85	D-87	D-89	D-93	I-9	I-11	I-62	I-65	I-66
				Sample Depth (ft BGS)	96.5-106.5	96.5-106.5	133.7-143.7	123-133	77-97	62-82	91-111	33-48	92-112	43.1-53.1	80.5-90.5	34-44	26-36	26.9-36.9
				Sample Date	11-20-2020	11-12-2020	11-12-2020	11-13-2020	11-16-2020	11-30-2020	11-20-2020	12-03-2020	11-23-2020	11-23-2020	11-12-2020	11-16-2020	11-24-2020	11-05-2020
				Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1														
Semivolatile Organic Compounds, Total (#–C)																		
1,2,4,5-Tetrachlorobenzene	SW8270C	ug/L	NE	0.17	< 9.1 UJ	< 9.1 UJ	< 9.1 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.1 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 10.0 UJ	< 9.1 UJ	< 10.0 UJ
1,3,5-Trinitrobenzene	SW8270C	ug/L	NE	59	< 18.2 UJ	< 18.2 UJ	< 18.2 UJ	< 19.0 UJ	< 19.0 U	< 18.2 UJ	< 18.2 UJ	< 20.0 UJ	< 19.0 U	< 19.0 U	< 18.2 UJ	< 20.0 U	< 18.2 U	< 20.0 UJ
1,3-Dinitrobenzene	SW8270C	ug/L	NE	0.2	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
1,4-Naphthoquinone	SW8270C	ug/L	NE	NE	< 18.2 U	< 18.2 U	< 18.2 U	< 19.0 U	< 19.0 U	< 18.2 U	< 18.2 U	< 20.0 U	< 19.0 U	< 19.0 U	< 18.2 U	< 20.0 U	< 18.2 U	< 20.0 U
2,2-Oxybis(1-chloropropane)	SW8270C	ug/L	NE	71	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
2,3,4,6-Tetrachlorophenol	SW8270C	ug/L	NE	24	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
2,4,5-Trichlorophenol	SW8270C	ug/L	NE	120	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
2,4,6-Trichlorophenol	SW8270C	ug/L	NE	1.2	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
2,4-Dichlorophenol	SW8270C	ug/L	NE	4.6	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
2,4-Dimethylphenol	SW8270C	ug/L	NE	36	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	**6.7 J**	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
2,4-Dinitrophenol	SW8270C	ug/L	NE	3.9	< 45.5 U	< 45.5 U	< 45.5 U	< 47.6 U	< 47.6 U	< 45.5 U	< 45.5 U	< 50.0 U	< 47.6 U	< 47.6 U	< 45.5 U	< 50.0 U	< 45.5 U	< 50.0 U
2,4-Dinitrotoluene	SW8270C	ug/L	NE	0.24	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 UJ	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 UJ	< 9.1 U	< 10.0 U
2,6-Dichlorophenol	SW8270C	ug/L	NE	NE	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
2,6-Dinitrotoluene	SW8270C	ug/L	NE	0.049	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
2-Acetylaminofluorene	SW8270C	ug/L	NE	0.016	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
2-Chloronaphthalene	SW8270C	ug/L	NE	75	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
2-Chlorophenol	SW8270C	ug/L	NE	9.1	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
2-Nitroaniline	SW8270C	ug/L	NE	19	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
2-Nitrophenol	SW8270C	ug/L	NE	NE	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 UJ	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 UJ	< 9.5 UJ	< 9.1 U	< 10.0 UJ	< 9.1 UJ	< 10.0 U
3,3'-Dichlorobenzidine	SW8270C	ug/L	NE	0.13	< 18.2 U	< 18.2 U	< 18.2 U	< 19.0 U	< 19.0 U	< 18.2 U	< 18.2 U	< 20.0 U	< 19.0 U	< 19.0 U	< 18.2 U	< 20.0 U	< 18.2 U	< 20.0 U
3-Methylcholanthrene	SW8270C	ug/L	NE	0.0011	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
3-Nitroaniline	SW8270C	ug/L	NE	NE	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
4-Aminobiphenyl	SW8270C	ug/L	NE	0.003	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
4-Bromophenyl phenyl ether	SW8270C	ug/L	NE	NE	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
4-Chloro-3-methylphenol	SW8270C	ug/L	NE	140	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
4-Chlorophenyl phenyl ether	SW8270C	ug/L	NE	NE	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
4-Dimethylaminoazobenzene	SW8270C	ug/L	NE	0.005	< 9.1 UJ	< 9.1 UJ	< 9.1 UJ	< 9.5 UJ	< 9.5 U	< 9.1 UJ	< 9.1 UJ	< 10.0 UJ	< 9.5 U	< 9.5 U	< 9.1 UJ	< 10.0 U	< 9.1 U	< 10.0 UJ
4-Nitrophenol	SW8270C	ug/L	NE	NE	< 45.5 U	< 45.5 U	< 45.5 U	< 47.6 U	< 47.6 U	< 45.5 U	< 45.5 U	< 50.0 U	< 47.6 U	< 47.6 U	< 45.5 U	< 50.0 U	< 45.5 U	< 50.0 U
5-Nitro-o-toluidine	SW8270C	ug/L	NE	8.2	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
7,12-Dimethylbenz(a)anthracene	SW8270C	ug/L	NE	0.0001	< 18.2 U	< 18.2 U	< 18.2 U	< 19.0 U	< 19.0 U	< 18.2 U	< 18.2 U	< 20.0 U	< 19.0 U	< 19.0 U	< 18.2 U	< 20.0 U	< 18.2 U	< 20.0 U
Acetophenone	SW8270C	ug/L	NE	190	< 9.1 UJ	< 9.1 UJ	< 9.1 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.1 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 10.0 UJ	< 9.1 UJ	< 10.0 UJ
alpha-Naphthylamine	SW8270C	ug/L	NE	NE	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
Atrazine	SW8270C	ug/L	3	0.3	< 9.1 UJ	< 9.1 UJ	< 9.1 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.1 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 10.0 UJ	< 9.1 UJ	< 10.0 UJ
Benzaldehyde	SW8270C	ug/L	NE	19	< 45.5 UJ	< 45.5 UJ	< 45.5 UJ	< 47.6 UJ	< 47.6 UJ	< 45.5 UJ	< 45.5 UJ	< 50.0 UJ	< 47.6 UJ	< 47.6 UJ	< 45.5 UJ	< 50.0 UJ	< 45.5 UJ	< 50.0 UJ
Benzyl alcohol	SW8270C	ug/L	NE	200	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
Benzyl butyl phthalate	SW8270C	ug/L	NE	16	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 UJ	< 9.5 UJ	< 9.1 U	< 10.0 U	< 9.1 UJ	< 10.0 U
beta-Naphthylamine	SW8270C	ug/L	NE	0.039	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
Biphenyl	SW8270C	ug/L	NE	0.083	< 9.1 UJ	< 9.1 UJ	< 9.1 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.1 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 10.0 UJ	< 9.1 UJ	< 10.0 UJ
Bis(2-chloroethoxy)methane	SW8270C	ug/L	NE	5.9	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U
Bis(2-ethylhexyl)phthalate	SW8270C	ug/L	6	5.6	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 UJ	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 UJ	< 9.5 UJ	< 9.1 U	< 10.0 UJ	< 9.1 UJ	< 10.0 U
Caprolactam	SW8270C	ug/L	NE	990	< 9.1 UJ	< 9.1 UJ	< 9.1 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.1 UJ	**108 J**	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 10.0 UJ	< 9.1 UJ	< 10.0 UJ
Carbazole	SW8270C	ug/L	NE	NE	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 UJ	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 UJ	< 9.1 U	< 10.0 U
Chlorobenzilate	SW8270C	ug/L	NE	0.31	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 UJ	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 UJ	< 9.1 U	< 10.0 U

Notes and definitions are presented on Page 7

Table 9a: 2020 Validated Data for Semivolatile Organic Compounds
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Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1	Sample Location	I-67	I-68	I-73	LR-100	MW-1204	MW-1204	PZ-100-KS	PZ-100-SD	PZ-100-SS	PZ-101-SS	PZ-102R-SS	PZ-102-SS	PZ-103-SS	PZ-103-SS
					Sample Depth (ft BGS)	25.4-35.4	21.2-31.2	43.2-46.2	19.7-24.5	213.5-223.5	213.5-223.5	374-383.8	234.8-244.6	73.96-93.6	129.48-139.28	79.83-89.63	79.7-89.5	134.7-144.5	134.7-144.5
					Sample Date	11-10-2020	11-24-2020	11-30-2020	12-03-2020	11-06-2020	11-06-2020	12-02-2020	12-01-2020	12-01-2020	11-12-2020	11-06-2020	11-06-2020	12-03-2020	12-03-2020
					Sample Type	N	N	N	N	N	FD	N	N	N	N	N	N	N	FD
Semivolatile Organic Compounds, Total (#–C)																			
1,2,4,5-Tetrachlorobenzene	SW8270C	ug/L	NE	0.17		< 9.5 UJ	< 9.1 UJ	< 47.6 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.5 UJ
1,3,5-Trinitrobenzene	SW8270C	ug/L	NE	59		< 19.0 U	< 18.2 U	< 95.2 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 20.0 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 18.2 UJ	< 19.0 UJ
1,3-Dinitrobenzene	SW8270C	ug/L	NE	0.2		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
1,4-Naphthoquinone	SW8270C	ug/L	NE	NE		< 19.0 U	< 18.2 U	< 95.2 U	< 19.0 U	< 19.0 U	< 19.0 U	< 20.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U	< 19.0 U
2,2-Oxybis(1-chloropropane)	SW8270C	ug/L	NE	71		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
2,3,4,6-Tetrachlorophenol	SW8270C	ug/L	NE	24		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
2,4,5-Trichlorophenol	SW8270C	ug/L	NE	120		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 UJ	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
2,4,6-Trichlorophenol	SW8270C	ug/L	NE	1.2		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
2,4-Dichlorophenol	SW8270C	ug/L	NE	4.6		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
2,4-Dimethylphenol	SW8270C	ug/L	NE	36		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
2,4-Dinitrophenol	SW8270C	ug/L	NE	3.9		< 47.6 U	< 45.5 U	< 238 U	< 47.6 U	< 47.6 U	< 47.6 U	< 50.0 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U	< 45.5 U	< 47.6 U
2,4-Dinitrotoluene	SW8270C	ug/L	NE	0.24		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
2,6-Dichlorophenol	SW8270C	ug/L	NE	NE		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
2,6-Dinitrotoluene	SW8270C	ug/L	NE	0.049		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
2-Acetylaminofluorene	SW8270C	ug/L	NE	0.016		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
2-Chloronaphthalene	SW8270C	ug/L	NE	75		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
2-Chlorophenol	SW8270C	ug/L	NE	9.1		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
2-Nitroaniline	SW8270C	ug/L	NE	19		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
2-Nitrophenol	SW8270C	ug/L	NE	NE		< 9.5 U	< 9.1 UJ	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
3,3'-Dichlorobenzidine	SW8270C	ug/L	NE	0.13		< 19.0 U	< 18.2 U	< 95.2 U	< 19.0 U	< 19.0 U	< 19.0 U	< 20.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U	< 19.0 U
3-Methylcholanthrene	SW8270C	ug/L	NE	0.0011		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
3-Nitroaniline	SW8270C	ug/L	NE	NE		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
4-Aminobiphenyl	SW8270C	ug/L	NE	0.003		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
4-Bromophenyl phenyl ether	SW8270C	ug/L	NE	NE		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
4-Chloro-3-methylphenol	SW8270C	ug/L	NE	140		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
4-Chlorophenyl phenyl ether	SW8270C	ug/L	NE	NE		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
4-Dimethylaminoazobenzene	SW8270C	ug/L	NE	0.005		< 9.5 U	< 9.1 U	< 47.6 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.5 UJ
4-Nitrophenol	SW8270C	ug/L	NE	NE		< 47.6 U	< 45.5 U	< 238 U	< 47.6 U	< 47.6 U	< 47.6 U	< 50.0 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U	< 45.5 U	< 47.6 U
5-Nitro-o-toluidine	SW8270C	ug/L	NE	8.2		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
7,12-Dimethylbenz(a)anthracene	SW8270C	ug/L	NE	0.0001		< 19.0 U	< 18.2 U	< 95.2 U	< 19.0 U	< 19.0 U	< 19.0 U	< 20.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U	< 19.0 U
Acetophenone	SW8270C	ug/L	NE	190		< 9.5 UJ	< 9.1 UJ	< 47.6 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.5 UJ
alpha-Naphthylamine	SW8270C	ug/L	NE	NE		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
Atrazine	SW8270C	ug/L	3	0.3		< 9.5 UJ	< 9.1 UJ	< 47.6 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.5 UJ
Benzaldehyde	SW8270C	ug/L	NE	19		< 47.6 UJ	< 45.5 UJ	< 238 UJ	< 47.6 UJ	< 47.6 UJ	< 47.6 UJ	< 50.0 UJ	< 47.6 UJ	< 47.6 UJ	< 47.6 UJ	< 47.6 UJ	< 47.6 UJ	< 45.5 UJ	< 47.6 UJ
Benzyl alcohol	SW8270C	ug/L	NE	200		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
Benzyl butyl phthalate	SW8270C	ug/L	NE	16		< 9.5 UJ	< 9.1 UJ	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
beta-Naphthylamine	SW8270C	ug/L	NE	0.039		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
Biphenyl	SW8270C	ug/L	NE	0.083		< 9.5 UJ	< 9.1 UJ	< 47.6 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.5 UJ
Bis(2-chloroethoxy)methane	SW8270C	ug/L	NE	5.9		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
Bis(2-ethylhexyl)phthalate	SW8270C	ug/L	6	5.6		< 9.5 U	< 9.1 UJ	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
Caprolactam	SW8270C	ug/L	NE	990		< 9.5 UJ	< 9.1 UJ	**298 J**	< 9.5 UJ	**41.4 J**	**45.0 J**	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.5 UJ
Carbazole	SW8270C	ug/L	NE	NE		< 9.5 UJ	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U
Chlorobenzilate	SW8270C	ug/L	NE	0.31		< 9.5 U	< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U

Notes and definitions are presented on Page 7

Table 9a: 2020 Validated Data for Semivolatile Organic Compounds
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Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1	Sample Location	LCS-3D	LCS-3D	PZ-104-KS	LCS-5A	PZ-104-SD	PZ-104-SS	PZ-105-SS	PZ-106-KS	PZ-106-SD	PZ-106-SD	PZ-106-SS	PZ-107-SS	PZ-109-SS
					Sample Depth (ft BGS)	-	-	397.37-407.17	145-295	235.2-245	134.5-144.3	138.5-148.3	363.75-373.57	190.79-200.59	190.79-200.59	155.3-165.1	92.6-102.4	125.7-135.5
					Sample Date	12-08-2020	12-08-2020	12-03-2020	12-08-2020	11-04-2020	11-12-2020	11-06-2020	11-13-2020	11-13-2020	11-13-2020	11-11-2020	12-03-2020	11-10-2020
					Sample Type	N	FD	N	N	N	N	N	N	N	FD	N	N	N
Semivolatile Organic Compounds, Total (#–C)																		
1,2,4,5-Tetrachlorobenzene	SW8270C	ug/L	NE	0.17	< 476 UJ	< 476 UJ	< 10.0 UJ	< 47.6 UJ	< 9.1 UJ	< 9.5 UJ	< 10.0 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ
1,3,5-Trinitrobenzene	SW8270C	ug/L	NE	59	< 952 UJ	< 952 UJ	< 20.0 UJ	< 95.2 UJ	< 18.2 UJ	< 19.0 UJ	< 20.0 UJ	< 20.0 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 U	< 19.0 UJ	< 19.0 U	< 19.0 U
1,3-Dinitrobenzene	SW8270C	ug/L	NE	0.2	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
1,4-Naphthoquinone	SW8270C	ug/L	NE	NE	< 952 U	< 952 U	< 20.0 U	< 95.2 U	< 18.2 U	< 19.0 U	< 20.0 U	< 20.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U
2,2-Oxybis(1-chloropropane)	SW8270C	ug/L	NE	71	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
2,3,4,6-Tetrachlorophenol	SW8270C	ug/L	NE	24	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
2,4,5-Trichlorophenol	SW8270C	ug/L	NE	120	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
2,4,6-Trichlorophenol	SW8270C	ug/L	NE	1.2	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
2,4-Dichlorophenol	SW8270C	ug/L	NE	4.6	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
2,4-Dimethylphenol	SW8270C	ug/L	NE	36	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
2,4-Dinitrophenol	SW8270C	ug/L	NE	3.9	< 2,380 U	< 2,380 U	< 50.0 U	< 238 U	< 45.5 U	< 47.6 U	< 50.0 U	< 50.0 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U
2,4-Dinitrotoluene	SW8270C	ug/L	NE	0.24	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
2,6-Dichlorophenol	SW8270C	ug/L	NE	NE	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
2,6-Dinitrotoluene	SW8270C	ug/L	NE	0.049	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
2-Acetylaminofluorene	SW8270C	ug/L	NE	0.016	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
2-Chloronaphthalene	SW8270C	ug/L	NE	75	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
2-Chlorophenol	SW8270C	ug/L	NE	9.1	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
2-Nitroaniline	SW8270C	ug/L	NE	19	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
2-Nitrophenol	SW8270C	ug/L	NE	NE	< 476 UJ	< 476 UJ	< 10.0 U	< 47.6 UJ	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
3,3'-Dichlorobenzidine	SW8270C	ug/L	NE	0.13	< 952 U	< 952 U	< 20.0 U	< 95.2 U	< 18.2 U	< 19.0 U	< 20.0 U	< 20.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U
3-Methylcholanthrene	SW8270C	ug/L	NE	0.0011	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
3-Nitroaniline	SW8270C	ug/L	NE	NE	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
4-Aminobiphenyl	SW8270C	ug/L	NE	0.003	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
4-Bromophenyl phenyl ether	SW8270C	ug/L	NE	NE	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
4-Chloro-3-methylphenol	SW8270C	ug/L	NE	140	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
4-Chlorophenyl phenyl ether	SW8270C	ug/L	NE	NE	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
4-Dimethylaminoazobenzene	SW8270C	ug/L	NE	0.005	< 476 UJ	< 476 UJ	< 10.0 UJ	< 47.6 UJ	< 9.1 UJ	< 9.5 UJ	< 10.0 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 U	< 9.5 UJ	< 9.5 U	< 9.5 U
4-Nitrophenol	SW8270C	ug/L	NE	NE	< 2,380 U	< 2,380 U	< 50.0 U	< 238 U	< 45.5 U	< 47.6 U	< 50.0 U	< 50.0 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U
5-Nitro-o-toluidine	SW8270C	ug/L	NE	8.2	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
7,12-Dimethylbenz(a)anthracene	SW8270C	ug/L	NE	0.0001	< 952 U	< 952 U	< 20.0 U	< 95.2 U	< 18.2 U	< 19.0 U	< 20.0 U	< 20.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U
Acetophenone	SW8270C	ug/L	NE	190	< 476 UJ	< 476 UJ	< 10.0 UJ	< 47.6 UJ	< 9.1 UJ	< 9.5 UJ	< 10.0 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ
alpha-Naphthylamine	SW8270C	ug/L	NE	NE	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Atrazine	SW8270C	ug/L	3	0.3	< 476 UJ	< 476 UJ	< 10.0 UJ	< 47.6 UJ	< 9.1 UJ	< 9.5 UJ	< 10.0 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ
Benzaldehyde	SW8270C	ug/L	NE	19	< 2,380 UJ	< 2,380 UJ	< 50.0 UJ	< 238 UJ	< 45.5 UJ	< 47.6 UJ	< 50.0 UJ	< 50.0 UJ	< 47.6 UJ	< 47.6 UJ	< 47.6 UJ	< 47.6 UJ	< 47.6 UJ	< 47.6 UJ
Benzyl alcohol	SW8270C	ug/L	NE	200	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Benzyl butyl phthalate	SW8270C	ug/L	NE	16	< 476 UJ	< 476 UJ	< 10.0 U	< 47.6 UJ	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 UJ	< 9.5 U	< 9.5 UJ	< 9.5 UJ
beta-Naphthylamine	SW8270C	ug/L	NE	0.039	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Biphenyl	SW8270C	ug/L	NE	0.083	< 476 UJ	< 476 UJ	< 10.0 UJ	< 47.6 UJ	< 9.1 UJ	< 9.5 UJ	< 10.0 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ
Bis(2-chloroethoxy)methane	SW8270C	ug/L	NE	5.9	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Bis(2-ethylhexyl)phthalate	SW8270C	ug/L	6	5.6	< 476 U	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Caprolactam	SW8270C	ug/L	NE	990	< 476 UJ	< 476 UJ	< 10.0 UJ	< 47.6 UJ	< 9.1 UJ	< 9.5 UJ	< 10.0 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	**5.0 J**	< 9.5 UJ	< 9.5 UJ
Carbazole	SW8270C	ug/L	NE	NE	< 476 UJ	< 476 UJ	< 10.0 U	< 47.6 UJ	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 UJ	< 9.5 U	< 9.5 UJ	< 9.5 UJ
Chlorobenzilate	SW8270C	ug/L	NE	0.31	< 476 UJ	< 476 UJ	< 10.0 U	< 47.6 UJ	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U

Notes and definitions are presented on Page 7

Table 9a: 2020 Validated Data for Semivolatile Organic Compounds
West Lake Landfill OU-3
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Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1	Sample Location	PZ-109-SS	PZ-111-KS	PZ-111-SD	PZ-111-SS	PZ-113-AD	PZ-113-AD	PZ-113-AS	PZ-113-SS	PZ-114-AS	PZ-115-SS	PZ-115-SS	PZ-116-SS	PZ-200-SS	PZ-201A-SS
					Sample Depth (ft BGS)	125.7-135.5	357.15-366.96	199.4-209.2	105.5-115.5	98.6-108.4	98.6-108.4	28.9-38.7	148.57-158.37	19.9-29.7	74.68-84.48	74.68-84.48	151.4-161	9.62-97.64	80-89.8
					Sample Date	11-10-2020	11-09-2020	11-09-2020	11-09-2020	11-05-2020	11-05-2020	11-04-2020	11-05-2020	11-11-2020	11-24-2020	11-24-2020	12-04-2020	12-02-2020	12-04-2020
					Sample Type	FD	N	N	N	N	FD	N	N	N	N	FD	N	N	N
Semivolatile Organic Compounds, Total (#–C)																			
1,2,4,5-Tetrachlorobenzene	SW8270C	ug/L	NE	0.17	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.1 UJ	< 9.1 UJ	< 10.0 U	< 10.0 UJ	< 9.5 U
1,3,5-Trinitrobenzene	SW8270C	ug/L	NE	59	< 19.0 U	< 19.0 UJ	< 19.0 UJ	< 20.0 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 18.2 U	< 18.2 U	< 18.2 U	< 20.0 U	< 20.0 UJ	< 19.0 U
1,3-Dinitrobenzene	SW8270C	ug/L	NE	0.2	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
1,4-Naphthoquinone	SW8270C	ug/L	NE	NE	< 19.0 U	< 19.0 U	< 19.0 U	< 20.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U	< 18.2 U	< 18.2 U	< 20.0 U	< 20.0 U	< 19.0 U
2,2-Oxybis(1-chloropropane)	SW8270C	ug/L	NE	71	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
2,3,4,6-Tetrachlorophenol	SW8270C	ug/L	NE	24	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
2,4,5-Trichlorophenol	SW8270C	ug/L	NE	120	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 UJ	< 9.5 U
2,4,6-Trichlorophenol	SW8270C	ug/L	NE	1.2	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
2,4-Dichlorophenol	SW8270C	ug/L	NE	4.6	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
2,4-Dimethylphenol	SW8270C	ug/L	NE	36	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
2,4-Dinitrophenol	SW8270C	ug/L	NE	3.9	< 47.6 U	< 47.6 U	< 47.6 U	< 50.0 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U	< 45.5 U	< 45.5 U	< 45.5 U	< 50.0 U	< 50.0 U	< 47.6 U
2,4-Dinitrotoluene	SW8270C	ug/L	NE	0.24	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
2,6-Dichlorophenol	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
2,6-Dinitrotoluene	SW8270C	ug/L	NE	0.049	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
2-Acetylaminofluorene	SW8270C	ug/L	NE	0.016	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
2-Chloronaphthalene	SW8270C	ug/L	NE	75	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
2-Chlorophenol	SW8270C	ug/L	NE	9.1	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
2-Nitroaniline	SW8270C	ug/L	NE	19	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
2-Nitrophenol	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 UJ	< 9.1 UJ	< 10.0 U	< 10.0 U	< 9.5 U
3,3'-Dichlorobenzidine	SW8270C	ug/L	NE	0.13	< 19.0 U	< 19.0 U	< 19.0 U	< 20.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U	< 18.2 U	< 18.2 U	< 20.0 U	< 20.0 U	< 19.0 U
3-Methylcholanthrene	SW8270C	ug/L	NE	0.0011	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
3-Nitroaniline	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
4-Aminobiphenyl	SW8270C	ug/L	NE	0.003	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
4-Bromophenyl phenyl ether	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
4-Chloro-3-methylphenol	SW8270C	ug/L	NE	140	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
4-Chlorophenyl phenyl ether	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
4-Dimethylaminoazobenzene	SW8270C	ug/L	NE	0.005	< 9.5 U	< 9.5 UJ	< 9.5 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 UJ	< 9.5 U
4-Nitrophenol	SW8270C	ug/L	NE	NE	< 47.6 U	< 47.6 U	< 47.6 U	< 50.0 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U	< 45.5 U	< 45.5 U	< 45.5 U	< 50.0 U	< 50.0 U	< 47.6 U
5-Nitro-o-toluidine	SW8270C	ug/L	NE	8.2	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
7,12-Dimethylbenz(a)anthracene	SW8270C	ug/L	NE	0.0001	< 19.0 U	< 19.0 U	< 19.0 U	< 20.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U	< 18.2 U	< 18.2 U	< 20.0 U	< 20.0 U	< 19.0 U
Acetophenone	SW8270C	ug/L	NE	190	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.1 UJ	< 9.1 UJ	< 10.0 U	< 10.0 UJ	< 9.5 U
alpha-Naphthylamine	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
Atrazine	SW8270C	ug/L	3	0.3	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.1 UJ	< 9.1 UJ	< 10.0 U	< 10.0 UJ	< 9.5 U
Benzaldehyde	SW8270C	ug/L	NE	19	< 47.6 UJ	< 47.6 UJ	< 47.6 UJ	< 50.0 UJ	< 47.6 UJ	< 47.6 UJ	< 47.6 UJ	< 47.6 UJ	< 45.5 UJ	< 45.5 UJ	< 45.5 UJ	< 50.0 U	< 50.0 UJ	< 47.6 U
Benzyl alcohol	SW8270C	ug/L	NE	200	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
Benzyl butyl phthalate	SW8270C	ug/L	NE	16	< 9.5 UJ	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 UJ	< 9.1 UJ	< 9.1 UJ	< 10.0 UJ	< 10.0 U	< 9.5 UJ
beta-Naphthylamine	SW8270C	ug/L	NE	0.039	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
Biphenyl	SW8270C	ug/L	NE	0.083	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.1 UJ	< 9.1 UJ	< 10.0 U	< 10.0 UJ	< 9.5 U
Bis(2-chloroethoxy)methane	SW8270C	ug/L	NE	5.9	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U
Bis(2-ethylhexyl)phthalate	SW8270C	ug/L	6	5.6	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 UJ	< 9.1 UJ	< 10.0 UJ	< 10.0 U	< 9.5 UJ
Caprolactam	SW8270C	ug/L	NE	990	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.1 UJ	< 9.1 UJ	< 10.0 UJ	< 10.0 UJ	< 9.5 UJ
Carbazole	SW8270C	ug/L	NE	NE	< 9.5 UJ	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 UJ	< 9.1 U	< 9.1 U	< 10.0 UJ	< 10.0 U	< 9.5 UJ
Chlorobenzilate	SW8270C	ug/L	NE	0.31	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 UJ	< 10.0 U	< 9.5 UJ

Notes and definitions are presented on Page 7

Table 9a: 2020 Validated Data for Semivolatile Organic Compounds
West Lake Landfill OU-3
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Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1	Sample Location	PZ-202-SS	PZ-203-SS	PZ-204A-SS	PZ-204-SS	PZ-205-AS	PZ-205-SS	PZ-206-SS	PZ-207-AS	PZ-209-SS	PZ-210-SS	PZ-211-SD	PZ-211-SS	PZ-302-AI	PZ-302-AS
					Sample Depth (ft BGS)	40.2-89.1	99.6-109.4	79.5-89.1	10.95-89.35	38.55-48.35	88.57-98.37	115-124.8	34.9-39.7	140-150	138-148	237-247	137-147	32.6-42.4	12.2-22
					Sample Date	12-02-2020	11-16-2020	12-04-2020	12-04-2020	11-11-2020	11-11-2020	11-10-2020	12-01-2020	11-04-2020	11-03-2020	11-03-2020	12-04-2020	12-01-2020	11-30-2020
					Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Semivolatile Organic Compounds, Total (#–C)																			
1,2,4,5-Tetrachlorobenzene	SW8270C	ug/L	NE	0.17		< 9.1 UJ	< 10.5 UJ	< 10.5 UJ	< 9.1 UJ	< 45.5 UJ	< 9.1 UJ	< 10.0 UJ	< 9.1 UJ	< 9.1 UJ	< 9.1 UJ	< 9.5 UJ	< 10.5 UJ	< 10.0 UJ	< 10.0 UJ
1,3,5-Trinitrobenzene	SW8270C	ug/L	NE	59		< 18.2 UJ	< 21.1 U	< 21.1 U	< 18.2 U	< 90.9 U	< 18.2 U	< 20.0 U	< 18.2 UJ	< 18.2 UJ	< 18.2 UJ	< 19.0 UJ	< 21.1 U	< 20.0 UJ	< 20.0 UJ
1,3-Dinitrobenzene	SW8270C	ug/L	NE	0.2		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
1,4-Naphthoquinone	SW8270C	ug/L	NE	NE		< 18.2 U	< 21.1 U	< 21.1 U	< 18.2 U	< 90.9 U	< 18.2 U	< 20.0 U	< 18.2 U	< 18.2 U	< 18.2 U	< 19.0 U	< 21.1 U	< 20.0 U	< 20.0 U
2,2-Oxybis(1-chloropropane)	SW8270C	ug/L	NE	71		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
2,3,4,6-Tetrachlorophenol	SW8270C	ug/L	NE	24		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
2,4,5-Trichlorophenol	SW8270C	ug/L	NE	120		< 9.1 UJ	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
2,4,6-Trichlorophenol	SW8270C	ug/L	NE	1.2		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
2,4-Dichlorophenol	SW8270C	ug/L	NE	4.6		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
2,4-Dimethylphenol	SW8270C	ug/L	NE	36		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
2,4-Dinitrophenol	SW8270C	ug/L	NE	3.9		< 45.5 U	< 52.6 U	< 52.6 U	< 45.5 U	< 227 U	< 45.5 U	< 50.0 U	< 45.5 U	< 45.5 U	< 45.5 U	< 47.6 U	< 52.6 U	< 50.0 U	< 50.0 U
2,4-Dinitrotoluene	SW8270C	ug/L	NE	0.24		< 9.1 U	< 10.5 UJ	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
2,6-Dichlorophenol	SW8270C	ug/L	NE	NE		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
2,6-Dinitrotoluene	SW8270C	ug/L	NE	0.049		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
2-Acetylaminofluorene	SW8270C	ug/L	NE	0.016		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
2-Chloronaphthalene	SW8270C	ug/L	NE	75		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
2-Chlorophenol	SW8270C	ug/L	NE	9.1		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
2-Nitroaniline	SW8270C	ug/L	NE	19		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
2-Nitrophenol	SW8270C	ug/L	NE	NE		< 9.1 U	< 10.5 UJ	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
3,3'-Dichlorobenzidine	SW8270C	ug/L	NE	0.13		< 18.2 U	< 21.1 U	< 21.1 U	< 18.2 U	< 90.9 U	< 18.2 U	< 20.0 U	< 18.2 U	< 18.2 U	< 18.2 U	< 19.0 U	< 21.1 U	< 20.0 U	< 20.0 U
3-Methylcholanthrene	SW8270C	ug/L	NE	0.0011		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
3-Nitroaniline	SW8270C	ug/L	NE	NE		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
4-Aminobiphenyl	SW8270C	ug/L	NE	0.003		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
4-Bromophenyl phenyl ether	SW8270C	ug/L	NE	NE		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
4-Chloro-3-methylphenol	SW8270C	ug/L	NE	140		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
4-Chlorophenyl phenyl ether	SW8270C	ug/L	NE	NE		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
4-Dimethylaminoazobenzene	SW8270C	ug/L	NE	0.005		< 9.1 UJ	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 UJ	< 9.1 UJ	< 9.1 UJ	< 9.5 UJ	< 10.5 U	< 10.0 UJ	< 10.0 UJ
4-Nitrophenol	SW8270C	ug/L	NE	NE		< 45.5 U	< 52.6 U	< 52.6 U	< 45.5 U	< 227 U	< 45.5 U	< 50.0 U	< 45.5 U	< 45.5 U	< 45.5 U	< 47.6 U	< 52.6 U	< 50.0 U	< 50.0 U
5-Nitro-o-toluidine	SW8270C	ug/L	NE	8.2		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
7,12-Dimethylbenz(a)anthracene	SW8270C	ug/L	NE	0.0001		< 18.2 U	< 21.1 U	< 21.1 U	< 18.2 U	< 90.9 U	< 18.2 U	< 20.0 U	< 18.2 U	< 18.2 U	< 18.2 U	< 19.0 U	< 21.1 U	< 20.0 U	< 20.0 U
Acetophenone	SW8270C	ug/L	NE	190		< 9.1 UJ	< 10.5 UJ	< 10.5 UJ	< 9.1 UJ	< 45.5 UJ	< 9.1 UJ	< 10.0 UJ	< 9.1 UJ	< 9.1 UJ	< 9.1 UJ	< 9.5 UJ	< 10.5 UJ	< 10.0 UJ	< 10.0 UJ
alpha-Naphthylamine	SW8270C	ug/L	NE	NE		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
Atrazine	SW8270C	ug/L	3	0.3		< 9.1 UJ	< 10.5 UJ	< 10.5 UJ	< 9.1 UJ	< 45.5 UJ	< 9.1 UJ	< 10.0 UJ	< 9.1 UJ	< 9.1 UJ	< 9.1 UJ	< 9.5 UJ	< 10.5 UJ	< 10.0 UJ	< 10.0 UJ
Benzaldehyde	SW8270C	ug/L	NE	19		< 45.5 UJ	< 52.6 UJ	< 52.6 UJ	< 45.5 UJ	< 227 UJ	< 45.5 UJ	< 50.0 UJ	< 45.5 UJ	< 45.5 UJ	< 45.5 UJ	< 47.6 UJ	< 52.6 UJ	< 50.0 UJ	< 50.0 UJ
Benzyl alcohol	SW8270C	ug/L	NE	200		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
Benzyl butyl phthalate	SW8270C	ug/L	NE	16		< 9.1 U	< 10.5 U	< 10.5 UJ	< 9.1 UJ	< 45.5 UJ	< 9.1 UJ	< 10.0 UJ	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 UJ	< 10.0 U	< 10.0 U
beta-Naphthylamine	SW8270C	ug/L	NE	0.039		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
Biphenyl	SW8270C	ug/L	NE	0.083		< 9.1 UJ	< 10.5 UJ	< 10.5 UJ	< 9.1 UJ	< 45.5 UJ	< 9.1 UJ	< 10.0 UJ	< 9.1 UJ	< 9.1 UJ	< 9.1 UJ	< 9.5 UJ	< 10.5 UJ	< 10.0 UJ	< 10.0 UJ
Bis(2-chloroethoxy)methane	SW8270C	ug/L	NE	5.9		< 9.1 U	< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U
Bis(2-ethylhexyl)phthalate	SW8270C	ug/L	6	5.6		< 9.1 U	< 10.5 UJ	< 10.5 UJ	< 9.1 UJ	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 UJ	< 10.0 U	< 10.0 U
Caprolactam	SW8270C	ug/L	NE	990		**538 J**	< 10.5 UJ	**22.7 J**	< 9.1 UJ	**607 J**	< 9.1 UJ	< 10.0 UJ	< 9.1 UJ	< 9.1 UJ	< 9.1 UJ	< 9.5 UJ	< 10.5 UJ	< 10.0 UJ	< 10.0 UJ
Carbazole	SW8270C	ug/L	NE	NE		< 9.1 U	< 10.5 UJ	< 10.5 UJ	< 9.1 UJ	< 45.5 UJ	< 9.1 UJ	< 10.0 UJ	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 UJ	< 10.0 U	< 10.0 U
Chlorobenzilate	SW8270C	ug/L	NE	0.31		< 9.1 U	< 10.5 UJ	< 10.5 UJ	< 9.1 UJ	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 UJ	< 10.0 U	< 10.0 U

Notes and definitions are presented on Page 7

Table 9a: 2020 Validated Data for Semivolatile Organic Compounds
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				Sample Location	PZ-303-AS	PZ-304-AI	PZ-304-AS	S-5	S-5	S-10	S-82	S-84
				Sample Depth (ft BGS)	16-25.8	39-48.8	17.1-26.9	30-40	30-40	32-52	15.5-25.5	20.9-30.9
				Sample Date	12-04-2020	12-02-2020	12-02-2020	11-20-2020	11-20-2020	11-13-2020	11-23-2020	11-10-2020
				Sample Type	N	N	N	N	FD	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1								
Semivolatile Organic Compounds, Total (#–C)												
1,2,4,5-Tetrachlorobenzene	SW8270C	ug/L	NE	0.17	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.5 UJ	< 9.1 UJ	< 9.5 UJ	< 9.5 UJ
1,3,5-Trinitrobenzene	SW8270C	ug/L	NE	59	< 19.0 U	< 19.0 UJ	< 19.0 UJ	< 18.2 UJ	< 19.0 UJ	< 18.2 UJ	< 19.0 U	< 19.0 U
1,3-Dinitrobenzene	SW8270C	ug/L	NE	0.2	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
1,4-Naphthoquinone	SW8270C	ug/L	NE	NE	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U	< 19.0 U	< 18.2 U	< 19.0 U	< 19.0 U
2,2-Oxybis(1-chloropropane)	SW8270C	ug/L	NE	71	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
2,3,4,6-Tetrachlorophenol	SW8270C	ug/L	NE	24	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
2,4,5-Trichlorophenol	SW8270C	ug/L	NE	120	< 9.5 U	< 9.5 UJ	< 9.5 UJ	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
2,4,6-Trichlorophenol	SW8270C	ug/L	NE	1.2	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
2,4-Dichlorophenol	SW8270C	ug/L	NE	4.6	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
2,4-Dimethylphenol	SW8270C	ug/L	NE	36	**135**	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
2,4-Dinitrophenol	SW8270C	ug/L	NE	3.9	< 47.6 U	< 47.6 U	< 47.6 U	< 45.5 U	< 47.6 U	< 45.5 U	< 47.6 U	< 47.6 U
2,4-Dinitrotoluene	SW8270C	ug/L	NE	0.24	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
2,6-Dichlorophenol	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
2,6-Dinitrotoluene	SW8270C	ug/L	NE	0.049	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
2-Acetylaminofluorene	SW8270C	ug/L	NE	0.016	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
2-Chloronaphthalene	SW8270C	ug/L	NE	75	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
2-Chlorophenol	SW8270C	ug/L	NE	9.1	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
2-Nitroaniline	SW8270C	ug/L	NE	19	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
2-Nitrophenol	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 UJ	< 9.5 U
3,3'-Dichlorobenzidine	SW8270C	ug/L	NE	0.13	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U	< 19.0 U	< 18.2 U	< 19.0 U	< 19.0 U
3-Methylcholanthrene	SW8270C	ug/L	NE	0.0011	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
3-Nitroaniline	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
4-Aminobiphenyl	SW8270C	ug/L	NE	0.003	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
4-Bromophenyl phenyl ether	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
4-Chloro-3-methylphenol	SW8270C	ug/L	NE	140	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
4-Chlorophenyl phenyl ether	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
4-Dimethylaminoazobenzene	SW8270C	ug/L	NE	0.005	< 9.5 U	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.5 UJ	< 9.1 UJ	< 9.5 U	< 9.5 U
4-Nitrophenol	SW8270C	ug/L	NE	NE	< 47.6 U	< 47.6 U	< 47.6 U	< 45.5 U	< 47.6 U	< 45.5 U	< 47.6 U	< 47.6 U
5-Nitro-o-toluidine	SW8270C	ug/L	NE	8.2	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
7,12-Dimethylbenz(a)anthracene	SW8270C	ug/L	NE	0.0001	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U	< 19.0 U	< 18.2 U	< 19.0 U	< 19.0 U
Acetophenone	SW8270C	ug/L	NE	190	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.5 UJ	< 9.1 UJ	< 9.5 UJ	< 9.5 UJ
alpha-Naphthylamine	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Atrazine	SW8270C	ug/L	3	0.3	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.5 UJ	< 9.1 UJ	< 9.5 UJ	< 9.5 UJ
Benzaldehyde	SW8270C	ug/L	NE	19	< 47.6 UJ	< 47.6 UJ	< 47.6 UJ	< 45.5 UJ	< 47.6 UJ	< 45.5 UJ	< 47.6 UJ	< 47.6 UJ
Benzyl alcohol	SW8270C	ug/L	NE	200	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Benzyl butyl phthalate	SW8270C	ug/L	NE	16	< 9.5 UJ	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 UJ	< 9.5 UJ
beta-Naphthylamine	SW8270C	ug/L	NE	0.039	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Biphenyl	SW8270C	ug/L	NE	0.083	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.5 UJ	< 9.1 UJ	< 9.5 UJ	< 9.5 UJ
Bis(2-chloroethoxy)methane	SW8270C	ug/L	NE	5.9	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Bis(2-ethylhexyl)phthalate	SW8270C	ug/L	6	5.6	< 9.5 UJ	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 UJ	< 9.5 U
Caprolactam	SW8270C	ug/L	NE	990	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.5 UJ	< 9.1 UJ	< 9.5 UJ	< 9.5 UJ
Carbazole	SW8270C	ug/L	NE	NE	< 9.5 UJ	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 UJ
Chlorobenzilate	SW8270C	ug/L	NE	0.31	< 9.5 UJ	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U

Notes and definitions are presented on Page 7

Notes: 2020 Validated Data for Semivolatile Organic Compounds
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Notes:

ft BGS = feet below ground surface

ug/L = micrograms per liter

mg/L = milligrams per liter

USEPA Primary MCL = USEPA National Primary Drinking Water Regulation (May 2009). MCLs are for combined radium 226/228 (5 pCi/L) and gross alpha excluding uranium (15 pCi/L). Radium-226 contributes to both the combined radium-226/288 and gross alpha; the lower of the two MCLs is shown in the table for comparison. There is a total Uranium MCL of 30 ug/L presented in the metals result tables.

USEPA RSL TAPWATER THQ0.1 = RSL TAPWATER (TR=1E-06, THQ=0.1) May 2021, adapted for West Lake QAPP

Bold = Detected

Blue Font = Exceeds USEPA Primary MCL

Orange Shaded = Detected value exceeds USEPA RSL TAPWATER THQ0.1

Gray Shaded = Compound not detected above the reporting detection limit but reporting detection limit exceeds USEPA RSL TAPWATER THQ0.1

NE = Not Established

NA = Not Available

For the 2020 4th quarter groundwater monitoring event, turbidity for samples PZ-205-AS-WG-20201111, PZ-205-SS-WG-20201111, I-11-WG-20201112, D-12-WG-20201112, D-6-WG-20201112, S-10-WG-20201113, D-13-WG-20201113, I-62-WG-20201116, D-83-WG-20201116, S-5-WG-20201120, D-3-WG-20201120, D-87-WG-20201120, S-82-WG-20201123, D-93-WG-20201123, I-9-WG-20201123, I-65-WG-20201124, PZ-115-SS-WG-20201124, I-68-WG-20201124, D-85-WG-20201130, I-73-WG-20201130, PZ-302-AS-WG-20201130, PZ-302-AI-WG-20201201, PZ-207-AS-WG-20201201, PZ-202-SS-WG-20201202, PZ-304-AS-WG-20201202, PZ-304-AI-WG-20201202, LR-100-WG-20201203, PZ-107-SS-WG-20201203, PZ-103-SS-WG-20201203, PZ-303-AS-WG-20201204, PZ-201A-SS-WG-20201204, PZ-204A-SS-WG-20201204, and PZ-204-SS-WG-20201204 were analyzed using an instrument with a tungsten filament light source. Turbidity measured using this method is typically reported in NTU.

Qualifier Definition

J = Estimated concentration.

U = The analyte was analyzed for but was not detected at or above the referenced reporting limit.

UJ = The analyte was analyzed for, but was not detected. The reporting limit is approximate and may be inaccurate or imprecise.

Notes and definitions are presented on Page 7

Table 9b: 2020 Validated Data for Semivolatile Organic Compounds
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

			Sample Location	D-3	D-6	D-12	D-13	D-83	D-85	D-87	D-89	D-93	I-9	I-11	I-62	I-65	I-66	I-67
			Sample Depth (ft BGS)	96.5-106.5	96.5-106.5	133.7-143.7	123-133	77-97	62-82	91-111	33-48	92-112	43.1-53.1	80.5-90.5	34-44	26-36	26.9-36.9	25.4-35.4
			Sample Date	11-20-2020	11-12-2020	11-12-2020	11-13-2020	11-16-2020	11-30-2020	11-20-2020	12-03-2020	11-23-2020	11-23-2020	11-12-2020	11-16-2020	11-24-2020	11-05-2020	11-10-2020
			Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1														
Semivolatile Organic Compounds, Total (D–Z)																		
Diallate	SW8270C	ug/L	NE	0.54	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Dibenzofuran	SW8270C	ug/L	NE	0.79	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Dibutyl phthalate	SW8270C	ug/L	NE	90	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 UJ	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 UJ	< 9.5 UJ	< 9.1 U	< 10.0 UJ	< 9.1 UJ	< 10.0 U	< 9.5 U
Dichloroethyl ether	SW8270C	ug/L	NE	0.014	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Diethyl phthalate	SW8270C	ug/L	NE	1,500	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Dimethoate	SW8270C	ug/L	NE	4.4	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Dimethyl phthalate	SW8270C	ug/L	NE	NE	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Dinitro-o-cresol	SW8270C	ug/L	NE	0.15	< 18.2 U	< 18.2 U	< 18.2 U	< 19.0 U	< 19.0 U	< 18.2 U	< 18.2 U	< 20.0 U	< 19.0 U	< 19.0 U	< 18.2 U	< 20.0 U	< 18.2 U	< 20.0 U	< 19.0 U
Di-n-octyl phthalate	SW8270C	ug/L	NE	20	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 UJ	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 UJ	< 9.5 UJ	< 9.1 U	< 10.0 UJ	< 9.1 UJ	< 10.0 U	< 9.5 U
Diphenylamine	SW8270C	ug/L	NE	130	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Disulfoton	SW8270C	ug/L	NE	0.05	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Ethyl methanesulfonate	SW8270C	ug/L	NE	NE	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Famphur	SW8270C	ug/L	NE	NE	< 182 UJ	< 182 UJ	< 182 UJ	< 190 UJ	< 190 UJ	< 182 UJ	< 182 UJ	< 200 UJ	< 190 UJ	< 190 UJ	< 182 UJ	< 200 UJ	< 182 UJ	< 200 UJ	< 190 UJ
Hexachlorobenzene	SW8270C	ug/L	1	0.0098	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Hexachlorobutadiene	SW8270C	ug/L	NE	0.14	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Hexachlorocyclopentadiene	SW8270C	ug/L	50	0.041	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Hexachloroethane	SW8270C	ug/L	NE	0.33	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Hexachlorophene	SW8270C	ug/L	NE	0.6	< 182 UJ	< 182 UJ	< 182 UJ	< 190 UJ	< 190 UJ	< 182 UJ	< 182 UJ	< 200 UJ	< 190 UJ	< 190 UJ	< 182 UJ	< 200 UJ	< 182 UJ	< 200 UJ	< 190 UJ
Hexachloropropene	SW8270C	ug/L	NE	NE	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Isodrin	SW8270C	ug/L	NE	NE	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Isophorone	SW8270C	ug/L	NE	78	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Isosafrole	SW8270C	ug/L	NE	NE	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Kepone	SW8270C	ug/L	NE	0.0035	< 182 UJ	< 182 UJ	< 182 UJ	< 190 UJ	< 190 UJ	< 182 UJ	< 182 UJ	< 200 UJ	< 190 UJ	< 190 UJ	< 182 UJ	< 200 UJ	< 182 UJ	< 200 UJ	< 190 UJ
m,p-cresol	SW8270C	ug/L	NE	93	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Methapyrilene	SW8270C	ug/L	NE	NE	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Methyl methanesulfonate	SW8270C	ug/L	NE	0.79	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Methyl parathion	SW8270C	ug/L	NE	0.45	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Nitrobenzene	SW8270C	ug/L	NE	0.14	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
n-Nitrosodiethylamine	SW8270C	ug/L	NE	0.00017	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
n-Nitrosodimethylamine	SW8270C	ug/L	NE	0.00011	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
n-Nitrosodi-n-butylamine	SW8270C	ug/L	NE	0.0027	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
n-Nitrosodi-n-propylamine	SW8270C	ug/L	NE	0.011	< 45.5 U	< 45.5 U	< 45.5 U	< 47.6 U	< 47.6 U	< 45.5 U	< 45.5 U	< 50.0 U	< 47.6 U	< 47.6 U	< 45.5 U	< 50.0 U	< 45.5 U	< 50.0 U	< 47.6 U
n-Nitrosodiphenylamine	SW8270C	ug/L	NE	12	< 9.1 UJ	< 9.1 UJ	< 9.1 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.1 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 10.0 UJ	< 9.1 UJ	< 10.0 UJ	< 9.5 UJ
n-Nitrosomethylethylamine	SW8270C	ug/L	NE	0.00071	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
n-Nitrosopiperidine	SW8270C	ug/L	NE	0.0082	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
n-Nitrosopyrrolidine	SW8270C	ug/L	NE	0.037	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
o-Cresol	SW8270C	ug/L	NE	93	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
o-Tolidine	SW8270C	ug/L	NE	0.0065	< 18.2 UJ	< 18.2 UJ	< 18.2 UJ	< 19.0 UJ	< 19.0 UJ	< 18.2 UJ	< 18.2 UJ	< 20.0 UJ	< 19.0 UJ	< 19.0 UJ	< 18.2 UJ	< 20.0 UJ	< 18.2 UJ	< 20.0 UJ	< 19.0 UJ
o-Toluidine	SW8270C	ug/L	NE	4.7	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Parathion	SW8270C	ug/L	NE	8.6	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
p-Chloroaniline	SW8270C	ug/L	NE	0.37	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Pentachlorobenzene	SW8270C	ug/L	NE	0.32	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Pentachloronitrobenzene	SW8270C	ug/L	NE	0.12	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Pentachlorophenol	SW8270C	ug/L	1	0.041	< 45.5 U	< 45.5 U	< 45.5 U	< 47.6 U	< 47.6 U	< 45.5 U	< 45.5 U	< 50.0 U	< 47.6 U	< 47.6 U	< 45.5 U	< 50.0 U	< 45.5 U	< 50.0 U	< 47.6 U
Phenacetin	SW8270C	ug/L	NE	34	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Phenol	SW8270C	ug/L	NE	580	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Phorate	SW8270C	ug/L	NE	0.3	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
p-Nitroaniline	SW8270C	ug/L	NE	3.8	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
p-Phenylene diamine	SW8270C	ug/L	NE	2	< 18.2 UJ	< 18.2 UJ	< 18.2 UJ	< 19.0 UJ	< 19.0 U	< 18.2 UJ	< 18.2 UJ	< 20.0 UJ	< 19.0 U	< 19.0 U	< 18.2 UJ	< 20.0 U	< 18.2 U	< 20.0 UJ	< 19.0 U
Propyzamide	SW8270C	ug/L	NE	120	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Safrole	SW8270C	ug/L	NE	0.096	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Thionazin	SW8270C	ug/L	NE	NE	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U
Triethylphosphorothioate	SW8270C	ug/L	NE	NE	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 10.0 U	< 9.5 U

Notes and definitions are presented on Page 7

Table 9b: 2020 Validated Data for Semivolatile Organic Compounds
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1	Sample Location / Sample Depth (ft BGS) / Sample Date / Sample Type	I-68 21.2-31.2 11-24-2020 N	I-73 43.2-46.2 11-30-2020 N	LR-100 19.7-24.5 12-03-2020 N	MW-1204 213.5-223.5 11-06-2020 N	MW-1204 213.5-223.5 11-06-2020 FD	PZ-100-KS 374-383.8 12-02-2020 N	PZ-100-SD 234.8-244.6 12-01-2020 N	PZ-100-SS 73.96-93.6 12-01-2020 N	PZ-101-SS 129.48-139.28 11-12-2020 N	PZ-102R-SS 79.83-89.63 11-06-2020 N	PZ-102-SS 79.7-89.5 11-06-2020 N	PZ-103-SS 134.7-144.5 12-03-2020 N	PZ-103-SS 134.7-144.5 12-03-2020 FD	LCS-3D - 12-08-2020 N
Semivolatile Organic Compounds, Total (D–Z)																			
Diallate	SW8270C	ug/L	NE	0.54		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Dibenzofuran	SW8270C	ug/L	NE	0.79		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Dibutyl phthalate	SW8270C	ug/L	NE	90		< 9.1 UJ	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 UJ
Dichloroethyl ether	SW8270C	ug/L	NE	0.014		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Diethyl phthalate	SW8270C	ug/L	NE	1,500		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Dimethoate	SW8270C	ug/L	NE	4.4		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Dimethyl phthalate	SW8270C	ug/L	NE	NE		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Dinitro-o-cresol	SW8270C	ug/L	NE	0.15		< 18.2 U	< 95.2 U	< 19.0 U	< 19.0 U	< 19.0 U	< 20.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U	< 19.0 U	< 952 U
Di-n-octyl phthalate	SW8270C	ug/L	NE	20		< 9.1 UJ	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Diphenylamine	SW8270C	ug/L	NE	130		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Disulfoton	SW8270C	ug/L	NE	0.05		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Ethyl methanesulfonate	SW8270C	ug/L	NE	NE		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Famphur	SW8270C	ug/L	NE	NE		< 182 UJ	< 952 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 200 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 182 UJ	< 190 UJ	< 9,520 UJ
Hexachlorobenzene	SW8270C	ug/L	1	0.0098		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Hexachlorobutadiene	SW8270C	ug/L	NE	0.14		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Hexachlorocyclopentadiene	SW8270C	ug/L	50	0.041		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Hexachloroethane	SW8270C	ug/L	NE	0.33		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Hexachlorophene	SW8270C	ug/L	NE	0.6		< 182 UJ	< 952 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 200 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 182 UJ	< 190 UJ	< 9,520 UJ
Hexachloropropene	SW8270C	ug/L	NE	NE		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Isodrin	SW8270C	ug/L	NE	NE		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Isophorone	SW8270C	ug/L	NE	78		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Isosafrole	SW8270C	ug/L	NE	NE		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Kepone	SW8270C	ug/L	NE	0.0035		< 182 UJ	< 952 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 200 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 182 UJ	< 190 UJ	< 9,520 UJ
m,p-cresol	SW8270C	ug/L	NE	93		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	**5,230**
Methapyrilene	SW8270C	ug/L	NE	NE		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Methyl methanesulfonate	SW8270C	ug/L	NE	0.79		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Methyl parathion	SW8270C	ug/L	NE	0.45		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Nitrobenzene	SW8270C	ug/L	NE	0.14		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
n-Nitrosodiethylamine	SW8270C	ug/L	NE	0.00017		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
n-Nitrosodimethylamine	SW8270C	ug/L	NE	0.00011		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
n-Nitrosodi-n-butylamine	SW8270C	ug/L	NE	0.0027		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
n-Nitrosodi-n-propylamine	SW8270C	ug/L	NE	0.011		< 45.5 U	< 238 U	< 47.6 U	< 47.6 U	< 47.6 U	< 50.0 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U	< 45.5 U	< 47.6 U	< 2,380 U
n-Nitrosodiphenylamine	SW8270C	ug/L	NE	12		< 9.1 UJ	< 47.6 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.5 UJ	< 476 UJ
n-Nitrosomethylethylamine	SW8270C	ug/L	NE	0.00071		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
n-Nitrosopiperidine	SW8270C	ug/L	NE	0.0082		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
n-Nitrosopyrrolidine	SW8270C	ug/L	NE	0.037		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
o-Cresol	SW8270C	ug/L	NE	93		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
o-Tolidine	SW8270C	ug/L	NE	0.0065		< 18.2 UJ	< 95.2 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 20.0 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 18.2 UJ	< 19.0 UJ	< 952 UJ
o-Toluidine	SW8270C	ug/L	NE	4.7		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Parathion	SW8270C	ug/L	NE	8.6		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
p-Chloroaniline	SW8270C	ug/L	NE	0.37		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Pentachlorobenzene	SW8270C	ug/L	NE	0.32		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Pentachloronitrobenzene	SW8270C	ug/L	NE	0.12		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Pentachlorophenol	SW8270C	ug/L	1	0.041		< 45.5 U	< 238 U	< 47.6 U	< 47.6 U	< 47.6 U	< 50.0 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U	< 45.5 U	< 47.6 U	< 2,380 U
Phenacetin	SW8270C	ug/L	NE	34		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Phenol	SW8270C	ug/L	NE	580		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	**8,570**
Phorate	SW8270C	ug/L	NE	0.3		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
p-Nitroaniline	SW8270C	ug/L	NE	3.8		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
p-Phenylene diamine	SW8270C	ug/L	NE	2		< 18.2 U	< 95.2 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 20.0 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 18.2 UJ	< 19.0 UJ	< 952 UJ
Propyzamide	SW8270C	ug/L	NE	120		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Safrole	SW8270C	ug/L	NE	0.096		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Thionazin	SW8270C	ug/L	NE	NE		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U
Triethylphosphorothioate	SW8270C	ug/L	NE	NE		< 9.1 U	< 47.6 U	< 9.5 U	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.5 U	< 476 U

Notes and definitions are presented on Page 7

Table 9b: 2020 Validated Data for Semivolatile Organic Compounds
West Lake Landfill OU-3
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Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1	Sample Location / Sample Depth (ft BGS) / Sample Date / Sample Type: LCS-3D - 12-08-2020 FD	PZ-104-KS 397.37-407.17 12-03-2020 N	LCS-5A 145-295 12-08-2020 N	PZ-104-SD 235.2-245 11-04-2020 N	PZ-104-SS 134.5-144.3 11-12-2020 N	PZ-105-SS 138.5-148.3 11-06-2020 N	PZ-106-KS 363.75-373.57 11-13-2020 N	PZ-106-SD 190.79-200.59 11-13-2020 N	PZ-106-SD 190.79-200.59 11-13-2020 FD	PZ-106-SS 155.3-165.1 11-11-2020 N	PZ-107-SS 92.6-102.4 12-03-2020 N	PZ-109-SS 125.7-135.5 11-10-2020 N	PZ-109-SS 125.7-135.5 11-10-2020 FD
Semivolatile Organic Compounds, Total (D–Z)																	
Diallate	SW8270C	ug/L	NE	0.54	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Dibenzofuran	SW8270C	ug/L	NE	0.79	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Dibutyl phthalate	SW8270C	ug/L	NE	90	< 476 UJ	< 10.0 U	< 47.6 UJ	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Dichloroethyl ether	SW8270C	ug/L	NE	0.014	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Diethyl phthalate	SW8270C	ug/L	NE	1,500	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Dimethoate	SW8270C	ug/L	NE	4.4	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Dimethyl phthalate	SW8270C	ug/L	NE	NE	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Dinitro-o-cresol	SW8270C	ug/L	NE	0.15	< 952 U	< 20.0 U	< 95.2 U	< 18.2 U	< 19.0 U	< 20.0 U	< 20.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U
Di-n-octyl phthalate	SW8270C	ug/L	NE	20	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Diphenylamine	SW8270C	ug/L	NE	130	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Disulfoton	SW8270C	ug/L	NE	0.05	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Ethyl methanesulfonate	SW8270C	ug/L	NE	NE	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Famphur	SW8270C	ug/L	NE	NE	< 9,520 UJ	< 200 UJ	< 952 UJ	< 182 UJ	< 190 UJ	< 200 UJ	< 200 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 190 UJ
Hexachlorobenzene	SW8270C	ug/L	1	0.0098	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Hexachlorobutadiene	SW8270C	ug/L	NE	0.14	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Hexachlorocyclopentadiene	SW8270C	ug/L	50	0.041	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Hexachloroethane	SW8270C	ug/L	NE	0.33	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Hexachlorophene	SW8270C	ug/L	NE	0.6	< 9,520 UJ	< 200 UJ	< 952 UJ	< 182 UJ	< 190 UJ	< 200 UJ	< 200 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 190 UJ
Hexachloropropene	SW8270C	ug/L	NE	NE	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Isodrin	SW8270C	ug/L	NE	NE	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Isophorone	SW8270C	ug/L	NE	78	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Isosafrole	SW8270C	ug/L	NE	NE	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Kepone	SW8270C	ug/L	NE	0.0035	< 9,520 UJ	< 200 UJ	< 952 UJ	< 182 UJ	< 190 UJ	< 200 UJ	< 200 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 190 UJ
m,p-cresol	SW8270C	ug/L	NE	93	**4,960**	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Methapyrilene	SW8270C	ug/L	NE	NE	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Methyl methanesulfonate	SW8270C	ug/L	NE	0.79	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Methyl parathion	SW8270C	ug/L	NE	0.45	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Nitrobenzene	SW8270C	ug/L	NE	0.14	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
n-Nitrosodiethylamine	SW8270C	ug/L	NE	0.00017	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
n-Nitrosodimethylamine	SW8270C	ug/L	NE	0.00011	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
n-Nitrosodi-n-butylamine	SW8270C	ug/L	NE	0.0027	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
n-Nitrosodi-n-propylamine	SW8270C	ug/L	NE	0.011	< 2,380 U	< 50.0 U	< 238 U	< 45.5 U	< 47.6 U	< 50.0 U	< 50.0 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U
n-Nitrosodiphenylamine	SW8270C	ug/L	NE	12	< 476 UJ	< 10.0 UJ	< 47.6 UJ	< 9.1 UJ	< 9.5 UJ	< 10.0 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ
n-Nitrosomethylethylamine	SW8270C	ug/L	NE	0.00071	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
n-Nitrosopiperidine	SW8270C	ug/L	NE	0.0082	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
n-Nitrosopyrrolidine	SW8270C	ug/L	NE	0.037	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
o-Cresol	SW8270C	ug/L	NE	93	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
o-Tolidine	SW8270C	ug/L	NE	0.0065	< 952 UJ	< 20.0 UJ	< 95.2 UJ	< 18.2 UJ	< 19.0 UJ	< 20.0 UJ	< 20.0 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ
o-Toluidine	SW8270C	ug/L	NE	4.7	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Parathion	SW8270C	ug/L	NE	8.6	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
p-Chloroaniline	SW8270C	ug/L	NE	0.37	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Pentachlorobenzene	SW8270C	ug/L	NE	0.32	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Pentachloronitrobenzene	SW8270C	ug/L	NE	0.12	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Pentachlorophenol	SW8270C	ug/L	1	0.041	< 2,380 U	< 50.0 U	< 238 U	< 45.5 U	< 47.6 U	< 50.0 U	< 50.0 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U
Phenacetin	SW8270C	ug/L	NE	34	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Phenol	SW8270C	ug/L	NE	580	**8,540**	< 10.0 U	< 47.6 U	**9.0 J**	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Phorate	SW8270C	ug/L	NE	0.3	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
p-Nitroaniline	SW8270C	ug/L	NE	3.8	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
p-Phenylene diamine	SW8270C	ug/L	NE	2	< 952 UJ	< 20.0 UJ	< 95.2 UJ	< 18.2 UJ	< 19.0 UJ	< 20.0 UJ	< 20.0 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 U	< 19.0 UJ	< 19.0 U	< 19.0 U
Propyzamide	SW8270C	ug/L	NE	120	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Safrole	SW8270C	ug/L	NE	0.096	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Thionazin	SW8270C	ug/L	NE	NE	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U
Triethylphosphorothioate	SW8270C	ug/L	NE	NE	< 476 U	< 10.0 U	< 47.6 U	< 9.1 U	< 9.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U

Notes and definitions are presented on Page 7

Table 9b: 2020 Validated Data for Semivolatile Organic Compounds
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1	PZ-111-KS 357.15-366.96 11-09-2020 N	PZ-111-SD 199.4-209.2 11-09-2020 N	PZ-111-SS 105.5-115.5 11-09-2020 N	PZ-113-AD 98.6-108.4 11-05-2020 N	PZ-113-AD 98.6-108.4 11-05-2020 FD	PZ-113-AS 28.9-38.7 11-04-2020 N	PZ-113-SS 148.57-158.37 11-05-2020 N	PZ-114-AS 19.9-29.7 11-11-2020 N	PZ-115-SS 74.68-84.48 11-24-2020 N	PZ-115-SS 74.68-84.48 11-24-2020 FD	PZ-116-SS 151.4-161 12-04-2020 N	PZ-200-SS 9.62-97.64 12-02-2020 N	PZ-201A-SS 80-89.8 12-04-2020 N	PZ-202-SS 40.2-89.1 12-02-2020 N
Semivolatile Organic Compounds, Total (D–Z)																		
Diallate	SW8270C	ug/L	NE	0.54	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Dibenzofuran	SW8270C	ug/L	NE	0.79	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Dibutyl phthalate	SW8270C	ug/L	NE	90	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 UJ	< 9.1 UJ	< 10.0 UJ	< 10.0 U	< 9.5 UJ	< 9.1 U
Dichloroethyl ether	SW8270C	ug/L	NE	0.014	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Diethyl phthalate	SW8270C	ug/L	NE	1,500	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Dimethoate	SW8270C	ug/L	NE	4.4	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Dimethyl phthalate	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Dinitro-o-cresol	SW8270C	ug/L	NE	0.15	< 19.0 U	< 19.0 U	< 20.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U	< 18.2 U	< 18.2 U	< 20.0 U	< 20.0 U	< 19.0 U	< 18.2 U
Di-n-octyl phthalate	SW8270C	ug/L	NE	20	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 UJ	< 9.1 UJ	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Diphenylamine	SW8270C	ug/L	NE	130	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Disulfoton	SW8270C	ug/L	NE	0.05	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Ethyl methanesulfonate	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Famphur	SW8270C	ug/L	NE	NE	< 190 UJ	< 190 UJ	< 200 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 182 UJ	< 182 UJ	< 182 UJ	< 200 U	< 200 UJ	< 190 U	< 182 UJ
Hexachlorobenzene	SW8270C	ug/L	1	0.0098	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Hexachlorobutadiene	SW8270C	ug/L	NE	0.14	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Hexachlorocyclopentadiene	SW8270C	ug/L	50	0.041	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Hexachloroethane	SW8270C	ug/L	NE	0.33	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Hexachlorophene	SW8270C	ug/L	NE	0.6	< 190 UJ	< 190 UJ	< 200 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 182 UJ	< 182 UJ	< 182 UJ	< 200 UJ	< 200 UJ	< 190 UJ	< 182 UJ
Hexachloropropene	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Isodrin	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Isophorone	SW8270C	ug/L	NE	78	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Isosafrole	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Kepone	SW8270C	ug/L	NE	0.0035	< 190 UJ	< 190 UJ	< 200 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 182 UJ	< 182 UJ	< 182 UJ	< 200 U	< 200 UJ	< 190 U	< 182 UJ
m,p-cresol	SW8270C	ug/L	NE	93	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Methapyrilene	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Methyl methanesulfonate	SW8270C	ug/L	NE	0.79	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Methyl parathion	SW8270C	ug/L	NE	0.45	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Nitrobenzene	SW8270C	ug/L	NE	0.14	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
n-Nitrosodiethylamine	SW8270C	ug/L	NE	0.00017	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
n-Nitrosodimethylamine	SW8270C	ug/L	NE	0.00011	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
n-Nitrosodi-n-butylamine	SW8270C	ug/L	NE	0.0027	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
n-Nitrosodi-n-propylamine	SW8270C	ug/L	NE	0.011	< 47.6 U	< 47.6 U	< 50.0 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U	< 45.5 U	< 45.5 U	< 45.5 U	< 50.0 U	< 50.0 U	< 47.6 U	< 45.5 U
n-Nitrosodiphenylamine	SW8270C	ug/L	NE	12	< 9.5 UJ	< 9.5 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	< 9.1 UJ	< 9.1 UJ	< 10.0 U	< 10.0 UJ	< 9.5 U	< 9.1 UJ
n-Nitrosomethylethylamine	SW8270C	ug/L	NE	0.00071	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
n-Nitrosopiperidine	SW8270C	ug/L	NE	0.0082	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
n-Nitrosopyrrolidine	SW8270C	ug/L	NE	0.037	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
o-Cresol	SW8270C	ug/L	NE	93	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
o-Tolidine	SW8270C	ug/L	NE	0.0065	< 19.0 UJ	< 19.0 UJ	< 20.0 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 18.2 UJ	< 18.2 UJ	< 18.2 UJ	< 20.0 U	< 20.0 UJ	< 19.0 U	< 18.2 UJ
o-Toluidine	SW8270C	ug/L	NE	4.7	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Parathion	SW8270C	ug/L	NE	8.6	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
p-Chloroaniline	SW8270C	ug/L	NE	0.37	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Pentachlorobenzene	SW8270C	ug/L	NE	0.32	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Pentachloronitrobenzene	SW8270C	ug/L	NE	0.12	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Pentachlorophenol	SW8270C	ug/L	1	0.041	< 47.6 U	< 47.6 U	< 50.0 U	< 47.6 U	< 47.6 U	< 47.6 U	< 47.6 U	< 45.5 U	< 45.5 U	< 45.5 U	< 50.0 U	< 50.0 U	< 47.6 U	< 45.5 U
Phenacetin	SW8270C	ug/L	NE	34	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Phenol	SW8270C	ug/L	NE	580	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Phorate	SW8270C	ug/L	NE	0.3	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
p-Nitroaniline	SW8270C	ug/L	NE	3.8	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
p-Phenylene diamine	SW8270C	ug/L	NE	2	< 19.0 UJ	< 19.0 UJ	< 20.0 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 18.2 U	< 18.2 U	< 18.2 U	< 20.0 U	< 20.0 UJ	< 19.0 U	< 18.2 UJ
Propyzamide	SW8270C	ug/L	NE	120	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Safrole	SW8270C	ug/L	NE	0.096	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Thionazin	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U
Triethylphosphorothioate	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.5 U	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	< 9.1 U	< 9.1 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.1 U

Notes and definitions are presented on Page 7

Table 9b: 2020 Validated Data for Semivolatile Organic Compounds
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1	Sample Location	PZ-203-SS	PZ-204A-SS	PZ-204-SS	PZ-205-AS	PZ-205-SS	PZ-206-SS	PZ-207-AS	PZ-209-SS	PZ-210-SS	PZ-211-SD	PZ-211-SS	PZ-302-AI	PZ-302-AS	PZ-303-AS	PZ-304-AI
					Sample Depth (ft BGS)	99.6-109.4	79.5-89.1	10.95-89.35	38.55-48.35	88.57-98.37	115-124.8	34.9-39.7	140-150	138-148	237-247	137-147	32.6-42.4	12.2-22	16-25.8	39-48.8
					Sample Date	11-16-2020	12-04-2020	12-04-2020	11-11-2020	11-11-2020	11-10-2020	12-01-2020	11-04-2020	11-03-2020	11-03-2020	12-04-2020	12-01-2020	11-30-2020	12-04-2020	12-02-2020
					Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Semivolatile Organic Compounds, Total (D–Z)																				
Diallate	SW8270C	ug/L	NE	0.54		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Dibenzofuran	SW8270C	ug/L	NE	0.79		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Dibutyl phthalate	SW8270C	ug/L	NE	90		< 10.5 UJ	< 10.5 UJ	< 9.1 UJ	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 UJ	< 10.0 U	< 10.0 U	**6.9 J**	< 9.5 U
Dichloroethyl ether	SW8270C	ug/L	NE	0.014		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Diethyl phthalate	SW8270C	ug/L	NE	1,500		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Dimethoate	SW8270C	ug/L	NE	4.4		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Dimethyl phthalate	SW8270C	ug/L	NE	NE		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Dinitro-o-cresol	SW8270C	ug/L	NE	0.15		< 21.1 U	< 21.1 U	< 18.2 U	< 90.9 U	< 18.2 U	< 20.0 U	< 18.2 U	< 18.2 U	< 18.2 U	< 19.0 U	< 21.1 U	< 20.0 U	< 20.0 U	< 19.0 U	< 19.0 U
Di-n-octyl phthalate	SW8270C	ug/L	NE	20		< 10.5 UJ	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Diphenylamine	SW8270C	ug/L	NE	130		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Disulfoton	SW8270C	ug/L	NE	0.05		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Ethyl methanesulfonate	SW8270C	ug/L	NE	NE		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Famphur	SW8270C	ug/L	NE	NE		< 211 UJ	< 211 UJ	< 182 UJ	< 909 UJ	< 182 UJ	< 200 UJ	< 182 UJ	< 182 UJ	< 182 UJ	< 190 UJ	< 211 UJ	< 200 UJ	< 200 UJ	< 190 UJ	< 190 UJ
Hexachlorobenzene	SW8270C	ug/L	1	0.0098		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Hexachlorobutadiene	SW8270C	ug/L	NE	0.14		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Hexachlorocyclopentadiene	SW8270C	ug/L	50	0.041		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Hexachloroethane	SW8270C	ug/L	NE	0.33		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Hexachlorophene	SW8270C	ug/L	NE	0.6		< 211 UJ	< 211 UJ	< 182 UJ	< 909 UJ	< 182 UJ	< 200 UJ	< 182 UJ	< 182 UJ	< 182 UJ	< 190 UJ	< 211 UJ	< 200 UJ	< 200 UJ	< 190 UJ	< 190 UJ
Hexachloropropene	SW8270C	ug/L	NE	NE		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Isodrin	SW8270C	ug/L	NE	NE		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Isophorone	SW8270C	ug/L	NE	78		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Isosafrole	SW8270C	ug/L	NE	NE		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Kepone	SW8270C	ug/L	NE	0.0035		< 211 UJ	< 211 UJ	< 182 UJ	< 909 UJ	< 182 UJ	< 200 UJ	< 182 UJ	< 182 UJ	< 182 UJ	< 190 UJ	< 211 UJ	< 200 UJ	< 200 UJ	< 190 UJ	< 190 UJ
m,p-cresol	SW8270C	ug/L	NE	93		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Methapyrilene	SW8270C	ug/L	NE	NE		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Methyl methanesulfonate	SW8270C	ug/L	NE	0.79		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Methyl parathion	SW8270C	ug/L	NE	0.45		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Nitrobenzene	SW8270C	ug/L	NE	0.14		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
n-Nitrosodiethylamine	SW8270C	ug/L	NE	0.00017		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
n-Nitrosodimethylamine	SW8270C	ug/L	NE	0.00011		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
n-Nitrosodi-n-butylamine	SW8270C	ug/L	NE	0.0027		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
n-Nitrosodi-n-propylamine	SW8270C	ug/L	NE	0.011		< 52.6 U	< 52.6 U	< 45.5 U	< 227 U	< 45.5 U	< 50.0 U	< 45.5 U	< 45.5 U	< 45.5 U	< 47.6 U	< 52.6 U	< 50.0 U	< 50.0 U	< 47.6 U	< 47.6 U
n-Nitrosodiphenylamine	SW8270C	ug/L	NE	12		< 10.5 UJ	< 10.5 UJ	< 9.1 UJ	< 45.5 UJ	< 9.1 UJ	< 10.0 UJ	< 9.1 UJ	< 9.1 UJ	< 9.1 UJ	< 9.5 UJ	< 10.5 UJ	< 10.0 UJ	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ
n-Nitrosomethylethylamine	SW8270C	ug/L	NE	0.00071		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
n-Nitrosopiperidine	SW8270C	ug/L	NE	0.0082		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
n-Nitrosopyrrolidine	SW8270C	ug/L	NE	0.037		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
o-Cresol	SW8270C	ug/L	NE	93		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
o-Tolidine	SW8270C	ug/L	NE	0.0065		< 21.1 UJ	< 21.1 UJ	< 18.2 UJ	< 90.9 UJ	< 18.2 UJ	< 20.0 UJ	< 18.2 UJ	< 18.2 UJ	< 18.2 UJ	< 19.0 UJ	< 21.1 UJ	< 20.0 UJ	< 20.0 UJ	< 19.0 UJ	< 19.0 UJ
o-Toluidine	SW8270C	ug/L	NE	4.7		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Parathion	SW8270C	ug/L	NE	8.6		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
p-Chloroaniline	SW8270C	ug/L	NE	0.37		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Pentachlorobenzene	SW8270C	ug/L	NE	0.32		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Pentachloronitrobenzene	SW8270C	ug/L	NE	0.12		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Pentachlorophenol	SW8270C	ug/L	1	0.041		< 52.6 U	< 52.6 U	< 45.5 U	< 227 U	< 45.5 U	< 50.0 U	< 45.5 U	< 45.5 U	< 45.5 U	< 47.6 U	< 52.6 U	< 50.0 U	< 50.0 U	< 47.6 U	< 47.6 U
Phenacetin	SW8270C	ug/L	NE	34		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Phenol	SW8270C	ug/L	NE	580		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Phorate	SW8270C	ug/L	NE	0.3		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
p-Nitroaniline	SW8270C	ug/L	NE	3.8		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
p-Phenylene diamine	SW8270C	ug/L	NE	2		< 21.1 U	< 21.1 U	< 18.2 U	< 90.9 U	< 18.2 U	< 20.0 U	< 18.2 UJ	< 18.2 UJ	< 18.2 UJ	< 19.0 UJ	< 21.1 U	< 20.0 UJ	< 20.0 UJ	< 19.0 U	< 19.0 UJ
Propyzamide	SW8270C	ug/L	NE	120		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Safrole	SW8270C	ug/L	NE	0.096		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Thionazin	SW8270C	ug/L	NE	NE		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U
Triethylphosphorothioate	SW8270C	ug/L	NE	NE		< 10.5 U	< 10.5 U	< 9.1 U	< 45.5 U	< 9.1 U	< 10.0 U	< 9.1 U	< 9.1 U	< 9.1 U	< 9.5 U	< 10.5 U	< 10.0 U	< 10.0 U	< 9.5 U	< 9.5 U

Notes and definitions are presented on Page 7

Table 9b: 2020 Validated Data for Semivolatile Organic Compounds
West Lake Landfill OU-3
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Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1	Sample Location / Sample Depth (ft BGS) / Sample Date / Sample Type: PZ-304-AS 17.1-26.9 12-02-2020 N	S-5 30-40 11-20-2020 N	S-5 30-40 11-20-2020 FD	S-10 32-52 11-13-2020 N	S-82 15.5-25.5 11-23-2020 N	S-84 20.9-30.9 11-10-2020 N
Semivolatile Organic Compounds, Total (D–Z)										
Diallate	SW8270C	ug/L	NE	0.54	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Dibenzofuran	SW8270C	ug/L	NE	0.79	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Dibutyl phthalate	SW8270C	ug/L	NE	90	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 UJ	< 9.5 U
Dichloroethyl ether	SW8270C	ug/L	NE	0.014	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Diethyl phthalate	SW8270C	ug/L	NE	1,500	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Dimethoate	SW8270C	ug/L	NE	4.4	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Dimethyl phthalate	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Dinitro-o-cresol	SW8270C	ug/L	NE	0.15	< 19.0 U	< 18.2 U	< 19.0 U	< 18.2 U	< 19.0 U	< 19.0 U
Di-n-octyl phthalate	SW8270C	ug/L	NE	20	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 UJ	< 9.5 U
Diphenylamine	SW8270C	ug/L	NE	130	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Disulfoton	SW8270C	ug/L	NE	0.05	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Ethyl methanesulfonate	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Famphur	SW8270C	ug/L	NE	NE	< 190 UJ	< 182 UJ	< 190 UJ	< 182 UJ	< 190 UJ	< 190 UJ
Hexachlorobenzene	SW8270C	ug/L	1	0.0098	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Hexachlorobutadiene	SW8270C	ug/L	NE	0.14	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Hexachlorocyclopentadiene	SW8270C	ug/L	50	0.041	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Hexachloroethane	SW8270C	ug/L	NE	0.33	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Hexachlorophene	SW8270C	ug/L	NE	0.6	< 190 UJ	< 182 UJ	< 190 UJ	< 182 UJ	< 190 UJ	< 190 UJ
Hexachloropropene	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Isodrin	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Isophorone	SW8270C	ug/L	NE	78	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Isosafrole	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Kepone	SW8270C	ug/L	NE	0.0035	< 190 UJ	< 182 UJ	< 190 UJ	< 182 UJ	< 190 UJ	< 190 UJ
m,p-cresol	SW8270C	ug/L	NE	93	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Methapyrilene	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Methyl methanesulfonate	SW8270C	ug/L	NE	0.79	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Methyl parathion	SW8270C	ug/L	NE	0.45	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Nitrobenzene	SW8270C	ug/L	NE	0.14	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
n-Nitrosodiethylamine	SW8270C	ug/L	NE	0.00017	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
n-Nitrosodimethylamine	SW8270C	ug/L	NE	0.00011	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
n-Nitrosodi-n-butylamine	SW8270C	ug/L	NE	0.0027	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
n-Nitrosodi-n-propylamine	SW8270C	ug/L	NE	0.011	< 47.6 U	< 45.5 U	< 47.6 U	< 45.5 U	< 47.6 U	< 47.6 U
n-Nitrosodiphenylamine	SW8270C	ug/L	NE	12	< 9.5 UJ	< 9.1 UJ	< 9.5 UJ	< 9.1 UJ	< 9.5 UJ	< 9.5 UJ
n-Nitrosomethylethylamine	SW8270C	ug/L	NE	0.00071	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
n-Nitrosopiperidine	SW8270C	ug/L	NE	0.0082	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
n-Nitrosopyrrolidine	SW8270C	ug/L	NE	0.037	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
o-Cresol	SW8270C	ug/L	NE	93	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
o-Tolidine	SW8270C	ug/L	NE	0.0065	< 19.0 UJ	< 18.2 UJ	< 19.0 UJ	< 18.2 UJ	< 19.0 UJ	< 19.0 UJ
o-Toluidine	SW8270C	ug/L	NE	4.7	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Parathion	SW8270C	ug/L	NE	8.6	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
p-Chloroaniline	SW8270C	ug/L	NE	0.37	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Pentachlorobenzene	SW8270C	ug/L	NE	0.32	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Pentachloronitrobenzene	SW8270C	ug/L	NE	0.12	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Pentachlorophenol	SW8270C	ug/L	1	0.041	< 47.6 U	< 45.5 U	< 47.6 U	< 45.5 U	< 47.6 U	< 47.6 U
Phenacetin	SW8270C	ug/L	NE	34	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Phenol	SW8270C	ug/L	NE	580	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Phorate	SW8270C	ug/L	NE	0.3	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
p-Nitroaniline	SW8270C	ug/L	NE	3.8	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
p-Phenylene diamine	SW8270C	ug/L	NE	2	< 19.0 UJ	< 18.2 UJ	< 19.0 UJ	< 18.2 UJ	< 19.0 U	< 19.0 U
Propyzamide	SW8270C	ug/L	NE	120	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Safrole	SW8270C	ug/L	NE	0.096	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Thionazin	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U
Triethylphosphorothioate	SW8270C	ug/L	NE	NE	< 9.5 U	< 9.1 U	< 9.5 U	< 9.1 U	< 9.5 U	< 9.5 U

Notes and definitions are presented on Page 7

Notes: 2020 Validated Data for Semivolatile Organic Compounds
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Notes:

ft BGS = feet below ground surface

ug/L = micrograms per liter

mg/L = milligrams per liter

USEPA Primary MCL = USEPA National Primary Drinking Water Regulation (May 2009). MCLs are for combined radium 226/228 (5 pCi/L) and gross alpha excluding uranium (15 pCi/L). Radium-226 contributes to both the combined radium-226/288 and gross alpha; the lower of the two MCLs is shown in the table for comparison. There is a total Uranium MCL of 30 ug/L presented in the metals result tables.

USEPA RSL TAPWATER THQ0.1 = RSL TAPWATER (TR=1E-06, THQ=0.1) May 2021, adapted for West Lake QAPP

Bold = Detected

Blue Font = Exceeds USEPA Primary MCL

Orange Shaded = Detected value exceeds USEPA RSL TAPWATER THQ0.1

Gray Shaded = Compound not detected above the reporting detection limit but reporting detection limit exceeds USEPA RSL TAPWATER THQ0.1

NE = Not Established

NA = Not Available

For the 2020 4th quarter groundwater monitoring event, turbidity for samples PZ-205-AS-WG-20201111, PZ-205-SS-WG-20201111, I-11-WG-20201112, D-12-WG-20201112, D-6-WG-20201112, S-10-WG-20201113, D-13-WG-20201113, I-62-WG-20201116, D-83-WG-20201116, S-5-WG-20201120, D-3-WG-20201120, D-87-WG-20201120, S-82-WG-20201123, D-93-WG-20201123, I-9-WG-20201123, I-65-WG-20201124, PZ-115-SS-WG-20201124, I-68-WG-20201124, D-85-WG-20201130, I-73-WG-20201130, PZ-302-AS-WG-20201130, PZ-302-AI-WG-20201201, PZ-207-AS-WG-20201201, PZ-202-SS-WG-20201202, PZ-304-AS-WG-20201202, PZ-304-AI-WG-20201202, LR-100-WG-20201203, PZ-107-SS-WG-20201203, PZ-103-SS-WG-20201203, PZ-303-AS-WG-20201204, PZ-201A-SS-WG-20201204, PZ-204A-SS-WG-20201204, and PZ-204-SS-WG-20201204 were analyzed using an instrument with a tungsten filament light source. Turbidity measured using this method is typically reported in NTU.

Qualifier Definition

J = Estimated concentration.

U = The analyte was analyzed for but was not detected at or above the referenced reporting limit.

UJ = The analyte was analyzed for, but was not detected. The reporting limit is approximate and may be inaccurate or imprecise.

Notes and definitions are presented on Page 7

Table 10: 2020 Validated Data for Semivolatile Organic Compounds - PAHs
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				Sample Location	D-3	D-6	D-12	D-13	D-83	D-85	D-87	D-89	D-93	I-9	I-11	I-62	I-65	I-66	I-67
				Sample Depth (ft BGS)	96.5-106.5	96.5-106.5	133.7-143.7	123-133	77-97	62-82	91-111	33-48	92-112	43.1-53.1	80.5-90.5	34-44	26-36	26.9-36.9	25.4-35.4
				Sample Date	11-20-2020	11-12-2020	11-12-2020	11-13-2020	11-16-2020	11-30-2020	11-20-2020	12-03-2020	11-23-2020	11-23-2020	11-12-2020	11-16-2020	11-24-2020	11-05-2020	11-10-2020
				Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1															
Semivolatile Organic Compounds – PAHs, Total																			
1-Methylnaphthalene	SW8270C-SIM	ug/L	NE	1.1	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Methylnaphthalene	SW8270C-SIM	ug/L	NE	3.6	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	**0.23 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Acenaphthene	SW8270C-SIM	ug/L	NE	53	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	**0.11 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Acenaphthylene	SW8270C-SIM	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Anthracene	SW8270C-SIM	ug/L	NE	180	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 UJ	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(a)anthracene	SW8270C-SIM	ug/L	NE	0.03	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 UJ	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(a)pyrene	SW8270C-SIM	ug/L	0.2	0.025	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 UJ	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(b)fluoranthene	SW8270C-SIM	ug/L	NE	0.25	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 UJ	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(g,h,i)perylene	SW8270C-SIM	ug/L	NE	NE	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 UJ	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(k)fluoranthene	SW8270C-SIM	ug/L	NE	2.5	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 UJ	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Chrysene	SW8270C-SIM	ug/L	NE	25	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 UJ	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Dibenzo(a,h)anthracene	SW8270C-SIM	ug/L	NE	0.025	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 UJ	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Fluoranthene	SW8270C-SIM	ug/L	NE	80	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Fluorene	SW8270C-SIM	ug/L	NE	29	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Indeno(1,2,3-cd)pyrene	SW8270C-SIM	ug/L	NE	0.25	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 UJ	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Naphthalene	SW8270C-SIM	ug/L	NE	0.12	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	**0.21 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Phenanthrene	SW8270C-SIM	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.48 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Pyrene	SW8270C-SIM	ug/L	NE	12	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U

Notes and definitions are presented on Page 7

Table 10: 2020 Validated Data for Semivolatile Organic Compounds - PAHs
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				Sample Location	I-68	I-73	LR-100	MW-1204	MW-1204	PZ-100-KS	PZ-100-SD	PZ-100-SS	PZ-101-SS	PZ-102R-SS	PZ-102-SS	PZ-103-SS	PZ-103-SS	LCS-3D	LCS-3D
				Sample Depth (ft BGS)	21.2-31.2	43.2-46.2	19.7-24.5	213.5-223.5	213.5-223.5	374-383.8	234.8-244.6	73.96-93.6	129.48-139.28	79.83-89.63	79.7-89.5	134.7-144.5	134.7-144.5	-	-
				Sample Date	11-24-2020	11-30-2020	12-03-2020	11-06-2020	11-06-2020	12-02-2020	12-01-2020	12-01-2020	11-12-2020	11-06-2020	11-06-2020	12-03-2020	12-03-2020	12-08-2020	12-08-2020
				Sample Type	N	N	N	N	FD	N	N	N	N	N	N	N	FD	N	FD
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1															
Semivolatile Organic Compounds – PAHs, Total																			
1-Methylnaphthalene	SW8270C-SIM	ug/L	NE	1.1	< 1.0 U	< 1.0 UJ	**1.4**	< 1.1 U	< 1.1 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 200 U	< 200 U
2-Methylnaphthalene	SW8270C-SIM	ug/L	NE	3.6	< 1.0 U	< 1.0 UJ	**1.6**	< 1.1 U	< 1.1 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 200 U	< 200 U
Acenaphthene	SW8270C-SIM	ug/L	NE	53	< 1.0 U	< 1.0 UJ	**0.30 J**	< 1.1 U	< 1.1 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 200 U	< 200 U
Acenaphthylene	SW8270C-SIM	ug/L	NE	NE	< 1.0 U	< 1.0 UJ	< 1.0 U	**0.13 J**	**0.13 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.59 J**	**0.73 J**	< 200 U	< 200 U
Anthracene	SW8270C-SIM	ug/L	NE	180	< 0.10 U	< 0.10 UJ	< 0.10 U	< 0.11 U	< 0.11 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 20.0 U	< 20.0 U
Benzo(a)anthracene	SW8270C-SIM	ug/L	NE	0.03	< 0.10 U	< 0.10 UJ	< 0.10 U	< 0.11 U	< 0.11 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 20.0 U	< 20.0 U
Benzo(a)pyrene	SW8270C-SIM	ug/L	0.2	0.025	< 0.10 U	< 0.10 UJ	< 0.10 U	< 0.11 U	< 0.11 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 20.0 U	< 20.0 U
Benzo(b)fluoranthene	SW8270C-SIM	ug/L	NE	0.25	< 0.10 U	< 0.10 UJ	< 0.10 U	< 0.11 U	< 0.11 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 20.0 U	< 20.0 U
Benzo(g,h,i)perylene	SW8270C-SIM	ug/L	NE	NE	< 0.10 U	< 0.10 UJ	< 0.10 U	< 0.11 U	< 0.11 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 20.0 U	< 20.0 U
Benzo(k)fluoranthene	SW8270C-SIM	ug/L	NE	2.5	< 0.10 U	**0.15 J-**	< 0.10 U	< 0.11 U	< 0.11 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 20.0 U	< 20.0 U
Chrysene	SW8270C-SIM	ug/L	NE	25	< 0.50 U	< 0.50 UJ	< 0.50 U	< 0.53 U	< 0.53 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 100 U	< 100 U
Dibenzo(a,h)anthracene	SW8270C-SIM	ug/L	NE	0.025	< 0.10 U	< 0.10 UJ	< 0.10 U	< 0.11 U	< 0.11 U	< 0.10 U	**0.061 J**	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 20.0 U	< 20.0 U
Fluoranthene	SW8270C-SIM	ug/L	NE	80	< 1.0 U	< 1.0 UJ	**0.076 J**	< 1.1 U	< 1.1 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 200 U	< 200 U
Fluorene	SW8270C-SIM	ug/L	NE	29	< 1.0 U	< 1.0 UJ	**0.40 J**	< 1.1 U	< 1.1 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 200 U	< 200 U
Indeno(1,2,3-cd)pyrene	SW8270C-SIM	ug/L	NE	0.25	< 0.10 U	< 0.10 UJ	< 0.10 U	< 0.11 U	< 0.11 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 20.0 U	< 20.0 U
Naphthalene	SW8270C-SIM	ug/L	NE	0.12	< 1.0 U	< 1.0 UJ	**0.37 J**	< 1.1 U	< 1.1 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.49 J**	< 1.0 U	< 1.0 U	**0.87 J**	< 1.0 U	< 200 U	< 200 U
Phenanthrene	SW8270C-SIM	ug/L	NE	NE	< 1.0 U	**0.31 J-**	**0.37 J**	< 1.1 U	< 1.1 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**9.1**	**8.4**	**362**	**378**
Pyrene	SW8270C-SIM	ug/L	NE	12	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.1 U	< 1.1 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 200 U	< 200 U

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Table 10: 2020 Validated Data for Semivolatile Organic Compounds - PAHs
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				Sample Location	PZ-104-KS	LCS-5A	PZ-104-SD	PZ-104-SS	PZ-105-SS	PZ-106-KS	PZ-106-SD	PZ-106-SD	PZ-106-SS	PZ-107-SS	PZ-109-SS	PZ-109-SS	PZ-111-KS	PZ-111-SD
				Sample Depth (ft BGS)	397.37-407.17	145-295	235.2-245	134.5-144.3	138.5-148.3	363.75-373.57	190.79-200.59	190.79-200.59	155.3-165.1	92.6-102.4	125.7-135.5	125.7-135.5	357.15-366.96	199.4-209.2
				Sample Date	12-03-2020	12-08-2020	11-04-2020	11-12-2020	11-06-2020	11-13-2020	11-13-2020	11-13-2020	11-11-2020	12-03-2020	11-10-2020	11-10-2020	11-09-2020	11-09-2020
				Sample Type	N	N	N	N	N	N	N	FD	N	N	N	FD	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1														
Semivolatile Organic Compounds – PAHs, Total																		
1-Methylnaphthalene	SW8270C-SIM	ug/L	NE	1.1	< 1.0 U	**5.5 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Methylnaphthalene	SW8270C-SIM	ug/L	NE	3.6	< 1.0 U	**4.3 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Acenaphthene	SW8270C-SIM	ug/L	NE	53	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Acenaphthylene	SW8270C-SIM	ug/L	NE	NE	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.081 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Anthracene	SW8270C-SIM	ug/L	NE	180	< 0.10 U	< 1.0 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(a)anthracene	SW8270C-SIM	ug/L	NE	0.03	< 0.10 U	< 1.0 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(a)pyrene	SW8270C-SIM	ug/L	0.2	0.025	< 0.10 U	< 1.0 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(b)fluoranthene	SW8270C-SIM	ug/L	NE	0.25	< 0.10 U	< 1.0 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(g,h,i)perylene	SW8270C-SIM	ug/L	NE	NE	< 0.10 U	< 1.0 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(k)fluoranthene	SW8270C-SIM	ug/L	NE	2.5	< 0.10 U	< 1.0 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Chrysene	SW8270C-SIM	ug/L	NE	25	< 0.50 U	< 5.0 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Dibenzo(a,h)anthracene	SW8270C-SIM	ug/L	NE	0.025	< 0.10 U	< 1.0 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Fluoranthene	SW8270C-SIM	ug/L	NE	80	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Fluorene	SW8270C-SIM	ug/L	NE	29	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Indeno(1,2,3-cd)pyrene	SW8270C-SIM	ug/L	NE	0.25	< 0.10 U	< 1.0 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Naphthalene	SW8270C-SIM	ug/L	NE	0.12	< 1.0 U	**11.0**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Phenanthrene	SW8270C-SIM	ug/L	NE	NE	< 1.0 U	**0.79 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Pyrene	SW8270C-SIM	ug/L	NE	12	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U

Notes and definitions are presented on Page 7

Table 10: 2020 Validated Data for Semivolatile Organic Compounds - PAHs
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

				Sample Location	PZ-111-SS	PZ-113-AD	PZ-113-AD	PZ-113-AS	PZ-113-SS	PZ-114-AS	PZ-115-SS	PZ-115-SS	PZ-116-SS	PZ-200-SS	PZ-201A-SS	PZ-202-SS	PZ-203-SS	PZ-204A-SS	PZ-204-SS
				Sample Depth (ft BGS)	105.5-115.5	98.6-108.4	98.6-108.4	28.9-38.7	148.57-158.37	19.9-29.7	74.68-84.48	74.68-84.48	151.4-161	9.62-97.64	80-89.8	40.2-89.1	99.6-109.4	79.5-89.1	10.95-89.35
				Sample Date	11-09-2020	11-05-2020	11-05-2020	11-04-2020	11-05-2020	11-11-2020	11-24-2020	11-24-2020	12-04-2020	12-02-2020	12-04-2020	12-02-2020	11-16-2020	12-04-2020	12-04-2020
				Sample Type	N	N	FD	N	N	N	N	FD	N	N	N	N	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1															
Semivolatile Organic Compounds – PAHs, Total																			
1-Methylnaphthalene	SW8270C-SIM	ug/L	NE	1.1	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.14 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Methylnaphthalene	SW8270C-SIM	ug/L	NE	3.6	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.18 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Acenaphthene	SW8270C-SIM	ug/L	NE	53	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Acenaphthylene	SW8270C-SIM	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.14 J**	< 1.0 U	< 1.0 U	< 1.0 U
Anthracene	SW8270C-SIM	ug/L	NE	180	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(a)anthracene	SW8270C-SIM	ug/L	NE	0.03	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(a)pyrene	SW8270C-SIM	ug/L	0.2	0.025	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(b)fluoranthene	SW8270C-SIM	ug/L	NE	0.25	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(g,h,i)perylene	SW8270C-SIM	ug/L	NE	NE	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(k)fluoranthene	SW8270C-SIM	ug/L	NE	2.5	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Chrysene	SW8270C-SIM	ug/L	NE	25	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Dibenzo(a,h)anthracene	SW8270C-SIM	ug/L	NE	0.025	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Fluoranthene	SW8270C-SIM	ug/L	NE	80	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Fluorene	SW8270C-SIM	ug/L	NE	29	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Indeno(1,2,3-cd)pyrene	SW8270C-SIM	ug/L	NE	0.25	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Naphthalene	SW8270C-SIM	ug/L	NE	0.12	< 1.0 U	< 1.0 U	**0.71 J**	< 1.0 U	**1.6**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Phenanthrene	SW8270C-SIM	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Pyrene	SW8270C-SIM	ug/L	NE	12	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U

Notes and definitions are presented on Page 7

Table 10: 2020 Validated Data for Semivolatile Organic Compounds - PAHs
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				Sample Location	PZ-205-AS	PZ-205-SS	PZ-206-SS	PZ-207-AS	PZ-209-SS	PZ-210-SS	PZ-211-SD	PZ-211-SS	PZ-302-AI	PZ-302-AS	PZ-303-AS	PZ-304-AI	PZ-304-AS	S-5	S-5
				Sample Depth (ft BGS)	38.55-48.35	88.57-98.37	115-124.8	34.9-39.7	140-150	138-148	237-247	137-147	32.6-42.4	12.2-22	16-25.8	39-48.8	17.1-26.9	30-40	30-40
				Sample Date	11-11-2020	11-11-2020	11-10-2020	12-01-2020	11-04-2020	11-03-2020	11-03-2020	12-04-2020	12-01-2020	11-30-2020	12-04-2020	12-02-2020	12-02-2020	11-20-2020	11-20-2020
				Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1															
Semivolatile Organic Compounds – PAHs, Total																			
1-Methylnaphthalene	SW8270C-SIM	ug/L	NE	1.1	< 1.0 UJ	< 1.0 U	< 1.0 U	**1.2 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**22.8**	< 1.0 U	< 1.0 U	**1.2**	**1.2**
2-Methylnaphthalene	SW8270C-SIM	ug/L	NE	3.6	**0.73 J-**	< 1.0 U	< 1.0 U	**1.5**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**25.6**	< 1.0 U	< 1.0 U	**1.7**	**1.7**
Acenaphthene	SW8270C-SIM	ug/L	NE	53	< 1.0 UJ	< 1.0 U	< 1.0 U	**0.38 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.11 J**	< 1.0 U
Acenaphthylene	SW8270C-SIM	ug/L	NE	NE	**0.63 J-**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.20 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Anthracene	SW8270C-SIM	ug/L	NE	180	< 0.10 UJ	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(a)anthracene	SW8270C-SIM	ug/L	NE	0.03	< 0.10 UJ	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(a)pyrene	SW8270C-SIM	ug/L	0.2	0.025	< 0.10 UJ	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(b)fluoranthene	SW8270C-SIM	ug/L	NE	0.25	< 0.10 UJ	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(g,h,i)perylene	SW8270C-SIM	ug/L	NE	NE	< 0.10 UJ	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(k)fluoranthene	SW8270C-SIM	ug/L	NE	2.5	< 0.10 UJ	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Chrysene	SW8270C-SIM	ug/L	NE	25	< 0.50 UJ	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Dibenzo(a,h)anthracene	SW8270C-SIM	ug/L	NE	0.025	< 0.10 UJ	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Fluoranthene	SW8270C-SIM	ug/L	NE	80	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Fluorene	SW8270C-SIM	ug/L	NE	29	< 1.0 UJ	< 1.0 U	< 1.0 U	**0.25 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Indeno(1,2,3-cd)pyrene	SW8270C-SIM	ug/L	NE	0.25	< 0.10 UJ	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Naphthalene	SW8270C-SIM	ug/L	NE	0.12	**16.0 J-**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.14 J**	**0.27 J**	**17.7**	< 1.0 U	**1.9**	**3.0**	**3.0**
Phenanthrene	SW8270C-SIM	ug/L	NE	NE	**1.7 J-**	< 1.0 U	< 1.0 U	**0.19 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.1**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Pyrene	SW8270C-SIM	ug/L	NE	12	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U

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Table 10: 2020 Validated Data for Semivolatile Organic Compounds - PAHs
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				Sample Location	S-10	S-82	S-84
				Sample Depth (ft BGS)	32-52	15.5-25.5	20.9-30.9
				Sample Date	11-13-2020	11-23-2020	11-10-2020
				Sample Type	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1			
Semivolatile Organic Compounds – PAHs, Total							
1-Methylnaphthalene	SW8270C-SIM	ug/L	NE	1.1	< 1.0 U	**0.11 J**	< 1.0 U
2-Methylnaphthalene	SW8270C-SIM	ug/L	NE	3.6	< 1.0 U	**0.21 J**	< 1.0 U
Acenaphthene	SW8270C-SIM	ug/L	NE	53	**0.34 J**	**0.089 J**	< 1.0 U
Acenaphthylene	SW8270C-SIM	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U
Anthracene	SW8270C-SIM	ug/L	NE	180	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(a)anthracene	SW8270C-SIM	ug/L	NE	0.03	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(a)pyrene	SW8270C-SIM	ug/L	0.2	0.025	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(b)fluoranthene	SW8270C-SIM	ug/L	NE	0.25	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(g,h,i)perylene	SW8270C-SIM	ug/L	NE	NE	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(k)fluoranthene	SW8270C-SIM	ug/L	NE	2.5	< 0.10 U	< 0.10 U	< 0.10 U
Chrysene	SW8270C-SIM	ug/L	NE	25	< 0.50 U	< 0.50 U	< 0.50 U
Dibenzo(a,h)anthracene	SW8270C-SIM	ug/L	NE	0.025	< 0.10 U	< 0.10 U	< 0.10 U
Fluoranthene	SW8270C-SIM	ug/L	NE	80	< 1.0 U	< 1.0 U	< 1.0 U
Fluorene	SW8270C-SIM	ug/L	NE	29	**0.15 J**	< 1.0 U	< 1.0 U
Indeno(1,2,3-cd)pyrene	SW8270C-SIM	ug/L	NE	0.25	< 0.10 U	< 0.10 U	< 0.10 U
Naphthalene	SW8270C-SIM	ug/L	NE	0.12	< 1.0 U	**0.32 J**	< 1.0 U
Phenanthrene	SW8270C-SIM	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U
Pyrene	SW8270C-SIM	ug/L	NE	12	< 1.0 U	< 1.0 U	< 1.0 U

Notes and definitions are presented on Page 7

Notes:

ft BGS = feet below ground surface

ug/L = micrograms per liter

mg/L = milligrams per liter

USEPA Primary MCL = USEPA National Primary Drinking Water Regulation (May 2009). MCLs are for combined radium 226/228 (5 pCi/L) and gross alpha excluding uranium (15 pCi/L). Radium-226 contributes to both the combined radium-226/288 and gross alpha; the lower of the two MCLs is shown in the table for comparison. There is a total Uranium MCL of 30 ug/L presented in the metals result tables.

USEPA RSL TAPWATER THQ0.1 = RSL TAPWATER (TR=1E-06, THQ=0.1) May 2021, adapted for West Lake QAPP

Bold = Detected

Blue Font = Exceeds USEPA Primary MCL

Orange Shaded = Detected value exceeds USEPA RSL TAPWATER THQ0.1

Gray Shaded = Compound not detected above the reporting detection limit but reporting detection limit exceeds USEPA RSL TAPWATER THQ0.1

NE = Not Established

NA = Not Available

For the 2020 4th quarter groundwater monitoring event, turbidity for samples PZ-205-AS-WG-20201111, PZ-205-SS-WG-20201111, I-11-WG-20201112, D-12-WG-20201112, D-6-WG-20201112, S-10-WG-20201113, D-13-WG-20201113, I-62-WG-20201116, D-83-WG-20201116, S-5-WG-20201120, D-3-WG-20201120, D-87-WG-20201120, S-82-WG-20201123, D-93-WG-20201123, I-9-WG-20201123, I-65-WG-20201124, PZ-115-SS-WG-20201124, I-68-WG-20201124, D-85-WG-20201130, I-73-WG-20201130, PZ-302-AS-WG-20201130, PZ-302-AI-WG-20201201, PZ-207-AS-WG-20201201, PZ-202-SS-WG-20201202, PZ-304-AS-WG-20201202, PZ-304-AI-WG-20201202, LR-100-WG-20201203, PZ-107-SS-WG-20201203, PZ-103-SS-WG-20201203, PZ-303-AS-WG-20201204, PZ-201A-SS-WG-20201204, PZ-204A-SS-WG-20201204, and PZ-204-SS-WG-20201204 were analyzed using an instrument with a tungsten filament light source. Turbidity measured using this method is typically reported in NTU.

Qualifier Definition

J = Estimated concentration.

J- = The result is an estimated concentration, but may be biased low.

U = The analyte was analyzed for but was not detected at or above the referenced reporting limit.

UJ = The analyte was analyzed for, but was not detected. The reporting limit is approximate and may be inaccurate or imprecise.

Table 11: 2020 Validated Data for Total Petroleum Hydrocarbons and PCBs
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

					Sample Location	D-3	D-6	D-12	D-13	D-83	D-85	D-87	D-89	D-93	I-9	I-11	I-62	I-65	I-66	I-67
					Sample Depth (ft BGS)	96.5-106.5	96.5-106.5	133.7-143.7	123-133	77-97	62-82	91-111	33-48	92-112	43.1-53.1	80.5-90.5	34-44	26-36	26.9-36.9	25.4-35.4
					Sample Date	11-20-2020	11-12-2020	11-12-2020	11-13-2020	11-16-2020	11-30-2020	11-20-2020	12-03-2020	11-23-2020	11-23-2020	11-12-2020	11-16-2020	11-24-2020	11-05-2020	11-10-2020
					Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1																
Petroleum Hydrocarbons,Total																				
C12-C28-Total	TCEQ-TX-1005	ug/L	NE	NE	< 900 U	< 900 U	< 900 U	< 900 U	< 918 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 918 U	< 900 U	< 909 U	< 900 U
C28-C35-Total	TCEQ-TX-1005	ug/L	NE	NE	< 900 U	< 900 U	< 900 U	< 900 U	< 918 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 918 U	< 900 U	< 909 U	< 900 U
C6-C12-Total	TCEQ-TX-1005	ug/L	NE	NE	< 900 U	< 900 U	< 900 U	< 900 U	< 918 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 918 U	< 900 U	< 909 U	< 900 U
C6-C35-Total	TCEQ-TX-1005	ug/L	NE	NE	< 900 U	< 900 U	< 900 U	< 900 U	< 918 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 918 U	< 900 U	< 909 U	< 900 U
C10-C12-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,010 UJ	< 1,000 U
C10-C12-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,010 UJ	< 1,000 U
C12-C16-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,010 UJ	< 1,000 U
C12-C16-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,010 UJ	< 1,000 U
C16-C21-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,010 UJ	< 1,000 U
C16-C21-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,010 UJ	< 1,000 U
C21-C35-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,040 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,040 U	< 2,000 U	< 2,020 UJ	< 2,000 U
C21-C35-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,040 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,040 U	< 2,000 U	< 2,020 UJ	< 2,000 U
C6-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,010 UJ	< 1,000 U
C6-C8-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,010 UJ	< 1,000 U
C7-C8-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,010 UJ	< 1,000 U
C8-C10-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,010 UJ	< 1,000 U
C8-C10-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,010 UJ	< 1,000 U
Polychlorinated Biphenyls, Total																				
Aroclor 1016	SW8082A	ug/L	0.5	0.14	< 0.091 U	< 0.091 U	< 0.091 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.091 U	< 0.091 U	< 0.091 U	< 0.10 U	< 0.091 U
Aroclor 1221	SW8082A	ug/L	0.5	0.0047	< 0.091 U	< 0.091 U	< 0.091 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.091 U	< 0.091 U	< 0.091 U	< 0.10 U	< 0.091 U
Aroclor 1232	SW8082A	ug/L	0.5	0.0047	< 0.091 U	< 0.091 U	< 0.091 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.091 U	< 0.091 U	< 0.091 U	< 0.10 U	< 0.091 U
Aroclor 1242	SW8082A	ug/L	0.5	0.0078	< 0.091 U	< 0.091 U	< 0.091 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.091 U	< 0.091 U	< 0.091 U	< 0.10 U	< 0.091 U
Aroclor 1248	SW8082A	ug/L	0.5	0.0078	< 0.091 U	< 0.091 U	< 0.091 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.091 U	< 0.091 U	< 0.091 U	< 0.10 U	< 0.091 U
Aroclor 1254	SW8082A	ug/L	0.5	0.0078	< 0.091 U	< 0.091 U	< 0.091 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.091 U	< 0.091 U	< 0.091 U	< 0.10 U	< 0.091 U
Aroclor 1260	SW8082A	ug/L	0.5	0.0078	< 0.091 U	< 0.091 U	< 0.091 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.091 U	< 0.091 U	< 0.091 U	< 0.10 U	< 0.091 U
PCBs, Total	SW8082A	ug/L	0.5	0.044	< 0.091 U	< 0.091 U	< 0.091 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.091 U	< 0.091 U	< 0.091 U	< 0.10 U	< 0.091 U

Notes and definitions are presented on Page 7

Table 11: 2020 Validated Data for Total Petroleum Hydrocarbons and PCBs
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					Sample Location	I-68	I-73	LR-100	MW-1204	MW-1204	PZ-100-KS	PZ-100-SD	PZ-100-SS	PZ-101-SS	PZ-102R-SS	PZ-102-SS	PZ-103-SS	PZ-103-SS	LCS-3D	LCS-3D
					Sample Depth (ft BGS)	21.2-31.2	43.2-46.2	19.7-24.5	213.5-223.5	213.5-223.5	374-383.8	234.8-244.6	73.96-93.6	129.48-139.28	79.83-89.63	79.7-89.5	134.7-144.5	134.7-144.5	-	-
					Sample Date	11-24-2020	11-30-2020	12-03-2020	11-06-2020	11-06-2020	12-02-2020	12-01-2020	12-01-2020	11-12-2020	11-06-2020	11-06-2020	12-03-2020	12-03-2020	12-08-2020	12-08-2020
					Sample Type	N	N	N	N	FD	N	N	N	N	N	N	N	FD	N	FD
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1																
Petroleum Hydrocarbons,Total																				
C12-C28-Total	TCEQ-TX-1005	ug/L	NE	NE	< 900 U	**1,890**	< 918 U	< 900 U	< 900 U	< 909 U	< 909 U	< 918 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	**33,400 J**	**33,100 J**
C28-C35-Total	TCEQ-TX-1005	ug/L	NE	NE	< 900 U	< 900 U	< 918 U	< 900 U	< 900 U	< 909 U	< 909 U	< 918 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 927 UJ	< 945 UJ
C6-C12-Total	TCEQ-TX-1005	ug/L	NE	NE	< 900 U	**7,470**	< 918 U	< 900 U	< 900 U	< 909 U	< 909 U	< 918 U	< 900 U	< 900 U	< 900 U	**703 J**	**690 J**	**143,000 J**	**142,000 J**
C6-C35-Total	TCEQ-TX-1005	ug/L	NE	NE	< 900 U	**9,360**	< 918 U	< 900 U	< 900 U	< 909 U	< 909 U	< 918 U	< 900 U	< 900 U	< 900 U	**703 J**	**690 J**	**176,000 J**	**175,000 J**
C10-C12-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,000 U	< 1,010 UJ	< 1,010 UJ	< 1,020 UJ	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,050 UJ
C10-C12-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,000 U	< 1,010 UJ	< 1,010 UJ	< 1,020 UJ	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,050 UJ
C12-C16-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,000 U	< 1,010 UJ	< 1,010 UJ	< 1,020 UJ	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,050 UJ
C12-C16-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	**1,230**	< 1,000 U	< 1,000 U	< 1,010 UJ	< 1,010 UJ	< 1,020 UJ	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,050 UJ
C16-C21-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,000 U	< 1,010 UJ	< 1,010 UJ	< 1,020 UJ	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,050 UJ
C16-C21-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,000 U	< 1,010 UJ	< 1,010 UJ	< 1,020 UJ	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,050 UJ
C21-C35-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 2,000 U	< 2,000 U	< 2,040 U	< 2,000 U	< 2,000 U	< 2,020 UJ	< 2,020 UJ	< 2,040 UJ	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,060 UJ	< 2,100 UJ
C21-C35-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 2,000 U	< 2,000 U	< 2,040 U	< 2,000 U	**1,120 J**	< 2,020 UJ	< 2,020 UJ	< 2,040 UJ	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,060 UJ	< 2,100 UJ
C6-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,000 U	< 1,010 UJ	< 1,010 UJ	< 1,020 UJ	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,050 UJ
C6-C8-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,000 U	< 1,010 UJ	< 1,010 UJ	< 1,020 UJ	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,050 UJ
C7-C8-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,000 U	< 1,010 UJ	< 1,010 UJ	< 1,020 UJ	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,050 UJ
C8-C10-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,000 U	< 1,010 UJ	< 1,010 UJ	< 1,020 UJ	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,050 UJ
C8-C10-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,020 U	< 1,000 U	< 1,000 U	< 1,010 UJ	< 1,010 UJ	< 1,020 UJ	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,050 UJ
Polychlorinated Biphenyls, Total																				
Aroclor 1016	SW8082A	ug/L	0.5	0.14	< 0.095 U	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.091 U	< 0.095 U	< 0.10 U	< 0.095 U
Aroclor 1221	SW8082A	ug/L	0.5	0.0047	< 0.095 U	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.091 U	< 0.095 U	< 0.10 U	< 0.095 U
Aroclor 1232	SW8082A	ug/L	0.5	0.0047	< 0.095 U	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.091 U	< 0.095 U	< 0.10 U	< 0.095 U
Aroclor 1242	SW8082A	ug/L	0.5	0.0078	< 0.095 U	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.091 U	< 0.095 U	**0.25**	**0.28**
Aroclor 1248	SW8082A	ug/L	0.5	0.0078	< 0.095 U	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.091 U	< 0.095 U	< 0.10 U	< 0.095 U
Aroclor 1254	SW8082A	ug/L	0.5	0.0078	< 0.095 U	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.091 U	< 0.095 U	< 0.10 U	< 0.095 U
Aroclor 1260	SW8082A	ug/L	0.5	0.0078	< 0.095 U	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.091 U	< 0.095 U	< 0.10 U	< 0.095 U
PCBs, Total	SW8082A	ug/L	0.5	0.044	< 0.095 U	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.091 U	< 0.095 U	**0.29**	**0.31**

Notes and definitions are presented on Page 7

Table 11: 2020 Validated Data for Total Petroleum Hydrocarbons and PCBs
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					Sample Location	PZ-104-KS	LCS-5A	PZ-104-SD	PZ-104-SS	PZ-105-SS	PZ-106-KS	PZ-106-SD	PZ-106-SD	PZ-106-SS	PZ-107-SS	PZ-109-SS	PZ-109-SS	PZ-111-KS	PZ-111-SD
					Sample Depth (ft BGS)	397.37-407.17	145-295	235.2-245	134.5-144.3	138.5-148.3	363.75-373.57	190.79-200.59	190.79-200.59	155.3-165.1	92.6-102.4	125.7-135.5	125.7-135.5	357.15-366.96	199.4-209.2
					Sample Date	12-03-2020	12-08-2020	11-04-2020	11-12-2020	11-06-2020	11-13-2020	11-13-2020	11-13-2020	11-11-2020	12-03-2020	11-10-2020	11-10-2020	11-09-2020	11-09-2020
					Sample Type	N	N	N	N	N	N	N	FD	N	N	N	FD	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1															
Petroleum Hydrocarbons,Total																			
C12-C28-Total	TCEQ-TX-1005	ug/L	NE	NE	< 900 U	**1,120**	< 927 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 936 U	< 918 U
C28-C35-Total	TCEQ-TX-1005	ug/L	NE	NE	< 900 U	< 909 U	< 927 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 936 U	< 918 U
C6-C12-Total	TCEQ-TX-1005	ug/L	NE	NE	< 900 U	**1,180**	< 927 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 936 U	< 918 U
C6-C35-Total	TCEQ-TX-1005	ug/L	NE	NE	< 900 U	**2,300**	< 927 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 936 U	< 918 U
C10-C12-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,010 U	< 1,030 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 U	< 1,020 U
C10-C12-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,010 U	< 1,030 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 U	< 1,020 U
C12-C16-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,010 U	< 1,030 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 U	< 1,020 U
C12-C16-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,010 U	< 1,030 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 U	< 1,020 U
C16-C21-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,010 U	< 1,030 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 U	< 1,020 U
C16-C21-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,010 U	< 1,030 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 U	< 1,020 U
C21-C35-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 2,000 U	< 2,020 U	< 2,060 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,080 U	< 2,040 U
C21-C35-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 2,000 U	< 2,020 U	< 2,060 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,080 U	< 2,040 U
C6-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,010 U	< 1,030 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 U	< 1,020 U
C6-C8-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,010 U	< 1,030 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 U	< 1,020 U
C7-C8-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,010 U	< 1,030 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 U	< 1,020 U
C8-C10-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,010 U	< 1,030 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 U	< 1,020 U
C8-C10-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,010 U	< 1,030 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 U	< 1,020 U
Polychlorinated Biphenyls, Total																			
Aroclor 1016	SW8082A	ug/L	0.5	0.14	< 0.11 U	< 0.095 U	< 0.10 U	< 0.091 U	< 0.10 U	< 0.095 U	< 0.095 U	< 0.091 U	< 0.095 U	< 0.091 U	< 0.11 U	< 0.10 U	< 0.091 U	< 0.095 U
Aroclor 1221	SW8082A	ug/L	0.5	0.0047	< 0.11 U	< 0.095 U	< 0.10 U	< 0.091 U	< 0.10 U	< 0.095 U	< 0.095 U	< 0.091 U	< 0.095 U	< 0.091 U	< 0.11 U	< 0.10 U	< 0.091 U	< 0.095 U
Aroclor 1232	SW8082A	ug/L	0.5	0.0047	< 0.11 U	< 0.095 U	< 0.10 U	< 0.091 U	< 0.10 U	< 0.095 U	< 0.095 U	< 0.091 U	< 0.095 U	< 0.091 U	< 0.11 U	< 0.10 U	< 0.091 U	< 0.095 U
Aroclor 1242	SW8082A	ug/L	0.5	0.0078	< 0.11 U	< 0.095 U	< 0.10 U	< 0.091 U	< 0.10 U	< 0.095 U	< 0.095 U	< 0.091 U	< 0.095 U	< 0.091 U	< 0.11 U	< 0.10 U	< 0.091 U	< 0.095 U
Aroclor 1248	SW8082A	ug/L	0.5	0.0078	< 0.11 U	**0.14**	< 0.10 U	< 0.091 U	< 0.10 U	< 0.095 U	< 0.095 U	< 0.091 U	< 0.095 U	< 0.091 U	< 0.11 U	< 0.10 U	< 0.091 U	< 0.095 U
Aroclor 1254	SW8082A	ug/L	0.5	0.0078	< 0.11 U	< 0.095 U	< 0.10 U	< 0.091 U	< 0.10 U	< 0.095 U	< 0.095 U	< 0.091 U	< 0.095 U	< 0.091 U	< 0.11 U	< 0.10 U	< 0.091 U	< 0.095 U
Aroclor 1260	SW8082A	ug/L	0.5	0.0078	< 0.11 U	< 0.095 U	< 0.10 U	< 0.091 U	< 0.10 U	< 0.095 U	< 0.095 U	< 0.091 U	< 0.095 U	< 0.091 U	< 0.11 U	< 0.10 U	< 0.091 U	< 0.095 U
PCBs, Total	SW8082A	ug/L	0.5	0.044	< 0.11 U	**0.14**	< 0.10 U	< 0.091 U	< 0.10 U	< 0.095 U	< 0.095 U	< 0.091 U	< 0.095 U	< 0.091 U	< 0.11 U	< 0.10 U	< 0.091 U	< 0.095 U

Notes and definitions are presented on Page 7

Table 11: 2020 Validated Data for Total Petroleum Hydrocarbons and PCBs
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					Sample Location	PZ-111-SS	PZ-113-AD	PZ-113-AD	PZ-113-AS	PZ-113-SS	PZ-114-AS	PZ-115-SS	PZ-115-SS	PZ-116-SS	PZ-200-SS	PZ-201A-SS	PZ-202-SS	PZ-203-SS	PZ-204A-SS	PZ-204-SS
					Sample Depth (ft BGS)	105.5-115.5	98.6-108.4	98.6-108.4	28.9-38.7	148.57-158.37	19.9-29.7	74.68-84.48	74.68-84.48	151.4-161	9.62-97.64	80-89.8	40.2-89.1	99.6-109.4	79.5-89.1	10.95-89.35
					Sample Date	11-09-2020	11-05-2020	11-05-2020	11-04-2020	11-05-2020	11-11-2020	11-24-2020	11-24-2020	12-04-2020	12-02-2020	12-04-2020	12-02-2020	11-16-2020	12-04-2020	12-04-2020
					Sample Type	N	N	FD	N	N	N	N	FD	N	N	N	N	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1																
Petroleum Hydrocarbons,Total																				
C12-C28-Total	TCEQ-TX-1005	ug/L	NE	NE	< 918 U	< 918 U	< 900 U	< 909 U	< 909 U	< 900 U	< 900 U	< 900 U	< 900 U	< 918 U	< 900 U	< 909 U	< 909 U	< 900 U	< 900 U
C28-C35-Total	TCEQ-TX-1005	ug/L	NE	NE	< 918 U	< 918 U	< 900 U	< 909 U	< 909 U	< 900 U	< 900 U	< 900 U	< 900 U	< 918 U	< 900 U	< 909 U	< 909 U	< 900 U	< 900 U
C6-C12-Total	TCEQ-TX-1005	ug/L	NE	NE	< 918 U	< 918 U	< 900 U	< 909 U	< 909 U	< 900 U	< 900 U	< 900 U	< 900 U	< 918 U	< 900 U	**3,040**	< 909 U	< 900 U	< 900 U
C6-C35-Total	TCEQ-TX-1005	ug/L	NE	NE	< 918 U	< 918 U	< 900 U	< 909 U	< 909 U	< 900 U	< 900 U	< 900 U	< 900 U	< 918 U	< 900 U	**3,040**	< 909 U	< 900 U	< 900 U
C10-C12-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 UJ	< 1,000 U	< 1,010 UJ	< 1,010 U	< 1,000 U	< 1,000 U
C10-C12-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 UJ	< 1,000 U	< 1,010 UJ	< 1,010 U	< 1,000 U	< 1,000 U
C12-C16-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 UJ	< 1,000 U	< 1,010 UJ	< 1,010 U	< 1,000 U	< 1,000 U
C12-C16-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 UJ	< 1,000 U	< 1,010 UJ	< 1,010 U	< 1,000 U	< 1,000 U
C16-C21-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 UJ	< 1,000 U	< 1,010 UJ	< 1,010 U	< 1,000 U	< 1,000 U
C16-C21-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 UJ	< 1,000 U	< 1,010 UJ	< 1,010 U	< 1,000 U	< 1,000 U
C21-C35-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 2,040 U	< 2,040 U	< 2,000 U	< 2,020 U	< 2,020 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,040 UJ	< 2,000 U	< 2,020 UJ	< 2,020 U	< 2,000 U	< 2,000 U
C21-C35-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 2,040 U	< 2,040 U	< 2,000 U	< 2,020 U	< 2,020 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,040 UJ	< 2,000 U	< 2,020 UJ	< 2,020 U	< 2,000 U	< 2,000 U
C6-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 UJ	< 1,000 U	< 1,010 UJ	< 1,010 U	< 1,000 U	< 1,000 U
C6-C8-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 UJ	< 1,000 U	< 1,010 UJ	< 1,010 U	< 1,000 U	< 1,000 U
C7-C8-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 UJ	< 1,000 U	< 1,010 UJ	< 1,010 U	< 1,000 U	< 1,000 U
C8-C10-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 UJ	< 1,000 U	< 1,010 UJ	< 1,010 U	< 1,000 U	< 1,000 U
C8-C10-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,020 UJ	< 1,000 U	< 1,010 UJ	< 1,010 U	< 1,000 U	< 1,000 U
Polychlorinated Biphenyls, Total																				
Aroclor 1016	SW8082A	ug/L	0.5	0.14	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.095 U	< 0.091 U	< 0.091 U	< 0.11 U	< 0.10 U	< 0.091 U	< 0.095 U	< 0.10 U	< 0.095 U	< 0.095 U
Aroclor 1221	SW8082A	ug/L	0.5	0.0047	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.095 U	< 0.091 U	< 0.091 U	< 0.11 U	< 0.10 U	< 0.091 U	< 0.095 U	< 0.10 U	< 0.095 U	< 0.095 U
Aroclor 1232	SW8082A	ug/L	0.5	0.0047	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.095 U	< 0.091 U	< 0.091 U	< 0.11 U	< 0.10 U	< 0.091 U	< 0.095 U	< 0.10 U	< 0.095 U	< 0.095 U
Aroclor 1242	SW8082A	ug/L	0.5	0.0078	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.095 U	< 0.091 U	< 0.091 U	< 0.11 U	< 0.10 U	< 0.091 U	< 0.095 U	< 0.10 U	< 0.095 U	< 0.095 U
Aroclor 1248	SW8082A	ug/L	0.5	0.0078	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.095 U	< 0.091 U	< 0.091 U	< 0.11 U	< 0.10 U	< 0.091 U	< 0.095 U	< 0.10 U	< 0.095 U	< 0.095 U
Aroclor 1254	SW8082A	ug/L	0.5	0.0078	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.095 U	< 0.091 U	< 0.091 U	< 0.11 U	< 0.10 U	< 0.091 U	< 0.095 U	< 0.10 U	< 0.095 U	< 0.095 U
Aroclor 1260	SW8082A	ug/L	0.5	0.0078	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.095 U	< 0.091 U	< 0.091 U	< 0.11 U	< 0.10 U	< 0.091 U	< 0.095 U	< 0.10 U	< 0.095 U	< 0.095 U
PCBs, Total	SW8082A	ug/L	0.5	0.044	< 0.095 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.095 U	< 0.091 U	< 0.091 U	< 0.11 U	< 0.10 U	< 0.091 U	< 0.095 U	< 0.10 U	< 0.095 U	< 0.095 U

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Table 11: 2020 Validated Data for Total Petroleum Hydrocarbons and PCBs
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					Sample Location	PZ-205-AS	PZ-205-SS	PZ-206-SS	PZ-207-AS	PZ-209-SS	PZ-210-SS	PZ-211-SD	PZ-211-SD	PZ-211-SS	PZ-302-AI	PZ-302-AS	PZ-303-AS	PZ-304-AI	PZ-304-AS	S-5
					Sample Depth (ft BGS)	38.55-48.35	88.57-98.37	115-124.8	34.9-39.7	140-150	138-148	237-247	237-247	137-147	32.6-42.4	12.2-22	16-25.8	39-48.8	17.1-26.9	30-40
					Sample Date	11-11-2020	11-11-2020	11-10-2020	12-01-2020	11-04-2020	11-03-2020	11-03-2020	11-05-2020	12-04-2020	12-01-2020	11-30-2020	12-04-2020	12-02-2020	12-02-2020	11-20-2020
					Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1																
Petroleum Hydrocarbons,Total																				
C12-C28-Total	TCEQ-TX-1005	ug/L	NE	NE	**1,390**	< 918 U	< 900 U	< 918 U	< 918 U	< 918 U	< 945 U	< 945 U	NA	< 900 U	< 927 U	< 900 U	**12,000**	< 927 U	< 909 U	**770 J**
C28-C35-Total	TCEQ-TX-1005	ug/L	NE	NE	< 900 U	< 918 U	< 900 U	< 918 U	< 918 U	< 918 U	< 945 U	< 945 U	NA	< 900 U	< 927 U	< 900 U	**1,150**	< 927 U	< 909 U	< 900 U
C6-C12-Total	TCEQ-TX-1005	ug/L	NE	NE	**9,660**	< 918 U	< 900 U	< 918 U	< 918 U	< 918 U	< 945 U	< 945 U	NA	< 900 U	< 927 U	< 900 U	**3,540**	< 927 U	< 909 U	< 900 U
C6-C35-Total	TCEQ-TX-1005	ug/L	NE	NE	**11,100**	< 918 U	< 900 U	< 918 U	< 918 U	< 918 U	< 945 U	< 945 U	NA	< 900 U	< 927 U	< 900 U	**16,700**	< 927 U	< 909 U	**770 J**
C10-C12-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,020 U	< 1,000 U	< 1,020 UJ	< 1,020 U	< 1,050 U	< 1,050 U	NA	< 1,000 U	< 1,030 UJ	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,010 UJ	< 1,000 U
C10-C12-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,020 U	< 1,000 U	< 1,020 UJ	< 1,020 U	< 1,050 U	< 1,050 U	NA	< 1,000 U	< 1,030 UJ	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,010 UJ	< 1,000 U
C12-C16-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,020 U	< 1,000 U	< 1,020 UJ	< 1,020 U	< 1,050 U	< 1,050 U	NA	< 1,000 U	< 1,030 UJ	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,010 UJ	< 1,000 U
C12-C16-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,020 U	< 1,000 U	< 1,020 UJ	< 1,020 U	< 1,050 U	< 1,050 U	NA	< 1,000 U	< 1,030 UJ	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,010 UJ	< 1,000 U
C16-C21-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,020 U	< 1,000 U	< 1,020 UJ	< 1,020 U	< 1,050 U	< 1,050 U	NA	< 1,000 U	< 1,030 UJ	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,010 UJ	< 1,000 U
C16-C21-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,020 U	< 1,000 U	< 1,020 UJ	< 1,020 U	< 1,050 U	< 1,050 U	NA	< 1,000 U	< 1,030 UJ	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,010 UJ	< 1,000 U
C21-C35-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 2,000 U	< 2,040 U	< 2,000 U	< 2,040 UJ	< 2,040 U	< 2,100 U	< 2,100 U	NA	< 2,000 U	< 2,060 UJ	< 2,000 U	< 2,000 U	< 2,060 UJ	< 2,020 UJ	< 2,000 U
C21-C35-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 2,000 U	< 2,040 U	< 2,000 U	< 2,040 UJ	< 2,040 U	< 2,100 U	< 2,100 U	NA	< 2,000 U	< 2,060 UJ	< 2,000 U	< 2,000 U	< 2,060 UJ	< 2,020 UJ	< 2,000 U
C6-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,020 U	< 1,000 U	< 1,020 UJ	< 1,020 U	< 1,050 U	< 1,050 U	NA	< 1,000 U	< 1,030 UJ	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,010 UJ	< 1,000 U
C6-C8-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,020 U	< 1,000 U	< 1,020 UJ	< 1,020 U	< 1,050 U	< 1,050 U	NA	< 1,000 U	< 1,030 UJ	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,010 UJ	< 1,000 U
C7-C8-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,020 U	< 1,000 U	< 1,020 UJ	< 1,020 U	< 1,330 U	< 1,050 U	NA	< 1,000 U	< 1,030 UJ	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,010 UJ	< 1,000 U
C8-C10-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,020 U	< 1,000 U	< 1,020 UJ	< 1,020 U	< 1,050 U	< 1,050 U	NA	< 1,000 U	< 1,030 UJ	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,010 UJ	< 1,000 U
C8-C10-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,020 U	< 1,000 U	< 1,020 UJ	< 1,020 U	< 1,050 U	< 1,050 U	NA	< 1,000 U	< 1,030 UJ	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,010 UJ	< 1,000 U
Polychlorinated Biphenyls, Total																				
Aroclor 1016	SW8082A	ug/L	0.5	0.14	< 0.091 U	< 0.10 U	< 0.10 U	< 0.091 U	< 0.10 U	< 0.10 U	NA	< 0.10 U	< 0.10 U	< 0.091 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.091 U
Aroclor 1221	SW8082A	ug/L	0.5	0.0047	< 0.091 U	< 0.10 U	< 0.10 U	< 0.091 U	< 0.10 U	< 0.10 U	NA	< 0.10 U	< 0.10 U	< 0.091 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.091 U
Aroclor 1232	SW8082A	ug/L	0.5	0.0047	< 0.091 U	< 0.10 U	< 0.10 U	< 0.091 U	< 0.10 U	< 0.10 U	NA	< 0.10 U	< 0.10 U	< 0.091 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.091 U
Aroclor 1242	SW8082A	ug/L	0.5	0.0078	< 0.091 U	< 0.10 U	< 0.10 U	< 0.091 U	< 0.10 U	< 0.10 U	NA	< 0.10 U	< 0.10 U	< 0.091 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.091 U
Aroclor 1248	SW8082A	ug/L	0.5	0.0078	< 0.091 U	< 0.10 U	< 0.10 U	< 0.091 U	< 0.10 U	< 0.10 U	NA	< 0.10 U	< 0.10 U	< 0.091 U	< 0.095 U	**1.4**	< 0.095 U	< 0.095 U	< 0.095 U	< 0.091 U
Aroclor 1254	SW8082A	ug/L	0.5	0.0078	< 0.091 U	< 0.10 U	< 0.10 U	< 0.091 U	< 0.10 U	< 0.10 U	NA	< 0.10 U	< 0.10 U	< 0.091 U	< 0.095 U	**0.57**	< 0.095 U	< 0.095 U	< 0.095 U	< 0.091 U
Aroclor 1260	SW8082A	ug/L	0.5	0.0078	< 0.091 U	< 0.10 U	< 0.10 U	< 0.091 U	< 0.10 U	< 0.10 U	NA	< 0.10 U	< 0.10 U	< 0.091 U	< 0.095 U	**0.34**	< 0.095 U	< 0.095 U	< 0.095 U	< 0.091 U
PCBs, Total	SW8082A	ug/L	0.5	0.044	< 0.091 U	< 0.10 U	< 0.10 U	< 0.091 U	< 0.10 U	< 0.10 U	NA	< 0.10 U	< 0.10 U	< 0.091 U	< 0.095 U	**2.3**	< 0.095 U	< 0.095 U	< 0.095 U	< 0.091 U

Notes and definitions are presented on Page 7

Table 11: 2020 Validated Data for Total Petroleum Hydrocarbons and PCBs
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				Sample Location	S-5	S-10	S-82	S-84
				Sample Depth (ft BGS)	30-40	32-52	15.5-25.5	20.9-30.9
				Sample Date	11-20-2020	11-13-2020	11-23-2020	11-10-2020
				Sample Type	FD	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1				
Petroleum Hydrocarbons,Total								
C12-C28-Total	TCEQ-TX-1005	ug/L	NE	NE	**691 J**	< 900 U	< 900 U	< 900 U
C28-C35-Total	TCEQ-TX-1005	ug/L	NE	NE	< 900 U	< 900 U	< 900 U	< 900 U
C6-C12-Total	TCEQ-TX-1005	ug/L	NE	NE	< 900 U	< 900 U	< 900 U	< 900 U
C6-C35-Total	TCEQ-TX-1005	ug/L	NE	NE	**691 J**	< 900 U	< 900 U	< 900 U
C10-C12-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U
C10-C12-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U
C12-C16-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U
C12-C16-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U
C16-C21-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U
C16-C21-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U
C21-C35-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U
C21-C35-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U
C6-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U
C6-C8-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U
C7-C8-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U
C8-C10-Aliphatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U
C8-C10-Aromatics	TCEQ-TX-1006	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U
Polychlorinated Biphenyls, Total								
Aroclor 1016	SW8082A	ug/L	0.5	0.14	< 0.091 U	< 0.095 U	< 0.091 U	< 0.095 U
Aroclor 1221	SW8082A	ug/L	0.5	0.0047	< 0.091 U	< 0.095 U	< 0.091 U	< 0.095 U
Aroclor 1232	SW8082A	ug/L	0.5	0.0047	< 0.091 U	< 0.095 U	< 0.091 U	< 0.095 U
Aroclor 1242	SW8082A	ug/L	0.5	0.0078	< 0.091 U	< 0.095 U	< 0.091 U	< 0.095 U
Aroclor 1248	SW8082A	ug/L	0.5	0.0078	< 0.091 U	< 0.095 U	< 0.091 U	< 0.095 U
Aroclor 1254	SW8082A	ug/L	0.5	0.0078	< 0.091 U	< 0.095 U	< 0.091 U	< 0.095 U
Aroclor 1260	SW8082A	ug/L	0.5	0.0078	< 0.091 U	< 0.095 U	< 0.091 U	< 0.095 U
PCBs, Total	SW8082A	ug/L	0.5	0.044	< 0.091 U	< 0.095 U	< 0.091 U	< 0.095 U

Notes and definitions are presented on Page 7

Notes: 2020 Validated Data for Total Petroleum Hydrocarbons and PCBs
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Notes:

ft BGS = feet below ground surface

ug/L = micrograms per liter

mg/L = milligrams per liter

USEPA Primary MCL = USEPA National Primary Drinking Water Regulation (May 2009). MCLs are for combined radium 226/228 (5 pCi/L) and gross alpha excluding uranium (15 pCi/L). Radium-226 contributes to both the combined radium-226/288 and gross alpha; the lower of the two MCLs is shown in the table for comparison. There is a total Uranium MCL of 30 ug/L presented in the metals result tables.

USEPA RSL TAPWATER THQ0.1 = RSL TAPWATER (TR=1E-06, THQ=0.1) May 2021, adapted for West Lake QAPP

Bold = Detected

Blue Font = Exceeds USEPA Primary MCL

Orange Shaded = Detected value exceeds USEPA RSL TAPWATER THQ0.1

Gray Shaded = Compound not detected above the reporting detection limit but reporting detection limit exceeds USEPA RSL TAPWATER THQ0.1

NE = Not Established

NA = Not Available

For the 2020 4th quarter groundwater monitoring event, turbidity for samples PZ-205-AS-WG-20201111, PZ-205-SS-WG-20201111, I-11-WG-20201112, D-12-WG-20201112, D-6-WG-20201112, S-10-WG-20201113, D-13-WG-20201113, I-62-WG-20201116, D-83-WG-20201116, S-5-WG-20201120, D-3-WG-20201120, D-87-WG-20201120, S-82-WG-20201123, D-93-WG-20201123, I-9-WG-20201123, I-65-WG-20201124, PZ-115-SS-WG-20201124, I-68-WG-20201124, D-85-WG-20201130, I-73-WG-20201130, PZ-302-AS-WG-20201130, PZ-302-AI-WG-20201201, PZ-207-AS-WG-20201201, PZ-202-SS-WG-20201202, PZ-304-AS-WG-20201202, PZ-304-AI-WG-20201202, LR-100-WG-20201203, PZ-107-SS-WG-20201203, PZ-103-SS-WG-20201203, PZ-303-AS-WG-20201204, PZ-201A-SS-WG-20201204, PZ-204A-SS-WG-20201204, and PZ-204-SS-WG-20201204 were analyzed using an instrument with a tungsten filament light source. Turbidity measured using this method is typically reported in NTU.

Qualifier Definition

J = Estimated concentration.

U = The analyte was analyzed for but was not detected at or above the referenced reporting limit.

UJ = The analyte was analyzed for, but was not detected. The reporting limit is approximate and may be inaccurate or imprecise.

Table 12a: 2020 Validated Data for Volatile Organic Compounds
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				Sample Location	D-3	D-6	D-12	D-13	D-83	D-85	D-87	D-89	D-93	I-9	I-11	I-62	I-65
				Sample Depth (ft BGS)	96.5-106.5	96.5-106.5	133.7-143.7	123-133	77-97	62-82	91-111	33-48	92-112	43.1-53.1	80.5-90.5	34-44	26-36
				Sample Date	11-20-2020	11-12-2020	11-12-2020	11-13-2020	11-16-2020	11-30-2020	11-20-2020	12-03-2020	11-23-2020	11-23-2020	11-12-2020	11-16-2020	11-24-2020
				Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1													
Volatile Organic Compounds, Total (#–C)																	
1,1,1,2-Tetrachloroethane	SW8260C	ug/L	NE	0.57	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,1-Trichloroethane	SW8260C	ug/L	200	800	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane	SW8260C	ug/L	NE	0.076	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113)	SW8260C	ug/L	NE	1,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	SW8260C	ug/L	5	0.041	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	SW8260C	ug/L	NE	2.8	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	SW8260C	ug/L	7	28	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloropropene	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichlorobenzene	SW8260C	ug/L	NE	0.7	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichloropropane	SW8260C	ug/L	NE	0.00075	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	SW8260C	ug/L	70	0.4	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	SW8260C	ug/L	NE	5.6	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dibromo-3-chloropropane	SW8011	ug/L	0.2	0.00033	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.037 U	< 0.037 U	< 0.034 U	< 0.035 U	< 0.036 U	< 0.037 U	< 0.037 U	< 0.036 U
1,2-Dichlorobenzene	SW8260C	ug/L	600	30	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	SW8260C	ug/L	5	0.17	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloropropane	SW8260C	ug/L	5	0.82	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	SW8260C	ug/L	NE	6	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,3-Dichlorobenzene	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3-Dichloropropane	SW8260C	ug/L	NE	37	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	SW8260C	ug/L	75	0.48	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dioxane	SW8260C	ug/L	NE	0.46	< 100 R	< 100 UJ	< 100 UJ	< 100 U	< 100 UJ	< 100 UJ	< 100 R	< 100 UJ	< 100 UJ	< 100 R	< 100 UJ	< 100 UJ	< 100 UJ
2,2-Dichloropropane	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Butanone	SW8260C	ug/L	NE	560	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
2-Hexanone	SW8260C	ug/L	NE	3.8	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
4-Chlorotoluene	SW8260C	ug/L	NE	25	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Isopropyltoluene	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Methyl-2-pentanone	SW8260C	ug/L	NE	630	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetone	SW8260C	ug/L	NE	1,400	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetonitrile	SW8260C	ug/L	NE	13	< 100 U	< 100 R	< 100 R	< 100 R	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 R	< 100 U	< 100 U
Acrolein	SW8260C	ug/L	NE	0.0042	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acrylonitrile	SW8260C	ug/L	NE	0.052	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Allyl chloride	SW8260C	ug/L	NE	0.21	< 20.0 U	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 UJ	< 20.0 U	< 20.0 UJ	< 20.0 U	< 20.0 U
Benzene	SW8260C	ug/L	5	0.46	**1.4**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**148**	< 1.0 U	**0.71 J**	< 1.0 U	< 1.0 U	< 1.0 U
beta-Chloroprene	SW8260C	ug/L	NE	0.019	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 U	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Bromobenzene	SW8260C	ug/L	NE	6.2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromodichloromethane	SW8260C	ug/L	80	0.13	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromoform	SW8260C	ug/L	80	3.3	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	SW8260C	ug/L	NE	0.75	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ
Carbon disulfide	SW8260C	ug/L	NE	81	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon tetrachloride	SW8260C	ug/L	5	0.46	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	SW8260C	ug/L	100	7.8	**15.3**	< 1.0 U	< 1.0 U	< 1.0 U	**2.5**	**10.5**	< 1.0 U	**1.2**	< 1.0 U	**5.1**	**2.8**	< 1.0 U	< 1.0 U
Chlorobromomethane	SW8260C	ug/L	NE	8.3	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroethane	SW8260C	ug/L	NE	2,100	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Chloroform	SW8260C	ug/L	80	0.22	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloromethane	SW8260C	ug/L	NE	19	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
cis-1,2-Dichloroethene	SW8260C	ug/L	70	3.6	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.25 J**	< 1.0 U	**0.88 J**	< 1.0 UJ	< 1.0 U	**0.27 J**	< 1.0 U
cis-1,3-Dichloropropene	SW8260C	ug/L	NE	0.47	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Cyclohexane	SW8260C	ug/L	NE	1,300	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U

Notes and definitions are presented on Page 7

Table 12a: 2020 Validated Data for Volatile Organic Compounds
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					Sample Location	I-66	I-67	I-68	I-73	LR-100	MW-1204	MW-1204	PZ-100-KS	PZ-100-SD	PZ-100-SS	PZ-101-SS	PZ-102R-SS	PZ-102-SS
					Sample Depth (ft BGS)	26.9-36.9	25.4-35.4	21.2-31.2	43.2-46.2	19.7-24.5	213.5-223.5	213.5-223.5	374-383.8	234.8-244.6	73.96-93.6	129.48-139.28	79.83-89.63	79.7-89.5
					Sample Date	11-05-2020	11-10-2020	11-24-2020	11-30-2020	12-03-2020	11-06-2020	11-06-2020	12-02-2020	12-01-2020	12-01-2020	11-12-2020	11-06-2020	11-06-2020
					Sample Type	N	N	N	N	N	N	FD	N	N	N	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1														
Volatile Organic Compounds, Total (#–C)																		
1,1,1,2-Tetrachloroethane	SW8260C	ug/L	NE	0.57	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,1-Trichloroethane	SW8260C	ug/L	200	800	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane	SW8260C	ug/L	NE	0.076	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113)	SW8260C	ug/L	NE	1,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	SW8260C	ug/L	5	0.041	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	SW8260C	ug/L	NE	2.8	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	SW8260C	ug/L	7	28	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloropropene	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichlorobenzene	SW8260C	ug/L	NE	0.7	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichloropropane	SW8260C	ug/L	NE	0.00075	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	SW8260C	ug/L	70	0.4	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	SW8260C	ug/L	NE	5.6	< 5.0 U	< 5.0 U	< 5.0 U	**1.3 J**	**0.31 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dibromo-3-chloropropane	SW8011	ug/L	0.2	0.00033	< 0.037 U	< 0.036 U	< 0.036 U	< 0.039 U	< 0.035 U	< 0.036 U	< 0.036 U	< 0.036 UJ	< 0.036 U	< 0.037 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.037 U
1,2-Dichlorobenzene	SW8260C	ug/L	600	30	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	SW8260C	ug/L	5	0.17	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloropropane	SW8260C	ug/L	5	0.82	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	SW8260C	ug/L	NE	6	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	**0.097 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,3-Dichlorobenzene	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.18 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3-Dichloropropane	SW8260C	ug/L	NE	37	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	SW8260C	ug/L	75	0.48	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**6.3**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.45 J**	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dioxane	SW8260C	ug/L	NE	0.46	< 100 UJ	< 100 UJ	< 100 UJ	**2,230 J**	< 100 R	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ
2,2-Dichloropropane	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Butanone	SW8260C	ug/L	NE	560	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
2-Hexanone	SW8260C	ug/L	NE	3.8	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
4-Chlorotoluene	SW8260C	ug/L	NE	25	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Isopropyltoluene	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Methyl-2-pentanone	SW8260C	ug/L	NE	630	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetone	SW8260C	ug/L	NE	1,400	< 20.0 U	< 20.0 U	< 20.0 U	**8.7 J**	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetonitrile	SW8260C	ug/L	NE	13	< 100 R	< 100 R	< 100 U	< 100 U	< 100 U	< 100 R	< 100 R	< 100 U	< 100 U	< 100 U	< 100 R	< 100 R	< 100 R	< 100 R
Acrolein	SW8260C	ug/L	NE	0.0042	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acrylonitrile	SW8260C	ug/L	NE	0.052	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Allyl chloride	SW8260C	ug/L	NE	0.21	< 20.0 UJ	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 UJ	< 20.0 U	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ
Benzene	SW8260C	ug/L	5	0.46	< 1.0 U	< 1.0 U	< 1.0 U	**301**	**8.9**	**1.3**	**1.4**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
beta-Chloroprene	SW8260C	ug/L	NE	0.019	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 U
Bromobenzene	SW8260C	ug/L	NE	6.2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromodichloromethane	SW8260C	ug/L	80	0.13	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromoform	SW8260C	ug/L	80	3.3	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	SW8260C	ug/L	NE	0.75	< 5.0 U	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 U	< 5.0 U	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 U	< 5.0 U	
Carbon disulfide	SW8260C	ug/L	NE	81	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon tetrachloride	SW8260C	ug/L	5	0.46	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	SW8260C	ug/L	100	7.8	< 1.0 U	< 1.0 U	< 1.0 U	**5.8**	**41.3**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**3.1**	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobromomethane	SW8260C	ug/L	NE	8.3	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroethane	SW8260C	ug/L	NE	2,100	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 UJ
Chloroform	SW8260C	ug/L	80	0.22	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloromethane	SW8260C	ug/L	NE	19	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 UJ
cis-1,2-Dichloroethene	SW8260C	ug/L	70	3.6	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,3-Dichloropropene	SW8260C	ug/L	NE	0.47	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Cyclohexane	SW8260C	ug/L	NE	1,300	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	**0.92 J**	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U

Notes and definitions are presented on Page 7

Table 12a: 2020 Validated Data for Volatile Organic Compounds
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Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1	PZ-103-SS 134.7-144.5 12-03-2020 N	PZ-103-SS 134.7-144.5 12-03-2020 FD	LCS-3D - 12-08-2020 N	LCS-3D - 12-08-2020 FD	PZ-104-KS 397.37-407.17 12-03-2020 N	LCS-5A 145-295 12-08-2020 N	PZ-104-SD 235.2-245 11-04-2020 N	PZ-104-SS 134.5-144.3 11-12-2020 N	PZ-105-SS 138.5-148.3 11-06-2020 N	PZ-106-KS 363.75-373.57 11-13-2020 N	PZ-106-SD 190.79-200.59 11-13-2020 N	PZ-106-SD 190.79-200.59 11-13-2020 FD
Volatile Organic Compounds, Total (#–C)																
1,1,1,2-Tetrachloroethane	SW8260C	ug/L	NE	0.57	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,1-Trichloroethane	SW8260C	ug/L	200	800	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane	SW8260C	ug/L	NE	0.076	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113)	SW8260C	ug/L	NE	1,000	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	SW8260C	ug/L	5	0.041	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	SW8260C	ug/L	NE	2.8	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	SW8260C	ug/L	7	28	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloropropene	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichlorobenzene	SW8260C	ug/L	NE	0.7	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichloropropane	SW8260C	ug/L	NE	0.00075	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	SW8260C	ug/L	70	0.4	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	SW8260C	ug/L	NE	5.6	< 5.0 U	< 5.0 U	**20.9 J**	**20.3 J**	< 5.0 U	**12.5**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dibromo-3-chloropropane	SW8011	ug/L	0.2	0.00033	< 0.034 U	< 0.037 U	< 0.034 U	< 0.034 U	< 0.035 U	< 0.035 U	< 0.037 U	< 0.037 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.037 U
1,2-Dichlorobenzene	SW8260C	ug/L	600	30	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	**0.62 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	SW8260C	ug/L	5	0.17	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloropropane	SW8260C	ug/L	5	0.82	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	SW8260C	ug/L	NE	6	< 5.0 U	< 5.0 U	< 50.0 U	< 50.0 U	< 5.0 U	**4.3 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,3-Dichlorobenzene	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	**0.38 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3-Dichloropropane	SW8260C	ug/L	NE	37	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	SW8260C	ug/L	75	0.48	< 1.0 U	< 1.0 U	**27.2**	**26.5**	< 1.0 U	**19.1**	**0.74 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dioxane	SW8260C	ug/L	NE	0.46	**633**	**637**	**48,100 J**	**19,200 J**	< 100 UJ	**98.9 J**	< 100 UJ	< 100 UJ	< 100 UJ	< 100 U	< 100 U	< 100 U
2,2-Dichloropropane	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Butanone	SW8260C	ug/L	NE	560	< 20.0 U	< 20.0 U	**30,800**	**31,400**	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
2-Hexanone	SW8260C	ug/L	NE	3.8	< 20.0 U	< 20.0 U	**626**	**629**	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
4-Chlorotoluene	SW8260C	ug/L	NE	25	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Isopropyltoluene	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	**32.9**	**31.9**	< 1.0 U	**15.3**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Methyl-2-pentanone	SW8260C	ug/L	NE	630	< 20.0 U	< 20.0 U	**372**	**380**	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetone	SW8260C	ug/L	NE	1,400	< 20.0 U	< 20.0 U	**56,700**	**58,900**	< 20.0 U	**8.0 J**	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetonitrile	SW8260C	ug/L	NE	13	< 100 U	< 100 U	< 1,000 U	< 1,000 U	< 100 U	< 100 U	< 100 R	< 100 R	< 100 R	< 100 R	< 100 R	< 100 R
Acrolein	SW8260C	ug/L	NE	0.0042	< 20.0 UJ	< 20.0 UJ	< 200 UJ	< 200 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acrylonitrile	SW8260C	ug/L	NE	0.052	< 100 U	< 100 U	< 1,000 U	< 1,000 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Allyl chloride	SW8260C	ug/L	NE	0.21	< 20.0 UJ	< 20.0 UJ	< 200 UJ	< 200 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ
Benzene	SW8260C	ug/L	5	0.46	**44.4**	**42.8**	**293**	**320**	< 1.0 U	**41.9**	**6.1**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
beta-Chloroprene	SW8260C	ug/L	NE	0.019	< 100 UJ	< 100 UJ	< 1,000 U	< 1,000 U	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Bromobenzene	SW8260C	ug/L	NE	6.2	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromodichloromethane	SW8260C	ug/L	80	0.13	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromoform	SW8260C	ug/L	80	3.3	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	SW8260C	ug/L	NE	0.75	< 5.0 UJ	< 5.0 UJ	< 50.0 UJ	< 50.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 U	< 5.0 UJ	< 5.0 U	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ
Carbon disulfide	SW8260C	ug/L	NE	81	< 5.0 U	< 5.0 U	< 50.0 U	< 50.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon tetrachloride	SW8260C	ug/L	5	0.46	< 1.0 U	< 1.0 U	< 10.0 UJ	< 10.0 UJ	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	SW8260C	ug/L	100	7.8	**3.8**	**3.8**	**5.1 J**	**5.3 J**	< 1.0 U	**87.9**	**0.77 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobromomethane	SW8260C	ug/L	NE	8.3	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroethane	SW8260C	ug/L	NE	2,100	< 2.0 U	< 2.0 U	< 20.0 U	< 20.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 U	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U
Chloroform	SW8260C	ug/L	80	0.22	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloromethane	SW8260C	ug/L	NE	19	< 2.0 UJ	< 2.0 UJ	< 20.0 U	< 20.0 U	< 2.0 UJ	< 2.0 U	< 2.0 UJ	< 2.0 U	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ
cis-1,2-Dichloroethene	SW8260C	ug/L	70	3.6	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	**2.7**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,3-Dichloropropene	SW8260C	ug/L	NE	0.47	< 1.0 U	< 1.0 U	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Cyclohexane	SW8260C	ug/L	NE	1,300	< 20.0 U	< 20.0 U	< 200 U	< 200 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U

Notes and definitions are presented on Page 7

Table 12a: 2020 Validated Data for Volatile Organic Compounds
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					Sample Location	PZ-106-SS	PZ-107-SS	PZ-109-SS	PZ-109-SS	PZ-111-KS	PZ-111-SD	PZ-111-SS	PZ-113-AD	PZ-113-AD	PZ-113-AS	PZ-113-SS	PZ-114-AS	PZ-115-SS
					Sample Depth (ft BGS)	155.3-165.1	92.6-102.4	125.7-135.5	125.7-135.5	357.15-366.96	199.4-209.2	105.5-115.5	98.6-108.4	98.6-108.4	28.9-38.7	148.57-158.37	19.9-29.7	74.68-84.48
					Sample Date	11-11-2020	12-03-2020	11-10-2020	11-10-2020	11-09-2020	11-09-2020	11-09-2020	11-05-2020	11-05-2020	11-04-2020	11-05-2020	11-11-2020	11-24-2020
					Sample Type	N	N	N	FD	N	N	N	N	FD	N	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1														
Volatile Organic Compounds, Total (#–C)																		
1,1,1,2-Tetrachloroethane	SW8260C	ug/L	NE	0.57	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,1-Trichloroethane	SW8260C	ug/L	200	800	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane	SW8260C	ug/L	NE	0.076	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113)	SW8260C	ug/L	NE	1,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	SW8260C	ug/L	5	0.041	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	SW8260C	ug/L	NE	2.8	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	SW8260C	ug/L	7	28	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloropropene	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichlorobenzene	SW8260C	ug/L	NE	0.7	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichloropropane	SW8260C	ug/L	NE	0.00075	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	SW8260C	ug/L	70	0.4	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	SW8260C	ug/L	NE	5.6	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dibromo-3-chloropropane	SW8011	ug/L	0.2	0.00033	< 0.036 U	< 0.035 U	< 0.036 U	< 0.035 U	< 0.035 U	< 0.037 U	< 0.036 U	< 0.037 U	< 0.037 U	< 0.038 U	< 0.037 U	< 0.038 U	< 0.035 U
1,2-Dichlorobenzene	SW8260C	ug/L	600	30	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	SW8260C	ug/L	5	0.17	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloropropane	SW8260C	ug/L	5	0.82	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	SW8260C	ug/L	NE	6	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,3-Dichlorobenzene	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3-Dichloropropane	SW8260C	ug/L	NE	37	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	SW8260C	ug/L	75	0.48	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**6.6**	< 1.0 U
1,4-Dioxane	SW8260C	ug/L	NE	0.46	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ
2,2-Dichloropropane	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Butanone	SW8260C	ug/L	NE	560	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
2-Hexanone	SW8260C	ug/L	NE	3.8	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
4-Chlorotoluene	SW8260C	ug/L	NE	25	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Isopropyltoluene	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Methyl-2-pentanone	SW8260C	ug/L	NE	630	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetone	SW8260C	ug/L	NE	1,400	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetonitrile	SW8260C	ug/L	NE	13	< 100 R	< 100 U	< 100 R	< 100 R	< 100 R	< 100 R	< 100 R	< 100 R	< 100 R	< 100 R	< 100 R	< 100 R	< 100 R	< 100 U
Acrolein	SW8260C	ug/L	NE	0.0042	< 20.0 U	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acrylonitrile	SW8260C	ug/L	NE	0.052	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Allyl chloride	SW8260C	ug/L	NE	0.21	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 U
Benzene	SW8260C	ug/L	5	0.46	< 1.0 U	**2.2**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.94 J**	< 1.0 U
beta-Chloroprene	SW8260C	ug/L	NE	0.019	< 100 U	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Bromobenzene	SW8260C	ug/L	NE	6.2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromodichloromethane	SW8260C	ug/L	80	0.13	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromoform	SW8260C	ug/L	80	3.3	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	SW8260C	ug/L	NE	0.75	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 UJ	< 5.0 UJ
Carbon disulfide	SW8260C	ug/L	NE	81	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon tetrachloride	SW8260C	ug/L	5	0.46	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	SW8260C	ug/L	100	7.8	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**4.0**	**3.9**	< 1.0 U	< 1.0 U	**69.3**	< 1.0 U
Chlorobromomethane	SW8260C	ug/L	NE	8.3	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroethane	SW8260C	ug/L	NE	2,100	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U
Chloroform	SW8260C	ug/L	80	0.22	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloromethane	SW8260C	ug/L	NE	19	< 2.0 U	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 U	< 2.0 U
cis-1,2-Dichloroethene	SW8260C	ug/L	70	3.6	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,3-Dichloropropene	SW8260C	ug/L	NE	0.47	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Cyclohexane	SW8260C	ug/L	NE	1,300	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U

Notes and definitions are presented on Page 7

Table 12a: 2020 Validated Data for Volatile Organic Compounds
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Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1	PZ-115-SS 74.68-84.48 11-24-2020 FD	PZ-116-SS 151.4-161 12-04-2020 N	PZ-200-SS 9.62-97.64 12-02-2020 N	PZ-201A-SS 80-89.8 12-04-2020 N	PZ-202-SS 40.2-89.1 12-02-2020 N	PZ-203-SS 99.6-109.4 11-16-2020 N	PZ-204A-SS 79.5-89.1 12-04-2020 N	PZ-204-SS 10.95-89.35 12-04-2020 N	PZ-205-AS 38.55-48.35 11-11-2020 N	PZ-205-SS 88.57-98.37 11-11-2020 N	PZ-206-SS 115-124.8 11-10-2020 N	PZ-207-AS 34.9-39.7 12-01-2020 N	PZ-209-SS 140-150 11-04-2020 N
Volatile Organic Compounds, Total (#–C)																	
1,1,1,2-Tetrachloroethane	SW8260C	ug/L	NE	0.57	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,1-Trichloroethane	SW8260C	ug/L	200	800	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane	SW8260C	ug/L	NE	0.076	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113)	SW8260C	ug/L	NE	1,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	SW8260C	ug/L	5	0.041	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	SW8260C	ug/L	NE	2.8	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	SW8260C	ug/L	7	28	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloropropene	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichlorobenzene	SW8260C	ug/L	NE	0.7	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichloropropane	SW8260C	ug/L	NE	0.00075	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	SW8260C	ug/L	70	0.4	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	SW8260C	ug/L	NE	5.6	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	**11.8 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dibromo-3-chloropropane	SW8011	ug/L	0.2	0.00033	< 0.038 U	< 0.036 U	< 0.034 UJ	< 0.036 U	< 0.035 UJ	< 0.036 U	< 0.035 U	< 0.034 U	< 0.036 U	< 0.037 U	< 0.036 U	< 0.037 U	< 0.036 U
1,2-Dichlorobenzene	SW8260C	ug/L	600	30	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	SW8260C	ug/L	5	0.17	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloropropane	SW8260C	ug/L	5	0.82	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	SW8260C	ug/L	NE	6	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 50.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,3-Dichlorobenzene	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3-Dichloropropane	SW8260C	ug/L	NE	37	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	SW8260C	ug/L	75	0.48	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**10.7**	< 1.0 U	< 1.0 U	**3.9**	< 1.0 U
1,4-Dioxane	SW8260C	ug/L	NE	0.46	< 100 UJ	< 100 UJ	< 100 U	< 100 R	**293**	< 100 UJ	**233**	**115**	< 1,000 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ
2,2-Dichloropropane	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Butanone	SW8260C	ug/L	NE	560	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 200 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
2-Hexanone	SW8260C	ug/L	NE	3.8	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 200 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
4-Chlorotoluene	SW8260C	ug/L	NE	25	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Isopropyltoluene	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Methyl-2-pentanone	SW8260C	ug/L	NE	630	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 200 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetone	SW8260C	ug/L	NE	1,400	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 200 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetonitrile	SW8260C	ug/L	NE	13	< 100 U	< 100 U	< 100 UJ	< 100 U	< 100 UJ	< 100 U	< 100 U	< 100 U	< 1,000 R	< 100 R	< 100 R	< 100 U	< 100 R
Acrolein	SW8260C	ug/L	NE	0.0042	< 20.0 U	< 20.0 UJ	< 20.0 U	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 UJ	< 200 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acrylonitrile	SW8260C	ug/L	NE	0.052	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 1,000 U	< 100 U	< 100 U	< 100 U	< 100 U
Allyl chloride	SW8260C	ug/L	NE	0.21	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 U	< 20.0 UJ	< 20.0 U	< 20.0 UJ	< 20.0 UJ	< 200 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ
Benzene	SW8260C	ug/L	5	0.46	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**319**	< 1.0 U	**2.2**	< 1.0 U	**676**	< 1.0 U	< 1.0 U	**1.3**	< 1.0 U
beta-Chloroprene	SW8260C	ug/L	NE	0.019	< 100 U	< 100 UJ	< 100 U	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 U	< 1,000 U	< 100 U	< 100 U	< 100 UJ	< 100 U
Bromobenzene	SW8260C	ug/L	NE	6.2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromodichloromethane	SW8260C	ug/L	80	0.13	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromoform	SW8260C	ug/L	80	3.3	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	SW8260C	ug/L	NE	0.75	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 50.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 U
Carbon disulfide	SW8260C	ug/L	NE	81	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 50.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon tetrachloride	SW8260C	ug/L	5	0.46	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	SW8260C	ug/L	100	7.8	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**8.8 J**	< 1.0 U	< 1.0 U	**16.1**	< 1.0 U
Chlorobromomethane	SW8260C	ug/L	NE	8.3	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroethane	SW8260C	ug/L	NE	2,100	< 2.0 U	< 2.0 UJ	< 2.0 U	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 20.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ
Chloroform	SW8260C	ug/L	80	0.22	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloromethane	SW8260C	ug/L	NE	19	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 20.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ
cis-1,2-Dichloroethene	SW8260C	ug/L	70	3.6	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,3-Dichloropropene	SW8260C	ug/L	NE	0.47	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Cyclohexane	SW8260C	ug/L	NE	1,300	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 200 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U

Notes and definitions are presented on Page 7

Table 12a: 2020 Validated Data for Volatile Organic Compounds
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					Sample Location	PZ-210-SS	PZ-211-SD	PZ-211-SS	PZ-302-AI	PZ-302-AS	PZ-303-AS	PZ-304-AI	PZ-304-AS	S-5	S-5	S-10	S-82	S-84
					Sample Depth (ft BGS)	138-148	237-247	137-147	32.6-42.4	12.2-22	16-25.8	39-48.8	17.1-26.9	30-40	30-40	32-52	15.5-25.5	20.9-30.9
					Sample Date	11-03-2020	11-03-2020	12-04-2020	12-01-2020	11-30-2020	12-04-2020	12-02-2020	12-02-2020	11-20-2020	11-20-2020	11-13-2020	11-23-2020	11-10-2020
					Sample Type	N	N	N	N	N	N	N	N	N	FD	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1														
Volatile Organic Compounds, Total (#–C)																		
1,1,1,2-Tetrachloroethane	SW8260C	ug/L	NE	0.57	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,1-Trichloroethane	SW8260C	ug/L	200	800	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane	SW8260C	ug/L	NE	0.076	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113)	SW8260C	ug/L	NE	1,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	SW8260C	ug/L	5	0.041	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	SW8260C	ug/L	NE	2.8	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	SW8260C	ug/L	7	28	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloropropene	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichlorobenzene	SW8260C	ug/L	NE	0.7	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichloropropane	SW8260C	ug/L	NE	0.00075	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	SW8260C	ug/L	70	0.4	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**5.4**	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	SW8260C	ug/L	NE	5.6	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	**0.31 J**	**139**	< 5.0 U	< 5.0 U	< 25.0 U	< 25.0 U	< 5.0 U	< 5.0 U	< 5.0 U	
1,2-Dibromo-3-chloropropane	SW8011	ug/L	0.2	0.00033	< 0.036 U	< 0.037 U	< 0.034 U	< 0.036 U	< 0.036 U	< 0.035 U	< 0.034 UJ	< 0.034 UJ	< 0.037 U	< 0.035 U	< 0.037 U	< 0.036 U	< 0.037 U	
1,2-Dichlorobenzene	SW8260C	ug/L	600	30	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**2.3**	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	
1,2-Dichloroethane	SW8260C	ug/L	5	0.17	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	
1,2-Dichloropropane	SW8260C	ug/L	5	0.82	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	
1,3,5-Trimethylbenzene	SW8260C	ug/L	NE	6	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	**0.14 J**	**59.4**	< 5.0 U	< 5.0 U	< 25.0 U	< 25.0 U	< 5.0 U	< 5.0 U	< 5.0 U	
1,3-Dichlorobenzene	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**2.7**	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	
1,3-Dichloropropane	SW8260C	ug/L	NE	37	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	SW8260C	ug/L	75	0.48	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**8.6**	**0.42 J**	**1.1**	**24.2**	**10.5**	**10.0**	**1.3**	< 1.0 U	< 1.0 U	
1,4-Dioxane	SW8260C	ug/L	NE	0.46	< 100 UJ	< 100 UJ	< 100 U	< 100 UJ	< 100 UJ	< 100 U	< 100 UJ	< 100 UJ	< 500 R	< 500 R	< 100 U	< 100 UJ	< 100 UJ	
2,2-Dichloropropane	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	
2-Butanone	SW8260C	ug/L	NE	560	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 100 U	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U	
2-Hexanone	SW8260C	ug/L	NE	3.8	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 100 U	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U	
4-Chlorotoluene	SW8260C	ug/L	NE	25	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	
4-Isopropyltoluene	SW8260C	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**4.6**	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	
4-Methyl-2-pentanone	SW8260C	ug/L	NE	630	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 100 U	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U	
Acetone	SW8260C	ug/L	NE	1,400	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 100 U	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U	
Acetonitrile	SW8260C	ug/L	NE	13	< 100 R	< 100 R	< 100 U	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 UJ	< 500 U	< 500 U	< 100 R	< 100 U	< 100 R	
Acrolein	SW8260C	ug/L	NE	0.0042	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 U	< 20.0 U	< 100 U	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U	
Acrylonitrile	SW8260C	ug/L	NE	0.052	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 500 U	< 100 U	< 100 U	< 100 U	
Allyl chloride	SW8260C	ug/L	NE	0.21	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 U	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 100 U	< 100 U	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	
Benzene	SW8260C	ug/L	5	0.46	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**108**	**39.2**	**3.0**	**9.9**	**4.8 J**	**4.6 J**	**0.80 J**	< 1.0 U	< 1.0 U	
beta-Chloroprene	SW8260C	ug/L	NE	0.019	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 UJ	< 100 U	< 100 U	< 100 U	< 500 U	< 500 U	< 100 U	< 100 U	< 100 U	
Bromobenzene	SW8260C	ug/L	NE	6.2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	
Bromodichloromethane	SW8260C	ug/L	80	0.13	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	
Bromoform	SW8260C	ug/L	80	3.3	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	
Bromomethane	SW8260C	ug/L	NE	0.75	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 25.0 UJ	< 25.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	
Carbon disulfide	SW8260C	ug/L	NE	81	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 25.0 U	< 25.0 U	< 5.0 U	< 5.0 U	< 5.0 U	
Carbon tetrachloride	SW8260C	ug/L	5	0.46	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	
Chlorobenzene	SW8260C	ug/L	100	7.8	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**51.9**	< 1.0 U	**4.0**	**179**	**7.3**	**7.4**	**6.1**	**2.2**	**0.68 J**	
Chlorobromomethane	SW8260C	ug/L	NE	8.3	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	
Chloroethane	SW8260C	ug/L	NE	2,100	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	**3.3**	< 2.0 U	< 10.0 U	< 10.0 U	**13.9**	< 2.0 U	< 2.0 U	
Chloroform	SW8260C	ug/L	80	0.22	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	
Chloromethane	SW8260C	ug/L	NE	19	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 10.0 U	< 10.0 U	< 2.0 UJ	< 2.0 UJ	< 2.0 U	
cis-1,2-Dichloroethene	SW8260C	ug/L	70	3.6	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.3**	< 1.0 UJ	**0.16 J**	< 5.0 UJ	< 5.0 UJ	**1.4**	**1.3**	< 1.0 U	
cis-1,3-Dichloropropene	SW8260C	ug/L	NE	0.47	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	
Cyclohexane	SW8260C	ug/L	NE	1,300	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	**10.8 J**	< 20.0 U	< 20.0 U	< 100 U	< 100 U	**0.44 J**	< 20.0 U	< 20.0 U	

Notes and definitions are presented on Page 7

Notes:

ft BGS = feet below ground surface

ug/L = micrograms per liter

mg/L = milligrams per liter

USEPA Primary MCL = USEPA National Primary Drinking Water Regulation (May 2009). MCLs are for combined radium 226/228 (5 pCi/L) and gross alpha excluding uranium (15 pCi/L). Radium-226 contributes to both the combined radium-226/288 and gross alpha; the lower of the two MCLs is shown in the table for comparison. There is a total Uranium MCL of 30 ug/L presented in the metals result tables.

USEPA RSL TAPWATER THQ0.1 = RSL TAPWATER (TR=1E-06, THQ=0.1) May 2021, adapted for West Lake QAPP

Bold = Detected

Blue Font = Exceeds USEPA Primary MCL

Orange Shaded = Detected value exceeds USEPA RSL TAPWATER THQ0.1

Gray Shaded = Compound not detected above the reporting detection limit but reporting detection limit exceeds USEPA RSL TAPWATER THQ0.1

NE = Not Established

NA = Not Available

For the 2020 4th quarter groundwater monitoring event, turbidity for samples PZ-205-AS-WG-20201111, PZ-205-SS-WG-20201111, I-11-WG-20201112, D-12-WG-20201112, D-6-WG-20201112, S-10-WG-20201113, D-13-WG-20201113, I-62-WG-20201116, D-83-WG-20201116, S-5-WG-20201120, D-3-WG-20201120, D-87-WG-20201120, S-82-WG-20201123, D-93-WG-20201123, I-9-WG-20201123, I-65-WG-20201124, PZ-115-SS-WG-20201124, I-68-WG-20201124, D-85-WG-20201130, I-73-WG-20201130, PZ-302-AS-WG-20201130, PZ-302-AI-WG-20201201, PZ-207-AS-WG-20201201, PZ-202-SS-WG-20201202, PZ-304-AS-WG-20201202, PZ-304-AI-WG-20201202, LR-100-WG-20201203, PZ-107-SS-WG-20201203, PZ-103-SS-WG-20201203, PZ-303-AS-WG-20201204, PZ-201A-SS-WG-20201204, PZ-204A-SS-WG-20201204, and PZ-204-SS-WG-20201204 were analyzed using an instrument with a tungsten filament light source. Turbidity measured using this method is typically reported in NTU.

Qualifier Definition

J = Estimated concentration.

R = Rejected, data not usable.

U = The analyte was analyzed for but was not detected at or above the referenced reporting limit.

UJ = The analyte was analyzed for, but was not detected. The reporting limit is approximate and may be inaccurate or imprecise.

Table 12b: 2020 Validated Data for Volatile Organic Compounds
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

				Sample Location	D-3	D-6	D-12	D-13	D-83	D-85	D-87	D-89	D-93	I-9	I-11	I-62	I-65	I-66
				Sample Depth (ft BGS)	96.5-106.5	96.5-106.5	133.7-143.7	123-133	77-97	62-82	91-111	33-48	92-112	43.1-53.1	80.5-90.5	34-44	26-36	26.9-36.9
				Sample Date	11-20-2020	11-12-2020	11-12-2020	11-13-2020	11-16-2020	11-30-2020	11-20-2020	12-03-2020	11-23-2020	11-23-2020	11-12-2020	11-16-2020	11-24-2020	11-05-2020
				Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1														
Volatile Organic Compounds, Total (D–Z)																		
Dibromochloromethane	SW8260C	ug/L	80	0.87	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dibromomethane	SW8260C	ug/L	NE	0.83	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichlorodifluoromethane (Freon 12)	SW8260C	ug/L	NE	20	< 2.0 U	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U
Ethyl ether	SW8260C	ug/L	NE	390	**13.5 J**	**5.7 J**	**6.1 J**	< 20.0 U	< 20.0 U	< 20.0 U	**5.9 J**	**10.9 J**	**34.3**	**123**	**6.1 J**	< 20.0 U	< 20.0 U	< 20.0 U
Ethyl methacrylate	SW8260C	ug/L	NE	63	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Ethylbenzene	SW8260C	ug/L	700	1.5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.85 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Ethylene dibromide	SW8011	ug/L	0.05	0.0075	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.037 U	< 0.037 U	< 0.034 U	< 0.035 U	< 0.036 U	< 0.037 U	< 0.037 U	< 0.036 U	< 0.037 U
Hexachlorobutadiene	SW8260C	ug/L	NE	0.14	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isobutyl alcohol	SW8260C	ug/L	NE	590	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 UJ	< 100 U	< 100 UJ	< 100 UJ	< 100 U	< 100 UJ	< 100 U	< 100 U
Isopropylbenzene (Cumene)	SW8260C	ug/L	NE	45	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.1**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
m,p-Xylenes	SW8260C	ug/L	NE	19	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	**0.81 J**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Methacrylonitrile	SW8260C	ug/L	NE	0.19	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Methyl acetate	SW8260C	ug/L	NE	2,000	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl iodide	SW8260C	ug/L	NE	NE	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ
Methyl methacrylate	SW8260C	ug/L	NE	140	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl tert-butyl ether	SW8260C	ug/L	NE	14	**0.31 J**	**9.0**	**1.7 J**	**0.56 J**	< 4.0 U	< 4.0 U	**0.14 J**	**2.5 J**	**0.29 J**	**0.28 J**	**1.5 J**	< 4.0 U	< 4.0 U	< 4.0 U
Methylcyclohexane	SW8260C	ug/L	NE	NE	< 20.0 U	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 UJ
Methylene chloride	SW8260C	ug/L	5	11	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Butylbenzene	SW8260C	ug/L	NE	100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Hexane	SW8260C	ug/L	NE	150	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Propylbenzene	SW8260C	ug/L	NE	66	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Chlorotoluene (2-chlorotoluene)	SW8260C	ug/L	NE	24	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Xylene	SW8260C	ug/L	NE	19	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.51 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Propionitrile	SW8260C	ug/L	NE	NE	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 U	< 100 U
sec-Butylbenzene	SW8260C	ug/L	NE	200	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Styrene	SW8260C	ug/L	100	120	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	SW8260C	ug/L	NE	69	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	SW8260C	ug/L	5	4.1	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Toluene	SW8260C	ug/L	1,000	110	**0.15 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**5.1**	< 1.0 U	**0.40 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,2-Dichloroethene	SW8260C	ug/L	100	6.8	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-Dichloropropene	SW8260C	ug/L	NE	0.47	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,4-Dichlorobutene	SW8260C	ug/L	NE	0.0013	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Trichloroethene	SW8260C	ug/L	5	0.28	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.34 J**	< 1.0 U	< 1.0 U
Trichlorofluoromethane (Freon 11)	SW8260C	ug/L	NE	520	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Vinyl acetate	SW8260C	ug/L	NE	41	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 U	< 20.0 UJ	< 20.0 UJ	< 20.0 U
Vinyl chloride	SW8260C	ug/L	2	0.019	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.3**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ
Xylene, Total	SW8260C	ug/L	10,000	19	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	**1.3 J**	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U

Notes and definitions are presented on Page 7

Table 12b: 2020 Validated Data for Volatile Organic Compounds
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				Sample Location	I-67	I-68	I-73	LR-100	MW-1204	MW-1204	PZ-100-KS	PZ-100-SD	PZ-100-SS	PZ-101-SS	PZ-102R-SS	PZ-102-SS	PZ-103-SS	PZ-103-SS
				Sample Depth (ft BGS)	25.4-35.4	21.2-31.2	43.2-46.2	19.7-24.5	213.5-223.5	213.5-223.5	374-383.8	234.8-244.6	73.96-93.6	129.48-139.28	79.83-89.63	79.7-89.5	134.7-144.5	134.7-144.5
				Sample Date	11-10-2020	11-24-2020	11-30-2020	12-03-2020	11-06-2020	11-06-2020	12-02-2020	12-01-2020	12-01-2020	11-12-2020	11-06-2020	11-06-2020	12-03-2020	12-03-2020
				Sample Type	N	N	N	N	N	FD	N	N	N	N	N	N	N	FD
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1														
Volatile Organic Compounds, Total (D–Z)																		
Dibromochloromethane	SW8260C	ug/L	80	0.87	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dibromomethane	SW8260C	ug/L	NE	0.83	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichlorodifluoromethane (Freon 12)	SW8260C	ug/L	NE	20	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Ethyl ether	SW8260C	ug/L	NE	390	< 20.0 U	< 20.0 U	**33.4**	**8.5 J**	**1.2 J**	**1.2 J**	< 20.0 U	< 20.0 U	< 20.0 U	**3.0 J**	< 20.0 U	< 20.0 U	**9.3 J**	**9.3 J**
Ethyl methacrylate	SW8260C	ug/L	NE	63	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Ethylbenzene	SW8260C	ug/L	700	1.5	< 1.0 U	< 1.0 U	**1.0**	**0.13 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.66 J**	**0.72 J**
Ethylene dibromide	SW8011	ug/L	0.05	0.0075	< 0.036 U	< 0.036 U	< 0.039 U	< 0.035 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.037 U	< 0.036 U	< 0.036 U	< 0.037 U	< 0.034 U	< 0.037 U
Hexachlorobutadiene	SW8260C	ug/L	NE	0.14	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isobutyl alcohol	SW8260C	ug/L	NE	590	< 100 U	< 100 U	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Isopropylbenzene (Cumene)	SW8260C	ug/L	NE	45	< 1.0 U	< 1.0 U	**1.0**	**19.2**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
m,p-Xylenes	SW8260C	ug/L	NE	19	< 2.0 U	< 2.0 U	**5.6**	**0.82 J**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	**0.48 J**	**0.50 J**
Methacrylonitrile	SW8260C	ug/L	NE	0.19	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Methyl acetate	SW8260C	ug/L	NE	2,000	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl iodide	SW8260C	ug/L	NE	NE	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ
Methyl methacrylate	SW8260C	ug/L	NE	140	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl tert-butyl ether	SW8260C	ug/L	NE	14	< 4.0 U	< 4.0 U	**3.6 J**	**0.18 J**	**2.2 J**	**2.3 J**	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	**3.0 J**	**2.9 J**
Methylcyclohexane	SW8260C	ug/L	NE	NE	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 U	< 20.0 U
Methylene chloride	SW8260C	ug/L	5	11	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Butylbenzene	SW8260C	ug/L	NE	100	< 1.0 U	< 1.0 U	< 1.0 U	**0.80 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Hexane	SW8260C	ug/L	NE	150	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Propylbenzene	SW8260C	ug/L	NE	66	< 1.0 U	< 1.0 U	**0.26 J**	**6.5**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Chlorotoluene (2-chlorotoluene)	SW8260C	ug/L	NE	24	< 1.0 U	< 1.0 U	**0.45 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Xylene	SW8260C	ug/L	NE	19	< 1.0 U	< 1.0 U	**2.8**	**0.36 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.61 J**	**0.56 J**
Propionitrile	SW8260C	ug/L	NE	NE	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
sec-Butylbenzene	SW8260C	ug/L	NE	200	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Styrene	SW8260C	ug/L	100	120	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	SW8260C	ug/L	NE	69	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	SW8260C	ug/L	5	4.1	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Toluene	SW8260C	ug/L	1,000	110	< 1.0 U	< 1.0 U	**0.81 J**	**0.21 J**	**0.36 J**	**0.40 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.1**	**1.1**
trans-1,2-Dichloroethene	SW8260C	ug/L	100	6.8	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-Dichloropropene	SW8260C	ug/L	NE	0.47	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,4-Dichlorobutene	SW8260C	ug/L	NE	0.0013	< 100 U	< 100 U	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Trichloroethene	SW8260C	ug/L	5	0.28	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichlorofluoromethane (Freon 11)	SW8260C	ug/L	NE	520	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Vinyl acetate	SW8260C	ug/L	NE	41	< 20.0 U	< 20.0 UJ	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 UJ
Vinyl chloride	SW8260C	ug/L	2	0.019	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 U	< 1.0 U
Xylene, Total	SW8260C	ug/L	10,000	19	< 3.0 U	< 3.0 U	**8.4**	**1.2 J**	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	**1.1 J**	**1.1 J**

Notes and definitions are presented on Page 7

Table 12b: 2020 Validated Data for Volatile Organic Compounds
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					Sample Location	LCS-3D	LCS-3D	PZ-104-KS	LCS-5A	PZ-104-SD	PZ-104-SS	PZ-105-SS	PZ-106-KS	PZ-106-SD	PZ-106-SD	PZ-106-SS	PZ-107-SS	PZ-109-SS
					Sample Depth (ft BGS)	-	-	397.37-407.17	145-295	235.2-245	134.5-144.3	138.5-148.3	363.75-373.57	190.79-200.59	190.79-200.59	155.3-165.1	92.6-102.4	125.7-135.5
					Sample Date	12-08-2020	12-08-2020	12-03-2020	12-08-2020	11-04-2020	11-12-2020	11-06-2020	11-13-2020	11-13-2020	11-13-2020	11-11-2020	12-03-2020	11-10-2020
					Sample Type	N	FD	N	N	N	N	N	N	N	FD	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1														
Volatile Organic Compounds, Total (D–Z)																		
Dibromochloromethane	SW8260C	ug/L	80	0.87	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dibromomethane	SW8260C	ug/L	NE	0.83	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichlorodifluoromethane (Freon 12)	SW8260C	ug/L	NE	20	< 20.0 U	< 20.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 U	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 U	**29.9**	< 2.0 U
Ethyl ether	SW8260C	ug/L	NE	390	< 200 U	< 200 U	< 20.0 U	**8.7 J**	**9.3 J**	< 20.0 U	**3.9 J**	< 20.0 U	< 20.0 U	< 20.0 U	**0.42 J**	**20.0 J**	< 20.0 U
Ethyl methacrylate	SW8260C	ug/L	NE	63	< 200 U	< 200 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Ethylbenzene	SW8260C	ug/L	700	1.5	**46.3**	**47.0**	< 1.0 U	**25.7**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Ethylene dibromide	SW8011	ug/L	0.05	0.0075	< 0.034 U	< 0.034 U	< 0.035 U	< 0.035 U	< 0.037 U	< 0.037 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.037 U	< 0.036 U	< 0.035 U	< 0.036 U
Hexachlorobutadiene	SW8260C	ug/L	NE	0.14	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isobutyl alcohol	SW8260C	ug/L	NE	590	**3,290**	**3,090**	< 100 U	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Isopropylbenzene (Cumene)	SW8260C	ug/L	NE	45	**7.0 J**	**6.6 J**	< 1.0 U	**3.6**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
m,p-Xylenes	SW8260C	ug/L	NE	19	**34.2**	**34.2**	< 2.0 UJ	**55.0**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 U
Methacrylonitrile	SW8260C	ug/L	NE	0.19	< 1,000 U	< 1,000 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Methyl acetate	SW8260C	ug/L	NE	2,000	**7,560**	**7,580**	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl iodide	SW8260C	ug/L	NE	NE	< 50.0 UJ	< 50.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ
Methyl methacrylate	SW8260C	ug/L	NE	140	< 200 U	< 200 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl tert-butyl ether	SW8260C	ug/L	NE	14	**11.3 J**	**12.0 J**	< 4.0 U	**1.1 J**	**3.2 J**	< 4.0 U	**1.7 J**	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	**0.51 J**	< 4.0 U
Methylcyclohexane	SW8260C	ug/L	NE	NE	< 200 U	< 200 U	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 U	< 20.0 UJ
Methylene chloride	SW8260C	ug/L	5	11	< 50.0 U	< 50.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Butylbenzene	SW8260C	ug/L	NE	100	< 10.0 U	< 10.0 U	< 1.0 U	**0.86 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Hexane	SW8260C	ug/L	NE	150	< 50.0 U	< 50.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Propylbenzene	SW8260C	ug/L	NE	66	< 10.0 U	< 10.0 U	< 1.0 U	**3.0**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Chlorotoluene (2-chlorotoluene)	SW8260C	ug/L	NE	24	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Xylene	SW8260C	ug/L	NE	19	**19.6**	**19.2**	< 1.0 U	**15.8**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Propionitrile	SW8260C	ug/L	NE	NE	< 1,000 U	< 1,000 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
sec-Butylbenzene	SW8260C	ug/L	NE	200	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Styrene	SW8260C	ug/L	100	120	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	SW8260C	ug/L	NE	69	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	SW8260C	ug/L	5	4.1	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Toluene	SW8260C	ug/L	1,000	110	**67.3**	**70.9**	< 1.0 U	**32.0**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,2-Dichloroethene	SW8260C	ug/L	100	6.8	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-Dichloropropene	SW8260C	ug/L	NE	0.47	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,4-Dichlorobutene	SW8260C	ug/L	NE	0.0013	< 1,000 U	< 1,000 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Trichloroethene	SW8260C	ug/L	5	0.28	< 10.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichlorofluoromethane (Freon 11)	SW8260C	ug/L	NE	520	< 20.0 U	< 20.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Vinyl acetate	SW8260C	ug/L	NE	41	< 200 U	< 200 U	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 U	< 20.0 UJ	< 20.0 U
Vinyl chloride	SW8260C	ug/L	2	0.019	< 10.0 U	< 10.0 U	< 1.0 U	**2.3**	< 1.0 UJ	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U
Xylene, Total	SW8260C	ug/L	10,000	19	**53.8**	**53.5**	< 3.0 U	**70.8**	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U

Notes and definitions are presented on Page 7

Table 12b: 2020 Validated Data for Volatile Organic Compounds
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				Sample Location	PZ-109-SS	PZ-111-KS	PZ-111-SD	PZ-111-SS	PZ-113-AD	PZ-113-AD	PZ-113-AS	PZ-113-SS	PZ-114-AS	PZ-115-SS	PZ-115-SS	PZ-116-SS	PZ-200-SS
				Sample Depth (ft BGS)	125.7-135.5	357.15-366.96	199.4-209.2	105.5-115.5	98.6-108.4	98.6-108.4	28.9-38.7	148.57-158.37	19.9-29.7	74.68-84.48	74.68-84.48	151.4-161	9.62-97.64
				Sample Date	11-10-2020	11-09-2020	11-09-2020	11-09-2020	11-05-2020	11-05-2020	11-04-2020	11-05-2020	11-11-2020	11-24-2020	11-24-2020	12-04-2020	12-02-2020
				Sample Type	FD	N	N	N	N	FD	N	N	N	N	FD	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1													
Volatile Organic Compounds, Total (D–Z)																	
Dibromochloromethane	SW8260C	ug/L	80	0.87	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dibromomethane	SW8260C	ug/L	NE	0.83	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichlorodifluoromethane (Freon 12)	SW8260C	ug/L	NE	20	< 2.0 U	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Ethyl ether	SW8260C	ug/L	NE	390	< 20.0 U	< 20.0 U	< 20.0 U	**6.5 J**	**8.6 J**	**8.7 J**	**6.6 J**	< 20.0 U	**0.75 J**	**1.4 J**	**1.5 J**	< 20.0 U	< 20.0 U
Ethyl methacrylate	SW8260C	ug/L	NE	63	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Ethylbenzene	SW8260C	ug/L	700	1.5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Ethylene dibromide	SW8011	ug/L	0.05	0.0075	< 0.035 U	< 0.035 U	< 0.037 U	< 0.036 U	< 0.037 U	< 0.037 U	< 0.038 U	< 0.037 U	< 0.038 U	< 0.035 U	< 0.038 U	< 0.036 U	< 0.034 U
Hexachlorobutadiene	SW8260C	ug/L	NE	0.14	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isobutyl alcohol	SW8260C	ug/L	NE	590	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 UJ
Isopropylbenzene (Cumene)	SW8260C	ug/L	NE	45	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
m,p-Xylenes	SW8260C	ug/L	NE	19	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 U
Methacrylonitrile	SW8260C	ug/L	NE	0.19	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Methyl acetate	SW8260C	ug/L	NE	2,000	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl iodide	SW8260C	ug/L	NE	NE	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ
Methyl methacrylate	SW8260C	ug/L	NE	140	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl tert-butyl ether	SW8260C	ug/L	NE	14	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	**2.3 J**	< 4.0 U	< 4.0 U	**0.11 J**	**0.12 J**	< 4.0 U	< 4.0 U
Methylcyclohexane	SW8260C	ug/L	NE	NE	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methylene chloride	SW8260C	ug/L	5	11	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Butylbenzene	SW8260C	ug/L	NE	100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Hexane	SW8260C	ug/L	NE	150	< 5.0 U	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Propylbenzene	SW8260C	ug/L	NE	66	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Chlorotoluene (2-chlorotoluene)	SW8260C	ug/L	NE	24	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Xylene	SW8260C	ug/L	NE	19	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Propionitrile	SW8260C	ug/L	NE	NE	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 UJ
sec-Butylbenzene	SW8260C	ug/L	NE	200	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Styrene	SW8260C	ug/L	100	120	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	SW8260C	ug/L	NE	69	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	SW8260C	ug/L	5	4.1	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Toluene	SW8260C	ug/L	1,000	110	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,2-Dichloroethene	SW8260C	ug/L	100	6.8	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-Dichloropropene	SW8260C	ug/L	NE	0.47	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,4-Dichlorobutene	SW8260C	ug/L	NE	0.0013	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 UJ
Trichloroethene	SW8260C	ug/L	5	0.28	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichlorofluoromethane (Freon 11)	SW8260C	ug/L	NE	520	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Vinyl acetate	SW8260C	ug/L	NE	41	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ
Vinyl chloride	SW8260C	ug/L	2	0.019	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Xylene, Total	SW8260C	ug/L	10,000	19	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U

Notes and definitions are presented on Page 7

Table 12b: 2020 Validated Data for Volatile Organic Compounds
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				Sample Location	PZ-201A-SS	PZ-202-SS	PZ-203-SS	PZ-204A-SS	PZ-204-SS	PZ-205-AS	PZ-205-SS	PZ-206-SS	PZ-207-AS	PZ-209-SS	PZ-210-SS	PZ-211-SD	PZ-211-SS	PZ-302-AI
				Sample Depth (ft BGS)	80-89.8	40.2-89.1	99.6-109.4	79.5-89.1	10.95-89.35	38.55-48.35	88.57-98.37	115-124.8	34.9-39.7	140-150	138-148	237-247	137-147	32.6-42.4
				Sample Date	12-04-2020	12-02-2020	11-16-2020	12-04-2020	12-04-2020	11-11-2020	11-11-2020	11-10-2020	12-01-2020	11-04-2020	11-03-2020	11-03-2020	12-04-2020	12-01-2020
				Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1														
Volatile Organic Compounds, Total (D–Z)																		
Dibromochloromethane	SW8260C	ug/L	80	0.87	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dibromomethane	SW8260C	ug/L	NE	0.83	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichlorodifluoromethane (Freon 12)	SW8260C	ug/L	NE	20	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 20.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Ethyl ether	SW8260C	ug/L	NE	390	< 20.0 U	**52.7**	**0.20 J**	**1.3 J**	< 20.0 U	**65.6 J**	< 20.0 U	**0.53 J**	**18.6 J**	< 20.0 U	**1.9 J**	**0.32 J**	< 20.0 U	**10.7 J**
Ethyl methacrylate	SW8260C	ug/L	NE	63	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 200 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Ethylbenzene	SW8260C	ug/L	700	1.5	< 1.0 U	**0.39 J**	< 1.0 U	< 1.0 U	< 1.0 U	**17.3**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Ethylene dibromide	SW8011	ug/L	0.05	0.0075	< 0.036 U	< 0.035 U	< 0.036 U	< 0.035 U	< 0.034 U	< 0.036 U	< 0.037 U	< 0.036 U	< 0.037 U	< 0.036 U	< 0.036 U	< 0.037 U	< 0.034 U	< 0.036 U
Hexachlorobutadiene	SW8260C	ug/L	NE	0.14	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isobutyl alcohol	SW8260C	ug/L	NE	590	< 100 R	< 100 UJ	< 100 UJ	< 100 U	< 100 U	< 1,000 U	< 100 U	< 100 U	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 U	< 100 UJ
Isopropylbenzene (Cumene)	SW8260C	ug/L	NE	45	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**5.9 J**	< 1.0 U	< 1.0 U	**5.9**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
m,p-Xylenes	SW8260C	ug/L	NE	19	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	**28.9**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Methacrylonitrile	SW8260C	ug/L	NE	0.19	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 1,000 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Methyl acetate	SW8260C	ug/L	NE	2,000	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 200 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl iodide	SW8260C	ug/L	NE	NE	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 50.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ
Methyl methacrylate	SW8260C	ug/L	NE	140	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 200 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl tert-butyl ether	SW8260C	ug/L	NE	14	< 4.0 U	**8.2**	< 4.0 U	**0.26 J**	< 4.0 U	**10.8 J**	< 4.0 U	< 4.0 U	**0.51 J**	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U
Methylcyclohexane	SW8260C	ug/L	NE	NE	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 200 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 U	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 U	< 20.0 U
Methylene chloride	SW8260C	ug/L	5	11	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 50.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Butylbenzene	SW8260C	ug/L	NE	100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Hexane	SW8260C	ug/L	NE	150	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 50.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Propylbenzene	SW8260C	ug/L	NE	66	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Chlorotoluene (2-chlorotoluene)	SW8260C	ug/L	NE	24	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Xylene	SW8260C	ug/L	NE	19	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**17.1**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Propionitrile	SW8260C	ug/L	NE	NE	< 100 U	< 100 UJ	< 100 UJ	< 100 U	< 100 U	< 1,000 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
sec-Butylbenzene	SW8260C	ug/L	NE	200	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	**1.2**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Styrene	SW8260C	ug/L	100	120	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	SW8260C	ug/L	NE	69	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	SW8260C	ug/L	5	4.1	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Toluene	SW8260C	ug/L	1,000	110	< 1.0 U	**8.4**	< 1.0 U	< 1.0 U	< 1.0 U	**17.5**	< 1.0 U	< 1.0 U	**0.42 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,2-Dichloroethene	SW8260C	ug/L	100	6.8	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-Dichloropropene	SW8260C	ug/L	NE	0.47	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,4-Dichlorobutene	SW8260C	ug/L	NE	0.0013	< 100 UJ	< 100 UJ	< 100 U	< 100 U	< 100 U	< 1,000 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Trichloroethene	SW8260C	ug/L	5	0.28	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichlorofluoromethane (Freon 11)	SW8260C	ug/L	NE	520	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 20.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ
Vinyl acetate	SW8260C	ug/L	NE	41	< 20.0 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 U	< 20.0 U	< 200 U	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 UJ
Vinyl chloride	SW8260C	ug/L	2	0.019	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Xylene, Total	SW8260C	ug/L	10,000	19	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	**46.1**	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U

Notes and definitions are presented on Page 7

Table 12b: 2020 Validated Data for Volatile Organic Compounds
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				Sample Location	PZ-302-AS	PZ-303-AS	PZ-304-AI	PZ-304-AS	S-5	S-5	S-10	S-82	S-84
				Sample Depth (ft BGS)	12.2-22	16-25.8	39-48.8	17.1-26.9	30-40	30-40	32-52	15.5-25.5	20.9-30.9
				Sample Date	11-30-2020	12-04-2020	12-02-2020	12-02-2020	11-20-2020	11-20-2020	11-13-2020	11-23-2020	11-10-2020
				Sample Type	N	N	N	N	N	FD	N	N	N
Analyte	Analytic Method	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1									
Volatile Organic Compounds, Total (D–Z)													
Dibromochloromethane	SW8260C	ug/L	80	0.87	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dibromomethane	SW8260C	ug/L	NE	0.83	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichlorodifluoromethane (Freon 12)	SW8260C	ug/L	NE	20	**0.63 J**	< 2.0 U	< 2.0 U	**3.2**	< 10.0 U	< 10.0 U	< 2.0 UJ	< 2.0 U	< 2.0 U
Ethyl ether	SW8260C	ug/L	NE	390	**7.4 J**	**23.4**	**7.3 J**	**11.3 J**	**18.0 J**	**19.3 J**	**12.3 J**	**16.7 J**	**0.45 J**
Ethyl methacrylate	SW8260C	ug/L	NE	63	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 100 U	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U
Ethylbenzene	SW8260C	ug/L	700	1.5	< 1.0 U	**7.1**	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Ethylene dibromide	SW8011	ug/L	0.05	0.0075	< 0.036 U	< 0.035 U	< 0.034 U	< 0.034 U	< 0.037 U	< 0.035 U	< 0.037 U	< 0.036 U	< 0.037 U
Hexachlorobutadiene	SW8260C	ug/L	NE	0.14	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isobutyl alcohol	SW8260C	ug/L	NE	590	< 100 UJ	< 100 U	< 100 UJ	< 100 UJ	< 500 UJ	< 500 UJ	< 100 U	< 100 UJ	< 100 U
Isopropylbenzene (Cumene)	SW8260C	ug/L	NE	45	**3.8**	**2.9**	< 1.0 U	**1.3**	**4.3 J**	**4.4 J**	< 1.0 U	< 1.0 U	< 1.0 U
m,p-Xylenes	SW8260C	ug/L	NE	19	**0.39 J**	**154**	< 2.0 U	< 2.0 U	< 10.0 U	< 10.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Methacrylonitrile	SW8260C	ug/L	NE	0.19	< 100 U	< 100 U	< 100 U	< 100 U	< 500 U	< 500 U	< 100 U	< 100 U	< 100 U
Methyl acetate	SW8260C	ug/L	NE	2,000	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 100 U	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl iodide	SW8260C	ug/L	NE	NE	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 25.0 UJ	< 25.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ
Methyl methacrylate	SW8260C	ug/L	NE	140	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 100 U	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl tert-butyl ether	SW8260C	ug/L	NE	14	**0.11 J**	**0.42 J**	< 4.0 U	**0.25 J**	**0.50 J**	**0.56 J**	**1.1 J**	< 4.0 U	< 4.0 U
Methylcyclohexane	SW8260C	ug/L	NE	NE	< 20.0 U	**4.1 J**	< 20.0 U	< 20.0 U	< 100 U	< 100 U	< 20.0 UJ	< 20.0 U	< 20.0 UJ
Methylene chloride	SW8260C	ug/L	5	11	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 25.0 U	< 25.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Butylbenzene	SW8260C	ug/L	NE	100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Hexane	SW8260C	ug/L	NE	150	< 5.0 U	**1.1 J**	< 5.0 U	< 5.0 U	< 25.0 U	< 25.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Propylbenzene	SW8260C	ug/L	NE	66	**0.89 J**	**4.2**	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Chlorotoluene (2-chlorotoluene)	SW8260C	ug/L	NE	24	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Xylene	SW8260C	ug/L	NE	19	**0.43 J**	**51.7**	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Propionitrile	SW8260C	ug/L	NE	NE	< 100 U	< 100 U	< 100 UJ	< 100 UJ	< 500 U	< 500 U	< 100 U	< 100 U	< 100 U
sec-Butylbenzene	SW8260C	ug/L	NE	200	< 1.0 U	**1.3**	< 1.0 U	**1.8**	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Styrene	SW8260C	ug/L	100	120	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	SW8260C	ug/L	NE	69	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	SW8260C	ug/L	5	4.1	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Toluene	SW8260C	ug/L	1,000	110	**0.29 J**	**8.9**	**0.21 J**	**0.34 J**	**1.7 J**	**1.5 J**	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,2-Dichloroethene	SW8260C	ug/L	100	6.8	< 1.0 U	**0.51 J**	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-Dichloropropene	SW8260C	ug/L	NE	0.47	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,4-Dichlorobutene	SW8260C	ug/L	NE	0.0013	< 100 UJ	< 100 U	< 100 UJ	< 100 UJ	< 500 U	< 500 U	< 100 U	< 100 U	< 100 U
Trichloroethene	SW8260C	ug/L	5	0.28	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichlorofluoromethane (Freon 11)	SW8260C	ug/L	NE	520	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 10.0 U	< 10.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Vinyl acetate	SW8260C	ug/L	NE	41	< 20.0 UJ	< 20.0 U	< 20.0 UJ	< 20.0 UJ	< 100 UJ	< 100 UJ	< 20.0 UJ	< 20.0 UJ	< 20.0 U
Vinyl chloride	SW8260C	ug/L	2	0.019	< 1.0 U	**2.5**	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U
Xylene, Total	SW8260C	ug/L	10,000	19	**0.82 J**	**206**	< 3.0 U	< 3.0 U	< 15.0 U	< 15.0 U	< 3.0 U	< 3.0 U	< 3.0 U

Notes and definitions are presented on Page 7

Notes:

ft BGS = feet below ground surface

ug/L = micrograms per liter

mg/L = milligrams per liter

USEPA Primary MCL = USEPA National Primary Drinking Water Regulation (May 2009). MCLs are for combined radium 226/228 (5 pCi/L) and gross alpha excluding uranium (15 pCi/L). Radium-226 contributes to both the combined radium-226/288 and gross alpha; the lower of the two MCLs is shown in the table for comparison. There is a total Uranium MCL of 30 ug/L presented in the metals result tables.

USEPA RSL TAPWATER THQ0.1 = RSL TAPWATER (TR=1E-06, THQ=0.1) May 2021, adapted for West Lake QAPP

Bold = Detected

Blue Font = Exceeds USEPA Primary MCL

Orange Shaded = Detected value exceeds USEPA RSL TAPWATER THQ0.1

Gray Shaded = Compound not detected above the reporting detection limit but reporting detection limit exceeds USEPA RSL TAPWATER THQ0.1

NE = Not Established

NA = Not Available

For the 2020 4th quarter groundwater monitoring event, turbidity for samples PZ-205-AS-WG-20201111, PZ-205-SS-WG-20201111, I-11-WG-20201112, D-12-WG-20201112, D-6-WG-20201112, S-10-WG-20201113, D-13-WG-20201113, I-62-WG-20201116, D-83-WG-20201116, S-5-WG-20201120, D-3-WG-20201120, D-87-WG-20201120, S-82-WG-20201123, D-93-WG-20201123, I-9-WG-20201123, I-65-WG-20201124, PZ-115-SS-WG-20201124, I-68-WG-20201124, D-85-WG-20201130, I-73-WG-20201130, PZ-302-AS-WG-20201130, PZ-302-AI-WG-20201201, PZ-207-AS-WG-20201201, PZ-202-SS-WG-20201202, PZ-304-AS-WG-20201202, PZ-304-AI-WG-20201202, LR-100-WG-20201203, PZ-107-SS-WG-20201203, PZ-103-SS-WG-20201203, PZ-303-AS-WG-20201204, PZ-201A-SS-WG-20201204, PZ-204A-SS-WG-20201204, and PZ-204-SS-WG-20201204 were analyzed using an instrument with a tungsten filament light source. Turbidity measured using this method is typically reported in NTU.

Qualifier Definition

J = Estimated concentration.

R = Rejected, data not usable.

U = The analyte was analyzed for but was not detected at or above the referenced reporting limit.

UJ = The analyte was analyzed for, but was not detected. The reporting limit is approximate and may be inaccurate or imprecise.

Table 13: 2020 Field Quality Control Data - Equipment Blanks
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		Sample ID Sample Type Sample Date	EB-001-WQ-20201103 EB 11/03/2020	EB-002-WQ-20201103 EB 11/03/2020	EB-003-WQ-20201113 EB 11/13/2020	EB-004-WQ-20201120 EB 11/20/2020	EB-004-WQ-20201123 EB 11/23/2020	EB-005-WQ-20201204 EB 12/04/2020	EB-006-WQ-20201204 EB 12/04/2020
Analyte	**Analytic Method**	**Unit**							
Dissolved Permanent Gases, Total									
Carbon dioxide	RSK-175	ug/L	< 900 U	< 900 U	< 900 U	< 900 U	NA	< 900 U	< 900 U
Methane	RSK-175	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	**13 J+**	NA	**5.4 J+**	**11 J+**
General Chemistry Parameters									
Bromide	SW9056A	mg/L	< 0.050 U	< 0.050 U	< 0.050 U	NA	< 0.050 U	< 0.050 U	< 0.050 U
Chloride	SW9056A	mg/L	< 0.25 U	< 0.25 U	**0.064 J**	NA	< 0.25 U	< 0.25 U	< 0.25 U
Fluoride	SW9056A	mg/L	< 0.10 U	< 0.10 U	< 0.10 U	NA	< 0.10 U	< 0.10 U	< 0.10 U
Iodide	SW9056A	mg/L	< 0.50 U	< 0.50 U	< 0.50 U	NA	< 0.50 U	< 0.50 U	< 0.50 U
Sulfate	SW9056A	mg/L	< 0.25 U	< 0.25 U	< 0.25 U	NA	< 0.25 U	< 0.25 U	< 0.25 U
Nitrate as N	9056A	mg/L	**0.020 J**	**0.018 J**	< 0.050 U	NA	< 0.050 U	< 0.050 U	< 0.050 U
Nitrite as N	9056A	mg/L	< 0.050 U	< 0.050 U	< 0.050 U	NA	< 0.050 U	< 0.050 U	< 0.050 U
Chromium (III)	CALC	mg/L	NA	NA	< 0.010 U	< 0.010 U	NA	< 0.010 U	< 0.010 U
Nitrite + Nitrate as N	E353.2	mg/L	**0.020 J**	**0.019 J**	< 0.10 U	NA	< 0.10 U	**0.022 J**	**0.048 J**
Phosphorus	E365.1	mg/L	< 0.050 U	< 0.050 U	< 0.050 U	NA	**0.034 J**	**0.028 J**	< 0.050 U
Chemical Oxygen Demand	E410.4	mg/L	< 10.0 U	< 10.0 U	< 10.0 U	NA	< 10.0 U	**6.2 J**	**29.8**
Alkalinity, Total as CaCO3	SM2320B	mg/L	< 2.0 U	< 2.0 U	< 2.0 U	NA	< 2.0 U	< 2.0 U	< 2.0 U
Bicarbonate Alkalinity as CaCO3	SM2320B	mg/L	< 2.0 U	< 2.0 U	< 2.0 U	NA	< 2.0 U	< 2.0 U	< 2.0 U
Carbonate Alkalinity as CaCO3	SM2320B	mg/L	< 2.0 U	< 2.0 U	< 2.0 U	NA	< 2.0 U	< 2.0 U	< 2.0 U
Dissolved Solids, Total	SM2540C	mg/L	< 10.0 U	< 10.0 U	< 10.0 U	NA	< 10.0 U	< 10.0 U	< 10.0 U
Total suspended solids	SM2540D	mg/L	< 2.5 U	< 2.5 U	< 2.5 U	NA	< 2.5 U	< 2.6 U	< 2.5 U
pH, Lab	SM4500-H-B	pH units	**5.6 J**	**5.6 J**	**7.2 J**	NA	**5.9 J**	**7.0 J**	**7.0 J**
Ammoniacal Nitrogen NH3N	SM4500-NH3G	mg/L	< 0.10 U	< 0.10 U	< 0.10 U	NA	< 0.10 U	< 0.10 U	< 0.10 U
Sulfide	SM4500-S2-D	mg/L	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U
Organic Carbon, Total	SM5310C	mg/L	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U
Herbicides, Total									
2,4,5-TP (Silvex)	SW8151A	ug/L	< 1.0 U	< 1.1 U	< 1.0 UJ	< 1.0 U	NA	< 1.0 U	< 1.0 U
2,4-Dichlorophenoxyacetic acid	SW8151A	ug/L	< 1.0 U	< 1.1 U	< 1.0 UJ	< 1.0 U	NA	< 1.0 U	< 1.0 U
Dinoseb	SW8151A	ug/L	< 1.0 U	< 1.1 U	< 1.0 UJ	< 1.0 U	NA	< 1.0 UJ	< 1.0 UJ
Trichlorophenoxyacetic Acid, 2,4,5-	SW8151A	ug/L	< 1.0 U	< 1.1 U	< 1.0 UJ	< 1.0 U	NA	< 1.0 U	< 1.0 U
Metals, Total									
Aluminum	SW6010B	ug/L	< 200 U	< 200 U	< 200 U	< 200 U	NA	< 200 U	< 200 U
Barium	SW6010B	ug/L	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	NA	< 10.0 U	< 10.0 U
Boron	SW6010B	ug/L	< 100 U	< 100 U	< 100 U	< 100 U	NA	< 100 U	< 100 U
Calcium	SW6010B	ug/L	< 500 U	< 500 U	< 500 U	< 500 U	NA	< 500 U	< 500 U
Cobalt	SW6010B	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	NA	< 5.0 U	< 5.0 U
Hardness as CaCO3	SW6010B	ug/L	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	NA	< 1,000 U	< 1,000 U
Iron	SW6010B	ug/L	< 50.0 U	< 50.0 U	< 50.0 U	< 50.0 U	NA	< 50.0 U	< 50.0 U
Lithium	SW6010B	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	**3.7 J**	NA	< 20.0 U	< 20.0 U
Magnesium	SW6010B	ug/L	< 500 U	< 500 U	< 500 U	< 500 U	NA	< 500 U	< 500 U
Manganese	SW6010B	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	NA	< 5.0 U	< 5.0 U
Molybdenum	SW6010B	ug/L	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	NA	< 10.0 U	< 10.0 U
Nickel	SW6010B	ug/L	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	NA	< 10.0 U	< 10.0 U
Potassium	SW6010B	ug/L	< 1,000 U	< 1,000 U	< 1,000 U	**280 J**	NA	< 1,000 U	< 1,000 U
Silicon	SW6010B	ug/L	< 200 U	< 200 U	< 200 U	**26.4 J**	NA	**40.6 J**	**42.3 J**
Sodium	SW6010B	ug/L	< 1,000 U	< 1,000 U	< 1,000 U	**276 J**	NA	< 1,000 U	**68.5 J**
Strontium	SW6010B	ug/L	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	NA	< 10.0 U	< 10.0 U
Tin	SW6010B	ug/L	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	NA	< 10.0 U	< 10.0 U
Titanium	SW6010B	ug/L	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	NA	< 10.0 U	< 10.0 U
Zinc	SW6010B	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	NA	< 20.0 U	< 20.0 U
Antimony	SW6020	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Arsenic	SW6020	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Beryllium	SW6020	ug/L	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	NA	< 0.20 U	< 0.20 U
Cadmium	SW6020	ug/L	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	NA	< 0.20 U	< 0.20 U
Chromium	SW6020	ug/L	< 2.0 U	< 2.0 U	**0.22 J**	< 2.0 U	NA	< 2.0 U	**0.12 J**
Copper	SW6020	ug/L	< 1.0 U	< 1.0 U	**0.27 J**	**0.21 J**	NA	**0.29 J**	< 1.0 U

Table 13: 2020 Field Quality Control Data - Equipment Blanks
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		Sample ID Sample Type Sample Date	EB-001-WQ-20201103 EB 11/03/2020	EB-002-WQ-20201103 EB 11/03/2020	EB-003-WQ-20201113 EB 11/13/2020	EB-004-WQ-20201120 EB 11/20/2020	EB-004-WQ-20201123 EB 11/23/2020	EB-005-WQ-20201204 EB 12/04/2020	EB-006-WQ-20201204 EB 12/04/2020
Analyte	**Analytic Method**	**Unit**							
Lead	SW6020	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Selenium	SW6020	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Silver	SW6020	ug/L	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	NA	**0.025 J**	< 0.50 U
Thallium	SW6020	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Thorium	SW6020	ug/L	< 1.0 U	< 1.0 U	**0.10 J**	< 1.0 U	NA	< 1.0 U	< 1.0 U
Uranium	SW6020	ug/L	< 1.0 U	< 1.0 U	**0.010 J**	< 1.0 U	NA	< 1.0 U	< 1.0 U
Vanadium	SW6020	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Chromium (VI)	SW7199	ug/L	NA	NA	**0.0447 J**	< 0.100 U	NA	< 0.100 U	< 0.100 U
Mercury	SW7470A	ug/L	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	NA	< 0.20 U	< 0.20 U
Cyanide CN-	SW9012A	mg/L	< 0.0050 U	< 0.0050 U	< 0.0050 U	NA	< 0.0050 U	< 0.0050 U	< 0.0050 U
Petroleum Hydrocarbons,Total									
C12-C28-Total	TCEQ-TX-1005	ug/L	< 918 U	< 918 U	< 900 U	< 900 U	NA	< 900 U	< 900 U
C28-C35-Total	TCEQ-TX-1005	ug/L	< 918 U	< 918 U	< 900 U	< 900 U	NA	< 900 U	< 900 U
C6-C12-Total	TCEQ-TX-1005	ug/L	< 918 U	< 918 U	< 900 U	< 900 U	NA	< 900 U	< 900 U
C6-C35-Total	TCEQ-TX-1005	ug/L	< 918 U	< 918 U	< 900 U	< 900 U	NA	< 900 U	< 900 U
C10-C12-Aliphatics	TCEQ-TX-1006	ug/L	< 1,020 U	< 1,020 U	< 1,000 U	< 1,000 U	NA	< 1,000 U	< 1,000 U
C10-C12-Aromatics	TCEQ-TX-1006	ug/L	< 1,020 U	< 1,020 U	< 1,000 U	< 1,000 U	NA	< 1,000 U	< 1,000 U
C12-C16-Aliphatics	TCEQ-TX-1006	ug/L	< 1,020 U	< 1,020 U	< 1,000 U	< 1,000 U	NA	< 1,000 U	< 1,000 U
C12-C16-Aromatics	TCEQ-TX-1006	ug/L	< 1,020 U	< 1,020 U	< 1,000 U	< 1,000 U	NA	< 1,000 U	< 1,000 U
C16-C21-Aliphatics	TCEQ-TX-1006	ug/L	< 1,020 U	< 1,020 U	< 1,000 U	< 1,000 U	NA	< 1,000 U	< 1,000 U
C16-C21-Aromatics	TCEQ-TX-1006	ug/L	< 1,020 U	< 1,020 U	< 1,000 U	< 1,000 U	NA	< 1,000 U	< 1,000 U
C21-C35-Aliphatics	TCEQ-TX-1006	ug/L	< 2,040 U	< 2,040 U	< 2,000 U	< 2,000 U	NA	< 2,000 U	< 2,000 U
C21-C35-Aromatics	TCEQ-TX-1006	ug/L	< 2,040 U	< 2,040 U	< 2,000 U	< 2,000 U	NA	< 2,000 U	< 2,000 U
C6-Aliphatics	TCEQ-TX-1006	ug/L	< 1,020 U	< 1,020 U	< 1,000 U	< 1,000 U	NA	< 1,000 U	< 1,000 U
C6-C8-Aliphatics	TCEQ-TX-1006	ug/L	< 1,020 U	< 1,020 U	< 1,000 U	< 1,000 U	NA	< 1,000 U	< 1,000 U
C7-C8-Aromatics	TCEQ-TX-1006	ug/L	< 1,030 U	< 1,020 U	< 1,000 U	< 1,000 U	NA	< 1,000 U	< 1,000 U
C8-C10-Aliphatics	TCEQ-TX-1006	ug/L	< 1,020 U	< 1,020 U	< 1,000 U	< 1,000 U	NA	< 1,000 U	< 1,000 U
C8-C10-Aromatics	TCEQ-TX-1006	ug/L	< 1,020 U	< 1,020 U	< 1,000 U	< 1,000 U	NA	< 1,000 U	< 1,000 U
Polychlorinated Biphenyls, Total									
Aroclor 1016	SW8082A	ug/L	< 0.10 U	< 0.095 U	< 0.095 U	< 0.091 U	NA	< 0.10 U	< 0.10 U
Aroclor 1221	SW8082A	ug/L	< 0.10 U	< 0.095 U	< 0.095 U	< 0.091 U	NA	< 0.10 U	< 0.10 U
Aroclor 1232	SW8082A	ug/L	< 0.10 U	< 0.095 U	< 0.095 U	< 0.091 U	NA	< 0.10 U	< 0.10 U
Aroclor 1242	SW8082A	ug/L	< 0.10 U	< 0.095 U	< 0.095 U	< 0.091 U	NA	< 0.10 U	< 0.10 U
Aroclor 1248	SW8082A	ug/L	< 0.10 U	< 0.095 U	< 0.095 U	< 0.091 U	NA	< 0.10 U	< 0.10 U
Aroclor 1254	SW8082A	ug/L	< 0.10 U	< 0.095 U	< 0.095 U	< 0.091 U	NA	< 0.10 U	< 0.10 U
Aroclor 1260	SW8082A	ug/L	< 0.10 U	< 0.095 U	< 0.095 U	< 0.091 U	NA	< 0.10 U	< 0.10 U
PCBs, Total	SW8082A	ug/L	< 0.10 U	< 0.095 U	< 0.095 U	< 0.091 U	NA	< 0.10 U	< 0.10 U
Radiochemistry, Total									
Radium-226	E903.1	pCi/L	-0.0501 ± 0.229 (0.539) U	-0.0799 ± 0.222 (0.524) U	-0.297 ± 0.452 (1.03) U	0.505 ± 0.521 (0.747) U	NA	0.122 ± 0.278 (0.448) U	0.221 ± 0.383 (0.684) U
Radium-228	E904.0	pCi/L	0.386 ± 0.452 (0.955) U	0.109 ± 0.478 (1.08) U	0.0438 ± 0.398 (0.910) U	0.643 ± 0.468 (0.914) U	NA	0.438 ± 0.389 (0.792) U	1.03 ± 0.570 (1.05) U
Radium-226/228	TOTRADIUMCALCULATION	pCi/L	0.386 ± 0.681 (1.49) U	0.109 ± 0.700 (1.60) U	0.0438 ± 0.850 (1.94) U	1.15 ± 0.989 (1.66) U	NA	0.560 ± 0.667 (1.24) U	1.25 ± 0.953 (1.73) U
Thorium-228	HASL300	pCi/L	0.107 ± 0.127 (0.238) U	0.089 ± 0.089 (0.145) U	0.017 ± 0.101 (0.223) U	0.024 ± 0.106 (0.244) U	NA	0.167 ± 0.152 (0.267) U	0.008 ± 0.133 (0.319) U
Thorium-230	HASL300	pCi/L	0 ± 0.062 (0.045) U	0.015 ± 0.056 (0.041) U	**0.168 ± 0.099 (0.092)**	**0.274 ± 0.134 (0.042)**	NA	**0.194 ± 0.120 (0.110)**	**0.380 ± 0.181 (0.122)**
Thorium-232	HASL300	pCi/L	0.005 ± 0.062 (0.110) U	-0.011 ± 0.056 (0.100) U	0.070 ± 0.063 (0.075) U	0.057 ± 0.062 (0.085) U	NA	-0.006 ± 0.062 (0.091) U	0.003 ± 0.072 (0.052) U
Uranium-234	HASL300	pCi/L	0.043 ± 0.079 (0.163) U	0.088 ± 0.086 (0.131) U	**0.266 ± 0.134 (0.043)**	**0.106 ± 0.093 (0.104)**	NA	**0.263 ± 0.133 (0.101)**	**0.145 ± 0.101 (0.115)**
Uranium-235	HASL300	pCi/L	**0.101 ± 0.095 (0.061)**	**0.170 ± 0.125 (0.137)**	**0.125 ± 0.102 (0.057)**	**0.074 ± 0.093 (0.067)**	NA	0.101 ± 0.093 (0.109) U	0.040 ± 0.075 (0.054) U
Uranium-238	HASL300	pCi/L	**0.097 ± 0.084 (0.094)**	0.010 ± 0.059 (0.087) U	**0.128 ± 0.091 (0.043)**	0.062 ± 0.077 (0.125) U	NA	0.071 ± 0.068 (0.084) U	0.040 ± 0.058 (0.084) U
Tritium	E906.0	pCi/L	37.3 ± 130 (225) U	83.2 ± 135 (228) U	12.6 ± 143 (250) U	40.5 ± 152 (262) U	NA	-142 ± 133 (246) U	-182 ± 159 (290) U
Semivolatile Organic Compounds - SIM, Total									
1-Methylnaphthalene	SW8270C-SIM	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
2-Methylnaphthalene	SW8270C-SIM	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Acenaphthene	SW8270C-SIM	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Acenaphthylene	SW8270C-SIM	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Anthracene	SW8270C-SIM	ug/L	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	NA	< 0.10 U	< 0.10 U
Benzo(a)anthracene	SW8270C-SIM	ug/L	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	NA	< 0.10 U	< 0.10 U

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Analyte	**Analytic Method**	**Unit**							
Benzo(a)pyrene	SW8270C-SIM	ug/L	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	NA	< 0.10 U	< 0.10 U
Benzo(b)fluoranthene	SW8270C-SIM	ug/L	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	NA	< 0.10 U	< 0.10 U
Benzo(g,h,i)perylene	SW8270C-SIM	ug/L	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	NA	< 0.10 U	< 0.10 U
Benzo(k)fluoranthene	SW8270C-SIM	ug/L	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	NA	< 0.10 U	< 0.10 U
Chrysene	SW8270C-SIM	ug/L	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	NA	< 0.50 U	< 0.50 U
Dibenzo(a,h)anthracene	SW8270C-SIM	ug/L	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	NA	< 0.10 U	< 0.10 U
Fluoranthene	SW8270C-SIM	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Fluorene	SW8270C-SIM	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Indeno(1,2,3-cd)pyrene	SW8270C-SIM	ug/L	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	NA	< 0.10 U	< 0.10 U
Naphthalene	SW8270C-SIM	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Phenanthrene	SW8270C-SIM	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Pyrene	SW8270C-SIM	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Semivolatile Organic Compounds, Total									
1,2,4,5-Tetrachlorobenzene	SW8270C	ug/L	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	NA	< 9.5 UJ	< 9.5 UJ
1,3,5-Trinitrobenzene	SW8270C	ug/L	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U	NA	< 19.0 UJ	< 19.0 UJ
1,3-Dinitrobenzene	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
1,4-Naphthoquinone	SW8270C	ug/L	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U	NA	< 19.0 U	< 19.0 U
2,2-Oxybis(1-chloropropane)	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
2,3,4,6-Tetrachlorophenol	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
2,4,5-Trichlorophenol	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
2,4,6-Trichlorophenol	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
2,4-Dichlorophenol	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
2,4-Dimethylphenol	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
2,4-Dinitrophenol	SW8270C	ug/L	< 47.6 U	< 47.6 U	< 47.6 U	< 45.5 U	NA	< 47.6 U	< 47.6 U
2,4-Dinitrotoluene	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
2,6-Dichlorophenol	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
2,6-Dinitrotoluene	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
2-Acetylaminofluorene	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 UJ	< 9.5 UJ
2-Chloronaphthalene	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
2-Chlorophenol	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
2-Nitroaniline	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
2-Nitrophenol	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
3,3'-Dichlorobenzidine	SW8270C	ug/L	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U	NA	< 19.0 U	< 19.0 U
3-Methylcholanthrene	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
3-Nitroaniline	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
4-Aminobiphenyl	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
4-Bromophenyl phenyl ether	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
4-Chloro-3-methylphenol	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
4-Chlorophenyl phenyl ether	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
4-Dimethylaminoazobenzene	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
4-Nitrophenol	SW8270C	ug/L	< 47.6 U	< 47.6 U	< 47.6 U	< 45.5 U	NA	< 47.6 U	< 47.6 U
5-Nitro-o-toluidine	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 UJ	< 9.5 UJ
7,12-Dimethylbenz(a)anthracene	SW8270C	ug/L	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U	NA	< 19.0 U	< 19.0 U
Acetophenone	SW8270C	ug/L	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	NA	< 9.5 UJ	< 9.5 UJ
alpha-Naphthylamine	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Atrazine	SW8270C	ug/L	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	NA	< 9.5 UJ	< 9.5 UJ
Benzaldehyde	SW8270C	ug/L	< 47.6 UJ	< 47.6 UJ	< 47.6 UJ	< 45.5 UJ	NA	< 47.6 UJ	< 47.6 UJ
Benzyl alcohol	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Benzyl butyl phthalate	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 UJ	< 9.5 UJ
beta-Naphthylamine	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Biphenyl	SW8270C	ug/L	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	NA	< 9.5 UJ	< 9.5 UJ
Bis(2-chloroethoxy)methane	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Bis(2-ethylhexyl)phthalate	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 UJ	< 9.5 UJ
Caprolactam	SW8270C	ug/L	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	NA	< 9.5 UJ	< 9.5 UJ
Carbazole	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 UJ	< 9.5 UJ

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Analyte	**Analytic Method**	**Unit**							
Chlorobenzilate	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 UJ	< 9.5 UJ
Diallate	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Dibenzofuran	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Dibutyl phthalate	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 UJ	< 9.5 UJ
Dichloroethyl ether	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Diethyl phthalate	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Dimethoate	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Dimethyl phthalate	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Dinitro-o-cresol	SW8270C	ug/L	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U	NA	< 19.0 U	< 19.0 U
Di-n-octyl phthalate	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Diphenylamine	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Disulfoton	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Ethyl methanesulfonate	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Famphur	SW8270C	ug/L	< 190 UJ	< 190 UJ	< 190 UJ	< 182 UJ	NA	< 190 U	< 190 U
Hexachlorobenzene	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Hexachlorobutadiene	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Hexachlorocyclopentadiene	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Hexachloroethane	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Hexachlorophene	SW8270C	ug/L	< 190 UJ	< 190 UJ	< 190 UJ	< 182 UJ	NA	< 190 UJ	< 190 UJ
Hexachloropropene	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Isodrin	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Isophorone	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Isosafrole	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Kepone	SW8270C	ug/L	< 190 UJ	< 190 UJ	< 190 UJ	< 182 UJ	NA	< 190 U	< 190 U
m,p-cresol	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Methapyrilene	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Methyl methanesulfonate	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Methyl parathion	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 UJ	< 9.5 UJ
Nitrobenzene	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
n-Nitrosodiethylamine	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
n-Nitrosodimethylamine	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
n-Nitrosodi-n-butylamine	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
n-Nitrosodi-n-propylamine	SW8270C	ug/L	< 47.6 U	< 47.6 U	< 47.6 U	< 45.5 U	NA	< 47.6 U	< 47.6 U
n-Nitrosodiphenylamine	SW8270C	ug/L	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ	NA	< 9.5 UJ	< 9.5 UJ
n-Nitrosomethylethylamine	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
n-Nitrosopiperidine	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
n-Nitrosopyrrolidine	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
o-Cresol	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
o-Tolidine	SW8270C	ug/L	< 19.0 UJ	< 19.0 UJ	< 19.0 UJ	< 18.2 UJ	NA	< 19.0 U	< 19.0 U
o-Toluidine	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Parathion	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 UJ	< 9.5 UJ
p-Chloroaniline	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Pentachlorobenzene	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Pentachloronitrobenzene	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Pentachlorophenol	SW8270C	ug/L	< 47.6 U	< 47.6 U	< 47.6 U	< 45.5 U	NA	< 47.6 U	< 47.6 U
Phenacetin	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Phenol	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Phorate	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
p-Nitroaniline	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
p-Phenylene diamine	SW8270C	ug/L	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U	NA	< 19.0 U	< 19.0 U
Propyzamide	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Safrole	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Thionazin	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Triethylphosphorothioate	SW8270C	ug/L	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U	NA	< 9.5 U	< 9.5 U
Volatile Organic Compounds, Total									

Table 13: 2020 Field Quality Control Data - Equipment Blanks
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

		Sample ID Sample Type Sample Date	EB-001-WQ-20201103 EB 11/03/2020	EB-002-WQ-20201103 EB 11/03/2020	EB-003-WQ-20201113 EB 11/13/2020	EB-004-WQ-20201120 EB 11/20/2020	EB-004-WQ-20201123 EB 11/23/2020	EB-005-WQ-20201204 EB 12/04/2020	EB-006-WQ-20201204 EB 12/04/2020
Analyte	**Analytic Method**	**Unit**							
1,1,1,2-Tetrachloroethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
1,1,1-Trichloroethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113)	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
1,1-Dichloroethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
1,1-Dichloroethene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
1,1-Dichloropropene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
1,2,3-Trichlorobenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
1,2,3-Trichloropropane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	SW8260C	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	NA	< 5.0 U	< 5.0 U
1,2-Dichlorobenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
1,2-Dichloroethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
1,2-Dichloropropane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	SW8260C	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	NA	< 5.0 U	< 5.0 U
1,3-Dichlorobenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
1,3-Dichloropropane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
1,4-Dioxane	SW8260C	ug/L	< 100 UJ	< 100 UJ	< 100 UJ	< 100 R	NA	< 100 U	< 100 U
2,2-Dichloropropane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
2-Butanone	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	NA	< 20.0 U	< 20.0 U
2-Hexanone	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	NA	< 20.0 U	< 20.0 U
4-Chlorotoluene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
4-Isopropyltoluene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
4-Methyl-2-pentanone	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	NA	< 20.0 U	< 20.0 U
Acetone	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	NA	< 20.0 U	< 20.0 U
Acetonitrile	SW8260C	ug/L	< 100 R	< 100 R	< 100 R	< 100 U	NA	< 100 U	< 100 U
Acrolein	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 U	NA	< 20.0 U	< 20.0 U
Acrylonitrile	SW8260C	ug/L	< 100 U	< 100 U	< 100 U	< 100 U	NA	< 100 U	< 100 U
Allyl chloride	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	NA	< 20.0 U	< 20.0 U
Benzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
beta-Chloroprene	SW8260C	ug/L	< 100 U	< 100 U	< 100 U	< 100 U	NA	< 100 U	< 100 U
Bromobenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Bromodichloromethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Bromoform	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Bromomethane	SW8260C	ug/L	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	NA	< 5.0 UJ	< 5.0 UJ
Carbon disulfide	SW8260C	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	**0.24 J**	NA	< 5.0 U	< 5.0 U
Carbon tetrachloride	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Chlorobenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Chlorobromomethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Chloroethane	SW8260C	ug/L	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	NA	< 2.0 U	< 2.0 U
Chloroform	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	**0.40 J**	NA	< 1.0 U	< 1.0 U
Chloromethane	SW8260C	ug/L	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 U	NA	< 2.0 U	< 2.0 U
cis-1,2-Dichloroethene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	NA	< 1.0 U	< 1.0 U
cis-1,3-Dichloropropene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Cyclohexane	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	NA	< 20.0 U	< 20.0 U
Dibromochloromethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Dibromomethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Dichlorodifluoromethane (Freon 12)	SW8260C	ug/L	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 U	NA	< 2.0 U	< 2.0 U
Ethyl ether	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	NA	< 20.0 U	< 20.0 U
Ethyl methacrylate	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	NA	< 20.0 U	< 20.0 U
Ethylbenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Hexachlorobutadiene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Isobutyl alcohol	SW8260C	ug/L	< 100 U	< 100 U	< 100 U	< 100 UJ	NA	< 100 U	< 100 U

Table 13: 2020 Field Quality Control Data - Equipment Blanks
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

		Sample ID Sample Type Sample Date	EB-001-WQ-20201103 EB 11/03/2020	EB-002-WQ-20201103 EB 11/03/2020	EB-003-WQ-20201113 EB 11/13/2020	EB-004-WQ-20201120 EB 11/20/2020	EB-004-WQ-20201123 EB 11/23/2020	EB-005-WQ-20201204 EB 12/04/2020	EB-006-WQ-20201204 EB 12/04/2020
Analyte	**Analytic Method**	**Unit**							
Isopropylbenzene (Cumene)	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
m,p-Xylenes	SW8260C	ug/L	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	NA	< 2.0 U	< 2.0 U
Methacrylonitrile	SW8260C	ug/L	< 100 U	< 100 U	< 100 UJ	< 100 U	NA	< 100 U	< 100 U
Methyl acetate	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 U	NA	< 20.0 U	< 20.0 U
Methyl iodide	SW8260C	ug/L	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	NA	< 5.0 UJ	< 5.0 UJ
Methyl methacrylate	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	NA	< 20.0 U	< 20.0 U
Methyl tert-butyl ether	SW8260C	ug/L	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	NA	< 4.0 U	< 4.0 U
Methylcyclohexane	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	NA	< 20.0 U	< 20.0 U
Methylene chloride	SW8260C	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	NA	< 5.0 U	< 5.0 U
n-Butylbenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
n-Hexane	SW8260C	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	NA	< 5.0 U	< 5.0 U
n-Propylbenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
o-Chlorotoluene (2-chlorotoluene)	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
o-Xylene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Propionitrile	SW8260C	ug/L	< 100 U	< 100 U	< 100 U	< 100 U	NA	< 100 U	< 100 U
sec-Butylbenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Styrene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
tert-Butylbenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Tetrachloroethene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Toluene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
trans-1,2-Dichloroethene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
trans-1,3-Dichloropropene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
trans-1,4-Dichlorobutene	SW8260C	ug/L	< 100 U	< 100 U	< 100 U	< 100 U	NA	< 100 U	< 100 U
Trichloroethene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Trichlorofluoromethane (Freon 11)	SW8260C	ug/L	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	NA	< 2.0 U	< 2.0 U
Vinyl acetate	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	NA	< 20.0 U	< 20.0 U
Vinyl chloride	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Xylene, Total	SW8260C	ug/L	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	NA	< 3.0 U	< 3.0 U
1,2-Dibromo-3-chloropropane	SW8011	ug/L	< 0.036 U	< 0.037 U	< 0.036 U	< 0.035 U	NA	< 0.035 U	< 0.036 U
Ethylene dibromide	SW8011	ug/L	< 0.036 U	< 0.037 U	< 0.036 U	< 0.035 U	NA	< 0.035 U	< 0.036 U

Notes:
ug/L = micrograms per liter
mg/L = milligrams per liter
pCi/L = picocuries per liter
Bold = Detected
NA = Not Available
Radiochemistry data is shown in the following format: activity ± total uncertainty (minimum detectable concentration) qualifiers

QualifierDefinition
J = Estimated concentration.
J+ = The result is an estimated concentration, but may be biased high.
R = Rejected, data not usable.
U = The analyte was analyzed for but was not detected at or above the referenced reporting limit or minimum detectable concentration.
UJ = The analyte was analyzed for, but was not detected. The reporting limit or minimum detectable concentration is approximate and may be inaccurate or imprecise.

Table 14: 2020 Field Quality Control Data - Field Blanks
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

		Sample ID	FB-001-WQ-20201105	FB-002-WQ-20201111	FB-003-WQ-20201130	FB-004-WQ-20201202	FB-005-WQ-20201208
		Sample Type	FB	FB	FB	FB	FB
		Sample Date	11/05/2020	11/11/2020	11/30/2020	12/02/2020	12/08/2020
Analyte	**Analytic Method**	**Unit**					
Dissolved Permanent Gases, Total							
Carbon dioxide	RSK-175	ug/L	< 900 U	< 900 U	**746 J**	**303 J**	**992**
Methane	RSK-175	ug/L	< 5.0 U	< 5.0 U	**9.5 J+**	**7.7 J+**	**5.2 J+**
General Chemistry Parameters							
Chromium (III)	CALC	mg/L	< 0.010 U	< 0.010 U	< 0.010 U	< 0.010 U	< 0.010 U
Herbicides, Total							
2,4,5-TP (Silvex)	SW8151A	ug/L	< 1.0 UJ	< 0.96 UJ	< 0.96 UJ	< 0.96 U	< 0.96 U
2,4-Dichlorophenoxyacetic acid	SW8151A	ug/L	< 1.0 U	< 0.96 U	< 0.96 UJ	< 0.96 U	< 0.96 UJ
Dinoseb	SW8151A	ug/L	< 1.0 U	< 0.96 U	< 0.96 UJ	< 0.96 U	< 0.96 UJ
Trichlorophenoxyacetic Acid, 2,4,5-	SW8151A	ug/L	< 1.0 U	< 0.96 UJ	< 0.96 UJ	< 0.96 U	< 0.96 UJ
Metals, Total							
Aluminum	SW6010B	ug/L	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U
Barium	SW6010B	ug/L	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
Boron	SW6010B	ug/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Calcium	SW6010B	ug/L	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U
Cobalt	SW6010B	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Hardness as CaCO3	SW6010B	ug/L	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U
Iron	SW6010B	ug/L	< 50.0 U	< 50.0 U	< 50.0 U	< 50.0 U	< 50.0 U
Lithium	SW6010B	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Magnesium	SW6010B	ug/L	< 500 U	< 500 U	< 500 U	< 500 U	< 500 U
Manganese	SW6010B	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Molybdenum	SW6010B	ug/L	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
Nickel	SW6010B	ug/L	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
Potassium	SW6010B	ug/L	< 1,000 U	< 1,000 U	**108 J**	< 1,000 U	< 1,000 U
Silicon	SW6010B	ug/L	< 200 U	**46.1 J**	**51.2 J**	< 200 U	**21.3 J**
Sodium	SW6010B	ug/L	< 1,000 U	**73.1 J**	**137 J**	**195 J**	**58.6 J**
Strontium	SW6010B	ug/L	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
Tin	SW6010B	ug/L	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
Titanium	SW6010B	ug/L	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
Zinc	SW6010B	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Antimony	SW6020	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Arsenic	SW6020	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Beryllium	SW6020	ug/L	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
Cadmium	SW6020	ug/L	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
Chromium	SW6020	ug/L	< 2.0 U	< 2.0 U	**0.25 J**	< 2.0 U	**0.18 J**
Copper	SW6020	ug/L	< 1.0 U	< 1.0 U	**0.24 J**	< 1.0 U	< 1.0 U
Lead	SW6020	ug/L	< 1.0 U	< 1.0 U	**0.35 J**	**0.081 J**	< 1.0 U
Selenium	SW6020	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Silver	SW6020	ug/L	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Thallium	SW6020	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Thorium	SW6020	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Uranium	SW6020	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Vanadium	SW6020	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chromium (VI)	SW7199	ug/L	< 0.100 U	**0.0861 J**	< 0.100 U	< 0.100 U	< 0.100 U
Mercury	SW7470A	ug/L	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
Petroleum Hydrocarbons,Total							
C12-C28-Total	TCEQ-TX-1005	ug/L	< 918 U	< 900 U	< 900 U	< 927 U	< 918 U
C28-C35-Total	TCEQ-TX-1005	ug/L	< 918 U	< 900 U	< 900 U	< 927 U	< 918 U
C6-C12-Total	TCEQ-TX-1005	ug/L	< 918 U	< 900 U	< 900 U	< 927 U	< 918 U
C6-C35-Total	TCEQ-TX-1005	ug/L	< 918 U	< 900 U	< 900 U	< 927 U	< 918 U
C10-C12-Aliphatics	TCEQ-TX-1006	ug/L	< 1,020 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,020 U
C10-C12-Aromatics	TCEQ-TX-1006	ug/L	< 1,020 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,020 U
C12-C16-Aliphatics	TCEQ-TX-1006	ug/L	< 1,020 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,020 U
C12-C16-Aromatics	TCEQ-TX-1006	ug/L	< 1,020 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,020 U
C16-C21-Aliphatics	TCEQ-TX-1006	ug/L	< 1,020 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,020 U
C16-C21-Aromatics	TCEQ-TX-1006	ug/L	< 1,020 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,020 U

Notes and definitions are presented on Page 6

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		Sample ID	FB-001-WQ-20201105	FB-002-WQ-20201111	FB-003-WQ-20201130	FB-004-WQ-20201202	FB-005-WQ-20201208
		Sample Type	FB	FB	FB	FB	FB
		Sample Date	11/05/2020	11/11/2020	11/30/2020	12/02/2020	12/08/2020
Analyte	**Analytic Method**	**Unit**					
C21-C35-Aliphatics	TCEQ-TX-1006	ug/L	< 2,040 U	< 2,000 U	< 2,000 U	< 2,060 UJ	< 2,040 U
C21-C35-Aromatics	TCEQ-TX-1006	ug/L	< 2,040 U	< 2,000 U	< 2,000 U	< 2,060 UJ	< 2,040 U
C6-Aliphatics	TCEQ-TX-1006	ug/L	< 1,020 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,020 U
C6-C8-Aliphatics	TCEQ-TX-1006	ug/L	< 1,020 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,020 U
C7-C8-Aromatics	TCEQ-TX-1006	ug/L	< 1,020 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,020 U
C8-C10-Aliphatics	TCEQ-TX-1006	ug/L	< 1,020 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,020 U
C8-C10-Aromatics	TCEQ-TX-1006	ug/L	< 1,020 U	< 1,000 U	< 1,000 U	< 1,030 UJ	< 1,020 U
Polychlorinated Biphenyls, Total							
Aroclor 1016	SW8082A	ug/L	< 0.10 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U
Aroclor 1221	SW8082A	ug/L	< 0.10 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U
Aroclor 1232	SW8082A	ug/L	< 0.10 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U
Aroclor 1242	SW8082A	ug/L	< 0.10 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U
Aroclor 1248	SW8082A	ug/L	< 0.10 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U
Aroclor 1254	SW8082A	ug/L	< 0.10 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U
Aroclor 1260	SW8082A	ug/L	< 0.10 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U
PCBs, Total	SW8082A	ug/L	< 0.10 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U
Radiochemistry, Total							
Radium-226	E903.1	pCi/L	0.411 ± 0.385 (0.546) U	0.252 ± 0.304 (0.464) U	-0.147 ± 0.577 (1.23) U	0.261 ± 0.315 (0.480) U	0.0784 ± 0.358 (0.728) UJ
Radium-228	E904.0	pCi/L	0.599 ± 0.475 (0.951) U	0.329 ± 0.512 (1.11) U	0.318 ± 0.432 (0.925) U	0.956 ± 0.897 (1.85) U	0.275 ± 0.340 (0.720) U
Radium-226/228	TOTRADIUMCALCULATION	pCi/L	1.01 ± 0.860 (1.50) U	0.581 ± 0.816 (1.57) U	0.318 ± 1.01 (2.16) U	1.22 ± 1.21 (2.33) U	0.353 ± 0.698 (1.45) UJ
Thorium-228	HASL300	pCi/L	-0.027 ± 0.068 (0.197) U	0.022 ± 0.116 (0.271) U	-0.065 ± 0.099 (0.285) U	0.114 ± 0.141 (0.268) U	0.036 ± 0.119 (0.268) U
Thorium-230	HASL300	pCi/L	-0.013 ± 0.052 (0.101) U	**0.264 ± 0.148 (0.146)**	**0.251 ± 0.135 (0.109)**	**0.281 ± 0.144 (0.048)**	**0.414 ± 0.179 (0.048)**
Thorium-232	HASL300	pCi/L	-0.006 ± 0.052 (0.078) U	0.090 ± 0.087 (0.119) U	0.045 ± 0.062 (0.093) U	**0.070 ± 0.070 (0.048)**	0.018 ± 0.066 (0.048) U
Uranium-234	HASL300	pCi/L	**0.181 ± 0.116 (0.119)**	**0.173 ± 0.113 (0.112)**	**0.114 ± 0.087 (0.112)**	**0.181 ± 0.105 (0.078)**	0.086 ± 0.088 (0.132) U
Uranium-235	HASL300	pCi/L	0.043 ± 0.081 (0.058) U	0.107 ± 0.101 (0.120) U	0.069 ± 0.078 (0.118) U	0.015 ± 0.070 (0.102) U	**0.091 ± 0.091 (0.062)**
Uranium-238	HASL300	pCi/L	**0.123 ± 0.093 (0.090)**	**0.152 ± 0.107 (0.112)**	0.085 ± 0.073 (0.090) U	0.018 ± 0.054 (0.095) U	**0.123 ± 0.093 (0.047)**
Tritium	E906.0	pCi/L	7.53 ± 129 (227) U	57.9 ± 145 (249) U	7.54 ± 145 (255) U	114 ± 153 (256) U	-258 ± 156 (289) U
Semivolatile Organic Compounds - SIM, Total							
1-Methylnaphthalene	SW8270C-SIM	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Methylnaphthalene	SW8270C-SIM	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Acenaphthene	SW8270C-SIM	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Acenaphthylene	SW8270C-SIM	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Anthracene	SW8270C-SIM	ug/L	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(a)anthracene	SW8270C-SIM	ug/L	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(a)pyrene	SW8270C-SIM	ug/L	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(b)fluoranthene	SW8270C-SIM	ug/L	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(g,h,i)perylene	SW8270C-SIM	ug/L	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Benzo(k)fluoranthene	SW8270C-SIM	ug/L	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Chrysene	SW8270C-SIM	ug/L	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Dibenzo(a,h)anthracene	SW8270C-SIM	ug/L	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Fluoranthene	SW8270C-SIM	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Fluorene	SW8270C-SIM	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Indeno(1,2,3-cd)pyrene	SW8270C-SIM	ug/L	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U
Naphthalene	SW8270C-SIM	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Phenanthrene	SW8270C-SIM	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Pyrene	SW8270C-SIM	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Semivolatile Organic Compounds, Total							
1,2,4,5-Tetrachlorobenzene	SW8270C	ug/L	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ
1,3,5-Trinitrobenzene	SW8270C	ug/L	< 20.0 U	< 19.0 UJ	< 19.0 U	< 19.0 U	< 18.2 U
1,3-Dinitrobenzene	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
1,4-Naphthoquinone	SW8270C	ug/L	< 20.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U
2,2-Oxybis(1-chloropropane)	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
2,3,4,6-Tetrachlorophenol	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
2,4,5-Trichlorophenol	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 UJ	< 9.1 U
2,4,6-Trichlorophenol	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
2,4-Dichlorophenol	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U

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		Sample ID	FB-001-WQ-20201105	FB-002-WQ-20201111	FB-003-WQ-20201130	FB-004-WQ-20201202	FB-005-WQ-20201208
		Sample Type	FB	FB	FB	FB	FB
		Sample Date	11/05/2020	11/11/2020	11/30/2020	12/02/2020	12/08/2020
Analyte	**Analytic Method**	**Unit**					
2,4-Dimethylphenol	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
2,4-Dinitrophenol	SW8270C	ug/L	< 50.0 U	< 47.6 U	< 47.6 U	< 47.6 U	< 45.5 U
2,4-Dinitrotoluene	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
2,6-Dichlorophenol	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
2,6-Dinitrotoluene	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
2-Acetylaminofluorene	SW8270C	ug/L	< 10.0 U	< 9.5 UJ	< 9.5 U	< 9.5 U	< 9.1 U
2-Chloronaphthalene	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
2-Chlorophenol	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
2-Nitroaniline	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
2-Nitrophenol	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 UJ
3,3'-Dichlorobenzidine	SW8270C	ug/L	< 20.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U
3-Methylcholanthrene	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
3-Nitroaniline	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
4-Aminobiphenyl	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
4-Bromophenyl phenyl ether	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
4-Chloro-3-methylphenol	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
4-Chlorophenyl phenyl ether	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
4-Dimethylaminoazobenzene	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
4-Nitrophenol	SW8270C	ug/L	< 50.0 U	< 47.6 U	< 47.6 U	< 47.6 U	< 45.5 U
5-Nitro-o-toluidine	SW8270C	ug/L	< 10.0 U	< 9.5 UJ	< 9.5 U	< 9.5 U	< 9.1 U
7,12-Dimethylbenz(a)anthracene	SW8270C	ug/L	< 20.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U
Acetophenone	SW8270C	ug/L	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ
alpha-Naphthylamine	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Atrazine	SW8270C	ug/L	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ
Benzaldehyde	SW8270C	ug/L	< 50.0 UJ	< 47.6 UJ	< 47.6 UJ	< 47.6 UJ	< 45.5 UJ
Benzyl alcohol	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Benzyl butyl phthalate	SW8270C	ug/L	< 10.0 U	< 9.5 UJ	< 9.5 U	< 9.5 U	< 9.1 UJ
beta-Naphthylamine	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Biphenyl	SW8270C	ug/L	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ
Bis(2-chloroethoxy)methane	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Bis(2-ethylhexyl)phthalate	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Caprolactam	SW8270C	ug/L	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ
Carbazole	SW8270C	ug/L	< 10.0 U	< 9.5 UJ	< 9.5 U	< 9.5 U	< 9.1 UJ
Chlorobenzilate	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 UJ
Diallate	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Dibenzofuran	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Dibutyl phthalate	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 UJ
Dichloroethyl ether	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Diethyl phthalate	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Dimethoate	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Dimethyl phthalate	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Dinitro-o-cresol	SW8270C	ug/L	< 20.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U
Di-n-octyl phthalate	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Diphenylamine	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Disulfoton	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Ethyl methanesulfonate	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Famphur	SW8270C	ug/L	< 200 UJ	< 190 U	< 190 UJ	< 190 UJ	< 182 UJ
Hexachlorobenzene	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Hexachlorobutadiene	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Hexachlorocyclopentadiene	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Hexachloroethane	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Hexachlorophene	SW8270C	ug/L	< 200 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 182 UJ
Hexachloropropene	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Isodrin	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Isophorone	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Isosafrole	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U

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		Sample ID	FB-001-WQ-20201105	FB-002-WQ-20201111	FB-003-WQ-20201130	FB-004-WQ-20201202	FB-005-WQ-20201208
		Sample Type	FB	FB	FB	FB	FB
		Sample Date	11/05/2020	11/11/2020	11/30/2020	12/02/2020	12/08/2020
Analyte	**Analytic Method**	**Unit**					
Kepone	SW8270C	ug/L	< 200 UJ	< 190 UJ	< 190 UJ	< 190 UJ	< 182 UJ
m,p-cresol	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Methapyrilene	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Methyl methanesulfonate	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Methyl parathion	SW8270C	ug/L	< 10.0 U	< 9.5 UJ	< 9.5 U	< 9.5 U	< 9.1 U
Nitrobenzene	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
n-Nitrosodiethylamine	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
n-Nitrosodimethylamine	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
n-Nitrosodi-n-butylamine	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
n-Nitrosodi-n-propylamine	SW8270C	ug/L	< 50.0 U	< 47.6 U	< 47.6 U	< 47.6 U	< 45.5 U
n-Nitrosodiphenylamine	SW8270C	ug/L	< 10.0 UJ	< 9.5 UJ	< 9.5 UJ	< 9.5 UJ	< 9.1 UJ
n-Nitrosomethylethylamine	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
n-Nitrosopiperidine	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
n-Nitrosopyrrolidine	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
o-Cresol	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
o-Tolidine	SW8270C	ug/L	< 20.0 UJ	< 19.0 U	< 19.0 UJ	< 19.0 UJ	< 18.2 UJ
o-Toluidine	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Parathion	SW8270C	ug/L	< 10.0 U	< 9.5 UJ	< 9.5 U	< 9.5 U	< 9.1 U
p-Chloroaniline	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Pentachlorobenzene	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Pentachloronitrobenzene	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Pentachlorophenol	SW8270C	ug/L	< 50.0 U	< 47.6 U	< 47.6 U	< 47.6 U	< 45.5 U
Phenacetin	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Phenol	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Phorate	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
p-Nitroaniline	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
p-Phenylene diamine	SW8270C	ug/L	< 20.0 U	< 19.0 U	< 19.0 U	< 19.0 U	< 18.2 U
Propyzamide	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Safrole	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Thionazin	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Triethylphosphorothioate	SW8270C	ug/L	< 10.0 U	< 9.5 U	< 9.5 U	< 9.5 U	< 9.1 U
Volatile Organic Compounds, Total							
1,1,1,2-Tetrachloroethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,1-Trichloroethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113)	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloropropene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichlorobenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichloropropane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	SW8260C	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dichlorobenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloropropane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	SW8260C	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,3-Dichlorobenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3-Dichloropropane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dioxane	SW8260C	ug/L	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 U
2,2-Dichloropropane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Butanone	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
2-Hexanone	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
4-Chlorotoluene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U

Notes and definitions are presented on Page 6

Table 14: 2020 Field Quality Control Data - Field Blanks
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

		Sample ID	FB-001-WQ-20201105	FB-002-WQ-20201111	FB-003-WQ-20201130	FB-004-WQ-20201202	FB-005-WQ-20201208
		Sample Type	FB	FB	FB	FB	FB
		Sample Date	11/05/2020	11/11/2020	11/30/2020	12/02/2020	12/08/2020
Analyte	**Analytic Method**	**Unit**					
4-Isopropyltoluene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Methyl-2-pentanone	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetone	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetonitrile	SW8260C	ug/L	< 100 R	< 100 R	< 100 U	< 100 UJ	< 100 U
Acrolein	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acrylonitrile	SW8260C	ug/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Allyl chloride	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 U
Benzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
beta-Chloroprene	SW8260C	ug/L	< 100 U	< 100 U	< 100 UJ	< 100 U	< 100 U
Bromobenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromodichloromethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromoform	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	SW8260C	ug/L	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ
Carbon disulfide	SW8260C	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon tetrachloride	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobromomethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroethane	SW8260C	ug/L	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Chloroform	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	**0.13 J**	< 1.0 U
Chloromethane	SW8260C	ug/L	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
cis-1,2-Dichloroethene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U
cis-1,3-Dichloropropene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Cyclohexane	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Dibromochloromethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dibromomethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichlorodifluoromethane (Freon 12)	SW8260C	ug/L	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Ethyl ether	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Ethyl methacrylate	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Ethylbenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Hexachlorobutadiene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isobutyl alcohol	SW8260C	ug/L	< 100 U	< 100 U	< 100 UJ	< 100 UJ	< 100 UJ
Isopropylbenzene (Cumene)	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
m,p-Xylenes	SW8260C	ug/L	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Methacrylonitrile	SW8260C	ug/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Methyl acetate	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl iodide	SW8260C	ug/L	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ
Methyl methacrylate	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl tert-butyl ether	SW8260C	ug/L	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U
Methylcyclohexane	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methylene chloride	SW8260C	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Butylbenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Hexane	SW8260C	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Propylbenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Chlorotoluene (2-chlorotoluene)	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Xylene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Propionitrile	SW8260C	ug/L	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 U
sec-Butylbenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Styrene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Toluene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,2-Dichloroethene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-Dichloropropene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,4-Dichlorobutene	SW8260C	ug/L	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 U
Trichloroethene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichlorofluoromethane (Freon 11)	SW8260C	ug/L	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 U	< 2.0 U

Notes and definitions are presented on Page 6

Table 14: 2020 Field Quality Control Data - Field Blanks
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

		Sample ID	FB-001-WQ-20201105	FB-002-WQ-20201111	FB-003-WQ-20201130	FB-004-WQ-20201202	FB-005-WQ-20201208
		Sample Type	FB	FB	FB	FB	FB
		Sample Date	11/05/2020	11/11/2020	11/30/2020	12/02/2020	12/08/2020
Analyte	**Analytic Method**	**Unit**					
Vinyl acetate	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Vinyl chloride	SW8260C	ug/L	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Xylene, Total	SW8260C	ug/L	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U
1,2-Dibromo-3-chloropropane	SW8011	ug/L	< 0.036 U	< 0.037 U	< 0.036 U	< 0.034 UJ	< 0.034 U
Ethylene dibromide	SW8011	ug/L	< 0.036 U	< 0.037 U	< 0.036 U	< 0.034 U	< 0.034 U

Notes:
ug/L = micrograms per liter
mg/L = milligrams per liter
pCi/L = picocuries per liter
Bold = Detected
NA = Not Available
Radiochemistry data is shown in the following format: activity ± total uncertainty (minimum detectable concentration) qualifiers

QualifierDefinition
J = Estimated concentration.
J+ = The result is an estimated concentration, but may be biased high.
R = Rejected, data not usable.
U = The analyte was analyzed for but was not detected at or above the referenced reporting limit or minimum detectable concentration.
UJ = The analyte was analyzed for, but was not detected. The reporting limit or minimum detectable concentration is approximate and may be inaccurate or imprecise.

Notes and definitions are presented on Page 6

Table 15: 2020 Field Quality Control Data - Filter Blank
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

Sample ID / Sample Type / Sample Date			FILTB-001-WQ-20201103 FILTB 11/03/2020	FILTB-003-WQ-20201103 FILTB 11/03/2020	FILTB-004-WQ-20201103 FILTB 11/03/2020	FILTB-005-WQ-20201208 FILTB 12/08/2020
Analyte	**Analytic**	**Unit**				
General Chemistry Parameters						
Dissolved Organic Carbon	SM5310C	mg/L	NA	< 1.0 U	**0.80 J**	< 1.0 U
Metals, Dissolved						
Antimony	SW6020	ug/L	NA	< 1.0 U	< 1.0 U	< 1.0 U
Arsenic	SW6020	ug/L	NA	< 1.0 U	< 1.0 U	< 1.0 U
Beryllium	SW6020	ug/L	NA	< 0.20 U	< 0.20 U	< 0.20 U
Cadmium	SW6020	ug/L	NA	< 0.20 U	< 0.20 U	< 0.20 U
Chromium	SW6020	ug/L	NA	< 2.0 U	**0.12 J**	**0.82 J**
Copper	SW6020	ug/L	NA	**0.32 J**	**0.22 J**	**0.18 J**
Lead	SW6020	ug/L	NA	< 1.0 U	< 1.0 U	< 1.0 U
Selenium	SW6020	ug/L	NA	< 1.0 U	< 1.0 U	< 1.0 U
Silver	SW6020	ug/L	NA	< 0.50 U	< 0.50 U	< 0.50 U
Thallium	SW6020	ug/L	NA	< 1.0 U	< 1.0 U	< 1.0 U
Thorium	SW6020	ug/L	NA	< 1.0 U	< 1.0 U	< 1.0 U
Uranium	SW6020	ug/L	NA	< 1.0 U	< 1.0 U	< 1.0 U
Vanadium	SW6020	ug/L	NA	< 1.0 U	< 1.0 U	< 1.0 U
Aluminum	SW6010B	ug/L	NA	< 200 U	< 200 U	< 200 U
Barium	SW6010B	ug/L	NA	< 10.0 U	**0.58 J**	< 10.0 U
Boron	SW6010B	ug/L	NA	< 100 U	< 100 U	< 100 U
Calcium	SW6010B	ug/L	NA	**413 J**	**232 J**	< 500 U
Cobalt	SW6010B	ug/L	NA	< 5.0 U	< 5.0 U	< 5.0 U
Iron	SW6010B	ug/L	NA	**26.2 J**	< 50.0 U	< 50.0 U
Lithium	SW6010B	ug/L	NA	< 20.0 U	< 20.0 U	< 20.0 U
Magnesium	SW6010B	ug/L	NA	**172 J**	**57.9 J**	< 500 U
Manganese	SW6010B	ug/L	NA	< 5.0 U	< 5.0 U	< 5.0 U
Molybdenum	SW6010B	ug/L	NA	< 10.0 U	< 10.0 U	< 10.0 U
Nickel	SW6010B	ug/L	NA	< 10.0 U	< 10.0 U	< 10.0 U
Potassium	SW6010B	ug/L	NA	< 1,000 U	< 1,000 U	< 1,000 U
Silicon	SW6010B	ug/L	NA	< 200 U	< 200 U	**26.7 J**
Sodium	SW6010B	ug/L	NA	< 1,000 U	< 1,000 U	< 1,000 U
Strontium	SW6010B	ug/L	NA	< 10.0 U	< 10.0 U	< 10.0 U
Tin	SW6010B	ug/L	NA	< 10.0 U	< 10.0 U	< 10.0 U
Titanium	SW6010B	ug/L	NA	**0.78 J**	< 10.0 U	< 10.0 U
Zinc	SW6010B	ug/L	NA	< 20.0 U	< 20.0 U	< 20.0 U
Mercury	SW7470A	ug/L	NA	< 0.20 U	< 0.20 U	< 0.20 U
Metals, Total						
Chromium (VI)	SW7199	ug/L	< 0.100 U	NA	NA	NA
Radiochemistry, Dissolved						
Radium-226	E903.1	pCi/L	NA	-0.0563 ± 0.259 (0.446) U	-0.0619 ± 0.384 (0.623) U	0.382 ± 0.397 (0.591) U
Radium-228	E904.0	pCi/L	NA	-0.0451 ± 0.394 (0.921) U	0.189 ± 0.349 (0.764) U	0.313 ± 0.340 (0.710) U
Radium-226/228	CALC	pCi/L	NA	0 ± 0.653 (1.37) U	0.189 ± 0.733 (1.39) U	0.695 ± 0.737 (1.30) U
Thorium-228	HASL300	pCi/L	NA	0.045 ± 0.131 (0.287) U	0.023 ± 0.092 (0.216) U	-0.024 ± 0.101 (0.264) U
Thorium-230	HASL300	pCi/L	NA	0.005 ± 0.062 (0.109) U	-0.006 ± 0.063 (0.092) U	**0.174 ± 0.111 (0.107)**
Thorium-232	HASL300	pCi/L	NA	0.016 ± 0.062 (0.044) U	0 ± 0.063 (0.045) U	0.042 ± 0.061 (0.088) U
Uranium-234	HASL300	pCi/L	NA	**0.132 ± 0.093 (0.084)**	**0.221 ± 0.125 (0.106)**	**0.153 ± 0.104 (0.106)**
Uranium-235	HASL300	pCi/L	NA	**0.080 ± 0.079 (0.054)**	0.114 ± 0.101 (0.114) U	0.076 ± 0.084 (0.114) U
Uranium-238	HASL300	pCi/L	NA	0.032 ± 0.058 (0.111) U	0.029 ± 0.060 (0.088) U	0.042 ± 0.060 (0.088) U

Notes and definitions are presented on Page 2

Table 15: 2020 Field Quality Control Data - Notes
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

Notes:
ug/L = micrograms per liter
mg/L = milligrams per liter
pCi/L = picocuries per liter
Bold = Detected
NA = Not Available
Radiochemistry data is shown in the following format: activity ± total uncertainty (minimum detectable concentration) qualifiers

QualifierDefinition
J = Estimated concentration.
U = The analyte was analyzed for but was not detected at or above the referenced reporting limit or minimum detectable concentration.

Notes and definitions are presented on Page 2

Table 16: 2020 Field Quality Control Data - Trip Blanks West
Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

Sample ID			TB-001-WQ-20201103	TB-002-WQ-20201104	TB-003-WQ-20201105	TB-004-WQ-20201105	TB-005-WQ-20201106	TB-006-WQ-20201109	TB-007-WQ-20201110	TB-008-WQ-20201110	TB-009-WQ-20201111	TB-010-WQ-20201112	TB-011-WQ-20201113	TB-013-WQ-20201120	TB-014-WQ-20201123	TB-015-WQ-20201124	TB-016-WQ-20201130	TB-017-WQ-20201201	TB-018-WQ-20201202	TB-019-WQ-20201203	TB-020-WQ-20201204	TB-020-WQ-20201208
Sample Type			TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB
Sample Date			11/03/2020	11/04/2020	11/05/2020	11/05/2020	11/06/2020	11/09/2020	11/10/2020	11/10/2020	11/11/2020	11/12/2020	11/13/2020	11/20/2020	11/23/2020	11/24/2020	11/30/2020	12/01/2020	12/02/2020	12/03/2020	12/04/2020	12/08/2020
Analyte	**Analytic Method**	**Unit**																				
Petroleum Hydrocarbons,Total																						
C12-C28-Total	TCEQ-TX-1005	ug/L	< 954 U	< 909 U	< 918 U	< 918 U	< 900 U	< 909 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 936 U	< 909 U	< 900 U	< 900 U	< 945 UJ
C28-C35-Total	TCEQ-TX-1005	ug/L	< 954 U	< 909 U	< 918 U	< 918 U	< 900 U	< 909 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 936 U	< 909 U	< 900 U	< 900 U	< 945 UJ
C6-C12-Total	TCEQ-TX-1005	ug/L	< 954 U	< 909 U	< 918 U	< 918 U	< 900 U	< 909 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 936 U	< 909 U	< 900 U	< 900 U	< 945 UJ
C6-C35-Total	TCEQ-TX-1005	ug/L	< 954 U	< 909 U	< 918 U	< 918 U	< 900 U	< 909 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 900 U	< 936 U	< 909 U	< 900 U	< 900 U	< 945 UJ
C10-C12-Aliphatics	TCEQ-TX-1006	ug/L	< 1,060 U	< 1,010 U	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 UJ	< 1,010 UJ	< 1,000 U	< 1,000 U	< 1,050 UJ
C10-C12-Aromatics	TCEQ-TX-1006	ug/L	< 1,060 U	< 1,010 U	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 UJ	< 1,010 UJ	< 1,000 U	< 1,000 U	< 1,050 UJ
C12-C16-Aliphatics	TCEQ-TX-1006	ug/L	< 1,060 U	< 1,010 U	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 UJ	< 1,010 UJ	< 1,000 U	< 1,000 U	< 1,050 UJ
C12-C16-Aromatics	TCEQ-TX-1006	ug/L	< 1,060 U	< 1,010 U	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 UJ	< 1,010 UJ	< 1,000 U	< 1,000 U	< 1,050 UJ
C16-C21-Aliphatics	TCEQ-TX-1006	ug/L	< 1,060 U	< 1,010 U	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 UJ	< 1,010 UJ	< 1,000 U	< 1,000 U	< 1,050 UJ
C16-C21-Aromatics	TCEQ-TX-1006	ug/L	< 1,060 U	< 1,010 U	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 UJ	< 1,010 UJ	< 1,000 U	< 1,000 U	< 1,050 UJ
C21-C35-Aliphatics	TCEQ-TX-1006	ug/L	< 2,120 U	< 2,020 U	< 2,040 U	< 2,040 U	< 2,000 U	< 2,020 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,080 UJ	< 2,020 UJ	< 2,000 U	< 2,000 U	< 2,100 UJ
C21-C35-Aromatics	TCEQ-TX-1006	ug/L	< 2,120 U	< 2,020 U	< 2,040 U	< 2,040 U	< 2,000 U	< 2,020 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,000 U	< 2,080 UJ	< 2,020 UJ	< 2,000 U	< 2,000 U	< 2,100 UJ
C6-Aliphatics	TCEQ-TX-1006	ug/L	< 1,060 U	< 1,010 U	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 UJ	< 1,010 UJ	< 1,000 U	< 1,000 U	< 1,050 UJ
C6-C8-Aliphatics	TCEQ-TX-1006	ug/L	< 1,060 U	< 1,010 U	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 UJ	< 1,010 UJ	< 1,000 U	< 1,000 U	< 1,050 UJ
C7-C8-Aromatics	TCEQ-TX-1006	ug/L	< 1,060 U	< 1,120 U	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 UJ	< 1,010 UJ	< 1,000 U	< 1,000 U	< 1,050 UJ
C8-C10-Aliphatics	TCEQ-TX-1006	ug/L	< 1,060 U	< 1,010 U	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 UJ	< 1,010 UJ	< 1,000 U	< 1,000 U	< 1,050 UJ
C8-C10-Aromatics	TCEQ-TX-1006	ug/L	< 1,060 U	< 1,010 U	< 1,020 U	< 1,020 U	< 1,000 U	< 1,010 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,000 U	< 1,040 UJ	< 1,010 UJ	< 1,000 U	< 1,000 U	< 1,050 UJ
Volatile Organic Compounds, Total																						
1,1,1,2-Tetrachloroethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,1-Trichloroethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113)	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloropropene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichlorobenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichloropropane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	SW8260C	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dichlorobenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloropropane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	SW8260C	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,3-Dichlorobenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3-Dichloropropane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dioxane	SW8260C	ug/L	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ
2,2-Dichloropropane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Butanone	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
2-Hexanone	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
4-Chlorotoluene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Isopropyltoluene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Methyl-2-pentanone	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetone	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetonitrile	SW8260C	ug/L	< 100 R	< 100 R	< 100 R	< 100 R	< 100 R	< 100 R	< 100 R	< 100 R	< 100 R	< 100 R	< 100 R	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 U	< 100 U	< 100 U
Acrolein	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 UJ	< 20.0 U
Acrylonitrile	SW8260C	ug/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Allyl chloride	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U
Benzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
beta-Chloroprene	SW8260C	ug/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 UJ	< 100 U	< 100 UJ	< 100 UJ	< 100 U
Bromobenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromodichloromethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromoform	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	SW8260C	ug/L	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ
Carbon disulfide	SW8260C	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon tetrachloride	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobromomethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroethane	SW8260C	ug/L	< 2.0 U	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 U
Chloroform	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloromethane	SW8260C	ug/L	< 2.0 U	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 U
cis-1,2-Dichloroethene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 U	< 1.0 UJ	< 1.0 U
cis-1,3-Dichloropropene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Cyclohexane	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Dibromochloromethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dibromomethane	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichlorodifluoromethane (Freon 12)	SW8260C	ug/L	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Ethyl ether	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Ethyl methacrylate	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Ethylbenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Hexachlorobutadiene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isobutyl alcohol	SW8260C	ug/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 UJ	< 100 U	< 100 UJ	< 100 U	< 100 UJ	< 100 U	< 100 UJ	< 100 U

Table 16: 2020 Field Quality Control Data - Trip Blanks West
Lake Landfill OU-3
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Sample ID			TB-001-WQ-20201103	TB-002-WQ-20201104	TB-003-WQ-20201105	TB-004-WQ-20201105	TB-005-WQ-20201106	TB-006-WQ-20201109	TB-007-WQ-20201110	TB-008-WQ-20201110	TB-009-WQ-20201111	TB-010-WQ-20201112	TB-011-WQ-20201113	TB-013-WQ-20201120	TB-014-WQ-20201123	TB-015-WQ-20201124	TB-016-WQ-20201130	TB-017-WQ-20201201	TB-018-WQ-20201202	TB-019-WQ-20201203	TB-020-WQ-20201204	TB-020-WQ-20201208
Sample Type			TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB
Sample Date			11/03/2020	11/04/2020	11/05/2020	11/05/2020	11/06/2020	11/09/2020	11/10/2020	11/10/2020	11/11/2020	11/12/2020	11/13/2020	11/20/2020	11/23/2020	11/24/2020	11/30/2020	12/01/2020	12/02/2020	12/03/2020	12/04/2020	12/08/2020
Analyte	**Analytic Method**	**Unit**																				
Isopropylbenzene (Cumene)	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
m,p-Xylenes	SW8260C	ug/L	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 UJ	< 2.0 U
Methacrylonitrile	SW8260C	ug/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Methyl acetate	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl iodide	SW8260C	ug/L	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ	< 5.0 UJ
Methyl methacrylate	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl tert-butyl ether	SW8260C	ug/L	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U
Methylcyclohexane	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methylene chloride	SW8260C	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Butylbenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Hexane	SW8260C	ug/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 UJ	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Propylbenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Chlorotoluene (2-chlorotoluene)	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Xylene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Propionitrile	SW8260C	ug/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 U	< 100 U	< 100 U
sec-Butylbenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Styrene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Toluene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,2-Dichloroethene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-Dichloropropene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,4-Dichlorobutene	SW8260C	ug/L	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 U	< 100 UJ	< 100 U
Trichloroethene	SW8260C	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichlorofluoromethane (Freon 11)	SW8260C	ug/L	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Vinyl acetate	SW8260C	ug/L	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 UJ	< 20.0 U
Vinyl chloride	SW8260C	ug/L	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Xylene, Total	SW8260C	ug/L	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U
1,2-Dibromo-3-chloropropane	SW8011	ug/L	< 0.036 U	< 0.037 U	< 0.037 U	< 0.036 U	< 0.035 U	< 0.036 U	< 0.037 U	< 0.036 U	< 0.035 U	< 0.036 U	< 0.035 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.035 U	< 0.036 U	< 0.034 UJ	< 0.035 U	< 0.035 U	< 0.036 U
Ethylene dibromide	SW8011	ug/L	< 0.036 U	< 0.037 U	< 0.037 U	< 0.036 U	< 0.035 U	< 0.036 U	< 0.037 U	< 0.036 U	< 0.035 U	< 0.036 U	< 0.035 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.035 U	< 0.036 U	< 0.034 U	< 0.035 U	< 0.035 U	< 0.036 U

Notes:
ug/L = micrograms per liter
mg/L = milligrams per liter
pCi/L = picocuries per liter
Bold = Detected
NA = Not Available
Radiochemistry data is shown in the following format: activity ± total uncertainty (minimum detectable concentration) qualifiers

QualifierDefinition
R = Rejected, data not usable.
U = The analyte was analyzed for but was not detected at or above the referenced reporting limit or minimum detectable concentration.
UJ = The analyte was analyzed for, but was not detected. The reporting limit or minimum detectable concentration is approximate and may be inaccurate or imprecise.

Table 17a: APS-001 and PZ-302-AS and PZ-302-AI Comparsion
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Analyte	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1	Sample Location	PZ-302-AS	APS-001	APS-001	APS-001	APS-001	PZ-302-AI	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001
				Sample Depth (ft BGS)	12.2 - 22	15 - 15.1	19 - 19.1	25 - 25.1	30 - 30.1	32.6 - 42.4	35 - 35.1	40 - 40.1	45 - 45.1	50 - 50.1	55 - 55.1	60 - 60.1	65 - 65.1	70 - 70.1	75 - 75.1	80 - 80.1	85 - 85.1	87.1 - 87.2
				Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
				Sample Date	11-30-2020	12-19-2020	12-19-2020	12-19-2020	12-19-2020	12-01-2020	12-20-2020	12-20-2020	12-20-2020	12-20-2020	12-20-2020	12-20-2020	12-20-2020	12-21-2020	12-21-2020	12-21-2020	12-21-2020	12-21-2020
Field Water Quality Parameters																					
Dissolved Oxygen, Field	ppm	NE	NE		0.15	1.32	1.44	1.51	1.74	0.24	2.98	1.46	0.98	1.12	0.97	1.03	1.12	6.78	2.95	1.62	1.47	5
Oxidation-Reduction Potential, Field	mV	NE	NE		-81.8	-88	-150	-146	-140	-3.2	19	28	-91	-120	-158	-156	-144	-85	-96	-130	-148	-155
pH, Field	SU	NE	NE		6.42	6.01	6.05	6	6.12	6.38	6.7	5.91	6.1	6.17	6.14	6.09	5.96	6.22	5.82	5.9	5.96	6.23
Specific Conductivity	uS/cm	NE	NE		1,455	1,374	1,510	1,720	1,660	1,561	270	1,590	1,770	1,860	1,960	2,170	2,520	3,370	5,610	6,540	6,880	2,940
Metals, Dissolved																						
Barium	ug/L	2,000	380		405	537	593	811	920	501	899	628	523	563	538	421	573	798	1,850	2,060	1,730	2,220
Calcium	ug/L	NE	NE		161,000	142,000	143,000	192,000	202,000	222,000	164,000	211,000	213,000	197,000	238,000	264,000	296,000	341,000	462,000	480,000	477,000	518,000
Iron	ug/L	NE	1,400		37,100	89,900	57,100	30,700	5,500	4,170	1,030	35,000	5,920	65,900	37,000	17,300	41,200	47,200	105,000	118,000	81,500	64,800
Magnesium	ug/L	NE	NE		56,400	45,800	52,800	61,500	73,000	57,500	47,600	62,000	60,000	68,000	63,500	68,500	74,600	94,800	141,000	145,000	150,000	149,000
Manganese	ug/L	NE	43		2,140	4,920	1,530	3,630	1,420	377	245	5,900	6,910	4,010	2,300	5,350	3,970	7,130	3,240	3,090	5,650	5,330
Volatile Organic Compounds, Total																						
1,1,1,2-Tetrachloroethane	ug/L	NE	0.57		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,1-Trichloroethane	ug/L	200	800		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane	ug/L	NE	0.076		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113)	ug/L	NE	1,000		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	ug/L	5	0.041		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	ug/L	NE	2.8		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	ug/L	7	28		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloropropene	ug/L	NE	NE		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichlorobenzene	ug/L	NE	0.7		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichloropropane	ug/L	NE	0.00075		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	ug/L	70	0.4		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	ug/L	NE	5.6		0.31 J	< 25.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	0.37 J	< 5.0 U	0.13 J	0.11 J	< 5.0 U	< 5.0 U	< 5.0 U	0.35 J	0.67 J	0.18 J	< 5.0 U
1,2-Dibromo-3-chloropropane	ug/L	0.2	0.00033			< 50.0 U	< 10.0 U	< 10.0 U	< 10.0 U		< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
1,2-Dichlorobenzene	ug/L	600	30		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	ug/L	5	0.17		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloropropane	ug/L	5	0.82		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	ug/L	NE	6		0.14 J	1.9 J	1.4 J	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	0.13 J	0.12 J	< 5.0 U	< 5.0 U	< 5.0 U	1.1 J	< 5.0 U	< 5.0 U	< 5.0 U
1,3-Dichlorobenzene	ug/L	NE	NE		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3-Dichloropropane	ug/L	NE	37		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	ug/L	75	0.48		8.6	5.9	3.2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	1.0	< 1.0 U	11.8	9.8	0.43 J	0.31 J	< 1.0 U	3.9	4.8	< 1.0 U	< 1.0 U
1,4-Dioxane	ug/L	NE	0.46		< 100 UJ	< 500 U	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	197	284	263	294
2,2-Dichloropropane	ug/L	NE	NE		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Butanone	ug/L	NE	560		< 20.0 U	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
2-Hexanone	ug/L	NE	3.8		< 20.0 U	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
4-Chlorotoluene	ug/L	NE	25		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Isopropyltoluene	ug/L	NE	NE		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Methyl-2-pentanone	ug/L	NE	630		< 20.0 U	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetone	ug/L	NE	1,400		< 20.0 U	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	5.9 J
Acetonitrile	ug/L	NE	13		< 100 U	< 500 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Acrolein	ug/L	NE	0.0042		< 20.0 U	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acrylonitrile	ug/L	NE	0.052		< 100 U	< 500 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Allyl chloride	ug/L	NE	0.21		< 20.0 U	< 100 U,L1	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1	< 20.0 UJ	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U,L1	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Benzene	ug/L	5	0.46		108	271	184	12.4	1.1	< 1.0 U	0.64 J	149	53.4	11.6	129	13.8	63.1	105	756	593	447	189
beta-Chloroprene	ug/L	NE	0.019		< 100 UJ	< 500 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 UJ	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2
Bromobenzene	ug/L	NE	6.2		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromodichloromethane	ug/L	80	0.13		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromoform	ug/L	80	3.3		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	ug/L	NE	0.75		< 5.0 UJ	< 25.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 UJ	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon disulfide	ug/L	NE	81		< 5.0 U	< 25.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	0.19 J	0.22 J	0.15 J	< 5.0 U	0.23 J	0.13 J	0.25 J	0.27 J	0.28 J	< 5.0 U
Carbon tetrachloride	ug/L	5	0.46		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	ug/L	100	7.8		51.9	70.7	40.8	172	0.49 J	< 1.0 U	142	297	326	173	296	56.0	63.9	9.0	64.2	59.1	35.6	6.4
Chlorobromomethane	ug/L	NE	8.3		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroethane	ug/L	NE	2,100		< 2.0 U	< 10.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Chloroform	ug/L	80	0.22		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloromethane	ug/L	NE	19		< 2.0 U	< 10.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
cis-1,2-Dichloroethene	ug/L	70	3.6		< 1.0 U	< 5.0 U	< 1.0 U	0.53 J	1.1	< 1.0 U	0.47 J	0.37 J	0.97 J	0.72 J	1.7	1.1	1.2	0.46 J	0.30 J	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,3-Dichloropropene	ug/L	NE	0.47		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Cyclohexane	ug/L	NE	1,300		< 20.0 U	< 100 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U	< 20.0 U,N2	< 20.0 U,N2	0.26 J,N2	< 20.0 U,N2	0.16 J,N2	< 20.0 U,N2	0.15 J,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Dibromochloromethane	ug/L	80	0.87		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dibromomethane	ug/L	NE	0.83		< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichlorodifluoromethane (Freon 12)	ug/L	NE	20		0.63 J	< 10.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Ethyl ether	ug/L	NE	390		7.4 J	4.3 J	5.1 J	24.2	14.1 J	10.7 J	14.6 J	19.5 J	72.7	48.5	70.9	20.2	47.0	27.7	40.5	36.4	32.9	25.5

Table 17a: APS-001 and PZ-302-AS and PZ-302-AI Comparsion
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			Sample Location	PZ-302-AS	APS-001	APS-001	APS-001	APS-001	PZ-302-AI	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001	APS-001
			Sample Depth (ft BGS)	12.2 - 22	15 - 15.1	19 - 19.1	25 - 25.1	30 - 30.1	32.6 - 42.4	35 - 35.1	40 - 40.1	45 - 45.1	50 - 50.1	55 - 55.1	60 - 60.1	65 - 65.1	70 - 70.1	75 - 75.1	80 - 80.1	85 - 85.1	87.1 - 87.2
			Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
			Sample Date	11-30-2020	12-19-2020	12-19-2020	12-19-2020	12-19-2020	12-01-2020	12-20-2020	12-20-2020	12-20-2020	12-20-2020	12-20-2020	12-20-2020	12-20-2020	12-21-2020	12-21-2020	12-21-2020	12-21-2020	12-21-2020
Ethyl methacrylate	ug/L	NE	63	< 20.0 U	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Ethylbenzene	ug/L	700	1.5	< 1.0 U	< 5.0 U	< 1.0 U	**0.38 J**	< 1.0 U	< 1.0 U	**0.48 J**	**25.0**	**0.28 J**	**0.11 J**	**0.70 J**	< 1.0 U	**0.24 J**	< 1.0 U	**2.8**	**4.4**	**4.2**	**0.29 J**
Ethylene dibromide	ug/L	0.05	0.0075		< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Hexachlorobutadiene	ug/L	NE	0.14	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isobutyl alcohol	ug/L	NE	590	< 100 UJ	< 500 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 UJ	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2
Isopropylbenzene (Cumene)	ug/L	NE	45	**3.8**	**3.7 J**	**2.6**	**0.93 J**	< 1.0 U	< 1.0 U	< 1.0 U	**3.5**	**0.46 J**	**1.6**	**3.2**	< 1.0 U	**0.78 J**	< 1.0 U	**4.2**	**4.6**	**1.4**	< 1.0 U
m,p-Xylenes	ug/L	NE	19	**0.39 J**	< 10.0 U	< 2.0 U	**1.3 J**	< 2.0 U	< 2.0 U	< 2.0 U	**16.3**	**3.6**	**2.0**	**6.0**	< 2.0 U	**0.28 J**	< 2.0 U	**3.2**	**4.6**	**1.2 J**	< 2.0 U
Methacrylonitrile	ug/L	NE	0.19	< 100 U	< 500 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Methyl acetate	ug/L	NE	2,000	< 20.0 U	< 100 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Methyl iodide	ug/L	NE	NE	< 5.0 UJ	< 25.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 UJ	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Methyl methacrylate	ug/L	NE	140	< 20.0 U	< 100 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl tert-butyl ether	ug/L	NE	14	**0.11 J**	< 20.0 U	< 4.0 U	**0.74 J**	< 4.0 U	< 4.0 U	**0.78 J**	**0.81 J**	**4.8**	**4.1**	**7.0**	**2.3 J**	**8.1**	**6.3**	**11.3**	**10.3**	**8.3**	**6.3**
Methylcyclohexane	ug/L	NE	NE	< 20.0 U	< 100 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Methylene chloride	ug/L	5	11	< 5.0 U	< 25.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Butylbenzene	ug/L	NE	100	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Hexane	ug/L	NE	150	< 5.0 U	< 25.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Propylbenzene	ug/L	NE	66	**0.89 J**	< 5.0 U	**0.77 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.94 J**	**1.1**	**0.26 J**	< 1.0 U
o-Chlorotoluene (2-chlorotoluene)	ug/L	NE	24	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Xylene	ug/L	NE	19	**0.43 J**	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.31 J**	**15.7**	**0.36 J**	**0.87 J**	**0.53 J**	< 1.0 U	**0.27 J**	**0.077 J**	**9.8**	**13.5**	**2.9**	**0.19 J**
Propionitrile	ug/L	NE	NE	< 100 U	< 500 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
sec-Butylbenzene	ug/L	NE	200	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Styrene	ug/L	100	120	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	ug/L	NE	69	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	ug/L	5	4.1	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Toluene	ug/L	1,000	110	**0.29 J**	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**3.2**	**0.58 J**	**1.1**	**1.2**	**0.44 J**	**2.1**	**0.76 J**	**13.5**	**17.6**	**13.3**	**3.1**
trans-1,2-Dichloroethene	ug/L	100	6.8	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.13 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-Dichloropropene	ug/L	NE	0.47	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,4-Dichlorobutene	ug/L	NE	0.0013	< 100 UJ	< 500 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Trichloroethene	ug/L	5	0.28	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.26 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichlorofluoromethane (Freon 11)	ug/L	NE	520	< 2.0 U	< 10.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Vinyl acetate	ug/L	NE	41	< 20.0 UJ	< 100 U,L2	< 20.0 U,L2	< 20.0 U,L2	< 20.0 U,L2	< 20.0 UJ	< 20.0 U,L2	< 20.0 U,L2	< 20.0 U,L2	< 20.0 U,L2	< 20.0 U,L2	< 20.0 U,L2	< 20.0 U,L2	< 20.0 U,L2	< 20.0 U,L2	< 20.0 U,L2	< 20.0 U,L2	< 20.0 U,L2
Vinyl chloride	ug/L	2	0.019	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.26 J**	< 1.0 U	**0.46 J**	< 1.0 U
Xylene, Total	ug/L	10,000	19	**0.82 J**	< 15.0 U	**0.53 J**	**1.3 J**	< 3.0 U	< 3.0 U	**0.42 J**	**32.0**	**3.9**	**2.9 J**	**6.6**	**0.43 J**	**0.55 J**	**0.19 J**	**12.9**	**18.2**	**4.2**	**0.28 J**

Notes:
ft BGS = feet below ground surface
ppm = parts per million
mV = millivolts
SU = standard units
uS/cm = microSiemens per centimeter
ml = milliliter
ug/L = micrograms per liter
Bold = Detected
USEPA Primary MCL = USEPA Primary Maximum Contaminant Level
USEPA RSL TAPWATER THQ0.1 = RSL TAPWATER (TR=1E-06, THQ=0.1) May 2021
Blue Font = Exceeds USEPA Primary MCL
Orange Shaded = Exceeds USEPA RSL TAPWATER THQ0.1

Qualifier Definition
J = Estimated concentration.
L1 = Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
L2 = Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
N2 = The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply.
U = The analyte was analyzed for but was not detected at or above the referenced reporting limit.
UJ = The analyte was analyzed for, but was not detected. The reporting limit is approximate and may be inaccurate or imprecise.

Table 17b: APS-002 and PZ-303-AS Comparsion
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

			Sample Location	PZ-303-AS	APS-002	APS-002	APS-002	APS-002	APS-002	APS-002	APS-002	APS-002	APS-002	APS-002	APS-002	APS-002	APS-002
			Sample Depth (ft BGS)	16 - 25.8	25 - 25.1	30 - 30.1	33 - 33.1	40 - 40.1	45 - 45.1	50 - 50.1	55 - 55.1	60 - 60.1	65 - 65.1	70 - 70.1	75 - 75.1	80 - 80.1	81 - 81.1
			Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N
			Sample Date	12-04-2020	12-17-2020	12-17-2020	12-17-2020	12-17-2020	12-17-2020	12-17-2020	12-17-2020	12-17-2020	12-17-2020	12-18-2020	12-18-2020	12-18-2020	12-18-2020
Analyte	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1														
Field Water Quality Parameters																	
Dissolved Oxygen, Field	ppm	NE	NE	**0.09**	**1.08**	**0.88**	**0.89**	**0.92**	**1.03**	**0.92**	**1.01**	**1.09**	**1.49**	**1.14**	**1.92**	**1.71**	**2.29**
Oxidation-Reduction Potential, Field	mV	NE	NE	**-98.3**	**-57**	**-187**	**-205**	**-192**	**-196**	**-198**	**-199**	**-196**	**-185**	**-144**	**-193**	**-192**	**-196**
pH, Field	SU	NE	NE	**6.59**	**6.3**	**6.42**	**6.51**	**6.41**	**6.4**	**6.35**	**6.44**	**6.4**	**6.37**	**6.43**	**6.47**	**6.47**	**6.42**
Specific Conductivity	uS/cm	NE	NE	**1,847**	**1,960**	**2,190**	**1,990**	**2,240**	**2,310**	**2,400**	**2,300**	**2,270**	**2,150**	**2,370**	**2,160**	**2,180**	**2,000**
Metals, Dissolved																	
Barium	ug/L	2,000	380	**672**	**998**	**780**	**870**	**708**	**855**	**822**	**731**	**796**	**840**	**1,010**	**880**	**1,000**	**919**
Calcium	ug/L	NE	NE	**244,000**	**197,000**	**229,000**	**285,000**	**247,000**	**268,000**	**270,000**	**242,000**	**237,000**	**238,000**	**261,000**	**254,000**	**249,000**	**226,000**
Iron	ug/L	NE	1,400	**72,700**	**71,300**	**60,900**	**39,200**	**43,200**	**42,600**	**31,900**	**40,800**	**35,700**	**37,800**	**47,100**	**37,500**	**42,100**	**43,000**
Magnesium	ug/L	NE	NE	**59,400**	**67,200**	**71,600**	**70,300**	**69,500**	**69,500**	**69,500**	**65,800**	**69,900**	**72,100**	**75,700**	**67,600**	**66,500**	**60,000**
Manganese	ug/L	NE	43	**1,450**	**478**	**3,080**	**2,450**	**1,600**	**1,970**	**1,210**	**984**	**954**	**965**	**905**	**780**	**853**	**832**
Volatile Organic Compounds, Total																	
1,1,1,2-Tetrachloroethane	ug/L	NE	0.57	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,1-Trichloroethane	ug/L	200	800	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane	ug/L	NE	0.076	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113)	ug/L	NE	1,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	ug/L	5	0.041	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	ug/L	NE	2.8	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.67 J**	< 1.0 U	**0.50 J**	**0.54 J**	**0.79 J**	**0.76 J**	**0.49 J**	**0.43 J**
1,1-Dichloroethene	ug/L	7	28	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloropropene	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichlorobenzene	ug/L	NE	0.7	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichloropropane	ug/L	NE	0.00075	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	ug/L	70	0.4	**5.4**	**3.0**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	ug/L	NE	5.6	**139**	**1.5 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dibromo-3-chloropropane	ug/L	0.2	0.00033		< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
1,2-Dichlorobenzene	ug/L	600	30	**2.3**	**1.0 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	ug/L	5	0.17	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloropropane	ug/L	5	0.82	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	ug/L	NE	6	**59.4**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,3-Dichlorobenzene	ug/L	NE	NE	**2.7**	**1.3**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3-Dichloropropane	ug/L	NE	37	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	ug/L	75	0.48	**0.42 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.27 J**	**0.69 J**	< 1.0 U	< 1.0 U	**0.34 J**	**0.38 J**	**0.36 J**	**0.42 J**
1,4-Dioxane	ug/L	NE	0.46	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
2,2-Dichloropropane	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Butanone	ug/L	NE	560	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
2-Hexanone	ug/L	NE	3.8	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
4-Chlorotoluene	ug/L	NE	25	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Isopropyltoluene	ug/L	NE	NE	**4.6**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Methyl-2-pentanone	ug/L	NE	630	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetone	ug/L	NE	1,400	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetonitrile	ug/L	NE	13	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Acrolein	ug/L	NE	0.0042	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acrylonitrile	ug/L	NE	0.052	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Allyl chloride	ug/L	NE	0.21	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1
Benzene	ug/L	5	0.46	**39.2**	**23.3**	**25.3**	**15.2**	**7.9**	**5.7**	**6.1**	< 1.0 U	**2.0**	**3.4**	**5.9**	**1.0**	**0.45 J**	**0.37 J**
beta-Chloroprene	ug/L	NE	0.019	< 100 U	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2
Bromobenzene	ug/L	NE	6.2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromodichloromethane	ug/L	80	0.13	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromoform	ug/L	80	3.3	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	ug/L	NE	0.75	< 5.0 UJ	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon disulfide	ug/L	NE	81	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	**0.26 J**	**0.29 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon tetrachloride	ug/L	5	0.46	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	ug/L	100	7.8	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.48 J**	**0.53 J**	**0.46 J**	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobromomethane	ug/L	NE	8.3	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U

Notes and definition are presented on Page 2

Table 17b: APS-002 and PZ-303-AS Comparsion
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			Sample Location	PZ-303-AS	APS-002	APS-002	APS-002	APS-002	APS-002	APS-002	APS-002	APS-002	APS-002	APS-002	APS-002	APS-002	APS-002
			Sample Depth (ft BGS)	16 - 25.8	25 - 25.1	30 - 30.1	33 - 33.1	40 - 40.1	45 - 45.1	50 - 50.1	55 - 55.1	60 - 60.1	65 - 65.1	70 - 70.1	75 - 75.1	80 - 80.1	81 - 81.1
			Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N
			Sample Date	12-04-2020	12-17-2020	12-17-2020	12-17-2020	12-17-2020	12-17-2020	12-17-2020	12-17-2020	12-17-2020	12-17-2020	12-18-2020	12-18-2020	12-18-2020	12-18-2020
Chloroethane	ug/L	NE	2,100	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Chloroform	ug/L	80	0.22	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloromethane	ug/L	NE	19	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
cis-1,2-Dichloroethene	ug/L	70	3.6	**1.3**	< 1.0 U	< 1.0 U	< 1.0 U	**18.1**	**23.7**	**16.6**	**9.3**	**10.6**	**14.3**	**21.4**	**14.4**	**9.1**	**8.3**
cis-1,3-Dichloropropene	ug/L	NE	0.47	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Cyclohexane	ug/L	NE	1,300	**10.8 J**	**4.1 J,N2**	**6.8 J,N2**	**3.9 J,N2**	**0.88 J,N2**	**1.4 J,N2**	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Dibromochloromethane	ug/L	80	0.87	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dibromomethane	ug/L	NE	0.83	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichlorodifluoromethane (Freon 12)	ug/L	NE	20	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Ethyl ether	ug/L	NE	390	**23.4**	**31.6**	**29.5**	**22.1**	**11.0 J**	**15.0 J**	**13.8 J**	**9.7 J**	**9.5 J**	**11.4 J**	**13.0 J**	**9.6 J**	**8.2 J**	**7.5 J**
Ethyl methacrylate	ug/L	NE	63	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Ethylbenzene	ug/L	700	1.5	**7.1**	**4.9**	**0.20 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Ethylene dibromide	ug/L	0.05	0.0075		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Hexachlorobutadiene	ug/L	NE	0.14	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isobutyl alcohol	ug/L	NE	590	< 100 U	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2
Isopropylbenzene (Cumene)	ug/L	NE	45	**2.9**	**5.2**	**5.1**	**0.90 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
m,p-Xylenes	ug/L	NE	19	**154**	**17.5**	**1.4 J**	**0.50 J**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Methacrylonitrile	ug/L	NE	0.19	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Methyl acetate	ug/L	NE	2,000	< 20.0 U	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Methyl iodide	ug/L	NE	NE	< 5.0 UJ	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Methyl methacrylate	ug/L	NE	140	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl tert-butyl ether	ug/L	NE	14	**0.42 J**	**0.51 J**	**0.46 J**	**0.31 J**	**0.092 J**	**0.13 J**	**0.23 J**	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U
Methylcyclohexane	ug/L	NE	NE	**4.1 J**	**0.65 J,N2**	**0.73 J,N2**	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Methylene chloride	ug/L	5	11	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Butylbenzene	ug/L	NE	100	< 1.0 U	**1.2**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Hexane	ug/L	NE	150	**1.1 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Propylbenzene	ug/L	NE	66	**4.2**	**5.8**	**2.1**	**0.15 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Chlorotoluene (2-chlorotoluene)	ug/L	NE	24	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Xylene	ug/L	NE	19	**51.7**	**4.1**	**0.14 J**	**0.089 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Propionitrile	ug/L	NE	NE	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
sec-Butylbenzene	ug/L	NE	200	**1.3**	**2.0**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Styrene	ug/L	100	120	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	ug/L	NE	69	< 1.0 U	**0.99 J,L1**	< 1.0 U,L1	**0.19 J,L1**	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	ug/L	5	4.1	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Toluene	ug/L	1,000	110	**8.9**	**6.0**	**0.62 J**	**0.30 J**	**0.21 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,2-Dichloroethene	ug/L	100	6.8	**0.51 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.53 J**	< 1.0 U	< 1.0 U	**0.49 J**	**0.58 J**	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-Dichloropropene	ug/L	NE	0.47	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,4-Dichlorobutene	ug/L	NE	0.0013	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Trichloroethene	ug/L	5	0.28	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichlorofluoromethane (Freon 11)	ug/L	NE	520	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Vinyl acetate	ug/L	NE	41	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U,L2	< 20.0 U,L2	< 20.0 U,L2	< 20.0 U,L2	< 20.0 U,L2	< 20.0 U,L2	< 20.0 U,L2	< 20.0 U,L2
Vinyl chloride	ug/L	2	0.019	**2.5**	< 1.0 U	< 1.0 U	< 1.0 U	**12.6**	**9.8**	**4.7**	**1.5**	**1.3**	**1.8**	**5.1**	**2.6**	**1.1**	**0.97 J**
Xylene, Total	ug/L	10,000	19	**206**	**21.6**	**1.5 J**	**0.59 J**	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U

Notes:
ft BGS = feet below ground surface
ppm = parts per million
mV = millivolts
SU = standard units
uS/cm = microSiemens per centimeter
ml = milliliter
ug/L = micrograms per liter
Bold = Detected
USEPA Primary MCL = USEPA Primary Maximum Contaminant Level
USEPA RSL TAPWATER THQ0.1 = RSL TAPWATER (TR=1E-06, THQ=0.1) May 2021
Blue Font = Exceeds USEPA Primary MCL
Orange Shaded = Exceeds USEPA RSL TAPWATER THQ0.1

Qualifier Definition
J = Estimated concentration.
L1 = Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
L2 = Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
N2 = The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply.
U = The analyte was analyzed for but was not detected at or above the referenced reporting limit.
UJ = The analyte was analyzed for, but was not detected. The reporting limit is approximate and may be inaccurate or imprecise.

Table 17c: APS-003 and PZ-304-AS and PZ-304-AI Comparsion
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			Sample Location	PZ-304-AS	APS-003	APS-003	APS-003	PZ-304-AI	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003
			Sample Depth (ft BGS)	17.1 - 26.9	23.1 - 23.2	30 - 30.1	35.2 - 35.3	39 - 48.8	40 - 40.1	45 - 45.1	50 - 50.1	55 - 55.1	60 - 60.1	65 - 65.1	70 - 70.1	75 - 75.1	80 - 80.1	85 - 85.1	90 - 90.1	95 - 95.1	100 - 100.1	105 - 105.1	113 - 113.1	117 - 117.1	121 - 121.1	125 - 125.1
			Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
			Sample Date	12-02-2020	12-09-2020	12-09-2020	12-09-2020	12-02-2020	12-14-2020	12-14-2020	12-14-2020	12-14-2020	12-14-2020	12-14-2020	12-14-2020	12-15-2020	12-15-2020	12-15-2020	12-15-2020	12-15-2020	12-15-2020	12-15-2020	12-16-2020	12-16-2020	12-16-2020	12-16-2020
Analyte	**Unit**	**USEPA Primary MCL**	**USEPA RSL TAPWATER THQ0.1**																							
Field Water Quality Parameters																										
Dissolved Oxygen, Field	ppm	NE	NE	**0.1**	**0.84**	**0.48**	**2.98**	**0.33**	**0.93**	**1.08**	**1.14**	**1.21**	**1.23**	**2.13**	**1.31**	**1.18**	**1.31**	**1.41**	**1.32**	**3.67**	**3.09**	**1.57**	**1.82**	**1.34**	**1.18**	**1.32**
Oxidation-Reduction Potential, Field	mV	NE	NE	**-105.1**	**-178**	**-203**	**-190**	**-83.1**	**-90**	**-151**	**-165**	**-175**	**-180**	**-187**	**-177**	**-68**	**-160**	**-174**	**-165**	**-170**	**-157**	**-160**	**22**	**-100**	**-168**	**-170**
pH, Field	SU	NE	NE	**6.63**	**6.33**	**6.5**	**6.45**	**6.75**	**6.09**	**6.26**	**6.35**	**6.41**	**6.41**	**6.53**	**6.44**	**6.4**	**6.41**	**6.4**	**6.36**	**6.35**	**6.42**	**6.44**	**6.46**	**6.45**	**6.53**	**6.45**
Specific Conductivity	uS/cm	NE	NE	**3,299**	**3,690**	**2,980**	**2,770**	**2,490**	**2,550**	**2,480**	**2,600**	**2,570**	**2,690**	**2,750**	**2,810**	**2,360**	**2,310**	**2,380**	**2,270**	**2,350**	**2,270**	**2,350**	**2,380**	**2,980**	**3,450**	**3,780**
Metals, Dissolved																										
Barium	ug/L	2,000	380	**2,700**	**1,400**	**745**	**949**	**1,390**	**1,480**	**1,480**	**2,000**	**1,580**	**1,170**	**1,420**	**1,580**	**65.8**	**44.4**	**72.4**	**98.1**	**127**	**44.0**	**843**	**1,590**	**1,310**	**1,650**	**1,900**
Calcium	ug/L	NE	NE	**67,300**	**190,000**	**234,000**	**210,000**	**257,000**	**241,000**	**254,000**	**263,000**	**251,000**	**258,000**	**259,000**	**266,000**	**124,000**	**103,000**	**115,000**	**135,000**	**125,000**	**103,000**	**257,000**	**289,000**	**292,000**	**304,000**	**329,000**
Iron	ug/L	NE	1,400	**20,200**	**46,800**	**51,200**	**42,100**	**18,700**	**30,500**	**22,700**	**22,400**	**18,200**	**19,900**	**23,200**	**24,800**	< 50.0 U	< 50.0 U	**2,930**	**1,880**	**506**	< 50.0 U	**13,500**	**15,300**	**12,800**	**13,300**	**18,000**
Magnesium	ug/L	NE	NE	**63,400**	**91,500**	**80,400**	**60,300**	**73,700**	**55,100**	**62,400**	**66,400**	**62,600**	**65,100**	**70,800**	**75,500**	**45,900**	**32,700**	**42,200**	**42,400**	**39,600**	**32,700**	**70,600**	**77,100**	**75,600**	**80,500**	**88,200**
Manganese	ug/L	NE	43	**66.4**	**556**	**1,130**	**2,920**	**1,140**	**2,250**	**2,120**	**2,260**	**1,500**	**760**	**2,530**	**1,750**	**7.4**	< 5.0 U	**68.0**	**83.9**	**30.6**	< 5.0 U	**202**	**380**	**232**	**278**	**460**
Volatile Organic Compounds, Total																										
1,1,1,2-Tetrachloroethane	ug/L	NE	0.57	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,1-Trichloroethane	ug/L	200	800	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane	ug/L	NE	0.076	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113)	ug/L	NE	1,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	ug/L	5	0.041	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	ug/L	NE	2.8	< 1.0 U	**0.78 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.80 J**	**1.0**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	ug/L	7	28	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloropropene	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichlorobenzene	ug/L	NE	0.7	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichloropropane	ug/L	NE	0.00075	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	ug/L	70	0.4	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	ug/L	NE	5.6	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dibromo-3-chloropropane	ug/L	0.2	0.00033		< 10.0 U	< 10.0 U	< 10.0 U		< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
1,2-Dichlorobenzene	ug/L	600	30	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	ug/L	5	0.17	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloropropane	ug/L	5	0.82	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	ug/L	NE	6	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,3-Dichlorobenzene	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3-Dichloropropane	ug/L	NE	37	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	ug/L	75	0.48	**24.2**	**1.4**	< 1.0 U	< 1.0 U	**1.1**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dioxane	ug/L	NE	0.46	< 100 UJ	< 100 U	**398**	< 100 U	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U,L1	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U,L1	< 100 U,L1	< 100 U,L1	< 100 U,L1	< 100 U,L1
2,2-Dichloropropane	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Butanone	ug/L	NE	560	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
2-Hexanone	ug/L	NE	3.8	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
4-Chlorotoluene	ug/L	NE	25	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Isopropyltoluene	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Methyl-2-pentanone	ug/L	NE	630	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetone	ug/L	NE	1,400	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetonitrile	ug/L	NE	13	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Acrolein	ug/L	NE	0.0042	< 20.0 U	< 20.0 U,L2	< 20.0 U,L2	< 20.0 U,L2	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acrylonitrile	ug/L	NE	0.052	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Allyl chloride	ug/L	NE	0.21	< 20.0 UJ	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1,M0	< 20.0 UJ	< 20.0 U	< 20.0 U,L1,M0	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1
Benzene	ug/L	5	0.46	**9.9**	**11.2**	**4.6**	**5.2**	**3.0**	**1.5**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
beta-Chloroprene	ug/L	NE	0.019	< 100 U	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2
Bromobenzene	ug/L	NE	6.2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromodichloromethane	ug/L	80	0.13	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromoform	ug/L	80	3.3	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	ug/L	NE	0.75	< 5.0 UJ	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 UJ	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon disulfide	ug/L	NE	81	< 5.0 U	**0.76 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon tetrachloride	ug/L	5	0.46	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U,L1	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	ug/L	100	7.8	**179**	**63.1**	**9.9**	**10.7**	**4.0**	**3.0**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobromomethane	ug/L	NE	8.3	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroethane	ug/L	NE	2,100	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	**3.3**	**4.6**	**3.0**	< 2.0 U	**3.3**	**5.4**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Chloroform	ug/L	80	0.22	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloromethane	ug/L	NE	19	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
cis-1,2-Dichloroethene	ug/L	70	3.6	**0.16 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	**1.4**	**3.1**	**4.0**	**6.5**	**16.5**	**21.4**	**15.1**	**17.0**	**16.5**	**11.9**	**10.5**	**5.2**	**2.3**	**5.2**	**0.64 J**
cis-1,3-Dichloropropene	ug/L	NE	0.47	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Cyclohexane	ug/L	NE	1,300	< 20.0 U	< 20.0 U,N2	**1.9 J,N2**	**1.1 J,N2**	< 20.0 U	**1.2 J,N2**	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Dibromochloromethane	ug/L	80	0.87	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dibromomethane	ug/L	NE	0.83	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichlorodifluoromethane (Freon 12)	ug/L	NE	20	**3.2**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U,L1,M0	< 2.0 U,L1	< 2.0 U,L1	< 2.0 U,L1	< 2.0 U,L1	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Ethyl ether	ug/L	NE	390	**11.3 J**	**12.9 J**	**8.2 J**	**8.1 J**	**7.3 J**	**8.4 J**	**8.6 J**	**7.4 J**	**8.5 J**	**8.7 J**	**7.0 J**	**7.6 J**	**12.0 J**	**12.9 J**	**10.7 J**	**9.5 J**	**11.2 J**	**4.3 J**	**8.0 J**	**10.4 J**	**9.5 J**	**13.4 J**	**12.7 J**
Ethyl methacrylate	ug/L	NE	63	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Ethylbenzene	ug/L	700	1.5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Ethylene dibromide	ug/L	0.05	0.0075		< 1.0 U	< 1.0 U	< 1.0 U		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Hexachlorobutadiene	ug/L	NE	0.14	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isobutyl alcohol	ug/L	NE	590	< 100 UJ	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 UJ	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2
Isopropylbenzene (Cumene)	ug/L	NE	45	**1.3**	**0.26 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
m,p-Xylenes	ug/L	NE	19	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	**0.30 J**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Methacrylonitrile	ug/L	NE	0.19	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Methyl acetate	ug/L	NE	2,000	< 20.0 U	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Methyl iodide	ug/L	NE	NE	< 5.0 UJ	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 UJ	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Methyl methacrylate	ug/L	NE	140	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl tert-butyl ether	ug/L	NE	14	**0.25 J**	**0.50 J**	**0.24 J**	**0.26 J**	< 4.0 U	**0.22 J**	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	< 4.0 U	**0.33 J**	**0.35 J**	**0.34 J**
Methylcyclohexane	ug/L	NE	NE	< 20.0 U	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U	**0.16 J,N2**	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Methylene chloride	ug/L	5	11	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U

Notes and definition are presented on Page 2

Table 17c: APS-003 and PZ-304-AS and PZ-304-AI Comparsion
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				Sample Location	PZ-304-AS	APS-003	APS-003	APS-003	PZ-304-AI	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003	APS-003
				Sample Depth (ft BGS)	17.1 - 26.9	23.1 - 23.2	30 - 30.1	35.2 - 35.3	39 - 48.8	40 - 40.1	45 - 45.1	50 - 50.1	55 - 55.1	60 - 60.1	65 - 65.1	70 - 70.1	75 - 75.1	80 - 80.1	85 - 85.1	90 - 90.1	95 - 95.1	100 - 100.1	105 - 105.1	113 - 113.1	117 - 117.1	121 - 121.1	125 - 125.1
				Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
				Sample Date	12-02-2020	12-09-2020	12-09-2020	12-09-2020	12-02-2020	12-14-2020	12-14-2020	12-14-2020	12-14-2020	12-14-2020	12-14-2020	12-14-2020	12-15-2020	12-15-2020	12-15-2020	12-15-2020	12-15-2020	12-15-2020	12-15-2020	12-16-2020	12-16-2020	12-16-2020	12-16-2020
n-Butylbenzene	ug/L	NE	100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Hexane	ug/L	NE	150	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Propylbenzene	ug/L	NE	66	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Chlorotoluene (2-chlorotoluene)	ug/L	NE	24	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Xylene	ug/L	NE	19	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.14 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Propionitrile	ug/L	NE	NE	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
sec-Butylbenzene	ug/L	NE	200	**1.8**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Styrene	ug/L	100	120	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	ug/L	NE	69	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1
Tetrachloroethene	ug/L	5	4.1	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Toluene	ug/L	1,000	110	**0.34 J**	< 1.0 U	< 1.0 U	< 1.0 U	**0.21 J**	**0.20 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,2-Dichloroethene	ug/L	100	6.8	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-Dichloropropene	ug/L	NE	0.47	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,4-Dichlorobutene	ug/L	NE	0.0013	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 UJ	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Trichloroethene	ug/L	5	0.28	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichlorofluoromethane (Freon 11)	ug/L	NE	520	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Vinyl acetate	ug/L	NE	41	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Vinyl chloride	ug/L	2	0.019	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.3**	< 1.0 U	**2.0**	**2.3**	**2.5**	**3.1**	**6.2**	**5.9**	**2.7**	**2.3**	**4.9**	**1.7**	**2.3**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Xylene, Total	ug/L	10,000	19	< 3.0 U	**0.42 J**	< 3.0 U	< 3.0 U	< 3.0 U	**0.44 J**	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U

Notes:
ft BGS = feet below ground surface
ppm = parts per million
mV = millivolts
SU = standard units
uS/cm = microSiemens per centimeter
ml = milliliter
ug/L = micrograms per liter
Bold = Detected
USEPA Primary MCL = USEPA Primary Maximum Contaminant Level
USEPA RSL TAPWATER THQ0.1 = RSL TAPWATER (TR=1E-06, THQ=0.1) May 2021
Blue Font = Exceeds USEPA Primary MCL
Orange Shaded = Exceeds USEPA RSL TAPWATER THQ0.1

Qualifier Definition
J = Estimated concentration.
L1 = Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
L2 = Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
N2 = The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply.
U = The analyte was analyzed for but was not detected at or above the referenced reporting limit.
UJ = The analyte was analyzed for, but was not detected. The reporting limit is approximate and may be inaccurate or imprecise.

Table 17d: APS-005 and S-82, I-9, and D-93 Comparsion
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Sample Location				S-82	APS-005	APS-005	APS-005	APS-005	I-9	APS-005	APS-005	APS-005	APS-005
Sample Depth (ft BGS)				15.5 - 25.5	23.9 - 24	29 - 29.1	34 - 34.1	39 - 39.1	43.1 - 53.1	44 - 44.1	49.1 - 49.2	54.1 - 54.2	58.9 - 59
Sample Type				N	N	N	N	N	N	N	N	N	N
Sample Date				11-23-2020	12-01-2020	12-01-2020	12-03-2020	12-03-2020	11-23-2020	12-03-2020	12-03-2020	12-03-2020	12-04-2020
Analyte	Unit	USEPA Primary MCL	USEPA RSL TAPWATER THQ0.1										
Field Water Quality Parameters													
Dissolved Oxygen, Field	ppm	NE	NE	0.14	1.15	1.16	1.35	0.87	0.17	0.81	0.83	0.82	1.05
Oxidation-Reduction Potential, Field	mV	NE	NE	-134.5	-158	-140	-48	-199	-129.3	-200	-196	-195	-198
pH, Field	SU	NE	NE	6.97	6.27	6.12	6.23	6.44	6.95	6.45	6.46	6.46	6.51
Specific Conductivity	uS/cm	NE	NE	2,836	1,421	2,570	2,210	3,600	3,080	3,680	3,720	3,410	3,340
Metals, Dissolved													
Barium	ug/L	2,000	380	1,120	347	581	1,090	1,600	2,220	1,470	1,940	2,280	2,010
Calcium	ug/L	NE	NE	190,000	191,000	271,000	295,000	326,000	282,000	311,000	321,000	263,000	255,000
Iron	ug/L	NE	1,400	30,200	17,700	12,200	24,100	25,400	44,500	30,700	28,700	29,700	23,000
Magnesium	ug/L	NE	NE	81,800	70,200	90,800	92,900	87,800	84,300	84,600	87,800	73,200	70,400
Manganese	ug/L	NE	43	1,380	4,950	4,450	2,690	1,880	467	1,140	958	639	484
Volatile Organic Compounds, Total													
1,1,1,2-Tetrachloroethane	ug/L	NE	0.57	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,1-Trichloroethane	ug/L	200	800	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane	ug/L	NE	0.076	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113)	ug/L	NE	1,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	ug/L	5	0.041	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	ug/L	NE	2.8	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	ug/L	7	28	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloropropene	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichlorobenzene	ug/L	NE	0.7	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichloropropane	ug/L	NE	0.00075	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	ug/L	70	0.4	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	ug/L	NE	5.6	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dibromo-3-chloropropane	ug/L	0.2	0.00033		< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U		< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
1,2-Dichlorobenzene	ug/L	600	30	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	ug/L	5	0.17	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloropropane	ug/L	5	0.82	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	ug/L	NE	6	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,3-Dichlorobenzene	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3-Dichloropropane	ug/L	NE	37	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	ug/L	75	0.48	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dioxane	ug/L	NE	0.46	< 100 UJ	< 100 U	< 100 U	< 100 U,L2,M0	< 100 U,L2	< 100 R	< 100 U,L2	< 100 U,L2	198 D6,M1	217
2,2-Dichloropropane	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Butanone	ug/L	NE	560	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
2-Hexanone	ug/L	NE	3.8	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
4-Chlorotoluene	ug/L	NE	25	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Isopropyltoluene	ug/L	NE	NE	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Methyl-2-pentanone	ug/L	NE	630	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetone	ug/L	NE	1,400	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetonitrile	ug/L	NE	13	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Acrolein	ug/L	NE	0.0042	< 20.0 U	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U,L1	< 20.0 U	< 20.0 U
Acrylonitrile	ug/L	NE	0.052	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Allyl chloride	ug/L	NE	0.21	< 20.0 UJ	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1,M0	< 20.0 U,L1	< 20.0 U	< 20.0 U,L1	< 20.0 U	< 20.0 U,L1,M0	< 20.0 U,L1
Benzene	ug/L	5	0.46	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	0.71 J	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
beta-Chloroprene	ug/L	NE	0.019	< 100 U	< 100 U,N2,L2	< 100 U,N2,L2	< 100 U,N2,L2,M0	< 100 U,N2,L2	< 100 U	< 100 U,N2,L2	< 100 U,N2	< 100 U,N2,L2,M0	< 100 U,N2,L2
Bromobenzene	ug/L	NE	6.2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromodichloromethane	ug/L	80	0.13	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromoform	ug/L	80	3.3	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	ug/L	NE	0.75	< 5.0 UJ	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 UJ	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon disulfide	ug/L	NE	81	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	0.64 J	0.67 J	< 5.0 U	0.68 J
Carbon tetrachloride	ug/L	5	0.46	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	ug/L	100	7.8	2.2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	5.1	< 1.0 U	< 1.0 U	< 1.0 U	1.7
Chlorobromomethane	ug/L	NE	8.3	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroethane	ug/L	NE	2,100	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Chloroform	ug/L	80	0.22	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloromethane	ug/L	NE	19	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
cis-1,2-Dichloroethene	ug/L	70	3.6	1.3	1.7	15.8	0.56 J	< 1.0 U	< 1.0 UJ	0.30 J	0.59 J	< 1.0 U	< 1.0 U
cis-1,3-Dichloropropene	ug/L	NE	0.47	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Cyclohexane	ug/L	NE	1,300	< 20.0 U	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Dibromochloromethane	ug/L	80	0.87	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dibromomethane	ug/L	NE	0.83	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichlorodifluoromethane (Freon 12)	ug/L	NE	20	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U,L1	< 2.0 U	< 2.0 U
Ethyl ether	ug/L	NE	390	16.7 J	5.2 J	47.6	15.8 J	16.0 J	123	14.7 J	14.7 J	28.0 D6	42.9
Ethyl methacrylate	ug/L	NE	63	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Ethylbenzene	ug/L	700	1.5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Ethylene dibromide	ug/L	0.05	0.0075		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Hexachlorobutadiene	ug/L	NE	0.14	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isobutyl alcohol	ug/L	NE	590	< 100 UJ	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 UJ	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2
Isopropylbenzene (Cumene)	ug/L	NE	45	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
m,p-Xylenes	ug/L	NE	19	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Methacrylonitrile	ug/L	NE	0.19	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Methyl acetate	ug/L	NE	2,000	< 20.0 U	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Methyl iodide	ug/L	NE	NE	< 5.0 UJ	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 UJ	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Methyl methacrylate	ug/L	NE	140	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl tert-butyl ether	ug/L	NE	14	< 4.0 U	< 4.0 U	0.76 J	0.30 J	0.29 J	0.28 J	0.28 J	0.31 J	0.31 J	0.36 J
Methylcyclohexane	ug/L	NE	NE	< 20.0 U	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Methylene chloride	ug/L	5	11	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Butylbenzene	ug/L	NE	100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Hexane	ug/L	NE	150	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Propylbenzene	ug/L	NE	66	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Chlorotoluene (2-chlorotoluene)	ug/L	NE	24	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Xylene	ug/L	NE	19	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U

Sample Location	APS-005	APS-005	APS-005	APS-005	APS-005	APS-005	D-93	APS-005	APS-005	APS-005	APS-005	APS-005
Sample Depth (ft BGS)	64 - 64.1	69 - 69.1	73.9 - 74	79 - 79.1	83.9 - 84	89 - 89.1	92 - 112	94 - 94.1	99 - 99.1	104 - 104.1	109 - 109.1	114.5 - 114.6
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N
Sample Date	12-04-2020	12-04-2020	12-04-2020	12-04-2020	12-05-2020	12-05-2020	11-23-2020	12-05-2020	12-05-2020	12-05-2020	12-05-2020	12-06-2020
Analyte												
Field Water Quality Parameters												
Dissolved Oxygen, Field	0.76	1.03	1.03	1.59	1.38	1.18	0.16	0.69	2.39	1.36	4.72	1.04
Oxidation-Reduction Potential, Field	-210	-196	-191	-188	-117	-189	-111.9	-203	-166	-180	-152	-128
pH, Field	6.56	6.48	6.52	6.46	6.55	6.49	7	6.58	6.55	6.59	6.56	6.62
Specific Conductivity	3,420	3,360	3,410	3,430	1,930	3,150	2,511	2,860	2,860	2,640	2,840	2,470
Metals, Dissolved												
Barium	2,040	1,860	1,820	1,900	1,550	1,900	1,150	2,090	2,080	1,880	2,300	2,020
Calcium	265,000	284,000	290,000	295,000	227,000	261,000	269,000	230,000	237,000	229,000	244,000	226,000
Iron	26,800	27,600	29,100	33,300	14,300	21,100	19,100	19,200	15,800	18,300	17,800	10,600
Magnesium	71,100	76,900	78,000	74,900	58,700	70,800	64,500	66,200	68,200	65,600	70,100	65,100
Manganese	532	588	641	760	483	305	519	223	221	263	288	256
Volatile Organic Compounds, Total												
1,1,1,2-Tetrachloroethane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,1-Trichloroethane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113)	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	1.3	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloropropene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichlorobenzene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichloropropane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dibromo-3-chloropropane	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U		< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U	< 10.0 U
1,2-Dichlorobenzene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloropropane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,3-Dichlorobenzene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3-Dichloropropane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dioxane	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U,L2	< 100 UJ	< 100 U,L2	< 100 U,L2	< 100 U,L2	< 100 U,L2	< 100 U,L2
2,2-Dichloropropane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Butanone	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
2-Hexanone	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
4-Chlorotoluene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Isopropyltoluene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Methyl-2-pentanone	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetone	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Acetonitrile	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Acrolein	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U,L1	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U,L1	< 20.0 U
Acrylonitrile	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Allyl chloride	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U,L1	< 20.0 U	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Benzene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	0.37 J	0.29 J	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
beta-Chloroprene	< 100 U,N2,L2	< 100 U,N2,L2	< 100 U,N2,L2	< 100 U,N2,L2	< 100 U,N2,L2	< 100 U,N2	< 100 U	< 100 U,N2,L2	< 100 U,N2,L2	< 100 U,N2,L2	< 100 U,N2	< 100 U,N2,L2
Bromobenzene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromodichloromethane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromoform	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 UJ	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon disulfide	0.74 J	< 5.0 U	< 5.0 U	0.66 J	0.59 J	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon tetrachloride	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobromomethane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroethane	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Chloroform	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloromethane	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
cis-1,2-Dichloroethene	0.31 J	< 1.0 U	< 1.0 U	0.45 J	2.6	1.8	0.88 J	0.68 J	0.35 J	< 1.0 U	0.39 J	0.085 J
cis-1,3-Dichloropropene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Cyclohexane	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Dibromochloromethane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dibromomethane	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichlorodifluoromethane (Freon 12)	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U,L1	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U,L1	< 2.0 U
Ethyl ether	40.2	20.2	15.5 J	14.0 J	11.7 J	14.2 J	34.3	14.2 J	14.6 J	14.1 J	16.5 J	13.7 J
Ethyl methacrylate	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Ethylbenzene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Ethylene dibromide	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Hexachlorobutadiene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isobutyl alcohol	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 UJ	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2	< 100 U,N2
Isopropylbenzene (Cumene)	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
m,p-Xylenes	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	0.17 J	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	0.18 J	< 2.0 U
Methacrylonitrile	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Methyl acetate	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Methyl iodide	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 UJ	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Methyl methacrylate	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Methyl tert-butyl ether	0.37 J	0.27 J	0.30 J	0.28 J	< 4.0 U	0.31 J	0.29 J	0.28 J	0.25 J	0.22 J	0.32 J	0.29 J
Methylcyclohexane	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2	< 20.0 U,N2
Methylene chloride	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Butylbenzene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Hexane	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
n-Propylbenzene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Chlorotoluene (2-chlorotoluene)	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Xylene	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U

Notes and definition are presented on Page 2

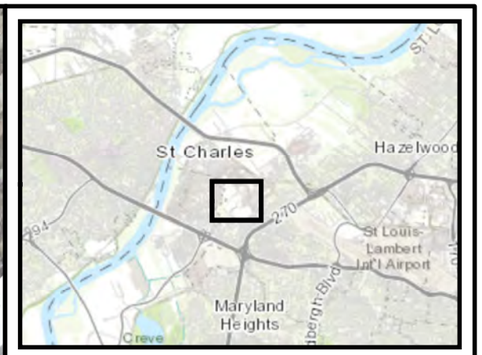
Table 17d: APS-005 and S-82, I-9, and D-93 Comparsion
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

			Sample Location	S-82	APS-005	APS-005	APS-005	APS-005	I-9	APS-005	APS-005	APS-005	APS-005	APS-005	APS-005	APS-005	APS-005	APS-005	D-93	APS-005	APS-005	APS-005	APS-005	APS-005
			Sample Depth (ft BGS)	15.5 - 25.5	23.9 - 24	29 - 29.1	34 - 34.1	39 - 39.1	43.1 - 53.1	44 - 44.1	49.1 - 49.2	54.1 - 54.2	58.9 - 59	64 - 64.1	69 - 69.1	73.9 - 74	79 - 79.1	83.9 - 84	89 - 89.1	92 - 112	94 - 94.1	99 - 99.1	104 - 104.1	109 - 109.1	114.5 - 114.6
			Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
			Sample Date	11-23-2020	12-01-2020	12-01-2020	12-03-2020	12-03-2020	11-23-2020	12-03-2020	12-03-2020	12-03-2020	12-04-2020	12-04-2020	12-04-2020	12-04-2020	12-04-2020	12-05-2020	12-05-2020	11-23-2020	12-05-2020	12-05-2020	12-05-2020	12-05-2020	12-06-2020
Propionitrile	ug/L	NE	NE	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
sec-Butylbenzene	ug/L	NE	200	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Styrene	ug/L	100	120	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	ug/L	NE	69	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1	< 1.0 U,L1
Tetrachloroethene	ug/L	5	4.1	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Toluene	ug/L	1,000	110	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.40 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.22 J**	< 1.0 U	**0.21 J**	**0.25 J**	**0.19 J**	**1.1**	**0.31 J**
trans-1,2-Dichloroethene	ug/L	100	6.8	< 1.0 U	< 1.0 U	**1.0**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-Dichloropropene	ug/L	NE	0.47	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,4-Dichlorobutene	ug/L	NE	0.0013	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
Trichloroethene	ug/L	5	0.28	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichlorofluoromethane (Freon 11)	ug/L	NE	520	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Vinyl acetate	ug/L	NE	41	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 UJ	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U	< 20.0 U
Vinyl chloride	ug/L	2	0.019	< 1.0 U	< 1.0 U	**0.73 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.58 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.71 J**	**1.6**	**1.3**	**0.41 J**	**0.70 J**	**0.83 J**	**0.69 J**	< 1.0 U
Xylene, Total	ug/L	10,000	19	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	**0.17 J**	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	**0.18 J**	< 3.0 U

Notes:
ft BGS = feet below ground surface
ppm = parts per million
mV = millivolts
SU = standard units
uS/cm = microSiemens per centimeter
ml = milliliter
ug/L = micrograms per liter
Bold = Detected
USEPA Primary MCL = USEPA Primary Maximum Contaminant Level
USEPA RSL TAPWATER THQ0.1 = RSL TAPWATER (TR=1E-06, THQ=0.1) May 2021
Blue Font = Exceeds USEPA Primary MCL
Orange Shaded = Exceeds USEPA RSL TAPWATER THQ0.1

Qualifier Definition
D6 = The precision between the sample and sample duplicate exceeded laboratory control limits.
J = Estimated concentration.
L1 = Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
L2 = Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1 = Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6 = Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
N2 = The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply.
R = Rejected, data not usable.
R1 = RPD value was outside control limits.
U = The analyte was analyzed for but was not detected at or above the referenced reporting limit.
UJ = The analyte was analyzed for, but was not detected. The reporting limit is approximate and may be inaccurate or imprecise.

FIGURES



Legend

Q4 Groundwater Sampling Status

- Complete
- Pending Access
- Unable to Sample
- Leachate Collection Sump - Complete
- Leachate Collection Sump - Unable to Sample
- OU-1
- Former Leachate Lagoon
- Landfill Property Boundary
- Superfund Site Boundary

N

0 250 500 1,000

Feet

Figure 1: **2020** Monitoring Well Sampling Event **and Well Maintenance** Locations

West Lake Landfill OU-3

Bridgeton, Missouri

ERM

Q:\Boston\eam\DMWV\Clients_V_Z\WestLake\WestLakeLandfill_MO\WVD2021_12_Revisions\2020\AnnualReport\Figure1_GWSampling_Q4.mxd - Joseph.Hakam - 1/20/2022

0 200 400 Feet

SCALE - 1" = 200'

NOTE: LCS-5A WAS REPLACED BY LCS-5B. LCS-5A IS AN INTERMEDIATE PUMPING LOCATON.

LEGEND

	PERMITTED WASTE BOUNDARY	LS-#	LIQUID COLLECTION SUMP
GEW-#	DUAL GAS EXTRACTION WELL	WT-#/ET-#	TRENCH SUMP
SEW-#	SURFACE EXTRACTION WELL	IT-#	INTERCEPTION TRENCH RISER
GIW-#	GAS INTERCEPTOR WELL	ITS-#/TS-#/ NT/NE IT/ MSD-PS-1	INTERCEPTION TRENCH SUMP
PS-#	PERIMETER SUMP		
LCS-#	LEACHATE COLLECTION SUMP		
HZ-#	HORIZONTAL COLLECTION SUMP	CT-#	LANDFILL GAS CONDENSATE TRAP

PREPARED BY
Engineering for a Better World
FEEZOR ENGINEERING, INC.
3377 Hollenberg Dr, Bridgeton, MO 63044, Ph: 217-483-3118
Missouri State Certificate Of Authority #: E-200912211

PROJECT
BRIDGETON LANDFILL
BRIDGETON, ST. LOUIS COUNTY, MO

PREPARED FOR
BRIDGETON LANDFILL
13570 ST. CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

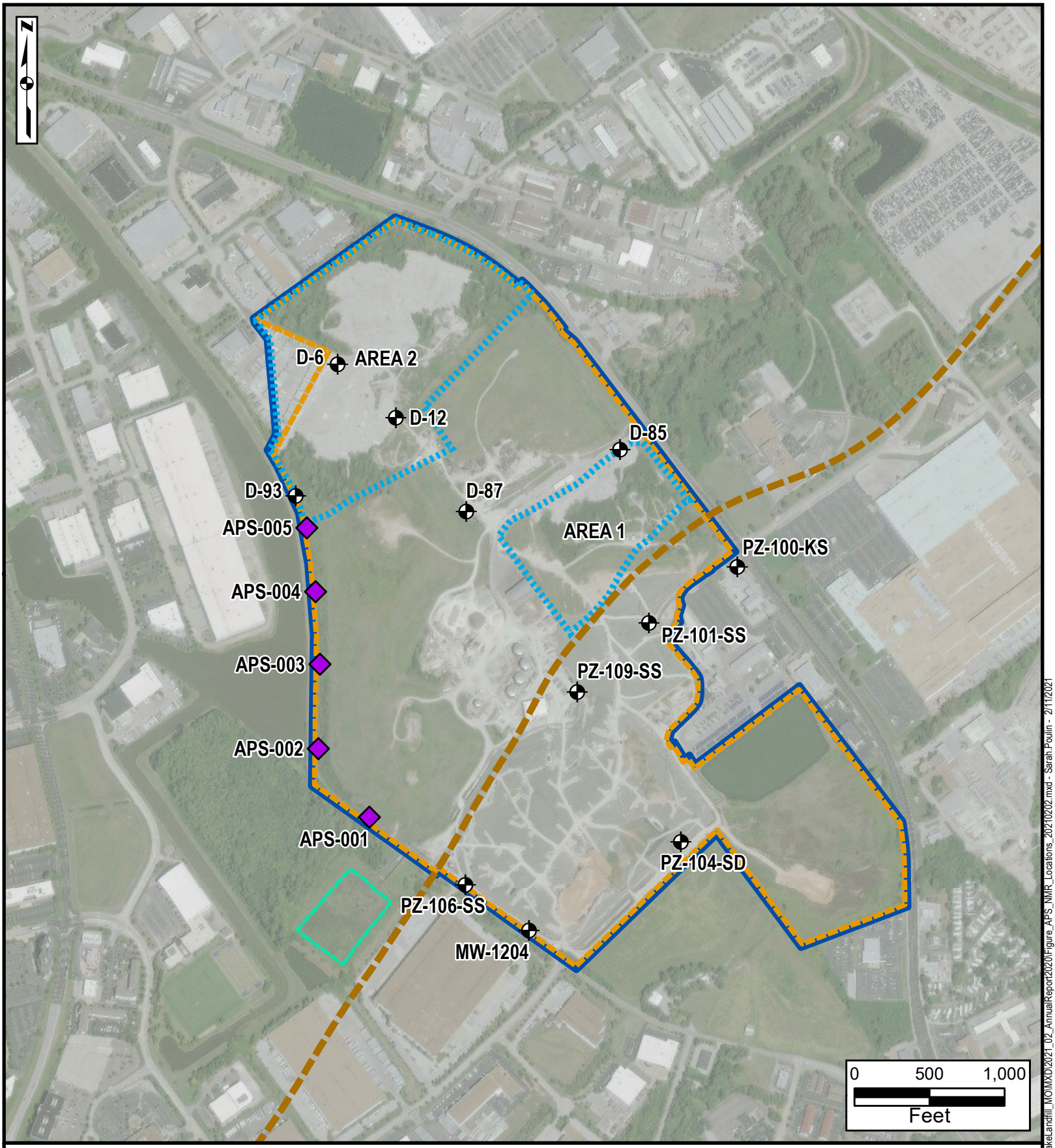
JANUARY 2022
DESIGNED BY: AMR
APPROVED BY: DRF

DRAWING #
001

DRAWING TITLE
FIGURE 2: BRIDGETON LANDFILL EOY 2020 ACTIVE PUMPING LOCATIONS

PROJECT NUMBER: BT-131-22
C:\Users\arobel\Dropbox (Feezor Engineering)\Bridgeton\100-149\BT-131 (2017 Surveying And Autocadd Support)\2022\1 - OU-3 Figure

REVISIONS:	DATE	DSN.	APV.
REV 1	1/12/22	AMR	DRF
REV 2	1/13/22	AMR	DRF



Legend

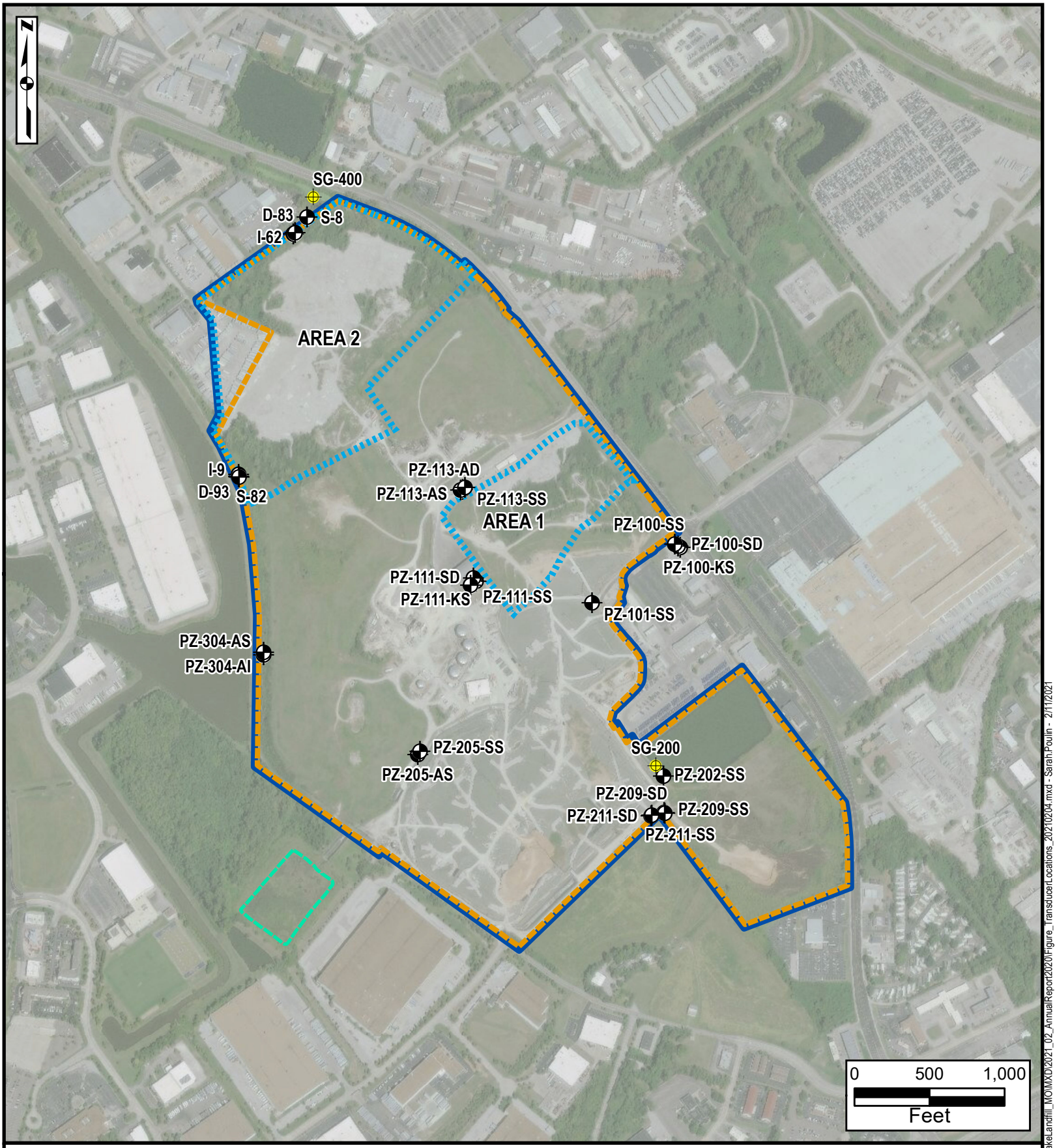
- Existing Wells logged with NMR
- WATERLOO APS Sampling Location
- Edge of Alluvium (approximate)
- OU-1
- Former Leachate Lagoon
- Landfill Property Boundary
- Superfund Site Boundary

Figure 3: WATERLOO APS and Nuclear Magnetic Resonance Locations Completed Through 2020

West Lake Landfill OU-3
Bridgeton, Missouri

ERM

Q:\Boston\Team\DMMV\Clients_V_Z\WestLake\WestLakeLandfill_MO\MXD\2021_02_AnnualReport2020\Figure_APS_NMR_Locations_20210202.mxd - Sarah.Poulin - 2/11/2021



Legend

- Stilling Well with Transducers
- Monitoring Well with Transducers
- OU-1
- Former Leachate Lagoon
- Landfill Property Boundary
- Superfund Site Boundary

Figure 4: Stilling Well and Transducer Locations

West Lake Landfill OU-3
Bridgeton, Missouri

ERM

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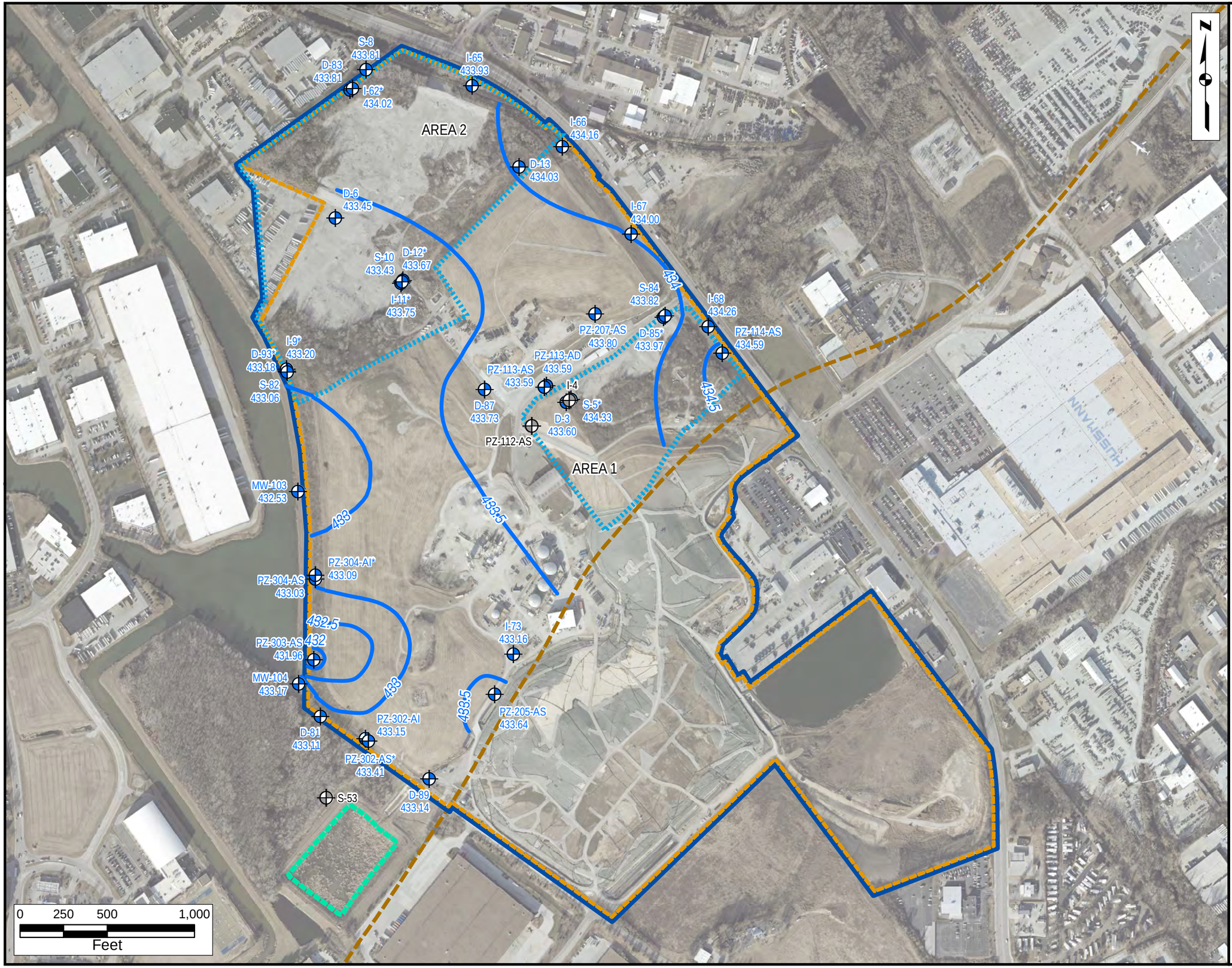


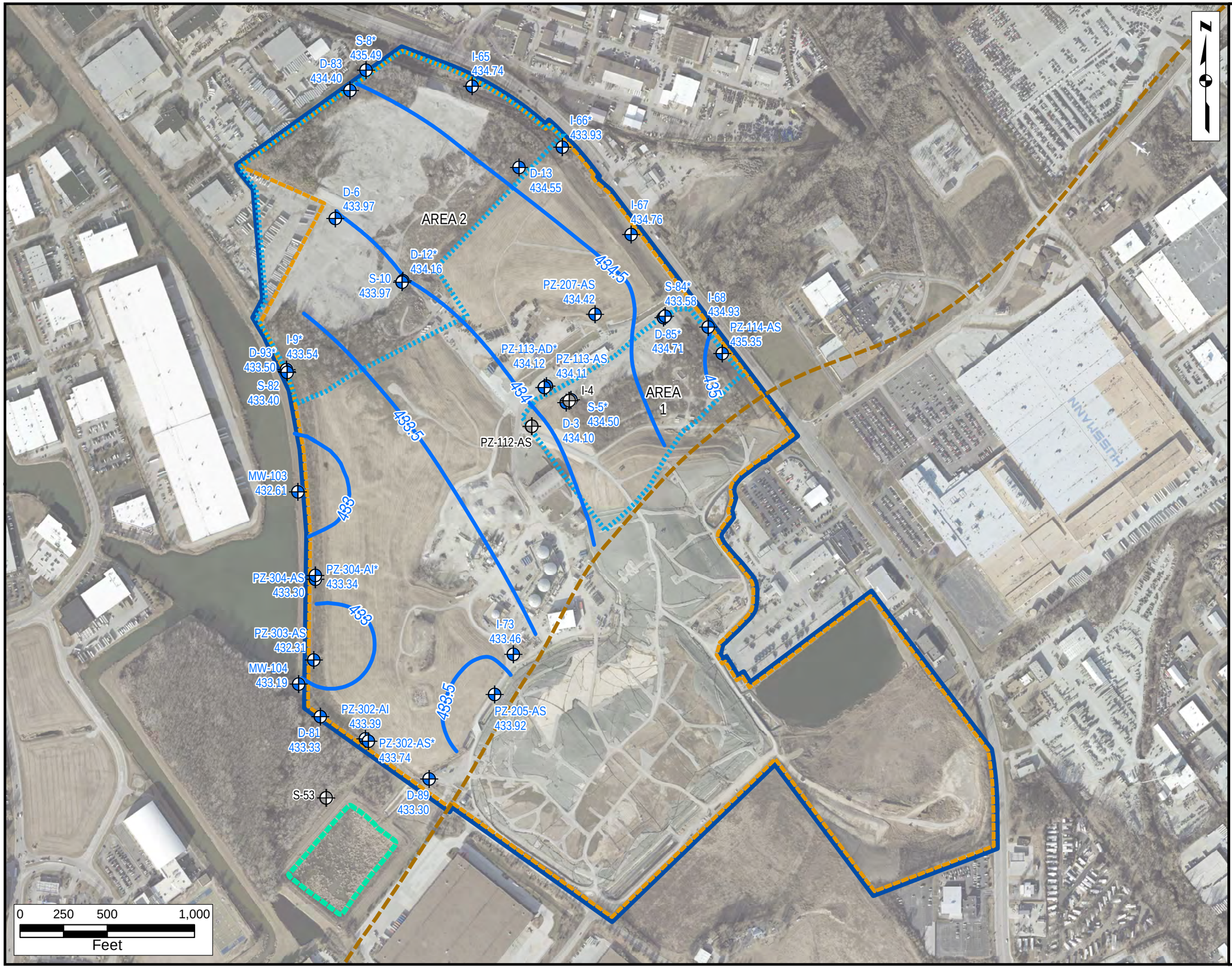
NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2019
2. amsl = Above Mean Sea Level
3. * = Well measurement not used in contouring.
4. For well clusters, the lowest value was included during contouring.
5. 2020 potentiometric maps were prepared based on a limited data set which did not include any surface water elevation data.
6. At the time of 2020 reporting, groundwater elevation data within the alluvium were plotted as a single hydrostratigraphic unit; therefore, the shallow, intermediate, and deep alluvium wells were combined. During 2021, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 5a: Alluvium Potentiometric Surface Map July 2020

West Lake Landfill OU-3
Bridgeton, Missouri

ERM



NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2019
2. amsl = Above Mean Sea Level
3. * = Well measurement not used in contouring.
4. For well clusters, the lowest value was included during contouring.
5. 2020 potentiometric maps were prepared based on a limited data set which did not include any surface water elevation data.
6. At the time of 2020 reporting, groundwater elevation data within the alluvium were plotted as a single hydrostratigraphic unit; therefore, the shallow, intermediate, and deep alluvium wells were combined. During 2021, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 5b: Alluvium Potentiometric Surface Map August 2020

West Lake Landfill OU-3
Bridgeton, Missouri

ERM

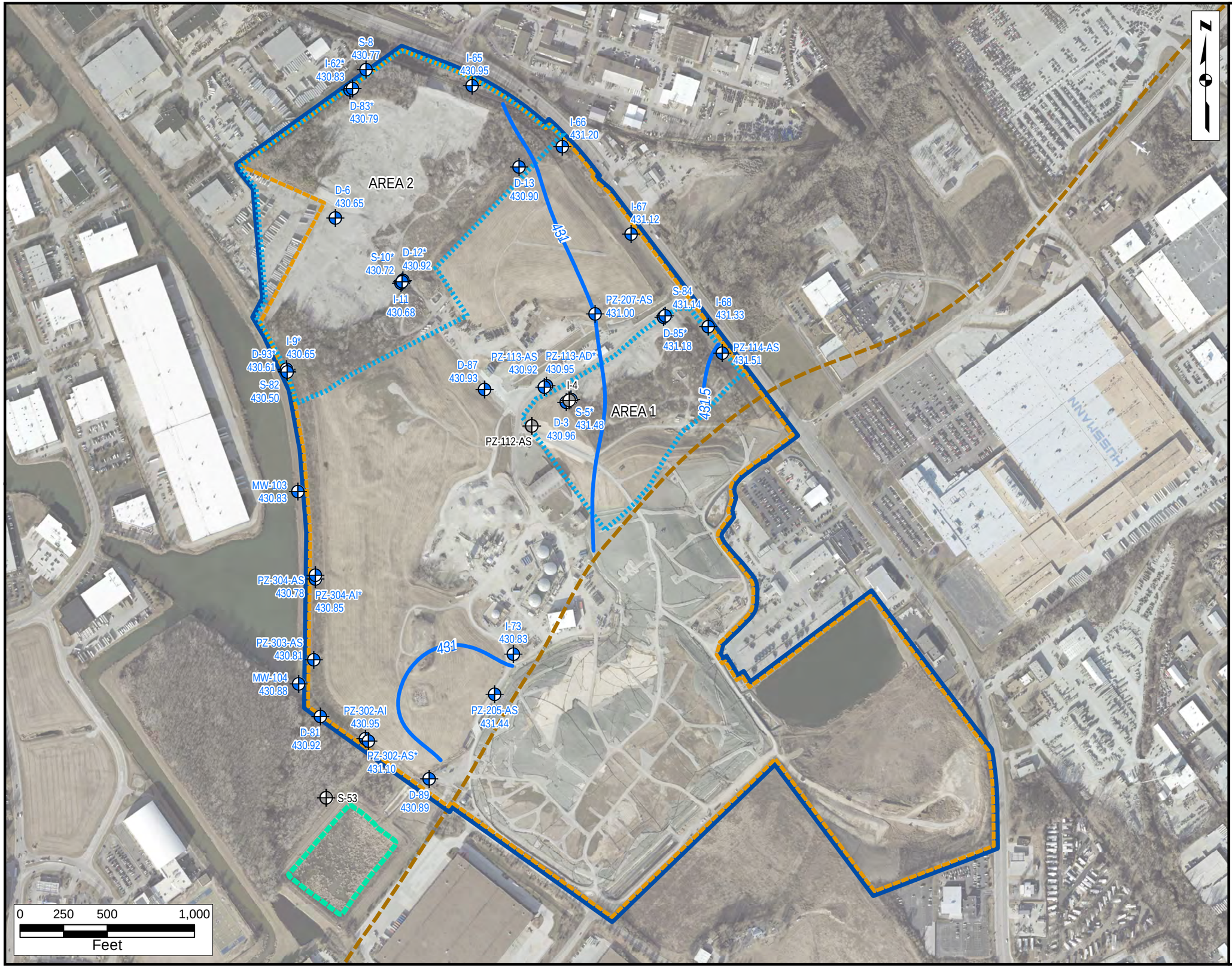
NOTES:

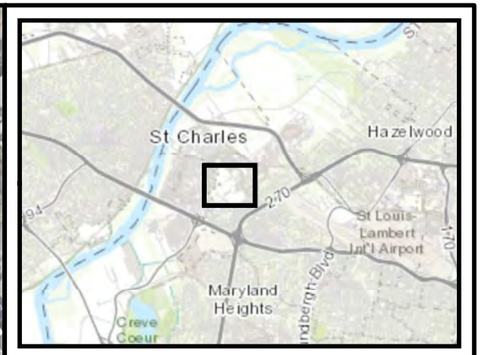
1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2019
2. amsl = Above Mean Sea Level
3. * = Well measurement not used in contouring.
4. For well clusters, the lowest value was included during contouring.
5. 2020 potentiometric maps were prepared based on a limited data set which did not include any surface water elevation data.
6. At the time of 2020 reporting, groundwater elevation data within the alluvium were plotted as a single hydrostratigraphic unit; therefore, the shallow, intermediate, and deep alluvium wells were combined. During 2021, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 5c: Alluvium Potentiometric Surface Map September 2020

West Lake Landfill OU-3
Bridgeton, Missouri

ERM





Legend

- Well Location
- Inactive Monitoring Well
- 456.87 Groundwater Elevation (ft. amsl)
- Groundwater Elevation Contour
- OU-1
- Former Leachate Lagoon
- Landfill Property Boundary
- Superfund Site Boundary
- Edge of Alluvium (approximate)

NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2019
2. amsl = Above Mean Sea Level
3. * = Well measurement not used in contouring.
4. For well clusters, the lowest value was included during contouring.
5. 2020 potentiometric maps were prepared based on a limited data set which did not include any surface water elevation data.
6. At the time of 2020 reporting, groundwater elevation data within the alluvium were plotted as a single hydrostratigraphic unit; therefore, the shallow, intermediate, and deep alluvium wells were combined. During 2021, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 5d: Alluvium Potentiometric Surface Map October 2020

West Lake Landfill OU-3
Bridgeton, Missouri

ERM

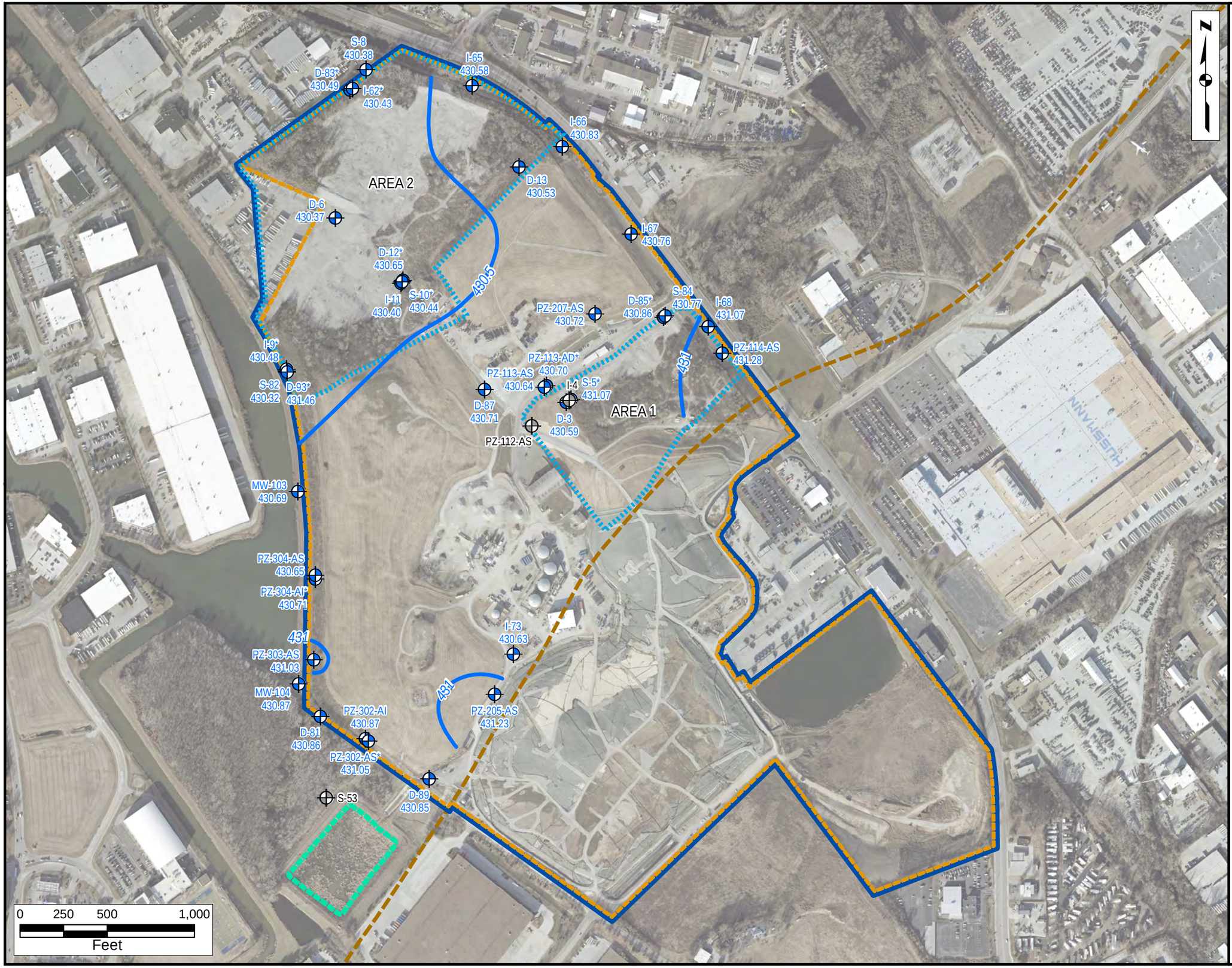
NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2019
2. amsl = Above Mean Sea Level
3. * = Well measurement not used in contouring.
4. For well clusters, the lowest value was included during contouring.
5. 2020 potentiometric maps were prepared based on a limited data set which did not include any surface water elevation data.
6. At the time of 2020 reporting, groundwater elevation data within the alluvium were plotted as a single hydrostratigraphic unit; therefore, the shallow, intermediate, and deep alluvium wells were combined. During 2021, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 5e: Alluvium Potentiometric Surface Map November 2020

West Lake Landfill OU-3
Bridgeton, Missouri

ERM



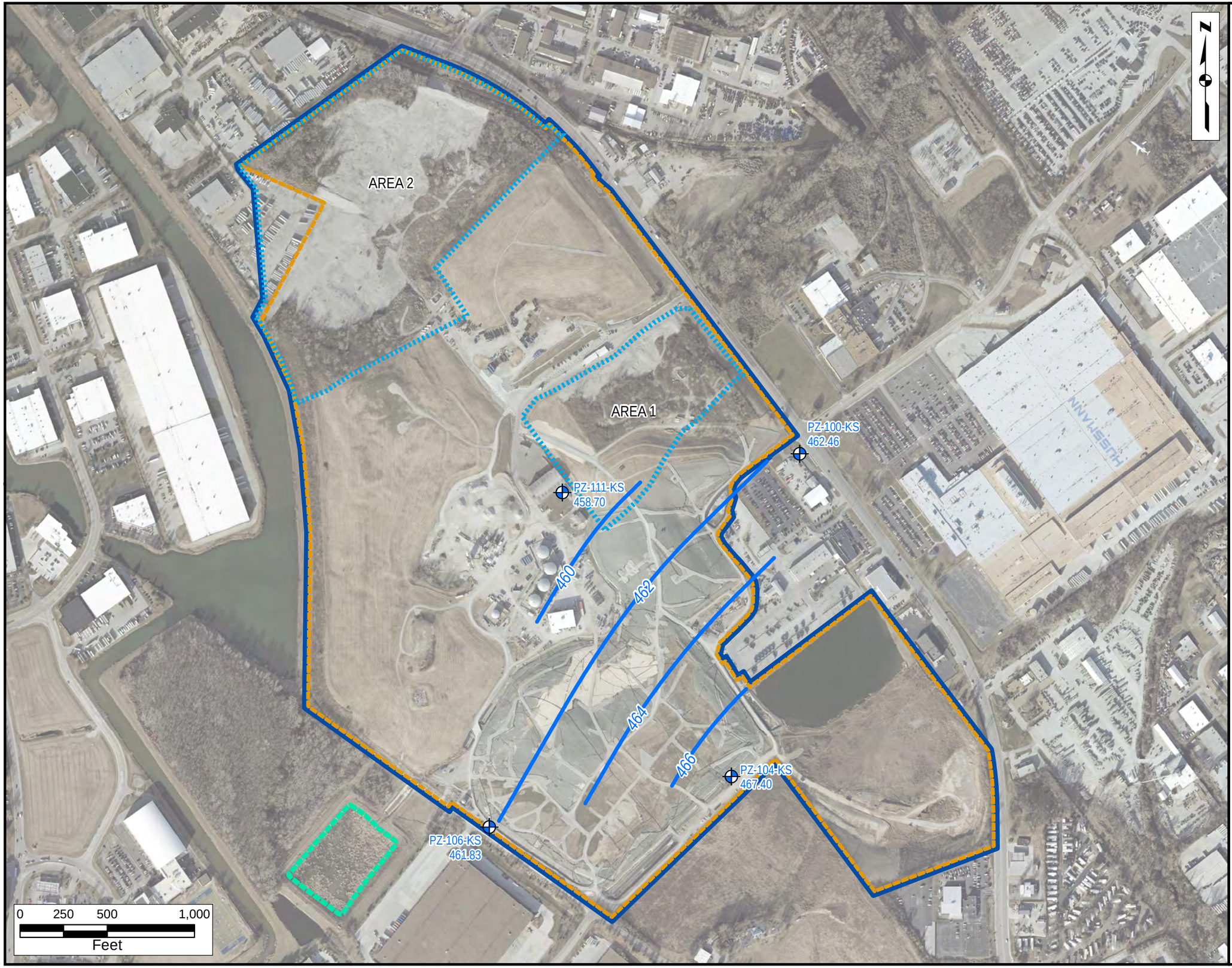
NOTES:

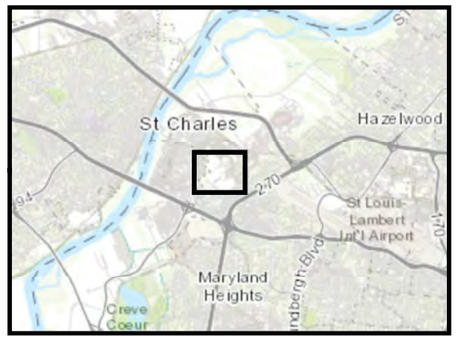
1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2019
2. amsl = Above Mean Sea Level
3. * = Well measurement not used in contouring.
4. For well clusters, the lowest value was included during contouring.
5. 2020 potentiometric maps were prepared based on a limited data set which did not include any surface water elevation data.
6. At the time of 2020 reporting, groundwater elevation data within the alluvium were plotted as a single hydrostratigraphic unit; therefore, the shallow, intermediate, and deep alluvium wells were combined. During 2021, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 5f: Alluvium Potentiometric Surface Map December 2020

West Lake Landfill OU-3
Bridgeton, Missouri

ERM





Legend

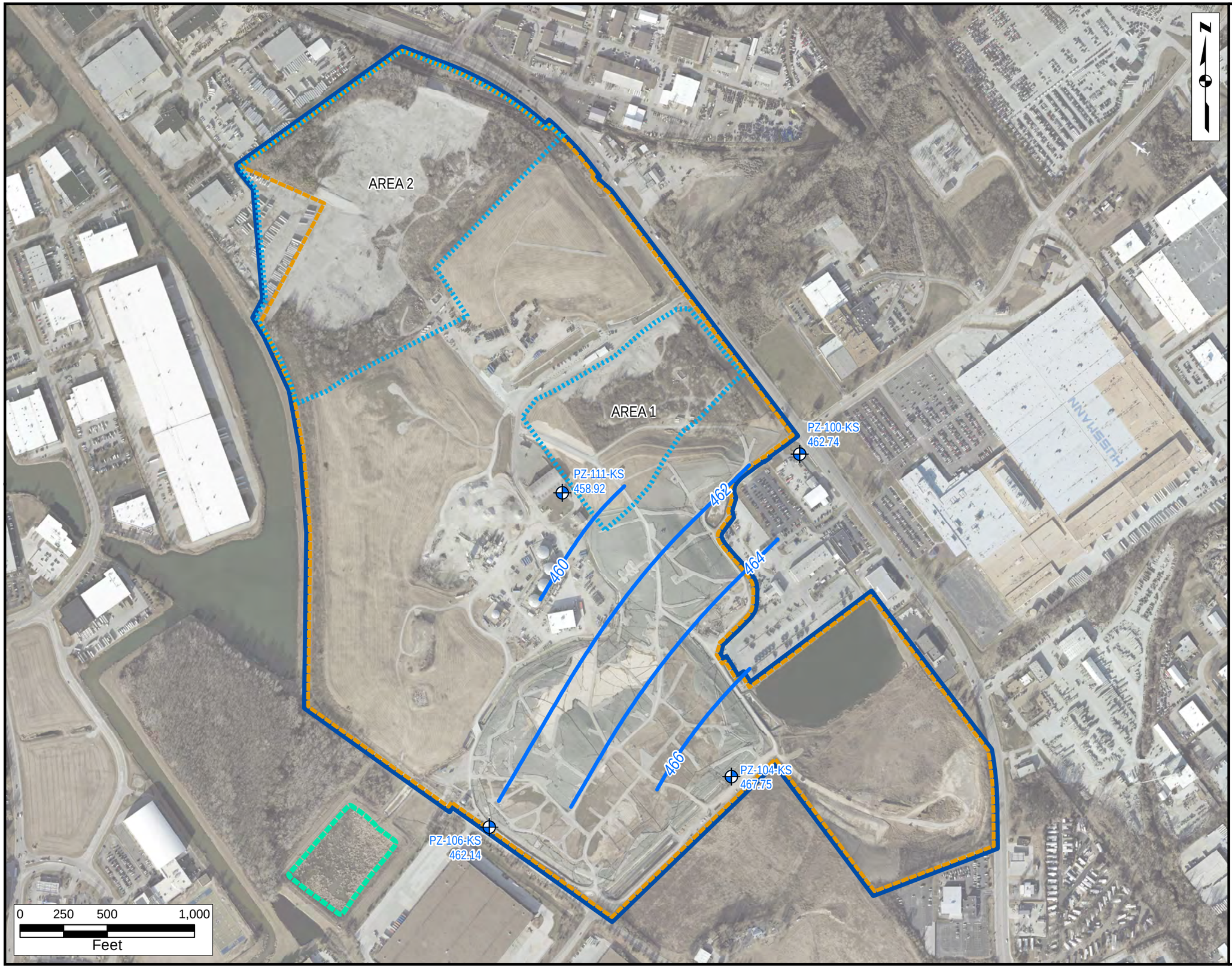
- Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- Groundwater Elevation Contour
- OU-1
- Former Leachate Lagoon
- Landfill Property Boundary
- Superfund Site Boundary

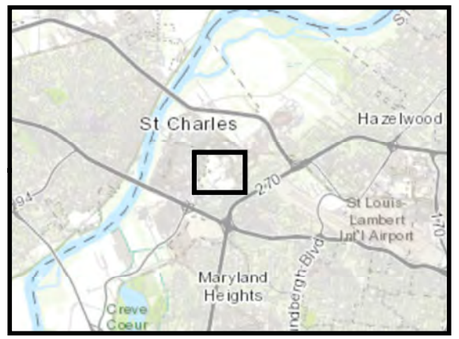
NOTES:
1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2019
2. amsl = Above Mean Sea Level

Figure 6a: Bedrock (Keokuk Formation) Potentiometric Surface Map
July 2020
West Lake Landfill OU-3
Bridgeton, Missouri

ERM

Q:\Boston\team\MW\Clients_V_Z\WestLake\WestLake.aprj_MXD\GW_Contours\20200707_July\WestLake_GWContours_July2020_Keokuk_20220105.mxd - KellyMcEvoy - 1/5/2022





Legend

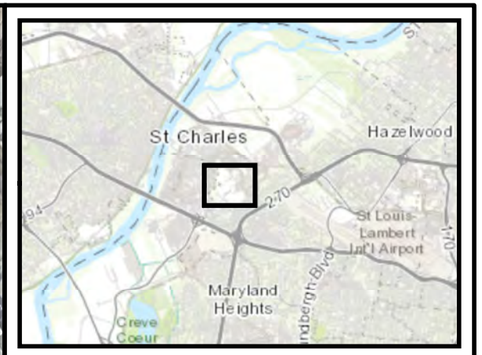
- Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- Groundwater Elevation Contour
- OU-1
- Former Leachate Lagoon
- Landfill Property Boundary
- Superfund Site Boundary

NOTES:
1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2019
2. amsl = Above Mean Sea Level

Figure 6b: Bedrock (Keokuk Formation) Potentiometric Surface Map
August 2020
West Lake Landfill OU-3
Bridgeton, Missouri

ERM

Q:\Boston\team\MW\Clients_V_Z\WestLake\WestLake.aprj_MXD\GW_Contours\20200808_AugustWestLake_GWContours_August2020_KeokukFormation_20220103.mxd - Kelly.Motzko - 1/5/2022



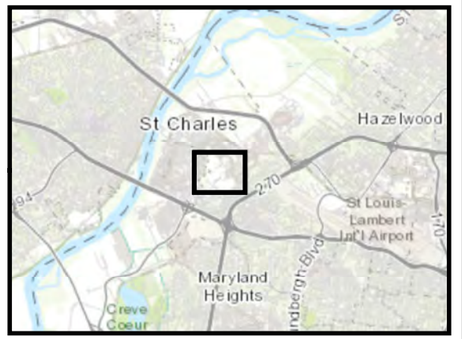
Legend

- Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- Groundwater Elevation Contour
- OU-1
- Former Leachate Lagoon
- Landfill Property Boundary
- Superfund Site Boundary

NOTES:
1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2019
2. amsl = Above Mean Sea Level

Figure 6c: Bedrock (Keokuk Formation) Potentiometric Surface Map
September 2020
West Lake Landfill OU-3
Bridgeton, Missouri

ERM



Legend

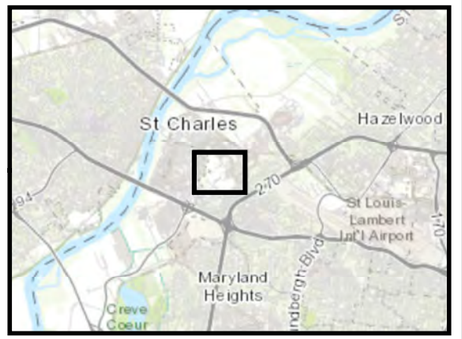
- Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- Groundwater Elevation Contour
- OU-1
- Former Leachate Lagoon
- Landfill Property Boundary
- Superfund Site Boundary

NOTES:
1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2019
2. amsl = Above Mean Sea Level

Figure 6d: Bedrock (Keokuk Formation) Potentiometric Surface Map
October 2020
West Lake Landfill OU-3
Bridgeton, Missouri

ERM

Q:\Boston\team\MW\Clients_V_Z\WestLake\WestLake.aprjx_MO\MXD\GW_Contours\2020\10_October\WestLake_GWContours_October2020_Keokuk_20201105.mxd - KellyM0zkb - 11/5/2022



Legend

- Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- Groundwater Elevation Contour
- OU-1
- Former Leachate Lagoon
- Landfill Property Boundary
- Superfund Site Boundary

NOTES:
1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2019
2. amsl = Above Mean Sea Level

Figure 6e: Bedrock (Keokuk Formation) Potentiometric Surface Map
November 2020
West Lake Landfill OU-3
Bridgeton, Missouri

ERM

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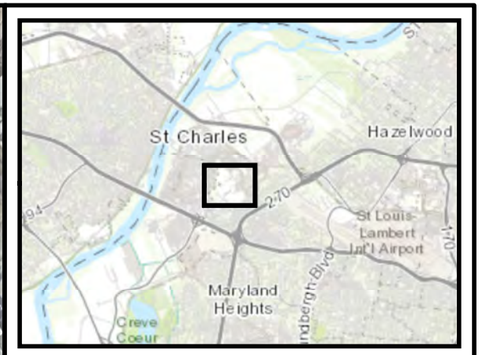


Legend

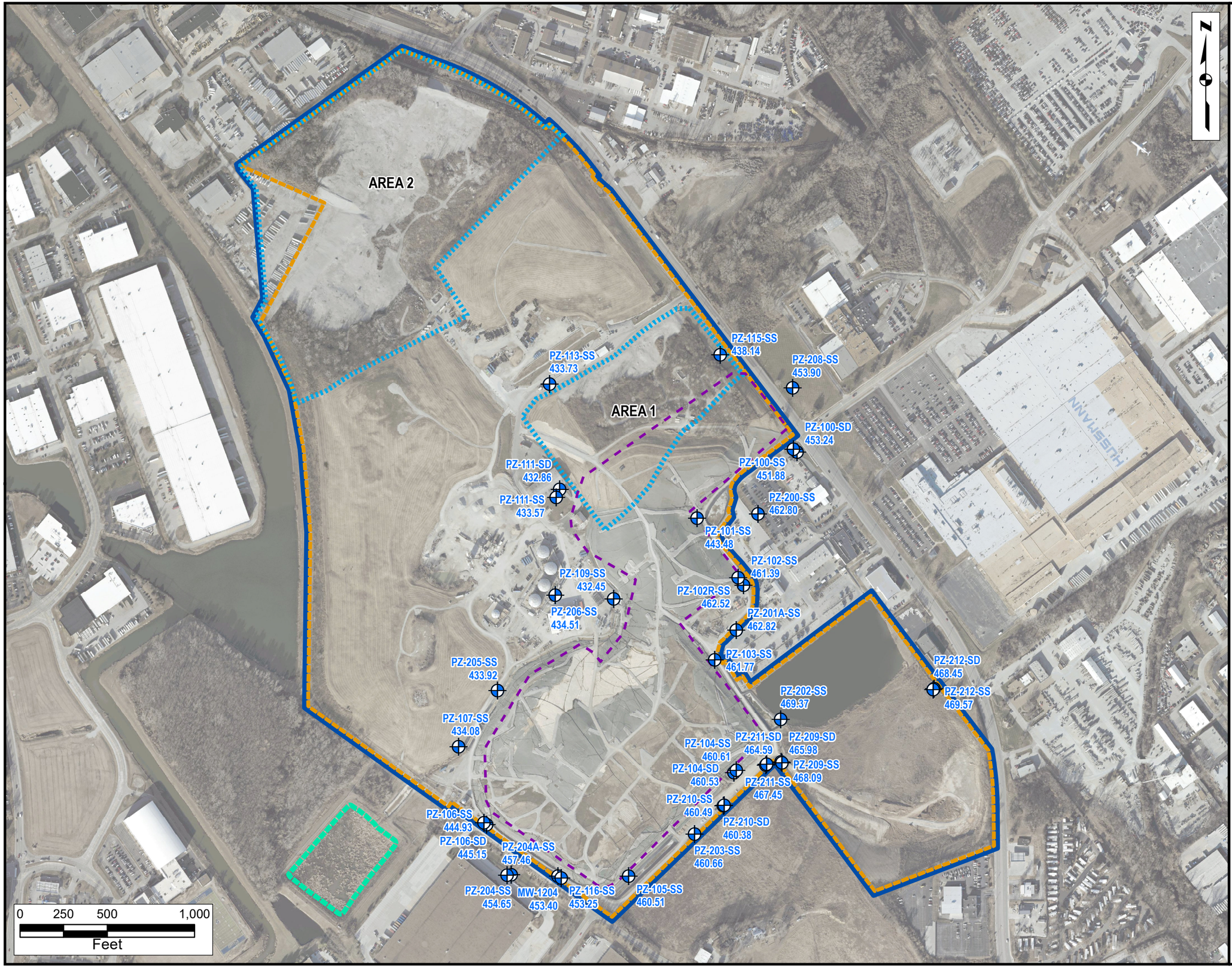
- Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- Groundwater Elevation Contour
- OU-1
- Former Leachate Lagoon
- Landfill Property Boundary
- Superfund Site Boundary

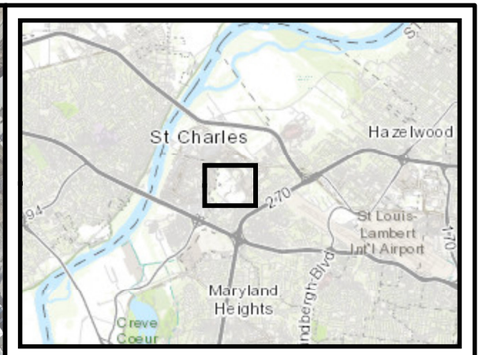
NOTES:
1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2019
2. amsl = Above Mean Sea Level

Figure 6f: Bedrock (Keokuk Formation) Potentiometric Surface Map December 2020

West Lake Landfill OU-3
Bridgeton, Missouri

ERM





Legend

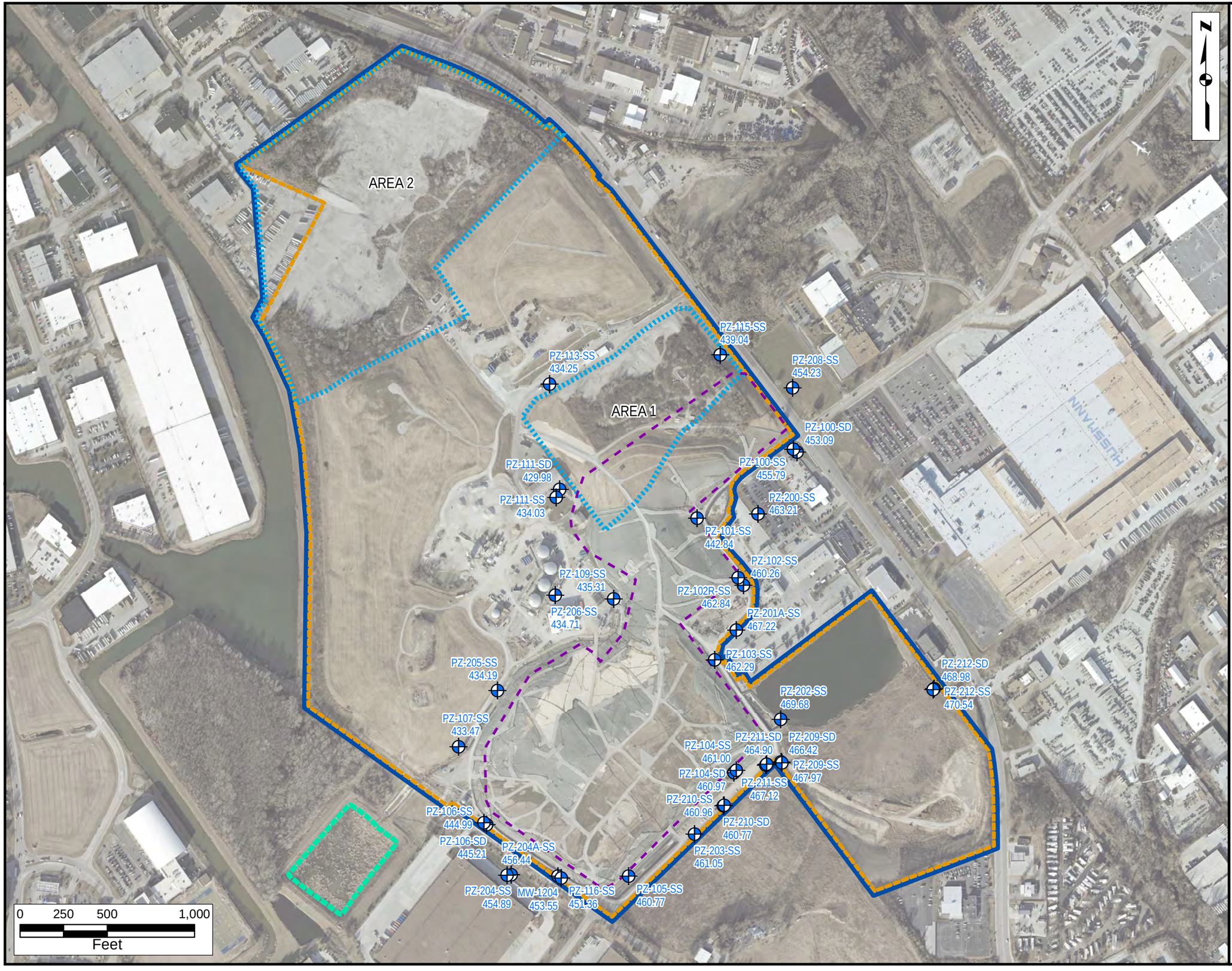
- Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- OU-1
- Former Leachate Lagoon
- Landfill Property Boundary
- Superfund Site Boundary
- Bridgeton Landfill Boundary

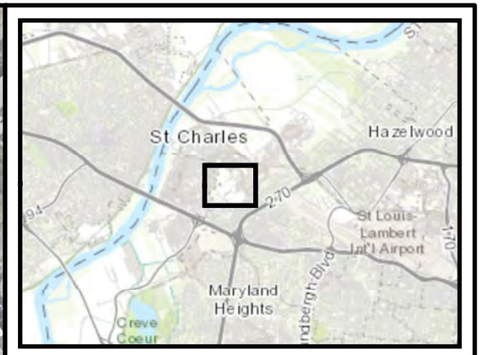
NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2019
2. amsl = Above Mean Sea Level
3. Bedrock wells screened within the St. Louis and Salem Formations are arrayed around the perimeter of the former quarries (i.e., the Bridgeton Landfill); insufficient data was available as of 2020 to evaluate potential effects of landfill characteristics on bedrock water levels surrounding South Quarry; therefore, ERM did not contour the St. Louis and Salem Formation groundwater elevation data.
4. At the time of 2020 reporting, groundwater elevation data within the St. Louis and Salem formations were plotted as a single bedrock unit; therefore, the St. Louis and Salem wells were combined. During 2021, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 7a: Bedrock (St. Louis and Salem Formations) Groundwater Elevations
July 2020
West Lake Landfill OU-3
Bridgeton, Missouri

ERM





Legend

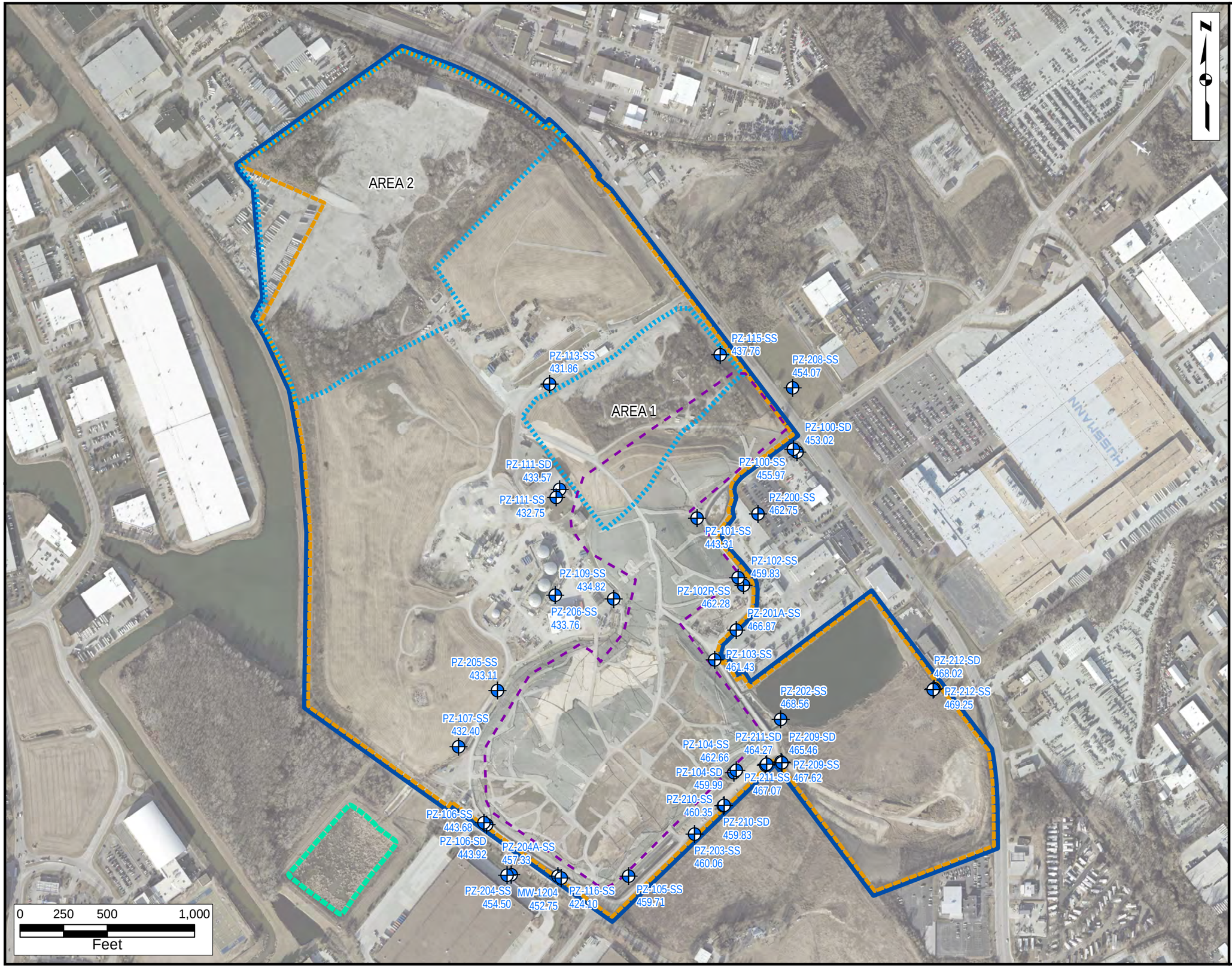
- Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- OU-1
- Former Leachate Lagoon
- Landfill Property Boundary
- Superfund Site Boundary
- Bridgeton Landfill Boundary

NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2019
2. amsl = Above Mean Sea Level
3. Bedrock wells screened within the St. Louis and Salem Formations are arrayed around the perimeter of the former quarries (i.e., the Bridgeton Landfill); insufficient data was available as of 2020 to evaluate potential effects of landfill characteristics on bedrock water levels surrounding South Quarry; therefore, ERM did not contour the St. Louis and Salem Formation groundwater elevation data.
4. At the time of 2020 reporting, groundwater elevation data within the St. Louis and Salem formations were plotted as a single bedrock unit; therefore, the St. Louis and Salem wells were combined. During 2021, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 7b: Bedrock (St. Louis and Salem Formations) Groundwater Elevations
August 2020
West Lake Landfill OU-3
Bridgeton, Missouri

ERM



Legend

- Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- OU-1
- Former Leachate Lagoon
- Landfill Property Boundary
- Superfund Site Boundary
- Bridgeton Landfill Boundary

NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2019
2. amsl = Above Mean Sea Level
3. Bedrock wells screened within the St. Louis and Salem Formations are arrayed around the perimeter of the former quarries (i.e., the Bridgeton Landfill); insufficient data was available as of 2020 to evaluate potential effects of landfill characteristics on bedrock water levels surrounding South Quarry; therefore, ERM did not contour the St. Louis and Salem Formation groundwater elevation data.
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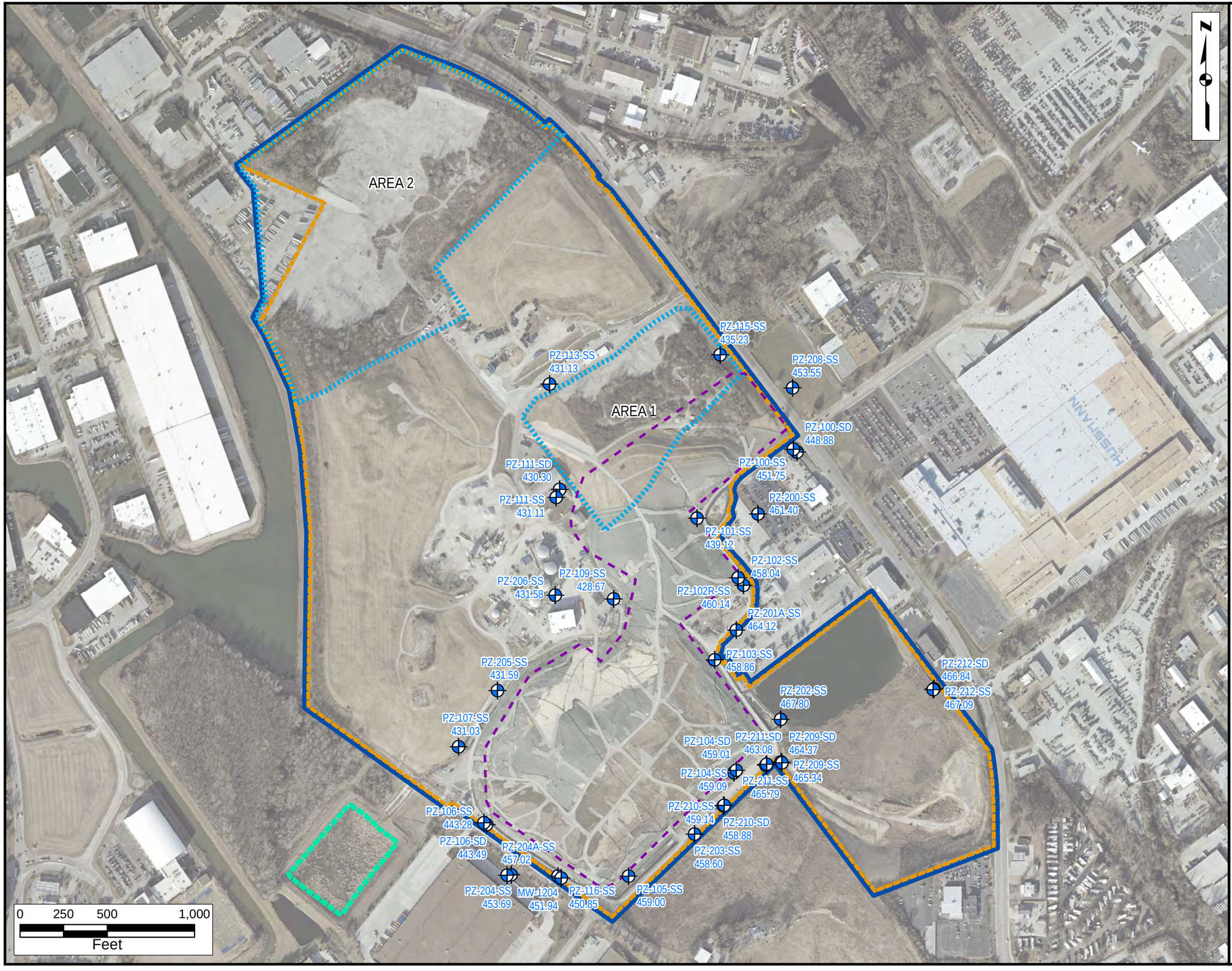
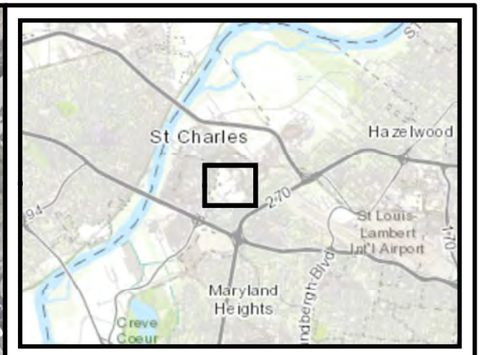
Figure 7c: Bedrock (St. Louis and Salem Formations) Groundwater Elevations
September 2020
West Lake Landfill OU-3
Bridgeton, Missouri

ERM





Legend

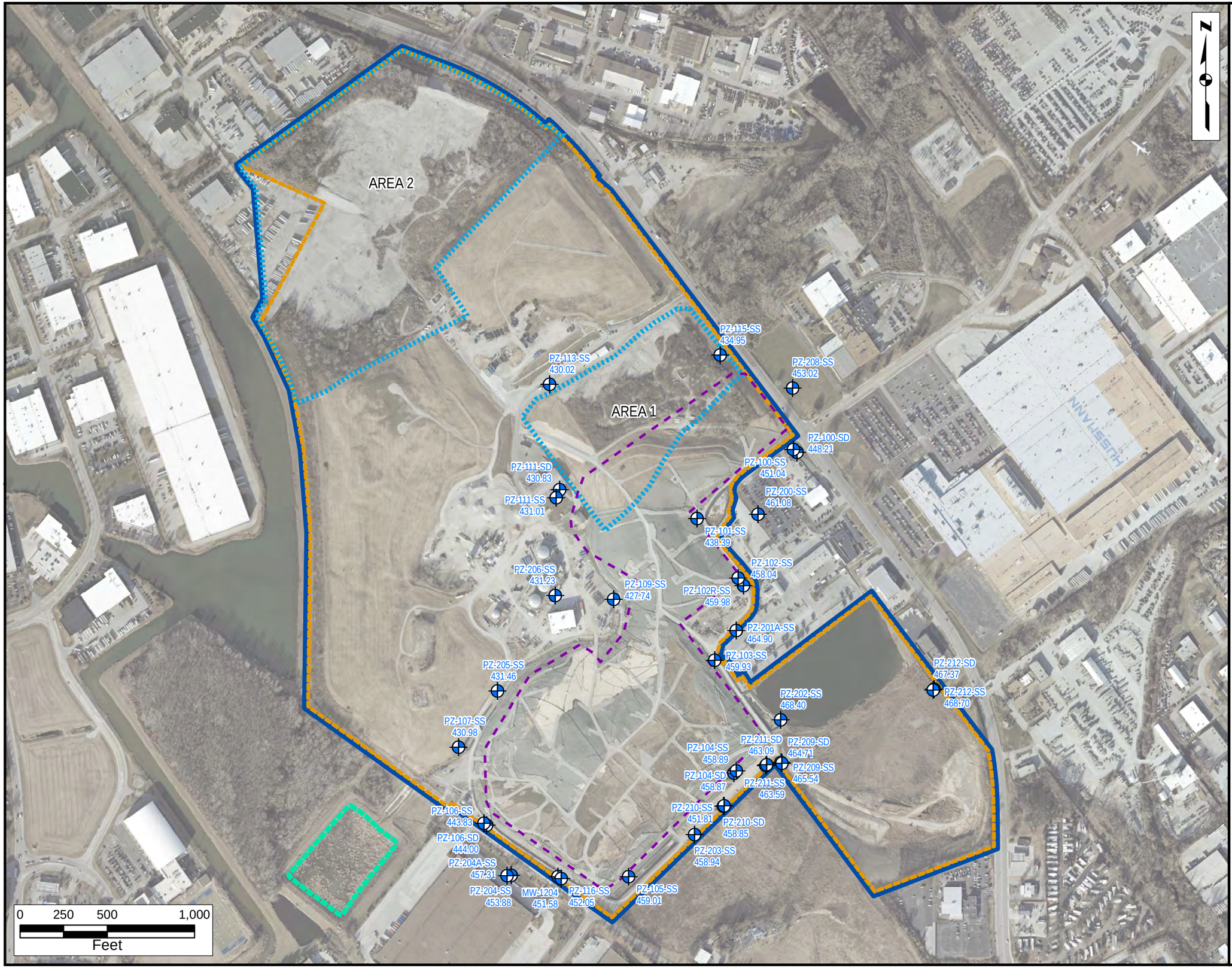
- Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- OU-1
- Former Leachate Lagoon
- Landfill Property Boundary
- Superfund Site Boundary
- Bridgeton Landfill Boundary

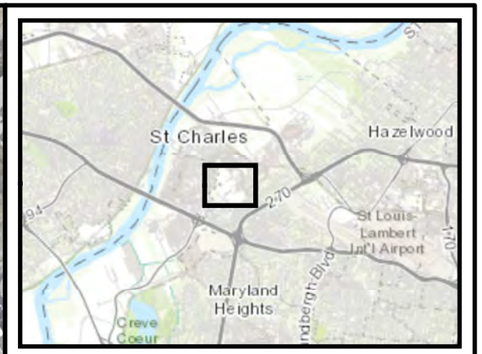
NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2019
2. amsl = Above Mean Sea Level
3. Bedrock wells screened within the St. Louis and Salem Formations are arrayed around the perimeter of the former quarries (i.e., the Bridgeton Landfill); insufficient data was available as of 2020 to evaluate potential effects of landfill characteristics on bedrock water levels surrounding South Quarry; therefore, ERM did not contour the St. Louis and Salem Formation groundwater elevation data.
4. At the time of 2020 reporting, groundwater elevation data within the St. Louis and Salem formations were plotted as a single bedrock unit; therefore, the St. Louis and Salem wells were combined. During 2021, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 7d: Bedrock (St. Louis and Salem Formations) Groundwater Elevations
October 2020
West Lake Landfill OU-3
Bridgeton, Missouri

ERM





Legend

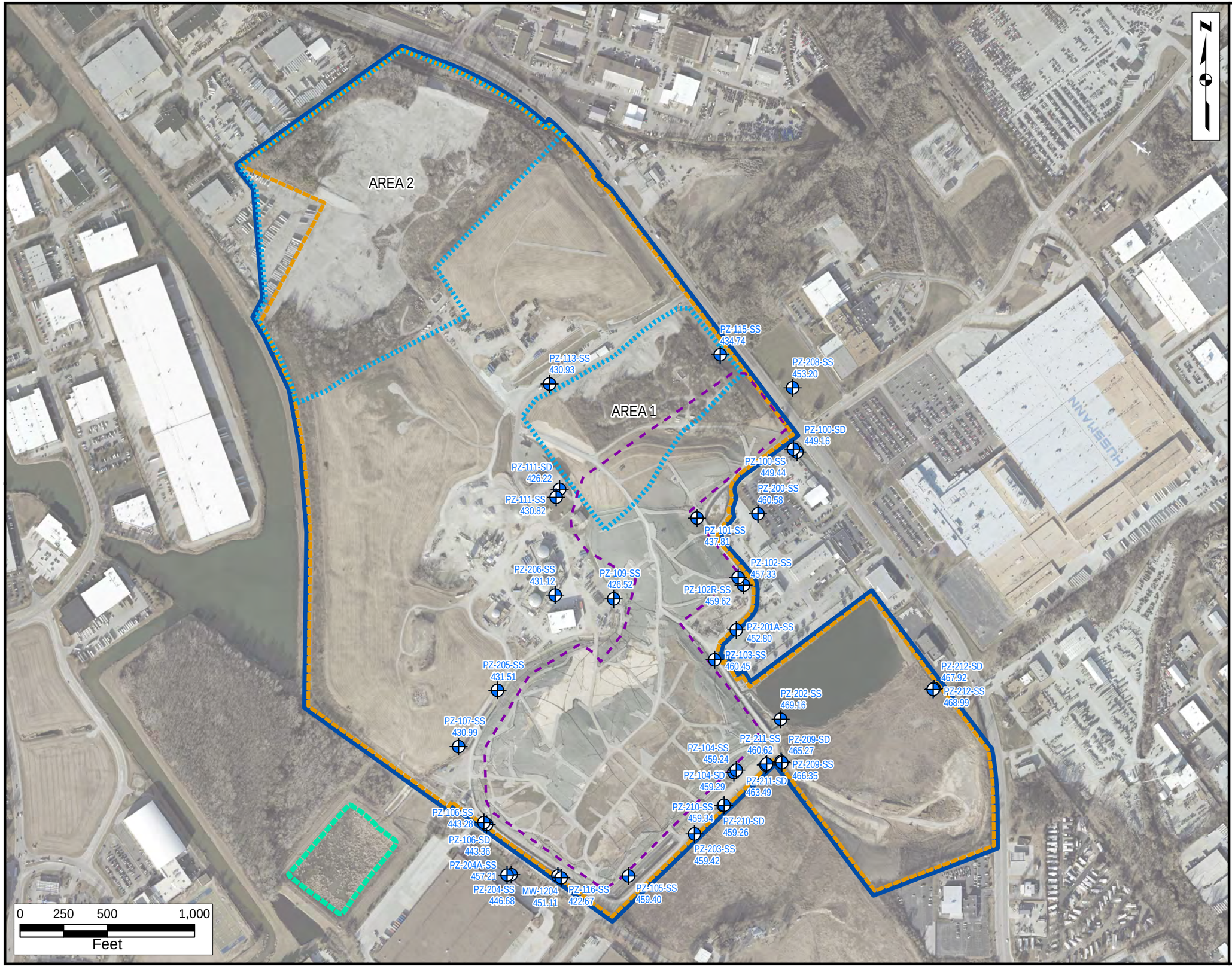
- Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- OU-1
- Former Leachate Lagoon
- Landfill Property Boundary
- Superfund Site Boundary
- Bridgeton Landfill Boundary

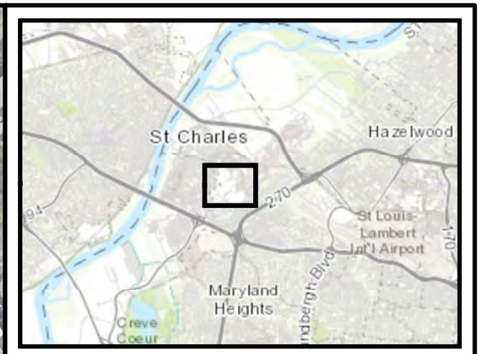
NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2019
2. amsl = Above Mean Sea Level
3. Bedrock wells screened within the St. Louis and Salem Formations are arrayed around the perimeter of the former quarries (i.e., the Bridgeton Landfill); insufficient data was available as of 2020 to evaluate potential effects of landfill characteristics on bedrock water levels surrounding South Quarry; therefore, ERM did not contour the St. Louis and Salem Formation groundwater elevation data.
4. At the time of 2020 reporting, groundwater elevation data within the St. Louis and Salem formations were plotted as a single bedrock unit; therefore, the St. Louis and Salem wells were combined. During 2021, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 7e: Bedrock (St. Louis and Salem Formations) Groundwater Elevations
November 2020
West Lake Landfill OU-3
Bridgeton, Missouri

ERM





Legend

- Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- OU-1
- Former Leachate Lagoon
- Landfill Property Boundary
- Superfund Site Boundary
- Bridgeton Landfill Boundary

NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2019
2. amsl = Above Mean Sea Level
3. Bedrock wells screened within the St. Louis and Salem Formations are arrayed around the perimeter of the former quarries (i.e., the Bridgeton Landfill); insufficient data was available as of 2020 to evaluate potential effects of landfill characteristics on bedrock water levels surrounding South Quarry; therefore, ERM did not contour the St. Louis and Salem Formation groundwater elevation data.
4. At the time of 2020 reporting, groundwater elevation data within the St. Louis and Salem formations were plotted as a single bedrock unit; therefore, the St. Louis and Salem wells were combined. During 2021, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 7f: Bedrock (St. Louis and Salem Formations) Groundwater Elevations
December 2020
West Lake Landfill OU-3
Bridgeton, Missouri

ERM

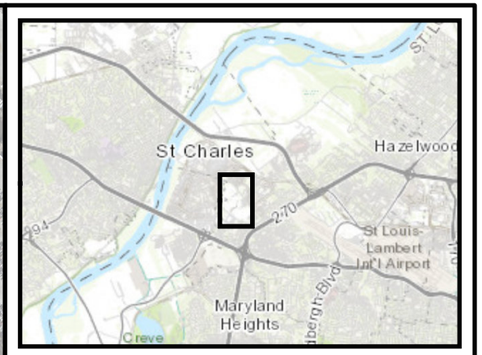
Alluvium Wells

Bedrock Wells

AREA 2
AREA 1
Closed Demolition Landfill
Inactive Sanitary Landfill
Quarry of Bridgeton Landfill

I-62 12.5
D-83 0.580
I-65 1.20
I-66 2.20
D-13 0.240
D-6 0.330
I-67 2.40
D-12 0.450
I-11 12.3
S-10 51.0
PZ-207-AS 7.00
D-85 31.2
S-84 395
PZ-114-AS 92.7
I-68 0.720
I-9 35.6
D-93 0.620
S-82 214
PZ-113-AS 15.6
PZ-113-AD 2.70
S-5 11.9
D-87 1.40
D-3 8.40
PZ-304-AS 249
PZ-304-AI 0.820
I-73 257
PZ-303-AS 71.2
PZ-205-AS 34.9
PZ-302-AI 2.60
PZ-302-AS 99.9
D-89 48.4

PZ-113-SS 0.840
PZ-115-SS 6.20
PZ-100-SS
PZ-100-SD: 1.20
PZ-100-KS
PZ-111-SS: 1.90
PZ-111-SD: 3.30
PZ-111-KS: 2.40
PZ-101-SS 10.8
PZ-200-SS: 5.80
PZ-109-SS 0.740
PZ-102R-SS: 0.700
PZ-102-SS
PZ-206-SS 1.90
PZ-201A-SS: 1.20
PZ-205-SS 0.650
PZ-103-SS: 3.70
PZ-202-SS: 40.7
PZ-107-SS 5.00
PZ-104-SS: 2.00
PZ-104-SD: 14.1
PZ-104-KS: 0.410
PZ-209-SS: 1.60
PZ-211-SS: 1.60
PZ-211-SD: 0.900
PZ-106-SS: 1.10
PZ-106-SD: 0.780
PZ-106-KS: 1.60
PZ-210-SS 0.920
MW-1204 3.00
PZ-203-SS 2.40
PZ-204A-SS: 17.7
PZ-204-SS: 0.400
PZ-116-SS 0.740
PZ-105-SS 0.790



Legend

Total Arsenic Concentration (ug/L)

- >100
- 20 - 100
- 10 - 20
- 1 - 10
- <1
- Not Detected Above the Reporting Limit
- OU-1
- Former Leachate Lagoon
- Closed Demolition Landfill Boundary
- Inactive Sanitary Landfill Boundary
- Bridgeton Landfill Boundary
- Landfill Property Boundary
- Superfund Site Boundary

NOTES:

EPA Regional Screening Level for Arsenic is 0.052 ug/L.
Groundwater results taken from Q4 2020 sampling event.

0 250 500 1,000
Feet

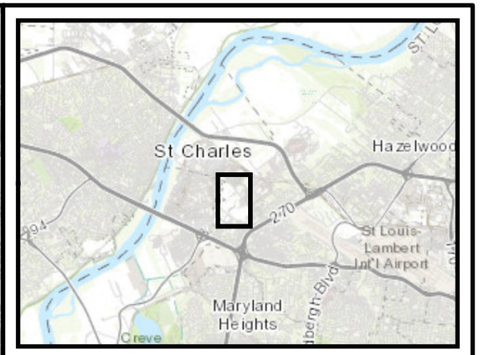
Figure 8: 2020 Arsenic Results

West Lake Landfill OU-3
Bridgeton, Missouri

ERM

Alluvium Wells

Bedrock Wells



AREA 2
AREA 1
Closed Demolition Landfill
Inactive Sanitary Landfill
Quarry of Bridgeton Landfill

I-62
D-83
I-65
I-66
D-13
D-6
I-67
S-10
0.800
D-12
I-11
S-84
D-85
I-68
PZ-207-AS
1.30
PZ-114-AS
0.940
I-9
0.710
S-82
D-93
PZ-113-AS
D-87
PZ-113-AD
S-5
4.80
D-3
1.40
PZ-304-AS
9.90
PZ-304-AI
3.00
I-73
301
PZ-303-AS
39.2
PZ-205-AS
676
PZ-302-AI
PZ-302-AS
108
D-89
148

PZ-115-SS
PZ-113-SS
PZ-100-SS
PZ-100-KS
PZ-100-SD
PZ-111-SD
PZ-111-SS
PZ-111-KS
PZ-200-SS
PZ-101-SS
PZ-102R-SS
PZ-102-SS
PZ-206-SS
PZ-109-SS
PZ-201A-SS
PZ-103-SS
44.4
PZ-202-SS
319
PZ-205-SS
PZ-104-KS
PZ-104-SS
PZ-211-SS
PZ-209-SS
PZ-107-SS
2.20
PZ-104-SD
6.10
PZ-211-SD
PZ-106-SD
PZ-106-SS
PZ-106-KS
PZ-210-SS
PZ-203-SS
MW-1204
1.30
PZ-204A-SS
2.20
PZ-204-SS
PZ-116-SS
PZ-105-SS

Legend

Benzene Concentration (ug/L)

- >50
- 10 - 50
- 5 - 10
- 1 - 5
- <1
- Not Detected Above the Reporting Limit
- OU-1
- Former Leachate Lagoon
- Closed Demolition Landfill Boundary
- Inactive Sanitary Landfill Boundary
- Bridgeton Landfill Boundary
- Landfill Property Boundary
- Superfund Site Boundary

NOTES:

EPA Regional Screening Level for Benzene is is 0.46 ug/L.
Groundwater results taken from Q4 2020 sampling event.

0 250 500 1,000
Feet

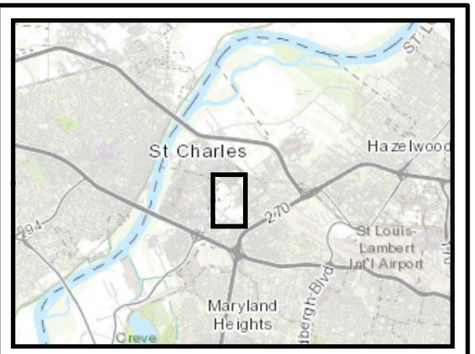
Figure 9: 2020 Benzene Results

West Lake Landfill OU-3
Bridgeton, Missouri

ERM

Alluvium Wells

Bedrock Wells



AREA 2
AREA 1
Closed Demolition Landfill
Inactive Sanitary Landfill
Quarry of Bridgeton Landfill

I-62 0.270
D-83
I-65
I-66
D-13
D-6
I-67
S-10 1.40
D-12
I-11
PZ-207-AS
S-84
D-85
I-68
PZ-114-AS
D-93 0.880
I-9
S-82 1.30
D-87 0.250
PZ-113-AS
PZ-113-AD
S-5
D-3
PZ-304-AS 0.160
PZ-304-AI
PZ-303-AS 1.30
I-73
PZ-205-AS
PZ-302-AI
PZ-302-AS
D-89

PZ-115-SS
PZ-113-SS
PZ-100-SS
PZ-100-SD
PZ-100-KS
PZ-111-SD
PZ-111-SS
PZ-111-KS
PZ-101-SS
PZ-200-SS
PZ-102R-SS
PZ-102-SS
PZ-206-SS
PZ-109-SS
PZ-201A-SS
PZ-205-SS
PZ-103-SS
PZ-202-SS
PZ-107-SS
PZ-104-SS
PZ-104-SD
PZ-104-KS
PZ-209-SS
PZ-211-SS
PZ-211-SD
PZ-106-SS
PZ-106-SD
PZ-106-KS
PZ-210-SS
PZ-203-SS
PZ-204-SS
PZ-204A-SS
MW-1204
PZ-116-SS
PZ-105-SS

Legend

cis-1,2-Dichloroethene Concentration (ug/L)

- >36
- 7.2-36
- 3.6-7.2
- 1-3.6
- <1
- Not Detected Above the Reporting Limit
- OU-1
- Former Leachate Lagoon
- Closed Demolition Landfill Boundary
- Inactive Sanitary Landfill Boundary
- Bridgeton Landfill Boundary
- Landfill Property Boundary
- Superfund Site Boundary

NOTES:

EPA Regional Screening Level for cis-1,2-DCE is 3.6 ug/L
Groundwater results taken from Q4 2020 sampling event.

0 250 500 1,000
Feet

Figure 10: 2020 Cis-1,2-Dichloroethene Results

West Lake Landfill OU-3
Bridgeton, Missouri

ERM

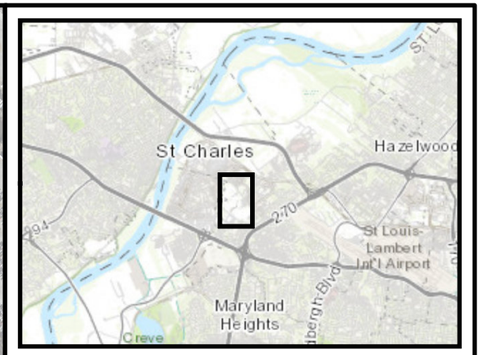
Alluvium Wells

Bedrock Wells

AREA 2
AREA 1
Closed Demolition Landfill
Inactive Sanitary Landfill
Quarry of Bridgeton Landfill

I-62
D-83
I-65
I-66
D-13
D-6
I-67
D-12
I-11
S-10
PZ-207-AS
S-84
D-85
I-68
PZ-114-AS
D-93
S-82
PZ-113-AS
PZ-113-AD
PZ-304-AS
PZ-304-AI
I-73
2,230
PZ-303-AS
PZ-205-AS
PZ-302-AI
PZ-302-AS
D-89

PZ-115-SS
PZ-113-SS
PZ-100-SS
PZ-100-SD
PZ-100-KS
PZ-111-SD
PZ-111-SS
PZ-111-KS
PZ-101-SS
PZ-200-SS
PZ-102R-SS
PZ-102-SS
PZ-206-SS
PZ-109-SS
PZ-103-SS
633
PZ-205-SS
PZ-202-SS
293
PZ-107-SS
PZ-104-SS
PZ-104-SD
PZ-104-KS
PZ-209-SS
PZ-211-SS
PZ-211-SD
PZ-106-SS
PZ-106-SD
PZ-106-KS
PZ-210-SS
PZ-203-SS
PZ-204A-SS
233
PZ-204-SS
115
PZ-116-SS
MW-1204
PZ-105-SS



Legend

1,4-Dioxane Concentration (ug/L)

- >2,000
- 1,000 - 2,000
- 200 - 1,000
- 100 - 200
- <100
- Not Detected Above the Reporting Limit

- OU-1
- Former Leachate Lagoon
- Closed Demolition Landfill Boundary
- Inactive Sanitary Landfill Boundary
- Bridgeton Landfill Boundary
- Landfill Property Boundary
- Superfund Site Boundary

NOTES:

EPA Regional Screening Level for 1,4-Dioxane is 0.46 ug/L
Groundwater results taken from Q4 2020 sampling event.

0 250 500 750 1,000
Feet

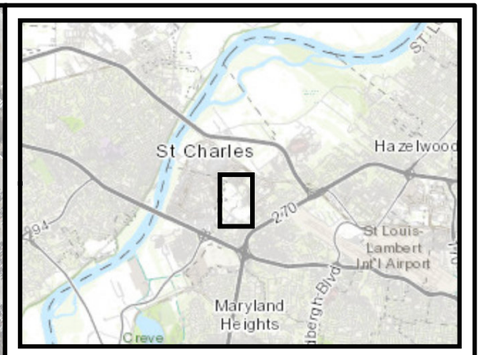
Figure 11: 2020 1,4-Dioxane Results

West Lake Landfill OU-3
Bridgeton, Missouri

ERM

Alluvium Wells

Bedrock Wells



AREA 2
AREA 1
Closed Demolition Landfill
Inactive Sanitary Landfill
Quarry of Bridgeton Landfill

I-62
D-83
I-65
I-66
D-13
D-6
I-67
D-12
I-11
S-10
S-84
D-85
I-68
PZ-114-AS
PZ-207-AS
1.50
I-9
0.230
D-93
S-82
0.210
PZ-113-AS
D-87
PZ-113-AD
S-5
1.70
D-3
PZ-304-AS
PZ-304-AI
PZ-303-AS
25.6
I-73
PZ-205-AS
0.730
PZ-302-AI
PZ-302-AS
D-89

PZ-115-SS
PZ-113-SS
0.180
PZ-100-SS
PZ-100-SD
PZ-100-KS
PZ-111-SD
PZ-111-SS
PZ-111-KS
PZ-101-SS
PZ-200-SS
PZ-102R-SS
PZ-102-SS
PZ-109-SS
PZ-206-SS
PZ-201A-SS
PZ-103-SS
PZ-205-SS
PZ-202-SS
PZ-107-SS
PZ-104-SS
PZ-104-SD
PZ-104-KS
PZ-209-SS
PZ-211-SS
PZ-211-SD
PZ-106-SS
PZ-106-SD
PZ-106-KS
PZ-210-SS
PZ-203-SS
MW-1204
PZ-204-SS
PZ-204A-SS
PZ-116-SS
PZ-105-SS

Legend

2-Methylnaphthalene Concentration (ug/L)

- >36
- 7.2 - 36
- 3.6 - 7.2
- 1 - 3.6
- <1
- Not Detected Above the Reporting Limit
- OU-1
- Former Leachate Lagoon
- Closed Demolition Landfill Boundary
- Inactive Sanitary Landfill Boundary
- Bridgeton Landfill Boundary
- Landfill Property Boundary
- Superfund Site Boundary

NOTES:

EPA Regional Screening Level for 2-Methylnaphthalene is 3.6 ug/L

Groundwater results taken from Q4 2020 sampling event.

0 250 500 1,000

Feet

Figure 12: 2020 2-Methylnaphthalene Results

West Lake Landfill OU-3
Bridgeton, Missouri

ERM

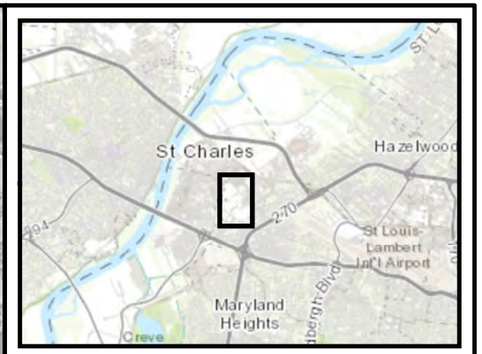
Alluvium Wells

Bedrock Wells

AREA 2
AREA 1
Closed Demolition Landfill
Inactive Sanitary Landfill

D-83 3.32
I-62
I-65
D-13 2.62
I-66
D-6 5.69
I-67
I-11 2.08
D-12
S-10
S-84 1.78
D-85 3.50
I-68
PZ-114-AS 2.16
PZ-207-AS 2.43
I-9 5.51
D-93 4.00
S-82 1.94
D-87 4.19
PZ-113-AD 6.73
PZ-113-AS
S-5
D-3 5.48
PZ-304-AS 3.02
PZ-304-AI 3.55
PZ-303-AS 1.75
I-73 8.24
PZ-205-AS 9.30
PZ-302-AI
PZ-302-AS
D-89 5.34

PZ-115-SS 15.0
PZ-113-SS 3.23
PZ-100-SS: 3.52
PZ-100-SD: 2.48
PZ-100-KS: 1.01
PZ-111-SD: 1.95
PZ-111-SS: 17.9
PZ-111-KS: 0.854
PZ-101-SS 12.8
PZ-200-SS 6.80
PZ-109-SS 1.64
PZ-206-SS 2.76
PZ-102R-SS: 2.60
PZ-102-SS: 3.51
PZ-201A-SS: 0.110
PZ-205-SS 2.27
PZ-103-SS: 5.56
PZ-202-SS: 3.08
PZ-107-SS 13.3
PZ-104-SS: 1.22
PZ-104-SD: 2.23
PZ-104-KS: 0.918
PZ-209-SS: 0.989
PZ-211-SS: 1.35
PZ-211-SD: 0.804
PZ-106-SS: 11.5
PZ-106-SD: 1.76
PZ-106-KS: 0.813
MW-1204 39.7
PZ-210-SS 2.18
PZ-203-SS 2.01
PZ-204A-SS: 2.47
PZ-204-SS: 1.19
PZ-116-SS 0.0616
PZ-105-SS 2.34



Legend

Total Radium 226/228 Activity (pCi/L)

- > 20
- 15 - 20
- 10 - 15
- 5 - 10
- < 5
- Not detected above the referenced reporting limit
- OU-1
- Former Leachate Lagoon
- Closed Demolition Landfill Boundary
- Inactive Sanitary Landfill Boundary
- Bridgeton Landfill Boundary
- Landfill Property Boundary
- Superfund Site Boundary

NOTES:
- Total radium values shown represent the sum of Ra-226 and Ra-228 activities in unfiltered samples (total fraction).
- EPA Maximum Contaminant Level (MCL) for Combined Radium 226/228 is 5 pCi/L

0 250 500 1,000
Feet

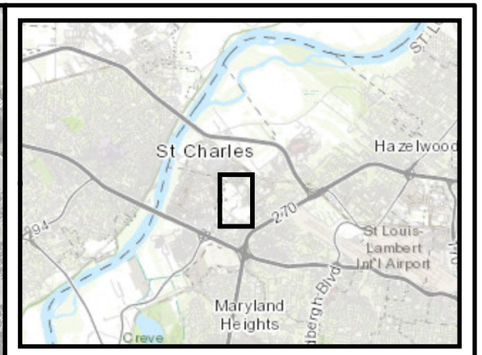
Figure 13: Q4 2020 Groundwater Total Radium 226/228 Activities
West Lake Landfill OU-3
Bridgeton, Missouri

ERM

Q:\Boston\Team\DMMV\Clients_V_Z\WestLake\WestLakeLandfill_MO\MXD\2021_12_Revisions\2020AnnualReport\totalRadium_Q42020_20211229.mxd - Joseph.Hakam - 1/6/2022

Alluvium Wells

Bedrock Wells



Legend

1,2,4-Trimethylbenzene Concentration (ug/L)

- >56
- 11.2 - 56
- 5.6 - 11.2
- 1 - 5.6
- <1
- Not Detected Above the Reporting Limit
- OU-1
- Former Leachate Lagoon
- Closed Demolition Landfill Boundary
- Inactive Sanitary Landfill Boundary
- Bridgeton Landfill Boundary
- Landfill Property Boundary
- Superfund Site Boundary

NOTES:

EPA Regional Screening Level for 1,2,4-Trimethylbenzene is is 5.6 ug/L.
Groundwater results taken from Q4 2020 sampling event.

0 250 500 1,000
Feet

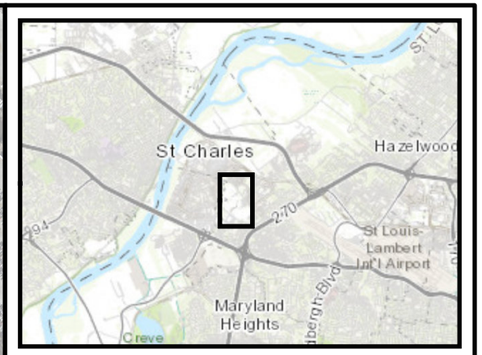
Figure 14: 2020 1,2,4-Trimethylbenzene Results
West Lake Landfill OU-3
Bridgeton, Missouri

ERM

Q:\Boston\Team\MMV\Clients_V_Z\WestLake\WestLakeLandfill_MO\MXD\2021_1Q_Revisions2020AnnualReport\1,2,4-Trimethylbenzene_Q42020_20220104.mxd - brett.shaver - 1/4/2022

Alluvium Wells

Bedrock Wells



Legend

Total Uranium Concentration (ug/L)

- >40
- 4 - 40
- 0.8 - 4
- 0.4 - 0.8
- < 0.4
- Not Detected Above the Reporting Limit
- OU-1
- Former Leachate Lagoon
- Closed Demolition Landfill Boundary
- Inactive Sanitary Landfill Boundary
- Bridgeton Landfill Boundary
- Landfill Property Boundary
- Superfund Site Boundary

NOTES:

EPA Regional Screening Level for Uranium is is 0.4 ug/L.
Groundwater results taken from Q4 2020 sampling event.

0 250 500 1,000
Feet

Figure 15: 2020 Uranium Results

West Lake Landfill OU-3
Bridgeton, Missouri

ERM

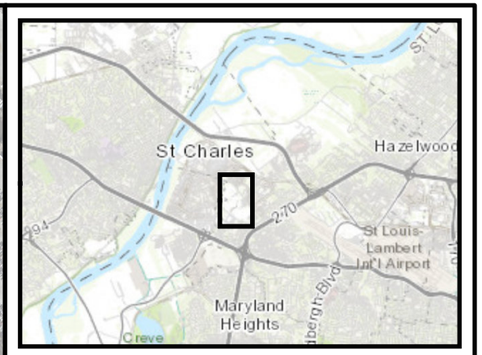
Alluvium Wells

Bedrock Wells

AREA 2
AREA 1
Closed Demolition Landfill
Inactive Sanitary Landfill
Quarry of Bridgeton Landfill

I-62
D-83
I-65
I-66
D-13
D-6
I-67
D-12
I-11
S-10
PZ-207-AS
S-84
D-85
I-68
PZ-114-AS
I-9
D-93
1.30
S-82
PZ-113-AS
S-5
D-87
PZ-113-AD
D-3
PZ-304-AS
PZ-304-AI
PZ-303-AS
2.50
I-73
PZ-205-AS
PZ-302-AI
PZ-302-AS
D-89

PZ-115-SS
PZ-113-SS
PZ-100-SS
PZ-100-SD
PZ-100-KS
PZ-111-SD
PZ-111-KS
PZ-111-SS
PZ-200-SS
PZ-101-SS
PZ-102R-SS
PZ-102-SS
PZ-206-SS
PZ-109-SS
PZ-201A-SS
PZ-103-SS
PZ-205-SS
PZ-202-SS
PZ-107-SS
PZ-104-SS
PZ-104-SD
PZ-104-KS
PZ-209-SS
PZ-211-SS
PZ-211-SD
PZ-106-SS
PZ-106-SD
PZ-106-KS
PZ-210-SS
PZ-203-SS
MW-1204
PZ-204-SS
PZ-204A-SS
PZ-116-SS
PZ-105-SS



Legend

Vinyl Chloride Concentration (ug/L)

- >20
- 4 - 20
- 2 - 4
- 1 - 2
- <1
- Not Detected Above the Reporting Limit

- OU-1
- Former Leachate Lagoon
- Closed Demolition Landfill Boundary
- Inactive Sanitary Landfill Boundary
- Bridgeton Landfill Boundary
- Landfill Property Boundary
- Superfund Site Boundary

NOTES:

EPA Regional Screening Level for Vinyl Chloride is is 0.019 ug/L.
Groundwater results taken from Q4 2020 sampling event.

0 250 500 1,000
Feet

Figure 16: 2020 Vinyl Chloride Results

West Lake Landfill OU-3
Bridgeton, Missouri

ERM

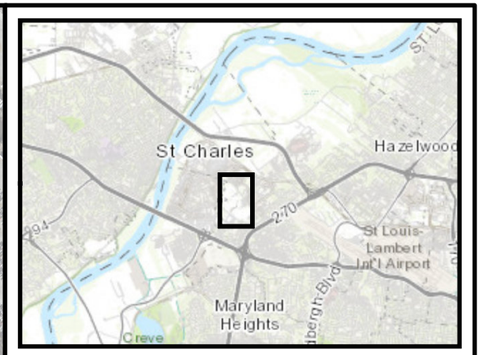
Alluvium Wells

Bedrock Wells

AREA 2
AREA 1
Closed Demolition Landfill
Inactive Sanitary Landfill
Quarry of Bridgeton Landfill

I-62 0.201
D-83 0.254
I-65 0.244
D-13 0.199
I-66
I-67 0.526
I-68 0.243
D-6
D-12 0.282
I-11 0.275
S-10 0.415
S-84
PZ-207-AS 0.252
D-85 0.427
I-9 0.309
D-93 0.262
PZ-113-AD
S-5 0.333
D-87 0.184
PZ-113-AS
D-3 0.249
PZ-304-AS 0.295
PZ-304-AI 0.509
I-73 0.197
PZ-303-AS
PZ-302-AI 0.316
PZ-302-AS 0.464
D-89 0.201

PZ-115-SS: 0.327
PZ-113-SS
PZ-100-SS: 0.309
PZ-100-SD: 0.26
PZ-100-KS: 0.308
PZ-111-SS: 0.209
PZ-111-SD: 0.245
PZ-111-KS: 0.187
PZ-101-SS 0.187
PZ-200-SS: 0.159
PZ-206-SS
PZ-109-SS
PZ-102R-SS
PZ-102-SS
PZ-201A-SS: 0.134
PZ-205-SS 0.364
PZ-103-SS: 0.394
PZ-107-SS 0.211
PZ-202-SS: 0.287
PZ-104-SS
PZ-104-SD
PZ-104-KS: 0.306
PZ-209-SS: 0.068
PZ-211-SD
PZ-211-SS: 0.318
PZ-106-SS: 0.31
PZ-106-SD: 0.148
PZ-106-KS: 0.238
PZ-210-SS
PZ-203-SS: 0.336
MW-1204
PZ-204-SS: 0.227
PZ-204A-SS: 0.291
PZ-116-SS 0.264
PZ-105-SS



Legend

Total Thorium 230 Activity (pCi/L)

- > 0.6
- 0.3 - 0.6
- 0.1 - 0.3
- < 0.1
- Not detected above the referenced reporting limit
- OU-1
- Former Leachate Lagoon
- Closed Demolition Landfill Boundary
- Inactive Sanitary Landfill Boundary
- Bridgeton Landfill Boundary
- Landfill Property Boundary
- Superfund Site Boundary

NOTES:

- The MCL for gross-alpha radiation is 15 pCi/L. Thorium 230 is a component of gross alpha radiation
- Groundwater results taken from Q4 2020 sampling event.

0 245 490 980
Feet

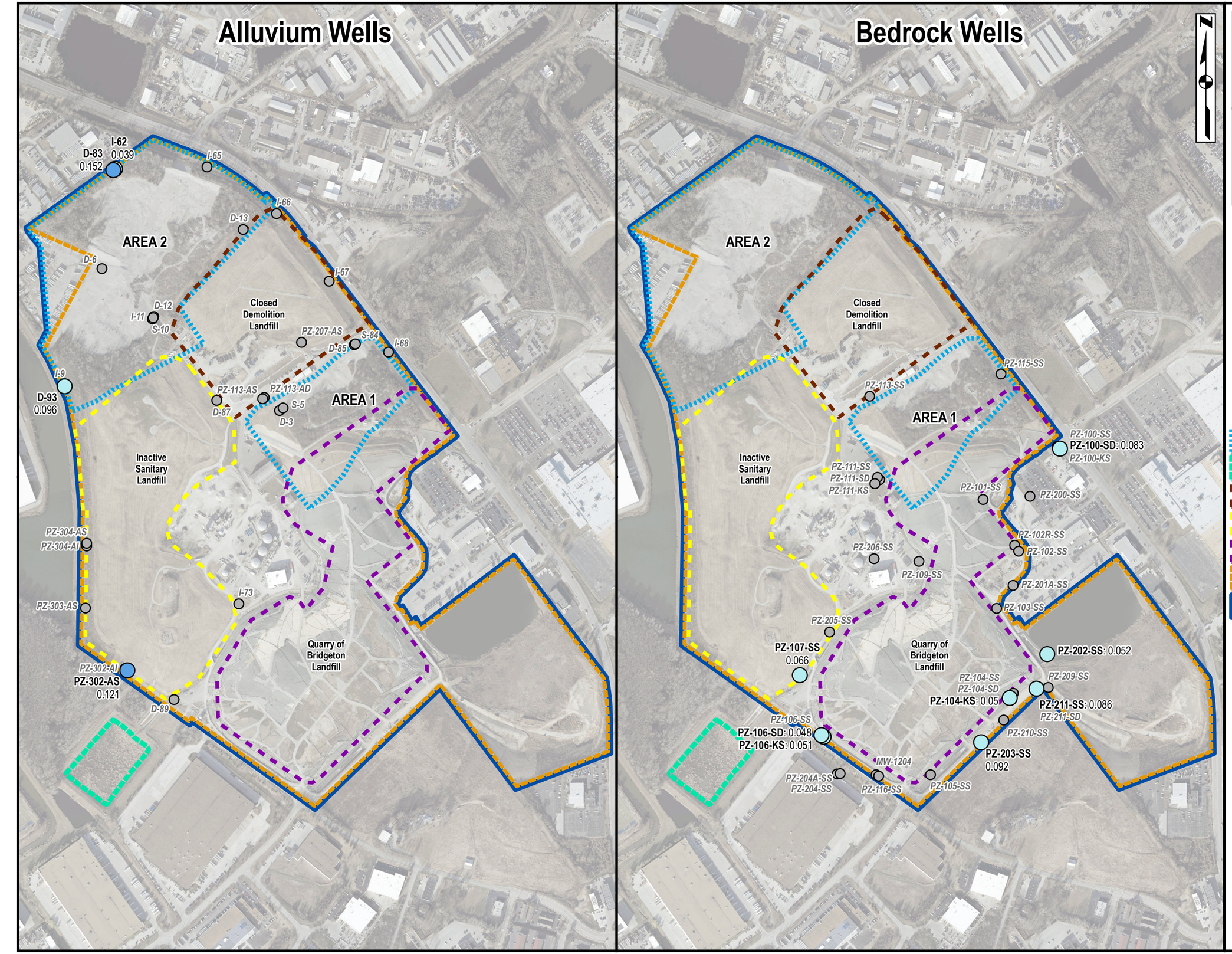
Figure 17a: 2020 Thorium-230 Results

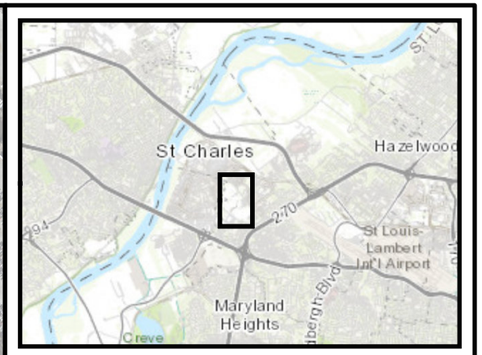
West Lake Landfill OU-3
Bridgeton, Missouri

ERM

Alluvium Wells

Bedrock Wells





Legend

Total Thorium 232 Activity (pCi/L)

- > 0.6
- 0.3 - 0.6
- 0.1 - 0.3
- < 0.1
- Not detected above the referenced reporting limit
- OU-1
- Former Leachate Lagoon
- Closed Demolition Landfill Boundary
- Inactive Sanitary Landfill Boundary
- Bridgeton Landfill Boundary
- Landfill Property Boundary
- Superfund Site Boundary

NOTES:

- The MCL for gross-alpha radiation is 15 pCi/L. Thorium 232 is a component of gross alpha radiation
- Groundwater results taken from Q4 2020 sampling event.

0 250 500 1,000

Feet

Figure 17b: 2020 Thorium-232 Results

West Lake Landfill OU-3
Bridgeton, Missouri

ERM

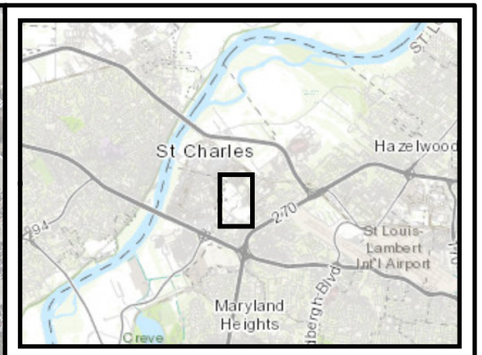
Alluvium Wells

Bedrock Wells

AREA 2
AREA 1
Closed Demolition Landfill
Inactive Sanitary Landfill
Quarry of Bridgeton Landfill

I-65 271
D-83
I-62
I-66
D-13
D-6 301
I-67
D-12 1,150
I-11 412
S-10 1,120
S-84 240
I-68
D-85
PZ-207-AS 371
PZ-114-AS
PZ-113-AS 257
PZ-113-AD
I-9
D-93
S-82
S-5
D-3
D-87
PZ-304-AS 467
PZ-304-AI 373
PZ-303-AS
I-73 24,100
PZ-205-AS 48,400
PZ-302-AI
PZ-302-AS 233
D-89 11,500

PZ-115-SS 283
PZ-113-SS
PZ-100-SS
PZ-100-SD
PZ-100-KS
PZ-111-SD
PZ-111-SS 574
PZ-111-KS
PZ-101-SS 4,450
PZ-200-SS
PZ-102R-SS
PZ-102-SS
PZ-109-SS
PZ-206-SS 1,120
PZ-201A-SS
PZ-103-SS: 5,240
PZ-205-SS
PZ-202-SS: 12,000
PZ-107-SS 2,150
PZ-104-SS
PZ-209-SS
PZ-104-SD: 865
PZ-104-KS
PZ-211-SS
PZ-211-SD: 544
PZ-106-SS: 914
PZ-106-SD: 745
PZ-106-KS
PZ-210-SS 378
PZ-203-SS
PZ-116-SS
PZ-204A-SS
PZ-204-SS: 12,500
MW-1204 4,450
PZ-105-SS: 333



Legend

Total Tritium Activity (pCi/L)

- > 10,000
- 5,000 - 10,000
- 1,000 - 5,000
- 100 - 1,000
- < 100
- Not detected above the referenced reporting limit
- OU-1
- Former Leachate Lagoon
- Closed Demolition Landfill Boundary
- Inactive Sanitary Landfill Boundary
- Bridgeton Landfill Boundary
- Landfill Property Boundary
- Superfund Site Boundary

NOTES:
EPA Maximum Contaminant Level (MCL) for Tritium is 20,000 pCi/L
Groundwater results taken from Q4 2020 sampling event.

0 250 500 1,000
Feet

Figure 18: 2020 Tritium Results

West Lake Landfill OU-3
Bridgeton, Missouri

ERM

APPENDIX A NUCLEAR MAGNETIC RESONANCE LOGS

Elevation (ft amsl)

Water Content (%)

80% 60% 40% 20%

460 450 440 430 420 410 400 390 380 370 360 350 340 330

Well Construction

D-6

Hydraulic Conductivity (ft/day)

10^{-2} 10^{0} 10^{2} 10^{4}

SDR

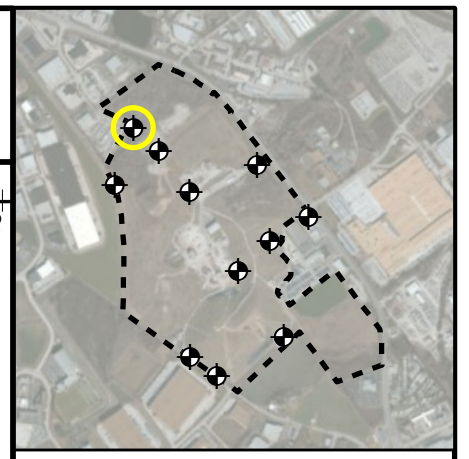
SOE

Transmissivity (ft^2/day) x 10^4

0 1 2

SDR

SOE



Water Content (%)

- Clay
- Capillary
- Mobile

Well Construction

- Top of Casing Elevation
- Screen
- Borehole
- Water Level

NOTES:

- SDR = the "Schlumberger algorithm" for estimating hydraulic conductivity
- SOE = the "Sum of Echoes algorithm" developed for unconsolidated sediments
- Water level data taken from November 2020 sampling event

D-6

NMR Log

West Lake Landfill

Bridgeton,

Missouri

ERM

Q:\Boston\Team\DMW\Clients_V_Z\WestLake\WestLakeLandfill_MOMXD\2021_02_AnnualReport2020\NMR_Logs\NMR_Log_D6_20210222.mxd - Sarah.Poulin - 2/23/2021

Elevation (ft amsl)

Water Content (%)

100% 80% 60% 40% 20%

Well Construction

D-12

Hydraulic Conductivity (ft/day)

10^{-2} 10^{0} 10^{2} 10^{4}

SDR

SOE

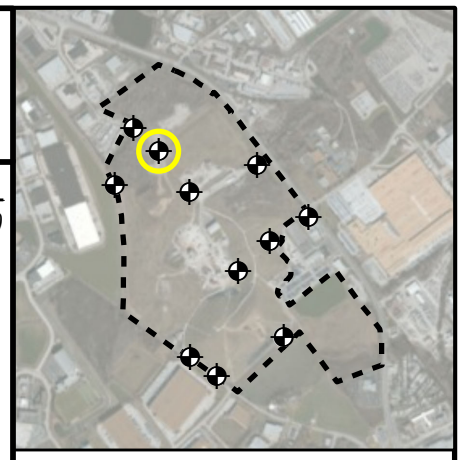
Transmissivity (ft^2/day) x 10^4

0 5 10

SDR

SOE

490 480 470 460 450 440 430 420 410 400 390 380 370 360 350 340 330



Water Content (%)

- Clay
- Capillary
- Mobile

Well Construction

- Top of Casing Elevation
- Screen
- Borehole
- Water Level

NOTES:

- SDR = the “Schlumberger algorithm” for estimating hydraulic conductivity
- SOE = the “Sum of Echoes algorithm” developed for unconsolidated sediments
- Water level data taken from November 2020 sampling event

D-12

NMR Log

West Lake Landfill

Bridgeton,

Missouri

ERM

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Elevation (ft amsl)

Water Content (%)

60% 40% 20%

Well Construction

D-85

Hydraulic Conductivity (ft/day)

10^{-5} 10^{0} 10^{5}

SDR

SOE

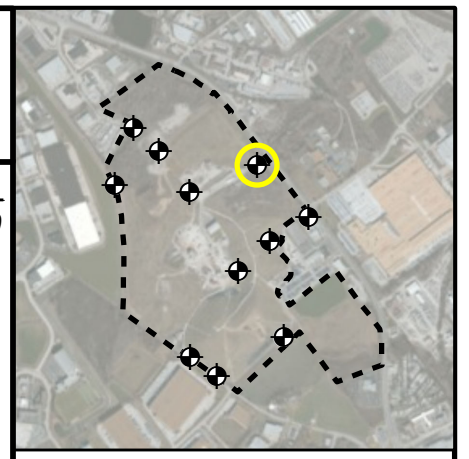
Transmissivity (ft^2/day)

0 5,000 10,000

SDR

SOE

460 450 440 430 420 410 400 390 380 370



Water Content (%)

- Clay
- Capillary
- Mobile

Well Construction

- Top of Casing Elevation
- Screen
- Borehole
- Water Level

NOTES:

- SDR = the "Schlumberger algorithm" for estimating hydraulic conductivity
- SOE = the "Sum of Echoes algorithm" developed for unconsolidated sediments
- Water level data taken from November 2020 sampling event

D-85

NMR Log

West Lake Landfill

Bridgeton,

Missouri

ERM

Q:\Boston\Team\DMM\VClients_V_Z\WestLake\WestLakeLandfill_MOMXD\2021_02_AnnualReport2020\NMR_Logs\NMR_Log_D85_20210222.mxd - Sarah.Poulin - 2/23/2021

Elevation (ft amsl)

Water Content (%)

80% 60% 40% 20%

480 470 460 450 440 430 420 410 400 390 380 370 360 350

Well Construction

D-87

Hydraulic Conductivity (ft/day)

10^{-5} 10^{0} 10^{5}

SDR

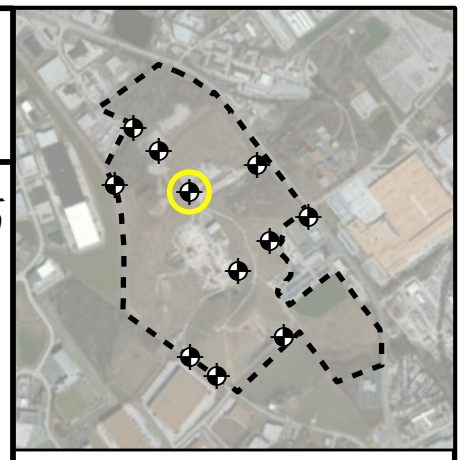
SOE

Transmissivity (ft^2/day)

0 5,000 10,000

SDR

SOE



Water Content (%)

- Clay
- Capillary
- Mobile

Well

- Top of Casing Elevation
- Screen
- Borehole
- Water Level

NOTES:

- SDR = the “Schlumberger algorithm” for estimating hydraulic conductivity
- SOE = the “Sum of Echoes algorithm” developed for unconsolidated sediments
- Water level data taken from November 2020 sampling event

D-87

NMR Log

West Lake Landfill

Bridgeton,

Missouri

ERM

Q:\Boston\Team\DMM\Clients_V_Z\WestLake\WestLakeLandfill_MO\MXD\2021_02_AnnualReport2020\NMR_Logs\NMR_Log_D87_20210222.mxd - Sarah.Poulin - 2/23/2021

Elevation (ft amsl)

Water Content (%)

80% 60% 40% 20%

Well Construction

D-93

Hydraulic Conductivity (ft/day)

10 100

SDR

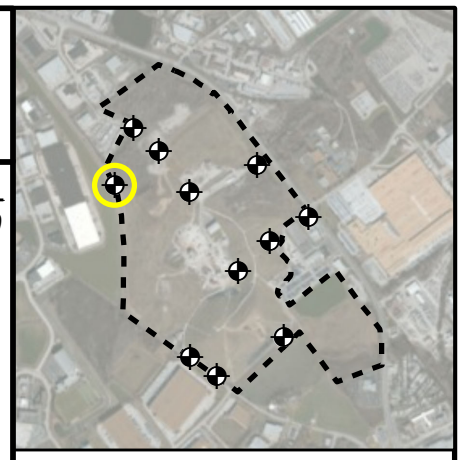
SOE

Transmissivity (ft^2/day)

0 5,000 10,000

SDR

SOE



Water Content (%)

- Mobile
- Capillary
- Clay

Well Construction

- Top of Casing Elevation
- Screen
- Borehole
- Water Level

NOTES:

- SDR = the "Schlumberger algorithm" for estimating hydraulic conductivity
- SOE = the "Sum of Echoes algorithm" developed for unconsolidated sediments
- Water level data taken from November 2020 sampling event

D-93

NMR Log

West Lake Landfill

Bridgeton,

Missouri

ERM

Q:\Boston\Team\DMM\Clients_V_Z\WestLake\WestLakeLandfill_MO\MXD\2021_02_AnnualReport2020\NMR_Logs\NMR_Log_D93_20210222.mxd - Sarah.Poulin - 2/23/2021

Elevation (ft amsl)

Water Content (%)

40% 20%

Well Construction

MW-1204

Hydraulic Conductivity (ft/day)

10^{-7} 10^{-5} 10^{-3} 10^{-1}

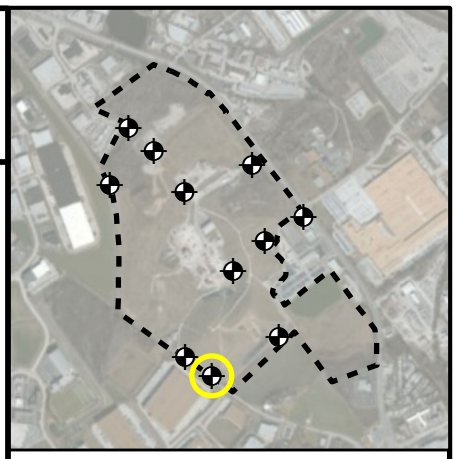
SDR

Transmissivity (ft^2/day)

0 0.15 0.3

SDR

480 470 460 450 440 430 420 410 400 390 380 370 360 350 340 330 320 310 300 290 280 270 260 250



Water Content (%)

- Mobile
- Capillary
- Clay

Well Construction

- Top of Casing Elevation
- Screen
- Borehole
- Water Level

NOTES:

- SDR = the "Schlumberger algorithm" for estimating hydraulic conductivity
- Water level data taken from November 2020 sampling event

MW-1204

NMR Log

West Lake Landfill

Bridgeton,

Missouri

ERM

Elevation (ft amsl)

Water Content (%)

80% 60% 40% 20%

Well Construction

PZ-100-KS

Hydraulic Conductivity (ft/day)

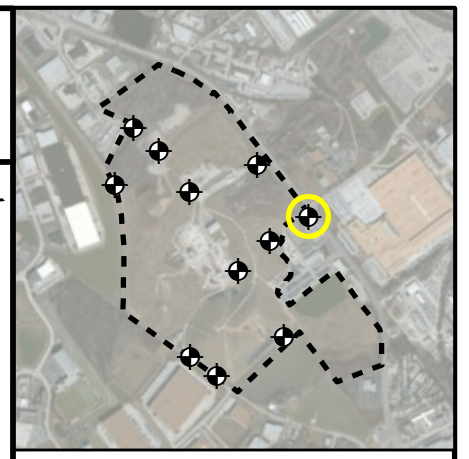
10^{-7} 10^{-5} 10^{-3} 10^{-1}

SDR

Transmissivity (ft^2/day)

0 0.50 1.0

SDR



Water Content (%)

- Mobile
- Capillary
- Clay

Well

- Top of Casing Elevation
- Screen
- Borehole
- Water Level

NOTES:

- SDR = the “Schlumberger algorithm” for estimating hydraulic conductivity
- Water level data taken from November 2020 sampling event

PZ-100-KS

NMR Log

West Lake Landfill

Bridgeton,

Missouri

ERM

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Elevation (ft amsl)

Water Content (%)

100% 80% 60% 40% 20%

Well Construction

PZ-101-SS

Hydraulic Conductivity (ft/day)

10^{-7} 10^{-5} 10^{-3} 10^{-1}

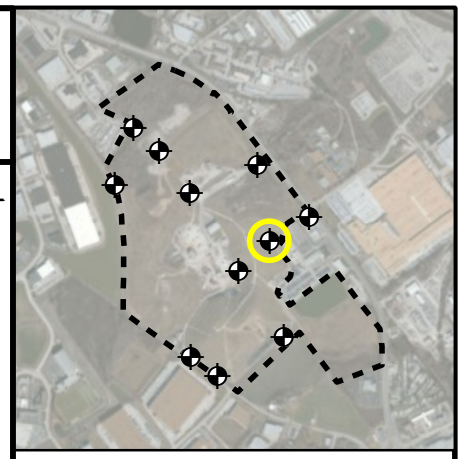
SDR

Transmissivity (ft^2/day)

0 0.05 0.1

SDR

500 490 480 470 460 450 440 430 420 410 400 390 380 370 360 350 340 330



Water Content (%)

- Mobile
- Capillary
- Clay

Well Construction

- Top of Casing Elevation
- Screen
- Borehole
- Water Level

NOTES:

- SDR = the “Schlumberger algorithm” for estimating hydraulic conductivity
- Water level data taken from November 2020 sampling event

PZ-101-SS

NMR Log

West Lake Landfill

Bridgeton,

Missouri

ERM

Q:\Boston\Team\DMMV\Clients_V_Z\WestLakeWestLakeLandfill_MO\MXD\2021_02_AnnualReport2020\NMR_Logs\NMR_Log_PZ101SS_20210222.mxd - Joseph.Hakam - 1/6/2022

Elevation (ft amsl)

Water Content (%)

60% 40% 20%

Well Construction

PZ-104-SD

Hydraulic Conductivity (ft/day)

10^{-7} 10^{-5} 10^{-3} 10^{0}

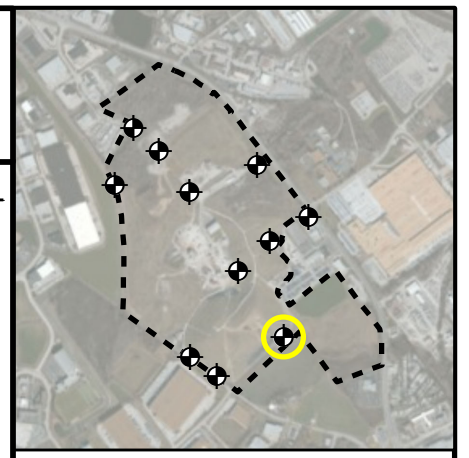
SDR

Transmissivity (ft^2/day)

0 0.05 0.1

SDR

490 480 470 460 450 440 430 420 410 400 390 380 370 360 350 340 330 320 310 300 290 280 270 260 250 240 230 220



Water Content (%)

- Mobile
- Capillary
- Clay

Well Construction

- Top of Casing Elevation
- Screen
- Borehole
- Water Level

NOTES:

- SDR = the "Schlumberger algorithm" for estimating hydraulic conductivity
- Water level data taken from November 2020 sampling event

PZ-104-SD

NMR Log

West Lake Landfill

Bridgeton,

Missouri

ERM

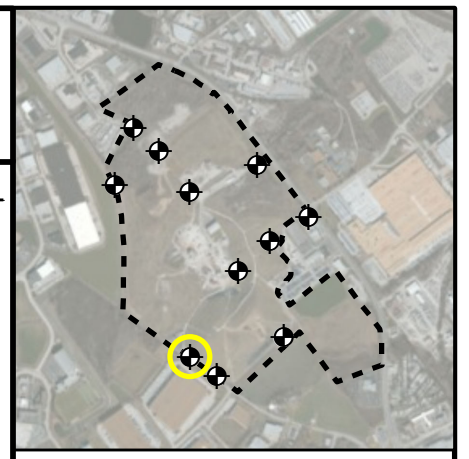
Elevation (ft amsl)

Water Content (%)

Well Construction

Hydraulic Conductivity (ft/day)

Transmissivity (ft^2/day)



Water Content (%)

- Mobile
- Capillary
- Clay

Well

- Top of Casing Elevation
- Screen
- Borehole
- Water Level

NOTES:

- SDR = the "Schlumberger algorithm" for estimating hydraulic conductivity
- Water level data taken from November 2020 sampling event

PZ-106-SD

NMR Log

West Lake Landfill

Bridgeton,

Missouri

ERM

Elevation (ft amsl)

Water Content (%)

80% 60% 40% 20%

470 460 450 440 430 420 410 400 390 380 370 360 350 340 330 320

Well Construction

PZ-109-SS

Hydraulic Conductivity (ft/day)

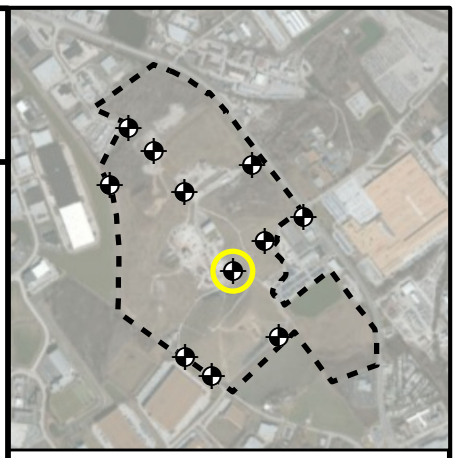
10^{-7} 10^{-5} 10^{-3}

SDR

Transmissivity (ft^2/day)

0 0.15 0.30

SDR



Water Content (%)

- Mobile
- Capillary
- Clay

Well Construction

- Top of Casing Elevation
- Screen
- Borehole
- Water Level

NOTES:

- SDR = the "Schlumberger algorithm" for estimating hydraulic conductivity
- Water level data taken from November 2020 sampling event

PZ-109-SS

NMR Log

West Lake Landfill

Bridgeton,

Missouri

ERM

Q:\Boston\Team\DMMV\Clients_V_Z\WestLakeWestLakeLandfill_MO\MXD\2021_02_AnnualReport2020\NMR_Logs\NMR_Log_PZ109SS_20210222.mxd - Sarah.Poulin - 2/23/2021

Table A-1: NMR Hydraulic Conductivity (feet per day) in Existing Alluvium Wells
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

Alluvium Wells									
D-6		D-12 (I-11, S-10)		D-85 (S-84)		D-87		D-93 (I-9, S-82)	
Depth (ft.)	Ksoe (ft/day)	Depth (ft.)	Ksoe (ft/day)	Depth (ft.)	Ksoe (ft/day)	Depth (ft.)	Ksoe (ft/day)	Depth (ft.)	Ksoe (ft/day)
18.4	22.8	51.9	21.4	25.7	106.8	33.0	74.9	18.8	112.9
20.0	15.4	53.5	136.0	27.1	140.5	34.5	38.4	20.3	121.5
21.6	20.0	55.1	43.4	28.5	100.2	36.1	98.3	21.8	184.1
23.2	25.0	56.7	15.8	30.0	237.2	37.6	264.0	23.3	121.5
24.7	25.3	58.3	59.6	31.4	318.9	39.1	190.5	24.8	95.9
26.3	44.7	59.9	253.9	32.9	311.9	40.6	93.8	26.3	98.4
27.9	22.2	61.5	429.1	34.3	294.0	42.1	63.3	27.8	70.0
29.5	27.6	63.1	472.1	35.8	175.1	43.6	61.8	29.3	94.9
31.0	7.5	64.7	450.2	37.2	81.9	45.1	56.4	30.8	78.0
32.6	1.8	66.3	322.9	38.6	102.3	46.6	29.9	32.3	97.2
34.2	1.8	67.9	368.5	40.1	65.0	48.1	14.6	33.9	102.3
35.8	35.1	69.6	412.5	41.5	19.0	49.6	48.0	35.4	146.1
37.3	90.8	71.2	379.0	43.0	10.9	51.1	115.4	36.9	93.0
38.9	290.0	72.8	329.5	44.4	8.9	52.7	90.0	38.4	73.4
40.5	278.9	74.4	306.3	45.9	13.8	54.2	79.9	39.9	82.1
42.1	253.5	76.0	513.1	47.3	53.8	55.7	112.4	41.4	81.2
43.6	133.3	77.6	577.5	48.8	94.7	57.2	113.6	42.9	113.3
45.2	99.9	79.2	528.9	50.2	123.9	58.7	121.1	44.4	104.8
46.8	219.6	80.8	453.0	51.6	152.5	60.2	133.8	45.9	63.5
48.4	107.2	82.4	414.2	53.1	177.6	61.7	133.7	47.4	46.8
49.9	87.0	84.0	345.7	54.5	210.1	63.2	114.0	48.9	35.6
51.5	88.3	85.6	425.4	56.0	296.0	64.7	104.1	50.5	86.2
53.1	29.5	87.2	426.4	57.4	346.4	66.2	121.1	52.0	166.1
54.7	39.4	88.8	332.5	58.9	289.9	67.7	130.2	53.5	215.2
56.2	11.3	90.5	380.8	60.3	236.8	69.3	225.4	55.0	140.3
57.8	19.3	92.1	403.7	61.7	235.6	70.8	343.5	56.5	69.9
59.4	89.6	93.7	353.1	63.2	269.7	72.3	343.5	58.0	96.2
61.0	114.0	95.3	378.3	64.6	280.4	73.8	277.2	59.5	53.5
62.5	182.6	96.9	385.7	66.1	276.8	75.3	306.4	61.0	97.4
64.1	231.9	98.5	353.4	67.5	278.5	76.8	320.4	62.5	137.4
65.7	273.0	100.1	457.9	69.0	264.7	78.3	277.2	64.0	89.9
67.3	195.3	101.7	419.5	70.4	239.6	79.8	191.7	65.6	152.0
68.8	180.6	103.3	350.7	71.8	214.3	81.3	162.4	67.1	168.8
70.4	285.5	104.9	444.4	73.3	231.0	82.8	180.6	68.6	129.1
72.0	241.4	106.5	507.4	74.7	197.8	84.3	82.9	70.1	84.8
73.6	156.9	108.1	510.2			85.9	11.1	71.6	119.1
75.1	100.9	109.7	485.3			87.4	8.5	73.1	180.4
76.7	175.1	111.4	541.4			88.9	11.1	74.6	194.8
78.3	230.5	113.0	389.6			90.4	9.2	76.1	162.0
79.9	209.0	114.6	431.1			91.9	8.2	77.6	81.8
81.4	124.1	116.2	377.4			93.4	13.9	79.1	66.8
83.0	137.5	117.8	299.3			94.9	31.3	80.6	88.4
84.6	93.2	119.4	440.1			96.4	57.7	82.2	55.1
86.2	116.6	121.0	457.0			97.9	35.7	83.7	29.5
87.7	131.9	122.6	324.8			99.4	43.6	85.2	24.2
89.3	193.7	124.2	466.9			101.0	53.9	86.7	47.3
90.9	175.5	125.8	457.9			102.5	66.6	88.2	29.5
92.5	254.6	127.4	373.1			104.0	36.3	89.7	42.5
94.0	396.3	129.0	579.8			105.5	25.2	91.2	21.3
95.6	341.7	130.6	472.3			107.0	16.9	92.7	14.4
97.2	227.2	132.2	397.9			108.5	13.7	94.2	9.8
98.8	186.6	133.9	449.3			110.0	19.9	95.7	30.3
100.3	140.3	135.5	448.9			111.5	30.6	97.2	71.7
101.9	89.2	137.1	542.7					98.8	115.8
103.5	74.2	138.7	477.2					100.3	109.4
105.1	97.0	140.3	469.8					101.8	104.9
		141.9	268.3					103.3	99.0
		143.5	359.5					104.8	80.8
								106.3	55.5
								107.8	30.8
								109.3	38.1
								110.8	39.8

Notes:
Variable Depth Scale
NQ = not quantified due to algorithm porosity parameter
Well Screen Interval

Table A-2: NMR Hydraulic Conductivity (feet per day) in Existing Bedrock Wells
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

Bedrock Wells									
MW-1204 (PZ-116)		PZ-100-KS (SD, SS)		PZ-101-SS		PZ-104-SD (SS)		PZ-106-SD (SS)		PZ-109-SS	
Depth (ft.)	Ksdr (ft/day)	Depth (ft.)	Ksdr (ft/day)	Depth (ft.)	Ksdr (ft/day)	Depth (ft.)	Ksdr (ft/day)	Depth (ft.)	Ksdr (ft/day)	Depth (ft.)	Ksdr (ft/day)
19.6	2.63E-03	28.6	3.75E-03	22.1	4.77E-03	36.7	9.63E-03	19.8	3.20E-03	9.5	9.10E-04
25.4	5.51E-04	30.2	1.92E-03	23.7	2.24E-03	38.2	3.75E-03	21.4	7.58E-03	10.9	1.34E-04
31.2	6.68E-05	31.7	1.28E-03	25.3	1.04E-02	39.8	3.77E-03	23.0	1.66E-02	12.4	4.65E-03
37.0	4.57E-06	33.2	1.75E-03	26.8	4.77E-03	41.3	7.98E-03	24.6	1.86E-02	13.9	1.07E-02
42.8	9.48E-07	34.8	8.79E-04	28.4	1.92E-03	42.8	2.97E-01	26.2	1.51E-02	15.3	6.30E-03
48.6	4.41E-08	36.3	1.65E-04	30.0	5.32E-04	44.4	2.09E-01	27.8	2.26E-03	16.8	6.26E-03
54.4	7.48E-07	37.9	1.33E-02	31.6	9.83E-04	45.9	1.78E-03	29.4	8.20E-07	18.2	1.25E-02
60.2	3.69E-06	39.4	1.30E-02	33.1	6.20E-04	47.5	2.34E-03	31.0	1.23E-07	19.7	9.31E-03
66.1	2.10E-05	40.9	1.38E-06	34.7	9.31E-06	49.0	2.19E-06	32.6	4.09E-07	21.2	7.80E-04
71.9	3.55E-05	42.5	4.55E-08	36.3	2.29E-05	50.6	4.32E-07	34.3	2.45E-08	22.6	5.81E-04
77.7	6.89E-06	44.0	6.89E-06	37.9	3.56E-04	52.1	1.44E-06	35.9	6.95E-06	24.1	3.57E-04
83.5	3.25E-04	45.6	2.20E-05	39.4	6.79E-04	53.6	9.55E-06	37.5	4.94E-05	25.5	1.83E-03
89.3	2.15E-03	47.1	6.49E-07	41.0	2.48E-05	55.2	1.75E-05	39.1	3.93E-05	27.0	7.50E-03
95.1	3.31E-04	48.7	2.64E-06	42.6	1.33E-04	56.7	1.41E-05	40.7	1.05E-03	28.5	2.45E-04
100.9	2.53E-05	50.2	5.63E-05	44.2	1.74E-04	58.3	4.68E-05	42.3	1.88E-03	29.9	2.52E-05
106.8	3.26E-08	51.7	2.61E-03	45.7	3.23E-04	59.8	2.35E-05	43.9	1.60E-04	31.4	2.65E-06
112.6	1.04E-08	53.3	2.28E-03	47.3	3.97E-05	61.4	4.05E-06	45.5	5.14E-05	32.8	9.73E-07
118.4	1.45E-05	54.8	3.99E-03	48.9	3.93E-07	62.9	1.79E-05	47.1	8.06E-05	34.3	1.07E-06
124.2	1.10E-05	56.4	1.81E-02	50.5	4.61E-07	64.4	2.27E-05	48.7	6.77E-06	35.8	4.63E-07
130.0	4.15E-06	57.9	2.59E-02	52.0	1.62E-06	66.0	2.08E-05	50.3	2.65E-06	37.2	4.54E-05
135.8	6.31E-06	59.4	2.44E-02	53.6	9.18E-06	67.5	4.91E-05	51.9	1.57E-06	38.7	1.21E-03
141.6	2.85E-06	61.0	3.89E-02	55.2	9.30E-06	69.1	2.22E-05	53.5	9.89E-07	40.1	2.44E-03
147.5	6.54E-06	62.5	4.98E-02	56.8	2.30E-06	70.6	9.22E-06	55.2	1.34E-05	41.6	1.59E-03
153.3	5.08E-06	64.1	2.27E-02	58.3	6.24E-07	72.1	5.94E-05	56.8	2.30E-03	43.1	2.57E-05
159.1	9.21E-07	65.6	2.85E-02	59.9	2.24E-06	73.7	2.74E-05	58.4	7.30E-03	44.5	1.62E-05
164.9	1.68E-06	67.2	4.49E-03	61.5	4.17E-06	75.2	4.56E-03	60.0	3.05E-03	46.0	2.31E-07
170.7	8.65E-06	68.7	5.50E-03	63.1	3.15E-06	76.8	1.88E-03	61.6	7.81E-04	47.4	2.24E-06
176.5	3.43E-05	70.2	1.76E-02	64.6	1.11E-05	78.3	1.38E-04	63.2	1.07E-03	48.9	3.64E-07
182.3	5.71E-04	71.8	5.19E-03	66.2	3.26E-07	79.9	1.91E-04	64.8	1.86E-03	50.4	3.12E-08
188.1	4.43E-03	73.3	3.46E-03	67.8	NQ	81.4	2.06E-03	66.4	1.74E-03	51.8	1.19E-07
194.0	8.34E-03	74.9	1.24E-03	69.4	NQ	82.9	4.78E-03	68.0	1.52E-03	53.3	4.68E-08
199.8	1.44E-02	76.4	7.26E-06	70.9	NQ	84.5	4.98E-03	69.6	1.11E-03	54.7	3.18E-07
		78.0	2.31E-05	72.5	3.84E-04	86.0	3.11E-03	71.2	1.76E-04	56.2	5.60E-06
		79.5	1.99E-05	74.1	1.29E-03	87.6	8.48E-04	72.8	1.12E-05	57.7	5.56E-06
		81.0	8.21E-05	75.7	6.86E-04	89.1	3.61E-04	74.4	4.75E-05	59.1	2.17E-06
		82.6	1.95E-04	77.2	3.26E-04	90.6	7.87E-04	76.0	1.78E-04	60.6	5.74E-07
		84.1	4.13E-05	78.8	1.91E-04	92.2	1.94E-04	77.7	2.67E-05	62.0	8.23E-04
		85.7	1.18E-06	80.4	1.38E-05	93.7	8.64E-05	79.3	2.51E-06	63.5	1.61E-02
		87.2	2.45E-04	82.0	1.23E-05	95.3	4.81E-05	80.9	1.16E-06	65.0	3.14E-02
		88.7	1.17E-02	83.5	2.80E-05	96.8	1.72E-04	82.5	5.66E-08	66.4	8.79E-04

Table A-2: NMR Hydraulic Conductivity (feet per day) in Existing Bedrock Wells
West Lake Landfill OU-3
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Bedrock Wells										
MW-1204 (PZ-116)		PZ-100-KS (SD, SS)		PZ-101-SS		PZ-104-SD (SS)		PZ-106-SD (SS)		PZ-109-SS	
Depth (ft.)	Ksdr (ft/day)	Depth (ft.)	Ksdr (ft/day)	Depth (ft.)	Ksdr (ft/day)	Depth (ft.)	Ksdr (ft/day)	Depth (ft.)	Ksdr (ft/day)	Depth (ft.)	Ksdr (ft/day)
		90.3	1.71E-03	85.1	2.31E-05	98.4	1.49E-04	84.1	1.23E-07	67.9	4.99E-04
		91.8	5.16E-03	86.7	2.36E-05	99.9	6.92E-05	85.7	1.54E-07	69.3	1.37E-03
		93.4	1.13E-02	88.3	9.62E-06	101.4	8.81E-05	87.3	3.32E-05	70.8	6.04E-04
		94.9	5.39E-03	89.8	3.33E-05	103.0	2.07E-04	88.9	1.14E-04	72.3	7.45E-04
		96.5	1.19E-04	91.4	5.50E-04	104.5	7.65E-04	90.5	1.98E-05	73.7	1.22E-03
		98.0	3.50E-04	93.0	2.94E-04	106.1	1.37E-03	92.1	8.22E-05	75.2	8.47E-04
		99.5	1.95E-03	94.6	2.27E-03	107.6	1.62E-03	93.7	1.45E-05	76.6	3.16E-03
		101.1	4.51E-03	96.1	1.11E-03	109.2	2.01E-03	95.3	1.90E-07	78.1	9.42E-04
		102.6	4.50E-03	97.7	1.99E-04	110.7	1.37E-03	96.9	5.11E-06	79.6	1.95E-03
		104.2	1.90E-03	99.3	4.94E-06	112.2	1.08E-03	98.6	2.63E-03	81.0	1.16E-03
		105.7	4.83E-03	100.9	1.54E-03	113.8	1.24E-03	100.2	3.42E-03	82.5	8.20E-05
		107.2	1.79E-03	102.4	2.00E-03	115.3	8.27E-04	101.8	6.01E-04	83.9	2.08E-06
		108.8	8.85E-04	104.0	3.14E-03	116.9	1.10E-03	103.4	8.13E-05	85.4	1.77E-05
		110.3	1.09E-03	105.6	3.74E-03	118.4	1.97E-03	105.0	2.71E-04	86.9	2.84E-05
		111.9	1.29E-03	107.2	1.04E-04	119.9	6.61E-04	106.6	3.55E-04	88.3	9.05E-06
		113.4	6.88E-04	108.7	4.75E-06	121.5	7.84E-04	108.2	2.49E-04	89.8	4.30E-05
		115.0	1.85E-04	110.3	1.93E-05	123.0	4.59E-03	109.8	4.82E-05	91.2	1.27E-04
		116.5	2.23E-05	111.9	3.05E-07	124.6	6.55E-03	111.4	1.10E-06	92.7	4.00E-06
		118.0	3.30E-05	113.5	3.40E-09	126.1	6.53E-04	113.0	1.28E-08	94.2	4.39E-05
		119.6	2.34E-05	115.0	4.05E-07	127.7	6.31E-04	114.6	2.78E-07	95.6	2.45E-04
		121.1	1.82E-06	116.6	3.43E-07	129.2	7.84E-04	116.2	1.20E-03	97.1	5.68E-04
		122.7	7.22E-07	118.2	9.66E-07	130.7	1.76E-03	117.8	2.73E-03	98.5	5.87E-04
		124.2	6.06E-07	119.7	4.25E-07	132.3	3.66E-03	119.5	1.89E-03	100.0	1.53E-03
		125.8	9.86E-08	121.3	6.69E-06	133.8	2.43E-03	121.1	3.23E-04	101.5	2.17E-03
		127.3	2.58E-06	122.9	7.17E-06	135.4	1.09E-03	122.7	2.48E-06	102.9	2.46E-03
		128.8	2.81E-06	124.5	7.00E-06	136.9	1.33E-03	124.3	1.42E-05	104.4	4.75E-03
		130.4	5.30E-09	126.0	7.33E-06	138.4	1.25E-04	125.9	2.00E-05	105.8	1.59E-03
		131.9	1.72E-08	127.6	1.37E-05	140.0	5.24E-03	127.5	3.15E-07	107.3	2.25E-03
		133.5	3.49E-07	129.2	9.47E-06	141.5	1.15E-02	129.1	1.01E-07	108.8	9.10E-04
		135.0	2.99E-06	130.8	7.69E-04	143.1	7.74E-04	130.7	1.33E-06	110.2	2.23E-04
		136.5	6.57E-06	132.3	6.58E-04	144.6	2.05E-04	132.3	1.03E-05	111.7	6.09E-04
		138.1	4.56E-06	133.9	1.35E-05	146.2	3.18E-04	133.9	2.65E-05	113.1	1.72E-03
		139.6	6.91E-08	135.5	1.85E-05	147.7	1.97E-06	135.5	3.36E-06	114.6	3.00E-03
		141.2	4.34E-08	137.1	1.03E-03	149.2	2.07E-07	137.1	6.36E-06	116.1	9.48E-04
		142.7	1.45E-07	138.6	1.81E-03	150.8	6.85E-07	138.7	7.18E-07	117.5	2.08E-04
		144.3	2.41E-05	140.2	1.88E-03	152.3	2.40E-05	140.4	1.88E-06	119.0	3.56E-05
		145.8	6.03E-05	141.8	1.19E-03	153.9	5.46E-05	142.0	1.58E-04		
		147.3	1.31E-06	143.4	2.85E-05	155.4	4.23E-06	143.6	1.02E-05		
		148.9	8.07E-06	144.9	4.14E-08	157.0	5.77E-06	145.2	1.86E-07		

Table A-2: NMR Hydraulic Conductivity (feet per day) in Existing Bedrock Wells
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Bedrock Wells									
MW-1204 (PZ-116)		PZ-100-KS (SD, SS)		PZ-101-SS		PZ-104-SD (SS)		PZ-106-SD (SS)		PZ-109-SS	
Depth (ft.)	Ksdr (ft/day)	Depth (ft.)	Ksdr (ft/day)	Depth (ft.)	Ksdr (ft/day)	Depth (ft.)	Ksdr (ft/day)	Depth (ft.)	Ksdr (ft/day)	Depth (ft.)	Ksdr (ft/day)
		150.4	4.66E-05	146.5	8.22E-05	158.5	1.18E-05	146.8	1.36E-06		
		152.0	7.59E-05	148.1	9.91E-05	160.0	6.92E-06	148.4	3.05E-04		
		153.5	NQ	149.7	4.14E-07	161.6	2.13E-05	150.0	2.36E-03		
		155.1	NQ	151.2	1.52E-07	163.1	6.69E-05	151.6	8.51E-04		
		156.6	NQ	152.8	1.86E-07	164.7	1.88E-04	153.2	2.07E-05		
		158.1	3.35E-07			166.2	3.10E-04	154.8	2.61E-05		
		159.7	4.17E-05			167.7	5.23E-05	156.4	3.49E-05		
		161.2	6.13E-04			169.3	2.53E-05	158.0	2.04E-05		
		162.8	7.33E-04			170.8	7.68E-05	159.6	4.81E-04		
		164.3	5.14E-04			172.4	1.38E-04	161.3	5.31E-04		
		165.8	1.87E-05			173.9	1.25E-05	162.9	1.35E-04		
		167.4	1.53E-08			175.5	1.63E-05	164.5	3.38E-04		
		168.9	1.72E-07			177.0	2.22E-05	166.1	4.58E-04		
		170.5	5.60E-08			178.5	1.47E-05	167.7	1.38E-04		
		172.0	1.43E-06			180.1	1.98E-05	169.3	1.22E-04		
		173.6	1.56E-07			181.6	2.09E-05	170.9	1.03E-04		
		175.1	8.38E-06			183.2	5.98E-05	172.5	1.19E-04		
		176.6	5.45E-05			184.7	4.43E-04	174.1	1.22E-04		
		178.2	4.93E-05			186.3	7.53E-04	175.7	3.22E-04		
		179.7	2.08E-05			187.8	9.89E-05	177.3	3.12E-04		
		181.3	2.59E-05			189.3	3.70E-04	178.9	1.34E-04		
		182.8	7.76E-06			190.9	6.95E-04	180.5	6.22E-04		
		184.3	1.12E-06			192.4	4.81E-04	182.2	5.61E-04		
		185.9	8.05E-08					183.8	5.24E-04		
		187.4	9.60E-09					185.4	3.97E-04		
		189.0	1.08E-05					187.0	1.95E-04		
		190.5	1.01E-03					188.6	3.73E-05		
		192.1	2.38E-03					190.2	2.58E-06		
		193.6	3.81E-03					191.8	1.78E-05		
		195.1	4.07E-03					193.4	1.74E-05		
		196.7	3.20E-03					195.0	7.83E-06		
		198.2	1.45E-03					196.6	2.54E-06		
		199.8	3.93E-04					198.2	2.50E-05		
		201.3	1.11E-04								

Table A-2: NMR Hydraulic Conductivity (feet per day) in Existing Bedrock Wells
West Lake Landfill OU-3
2020 Annual Hydrogeologic and Site Characterization Report

Bedrock Wells										
MW-1204 (PZ-116)		PZ-100-KS (SD, SS)		PZ-101-SS		PZ-104-SD (SS)		PZ-106-SD (SS)		PZ-109-SS	
Depth (ft.)	Ksdr (ft/day)	Depth (ft.)	Ksdr (ft/day)	Depth (ft.)	Ksdr (ft/day)	Depth (ft.)	Ksdr (ft/day)	Depth (ft.)	Ksdr (ft/day)	Depth (ft.)	Ksdr (ft/day)
		202.9	5.65E-05								
		204.4	1.80E-04								
		205.9	1.41E-04								
		207.5	8.20E-04								
		209.0	2.40E-03								
		210.6	4.83E-03								
		212.1	4.41E-03								
		213.6	1.17E-03								
		215.2	1.08E-03								
		216.7	2.42E-03								
		218.3	2.06E-03								
		219.8	6.75E-03								
		221.4	1.08E-03								
		222.9	3.10E-04								
		224.4	1.08E-03								
		226.0	1.90E-03								
		227.5	2.90E-03								
		229.1	3.32E-03								
		230.6	2.05E-03								
		232.1	1.40E-04								
		233.7	1.13E-05								
		235.2	6.27E-05								
		236.8	8.96E-05								
		238.3	1.49E-04								
		239.9	3.98E-05								
		241.4	3.04E-05								
		242.9	5.08E-05								
		244.5	1.10E-04								
		246.0	7.56E-05								
		247.6	4.13E-06								
		249.1	2.26E-06								
		250.7	1.64E-06								

Notes:
Variable Depth Scale

Well Screen Interval

NQ = not quantified due to algorithm porosity parameter error

Data Truncated at Top of Warsaw

APPENDIX B VISTA CLARA NUCLEAR MAGNETIC RESONANCE REPORT

VISTACLARA INC.
NMR GEOPHYSICS

JAVELIN NMR LOGGING REVIEW, ERM, WEST LAKE, ST. LOUIS

30-Nov-2020

Warren Caldwell
info@vista-clara.com

Overview

Logs were reviewed by Vista Clara for three principal issues of concern:

1. Radial variability between the two NMR measurement shells. If present, this can indicate the presence of drilling disturbance.
2. A data artifact causing an anomalously high or anomalously low first echo. This can create spuriously high or spuriously absent clay-bound water contents. In this project, this was occasionally present in F4 (the outer shell), never in F3 (inner shell).
3. High EMI noise, which lowers the SNR, decreasing the confidence in the final result. Elevated noise is present in the upper few meters of most wells.
4. Vertical window size. Unless otherwise noted, all wells were logged with the correct vertical window size of 0.5m.

All depths are converted to feet and referenced to ground surface (casing height removed).

Lithologic Constants

Each well is processed and results exported using two sets of processing parameters based on global averages from the literature.

1. Unconsolidated
    a. SDR parameters: C = 8900, N = 1
    b. SOE parameters: C = 4200, win = 500
    c. T2 cutoff (capillary) = 33ms
2. Limestone
    a. SDR parameters: C = 42, N = 4
    b. SOE parameters: C = 3333, win = 500
    c. T2 cutoff (capillary) = 90ms

Logs depicted below use the Unconsolidated parameters.

Wells

D6

- No widespread radial variability
- No first echo artifact in F4
- *Recommended processing: defaults*

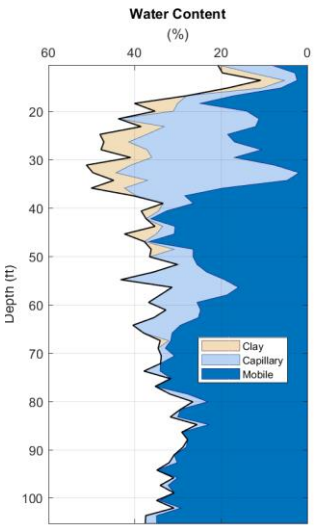


Figure 1: D6

D12

- No radial variability
- No first echo artifact in F4
- *Recommended processing: defaults*

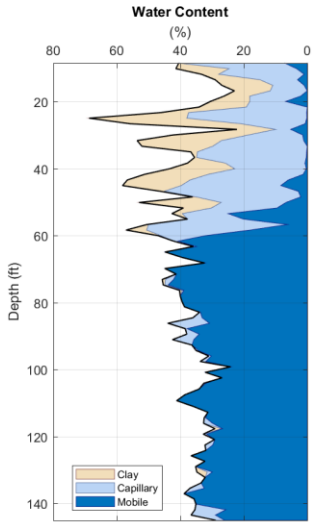


Figure 2: D12

D13

- **Empty folder, no data files**

D85

- No radial variability
- First echo artifact in F4 at some depths
- *Recommended processing: use both frequencies, eliminate first echo from F4*

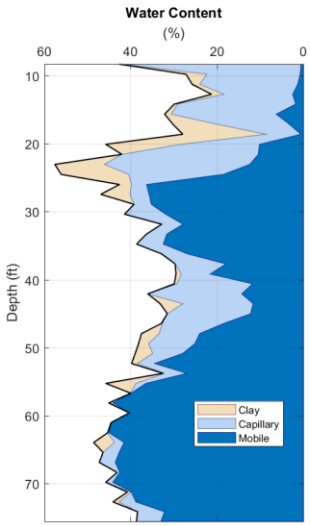


Figure 3: D85

D87

- No radial variability
- First echo artifact in F4 at some depths
- *Recommended processing: use both frequencies, eliminate first echo from F4*

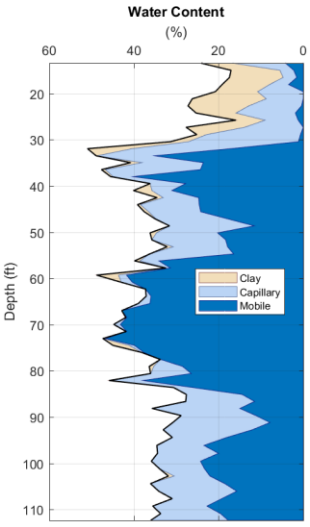


Figure 4: D87

D93

- No widespread radial variability
- First echo artifact in F4 at some depths

- *Recommended processing: use both frequencies, eliminate first echo from F4*

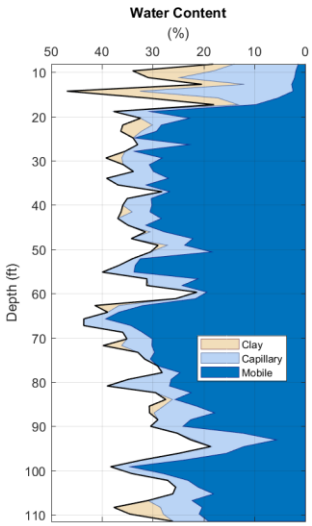


Figure 5: D93

MW1204

- No radial variability
- No first echo artifact in F4
- *Recommended processing: defaults*
- High logging speeds resulted in large vertical window sizes (Figure 7).

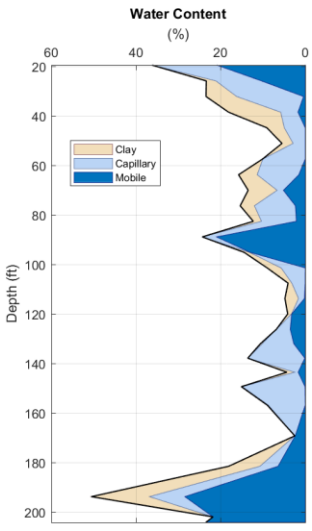


Figure 6: MW1204

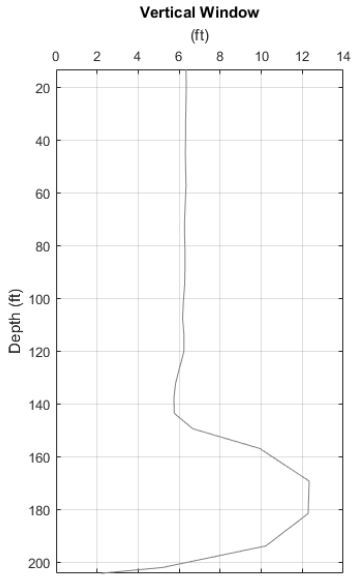


Figure 7: MW1204 vertical window size.

PZ100KS

- No stickup height specified in the "PZ100KS" log, but a stickup height of 0.11m/0.36ft was specified in the "PZ100KS_Down" log, so an offset of -0.36ft was applied to both PZ100KS logs.
- No widespread radial variability
- First echo artifact in F4
- *Recommended processing: use both frequencies, eliminate first echo from F4*
- "PZ100KS_Down" log shows the same large-scale features as the "PZ100KS" log. It was logged at a speed such that the vertical window size is around 25ft (that is, the system completed one cycle of stacking measurements and generated a stacked NMR measurement during the time it took the probe to traverse 25ft).

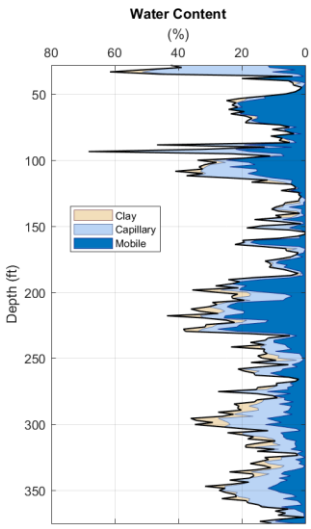


Figure 8: PZ100KS

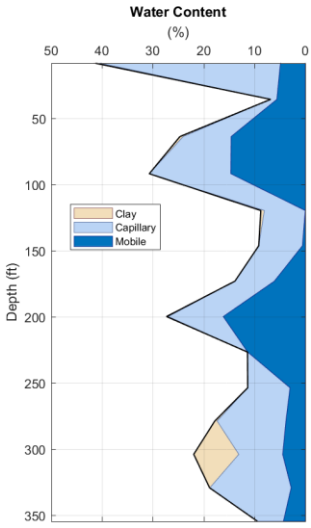


Figure 9: PZ100KS_Down

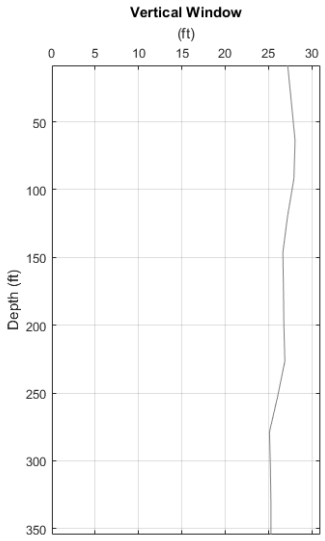


Figure 10: PZ100KS_Down window size

PZ101SS

- Extremely high noise from surface to 30ft depth
- No widespread radial variability
- First echo artifact in F4 at some depths
- *Recommended processing: use both frequencies, eliminate first echo from F4, disregard log above 30ft due to noise levels.*

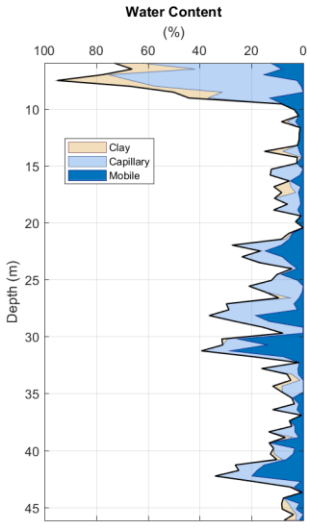


Figure 11: PZ101SS

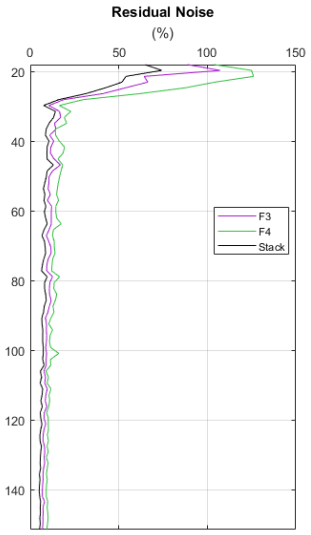


Figure 12: PZ101SS noise levels

PZ104SD

- Elevated noise above 36ft
- Radial variability present at isolated depths (e.g., 80ft, 130-135ft)
- First echo artifact in F4 at some depths
- *Recommended processing: use both frequencies, eliminate first echo from F4, disregard log above 36ft due to noise levels, mobile water content at depths indicated above may be elevated due to borehole disturbance*

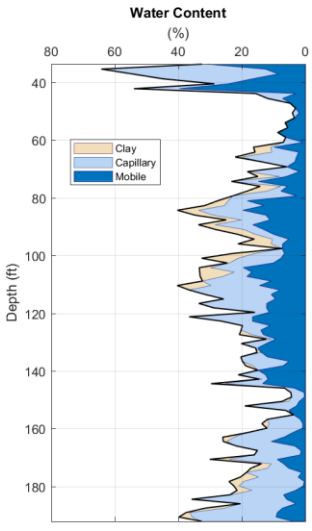


Figure 13: PZ104SD

PZ106SD

- Elevated noise above 25ft
- No widespread radial variability
- First echo artifact in F4 at some depths
- *Recommended processing: use both frequencies, eliminate first echo from F4, disregard log above 25ft due to noise levels*

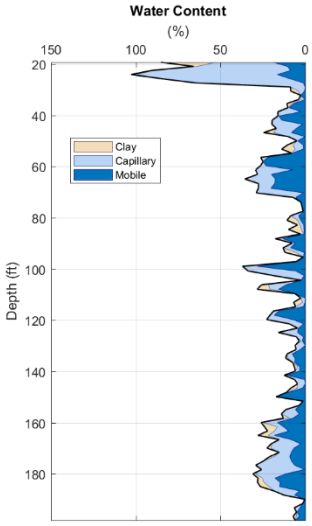


Figure 14: PZ106SD

PZ109SS

- Elevated noise above 15ft
- No widespread radial variability
- First echo artifact in F4 at some depths
- *Recommended processing: use both frequencies, eliminate first echo from F4, disregard log above 15ft due to noise levels*

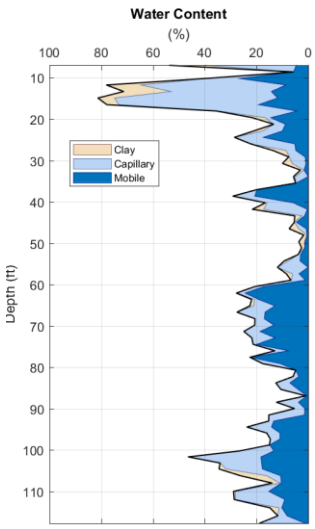


Figure 15: PZ109SS

APPENDIX C DRAFT WATERLOO APS FIELD LOGS

DRAFT

GROUNDWATER PROFILE LOG

Client: ERM

CASCADE DRILLING | TECHNICAL SERVICES

Profile Location: APS-001

	Started	Completed					
Dates:	19-12-20	21-12-20	KPRO Box Serial # / Acquisition Laptop:	481APS05	Gas Drive or Peri Pump:	Peri Pump	
Location:	Bridgeton, MO		Sonde Serial #:	ZCRQT7063	Atmospheric Pressure:	36.82	
CTS #:	203201243		Drilling Contractor:	Cascade	KPRO N_2 Pressure (set via P transducer):	69.17	
Sampler(s):	DB		Average Depth to Water:	-15.31	Gas Drive Pump N_2 Pressure:	NA	

PHYSICOCHEMICAL PARAMETERS

Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	pH	ORP (mV)	COMMENTS
-15.00	12/19/2020:10:31:50	600	-14.01	1374	1.32	6.01	-88	TPT=90m, PGT=45m
-19.00	12/19/2020:11:58:29	700	-14.58	1510	1.44	6.05	-150	TPT=75m, PGT=40m
-25.00	12/19/2020:13:56:03	800	-14.86	1720	1.51	6.00	-146	TPT=80m, PGT=43m
-30.00	12/19/2020:15:20:40	700	-14.83	1660	1.74	6.12	-140	TPT=85m, PGT=48m
-35.00	12/20/2020:09:25:56	600	-14.32	270	2.98	6.70	19	TPT=85m, PGT=45m
-40.00	12/20/2020:11:03:56	900	-15.51	1590	1.46	5.91	28	TPT=80m, PGT=45m
-45.00	12/20/2020:12:14:23	900	-14.88	1770	0.98	6.10	-91	TPT=55m, PGT=25m
-50.00	12/20/2020:13:10:08	700	-15.11	1860	1.12	6.17	-120	TPT=43m, PGT=22m
-55.00	12/20/2020:14:06:03	800	-17.09	1960	0.97	6.14	-158	TPT=37m, PGT=18m
-60.00	12/20/2020:14:55:15	900	-17.51	2170	1.03	6.09	-156	TPT=37m, PGT=18m
-65.00	12/20/2020:16:04:38	900	-17.17	2520	1.12	5.96	-144	TPT=47m, PGT=25m
-70.00	12/21/2020:08:27:50	900	-15.67	3370	6.78	6.22	-85	TPT=70m, PGT=40m
-75.00	12/21/2020:09:31:31	900	NC	5610	2.95	5.82	-96	TPT=44m, PGT=25m
-80.00	12/21/2020:10:46:19	1000	-14.70	6540	1.62	5.90	-130	TPT=60m, PGT=33m
-85.00	12/21/2020:11:52:50	800	-14.10	6880	1.47	5.96	-148	TPT=50m, PGT=25m
-87.10	12/21/2020:13:23:18	600	NC	2940	5.00	6.23	-155	TPT=92m, PGT=45m

*Added booster Pump

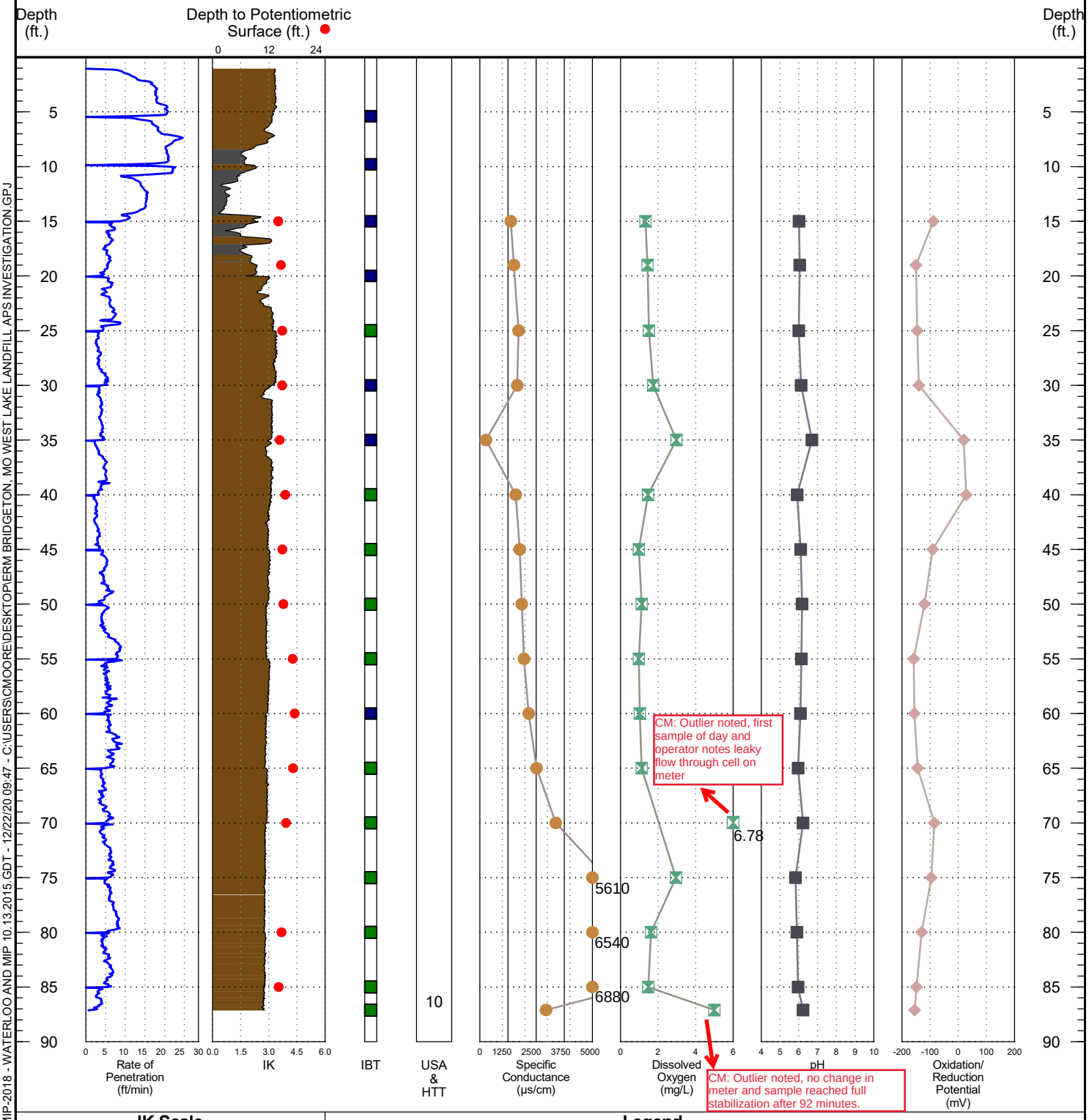
DRAFT

BORING NAME: APS-001

Total Depth 87.1 ft.

Waterloo APS-D™ ADVANCED PROFILING SYSTEM

Project Name West Lake Landfill APS Investigation
Date Completed 12/21/2020
Client ERM
Sampler(s) DB
Project Number 203201243
Drilling Contractor Cascade
Project Location Bridgeton, MO
Gas Drive or Peri Pump Peri Pump



WATERLOO AND MIP-2018 - WATERLOO AND MIP 10.13.2015.GDT - 12/22/20 09:47 - C:\USERS\CMOORE\DESKTOP\ERM BRIDGETON, MO WEST LAKE LANDFILL APS INVESTIGATION.GPJ

IK Scale

0 to 0.1
0.1 to 2
2 to 4
4 to 6
>6

Legend

IBT = IK Behavior Type
- = IK increase when hammer stops
- = IK decrease when hammer stops
- = No change when hammer stops

USA = Unsuccessful Sample Attempt
- ✳ = Could not produce water
- ▲ = Yield deemed too slow
- ■ = Equipment issue

HTT = Hole Termination Type
- 7 = Broken downhole equipment
- 8 = Reached Target Depth
- 9 = ROP dropped below threshold
- 10 = Sudden Hard Refusal

DRAFT

GROUNDWATER PROFILE LOG

Client: ERM

CASCADE DRILLING | TECHNICAL SERVICES

Profile Location: APS-002

	Started	Completed					
Dates:	17-12-20	18-12-20	KPRO Box Serial # / Acquisition Laptop:	481APS05	Gas Drive or Peri Pump:	Peri Pump
Location:	Bridgeton, MO		Sonde Serial #:	ZCRQT7063	Atmospheric Pressure:	36.86
CTS #:	203201243		Drilling Contractor:	Cascade	KPRO N_2 Pressure (set via P transducer):	69.47
Sampler(s):	DB		Average Depth to Water:	-20.65	Gas Drive Pump N_2 Pressure:	NA

PHYSICOCHEMICAL PARAMETERS

Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	pH	ORP (mV)	COMMENTS
-25.00	12/17/2020:09:23:30	1000	-21.44	1960	1.08	6.30	-57	TPT=36m, PGT=18m
-30.00	12/17/2020:10:13:16	1000	-21.72	2190	0.88	6.42	-187	TPT=34m, PGT=17m
-33.00	12/17/2020:11:03:51	1000	-19.85	1990	0.89	6.51	-205	TPT=31m, PGT=16m
-40.00	12/17/2020:11:55:38	1000	-21.25	2240	0.92	6.41	-192	TPT=39m, PGT=20m
-45.00	12/17/2020:12:46:01	900	-21.27	2310	1.03	6.40	-196	TPT=37m, PGT=19m
-50.00	12/17/2020:13:33:13	800	-20.98	2400	0.92	6.35	-198	TPT=35m, PGT=16m
-55.00	12/17/2020:14:26:15	1200	-20.70	2300	1.01	6.44	-199	TPT=44m, PGT=24m
-60.00	12/17/2020:15:19:33	800	-20.67	2270	1.09	6.40	-196	TPT=47m, PGT=23m
-65.00	12/17/2020:16:15:36	800	-21.10	2150	1.49	6.37	-185	TPT=45m, PGT=21m
-70.00	12/18/2020:08:55:37	1300	-20.00	2370	1.14	6.43	-144	TPT=62m, PGT=45m
-75.00	12/18/2020:09:55:50	700	-20.35	2160	1.92	6.47	-193	TPT=41m, PGT=20m
-80.00	12/18/2020:11:14:44	900	-19.43	2180	1.71	6.47	-192	TPT=82m, PGT=45m
-81.00	12/18/2020:12:56:01	1000	-19.70	2000	2.29	6.42	-196	TPT=60m, PGT=30m

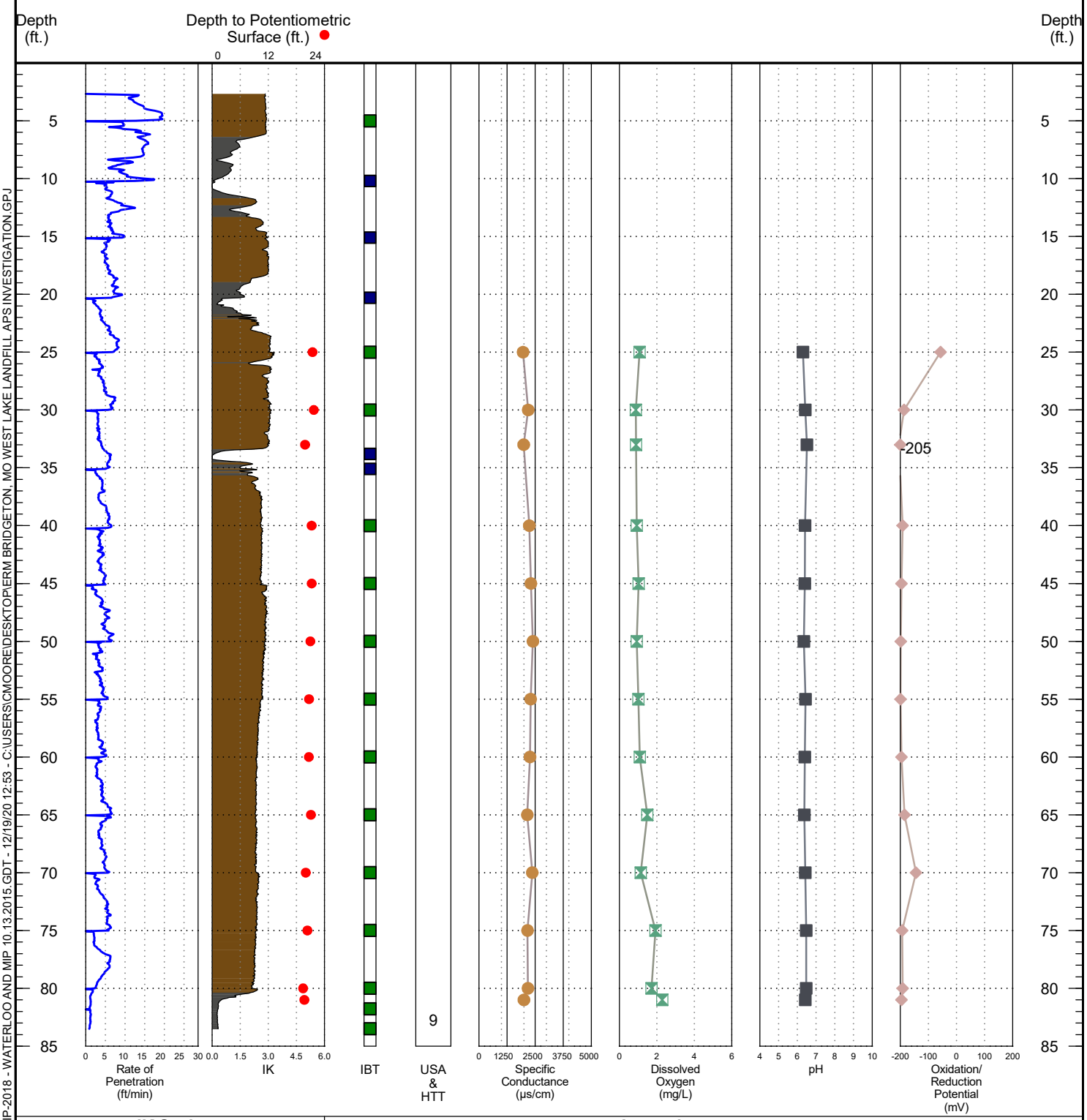
DRAFT

BORING NAME: APS-002

Total Depth 83.5 ft.

Waterloo APS-D™
ADVANCED PROFILING SYSTEM

Project Name West Lake Landfill APS Investigation
Date Completed 12/18/2020
Client ERM
Sampler(s) DB
Project Number 203201243
Drilling Contractor Cascade
Project Location Bridgeton, MO
Gas Drive or Peri Pump Peri Pump



WATERLOO AND MIP-2018 - WATERLOO AND MIP 10.13.2015.GDT - 12/19/20 12:53 - C:\USERS\CMOORE\DESKTOP\ERM BRIDGETON, MO WEST LAKE LANDFILL APS INVESTIGATION.GPJ

IK Scale

0 to 0.1
0.1 to 2
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4 to 6
>6

Legend

IBT = IK Behavior Type
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- = IK decrease when hammer stops
- = No change when hammer stops

USA = Unsuccessful Sample Attempt
- ✳ = Could not produce water
- ▲ = Yield deemed too slow
- ■ = Equipment issue

HTT = Hole Termination Type
- 7 = Broken downhole equipment
- 8 = Reached Target Depth
- 9 = ROP dropped below threshold
- 10 = Sudden Hard Refusal

DRAFT

GROUNDWATER PROFILE LOG

Client: ERM

CASCADE DRILLING | TECHNICAL SERVICES

Profile Location: APS-003

Started Completed

Dates: 09-12-20 16-12-20

KPRO Box Serial # / Acquisition Laptop: 481APS05

Gas Drive or Peri Pump: Peri Pump

Location: Bridgeton, MO

Sonde Serial #: ZCRQT7063

Atmospheric Pressure: 36.74

CTS #: 203201243

Drilling Contractor: Cascade

KPRO N_2 Pressure (set via P transducer): 69.21

Sampler(s): DB

Average Depth to Water: -20.51

Gas Drive Pump N_2 Pressure: NA

PHYSICOCHEMICAL PARAMETERS

Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	pH	ORP (mV)	COMMENTS
-23.10	12/09/2020:14:47:33	1400	-21.52	3690	0.84	6.33	-178	TPT=66m, PGT=40m
-30.00	12/09/2020:15:36:04	1100	-21.62	2980	0.48	6.50	-203	TPT=28m, PGT=18m
-35.20	12/09/2020:16:11:28	1000	-21.71	2770	2.98	6.45	-190	TPT=28m, PGT=16m
-40.00	12/14/2020:10:44:59	1700	-20.14	2550	0.93	6.09	-90	Experiment #3 TPT=69m, PGT=45m
-45.00	12/14/2020:11:37:59	900	-21.27	2480	1.08	6.26	-151	TPT=45m, PGT=19m
-50.00	12/14/2020:12:24:41	900	-19.53	2600	1.14	6.35	-165	TPT=35m, PGT=17m
-55.00	12/14/2020:13:13:56	800	-19.95	2570	1.21	6.41	-175	TPT=35m, PGT=16m
-60.00	12/14/2020:14:16:25	1000	-21.66	2690	1.23	6.41	-180	TPT=45m, PGT=26m
-65.00	12/14/2020:15:39:18	1500	-18.20	2750	2.13	6.53	-187	TPT=70m, PGT=48m
-70.00	12/14/2020:16:37:15	900	-19.65	2810	1.31	6.44	-177	TPT=50m, PGT=25m
-75.00	12/15/2020:09:48:00	1000	-18.86	2360	1.18	6.40	-68	TPT=50m, PGT=27m
-80.00	12/15/2020:11:01:15	1000	-21.06	2310	1.31	6.41	-160	TPT=55m, PGT=32m
-85.00	12/15/2020:12:07:07	800	-20.20	2380	1.41	6.40	-174	TPT=58m, PGT=25m
-90.00	12/15/2020:13:09:27	800	-21.40	2270	1.32	6.36	-165	TPT=50m, PGT=26m
-95.00	12/15/2020:14:14:47	800	-20.64	2350	3.67	6.35	-170	TPT=48m, PGT=24m
-100.00	12/15/2020:15:30:50	900	-20.60	2270	3.09	6.42	-157	TPT=65m, PGT=37m
-105.00	12/15/2020:16:50:49	900	-20.42	2350	1.57	6.44	-160	TPT=70m, PGT=39m
-113.00	12/16/2020:09:20:36	500	-19.73	2380	1.82	6.46	22	TPT=80m, PGT=45m
-117.00	12/16/2020:10:48:07	1000	-20.97	2980	1.34	6.45	-100	TPT=75m, PGT=40m
-121.00	12/16/2020:12:20:27	1000	-20.71	3450	1.18	6.53	-168	TPT=80m, PGT=45m
-125.00	12/16/2020:13:55:04	1000	-20.86	3780	1.32	6.45	-170	TPT=82m, PGT=45m

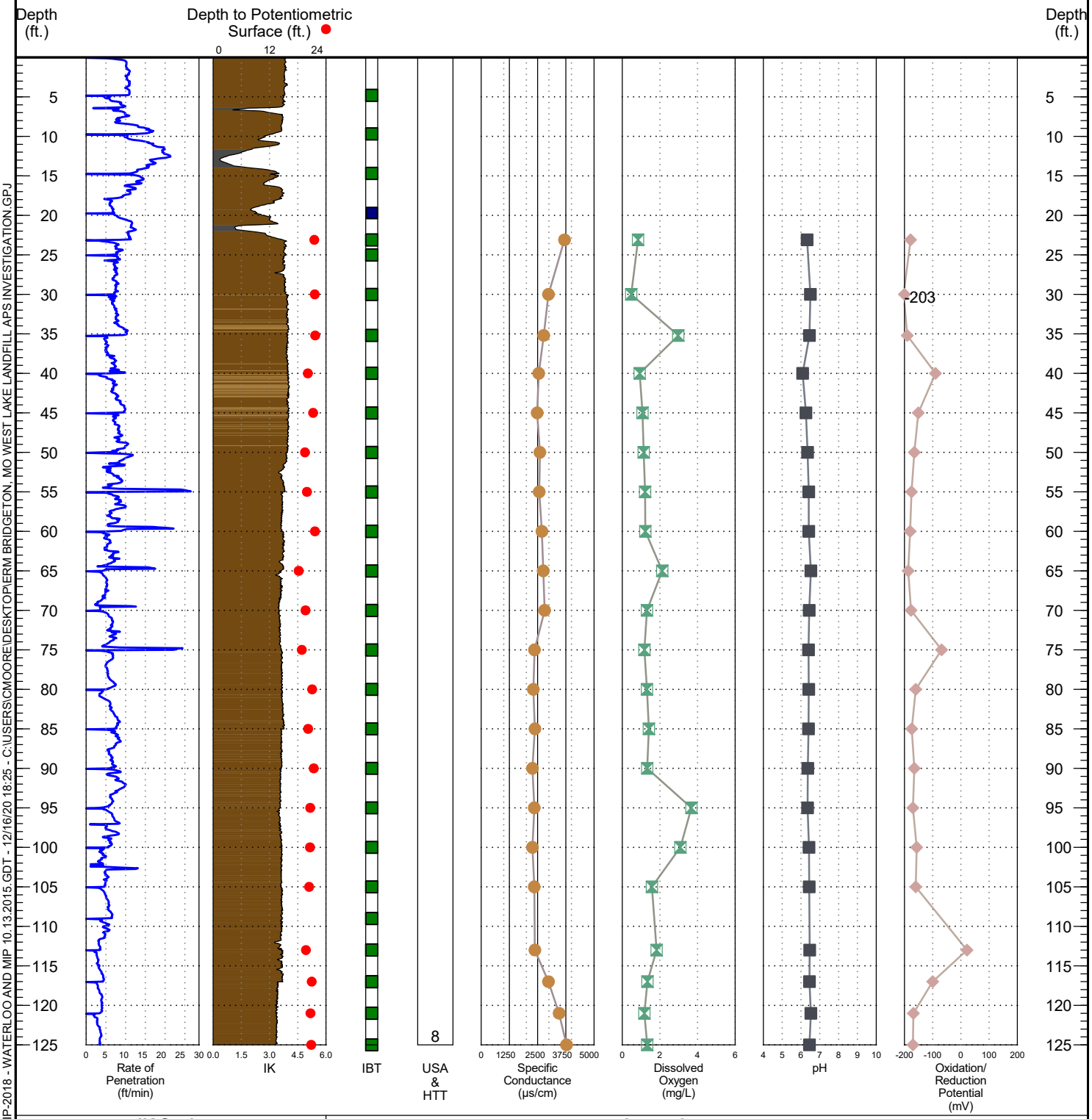
DRAFT

BORING NAME: APS-003

Total Depth 125 ft.

Waterloo APS-D™
ADVANCED PROFILING SYSTEM

Project Name West Lake Landfill APS Investigation
Date Completed 12/16/2020
Client ERM
Sampler(s) DB
Project Number 203201243
Drilling Contractor Cascade
Project Location Bridgeton, MO
Gas Drive or Peri Pump Peri Pump



WATERLOO AND MIP-2018 - WATERLOO AND MIP 10.13.2015.GDT - 12/16/20 18:25 - C:\USERS\CMOORE\DESKTOP\ERM BRIDGETON, MO WEST LAKE LANDFILL APS INVESTIGATION.GPJ

IK Scale

0 to 0.1
0.1 to 2
2 to 4
4 to 6
>6

Legend

IBT = IK Behavior Type
- = IK increase when hammer stops
- = IK decrease when hammer stops
- = No change when hammer stops

USA = Unsuccessful Sample Attempt
- ✳ = Could not produce water
- ▲ = Yield deemed too slow
- ■ = Equipment issue

HTT = Hole Termination Type
- 7 = Broken downhole equipment
- 8 = Reached Target Depth
- 9 = ROP dropped below threshold
- 10 = Sudden Hard Refusal

DRAFT

GROUNDWATER PROFILE LOG

Client: ERM

CASCADE DRILLING | TECHNICAL SERVICES

Profile Location: APS-004

	Started	Completed					
Dates:	06-12-20	09-12-20	KPRO Box Serial # / Acquisition Laptop:	481APS05	Gas Drive or Peri Pump:	Peri Pump
Location:	Bridgeton, MO		Sonde Serial #:	ZCRQT7063	Atmospheric Pressure:	36.02
CTS #:	203201243		Drilling Contractor:	Cascade	KPRO N_2 Pressure (set via P transducer):	69.84
Sampler(s):	JE		Average Depth to Water:	-17.08	Gas Drive Pump N_2 Pressure:	N/A

PHYSICOCHEMICAL PARAMETERS

Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	pH	ORP (mV)	COMMENTS
-20.00	12/06/2020:12:56:29	1500	-19.45	3980	0.76	6.86	-210	PGT= 34m , TPT= 62m
-25.00	12/06/2020:13:57:16	700	-18.80	4220	1.61	6.71	-186	PGT=18m , TPT= 35m
-30.00	12/06/2020:14:42:14	1000	-17.87	4510	0.75	6.67	-187	PGT=14m , TPT= 25m
-35.00	12/06/2020:15:16:12	1000	-17.69	4100	0.75	6.64	-197	PGT=15m , TPT=25m
-40.00	12/06/2020:15:57:39	900	-16.02	3850	0.99	6.62	-183	PGT=19m , TPT=34m
-45.00	12/07/2020:09:08:09	800	-15.54	1850	1.65	6.67	1	PGT=43m , TPT=85m
-50.00	12/07/2020:10:37:10	1200	-17.20	3060	1.15	6.52	-177	PGT=40m , TPT= 65m
-55.00	12/07/2020:11:27:32	100	-17.17	1520	1.82	6.84	0	Sample experiment per client request, PGT=91m , TPT=103m
-60.00	12/07/2020:13:33:17	100	-16.49	1088	3.10	6.89	0	Sample experiment per client request, PGT=116m , TPT= 138m
-65.00	12/07/2020:16:44:27	700	-17.79	2430	1.88	6.46	-152	PGT=83m , TPT=101m
-70.00	12/08/2020:08:53:44	500	NC	657	3.18	6.89	5	PGT=43m , TPT= 90m
-75.00	12/08/2020:10:51:31	600	-15.83	2550	1.68	6.50	-105	PGT=43m , TPT= 101m
-80.00	12/08/2020:12:45:32	600	-15.63	2820	1.88	6.46	-146	PGT=46m , TPT=90m
-85.00	12/08/2020:14:25:29	500	-15.27	1451	3.16	6.43	-126	PGT=41m , TPT= 84m
-90.00	12/08/2020:16:12:09	500	-18.77	2270	2.41	6.52	-107	PGT=44m , TPT=87m
-95.00	12/09/2020:09:12:17	550	NC	1720	2.50	6.60	26	PGT=45m , TPT=94m
-100.00	12/09/2020:10:58:15	500	-16.65	2420	2.50	6.48	-61	PGT=43m , TPT= 100m

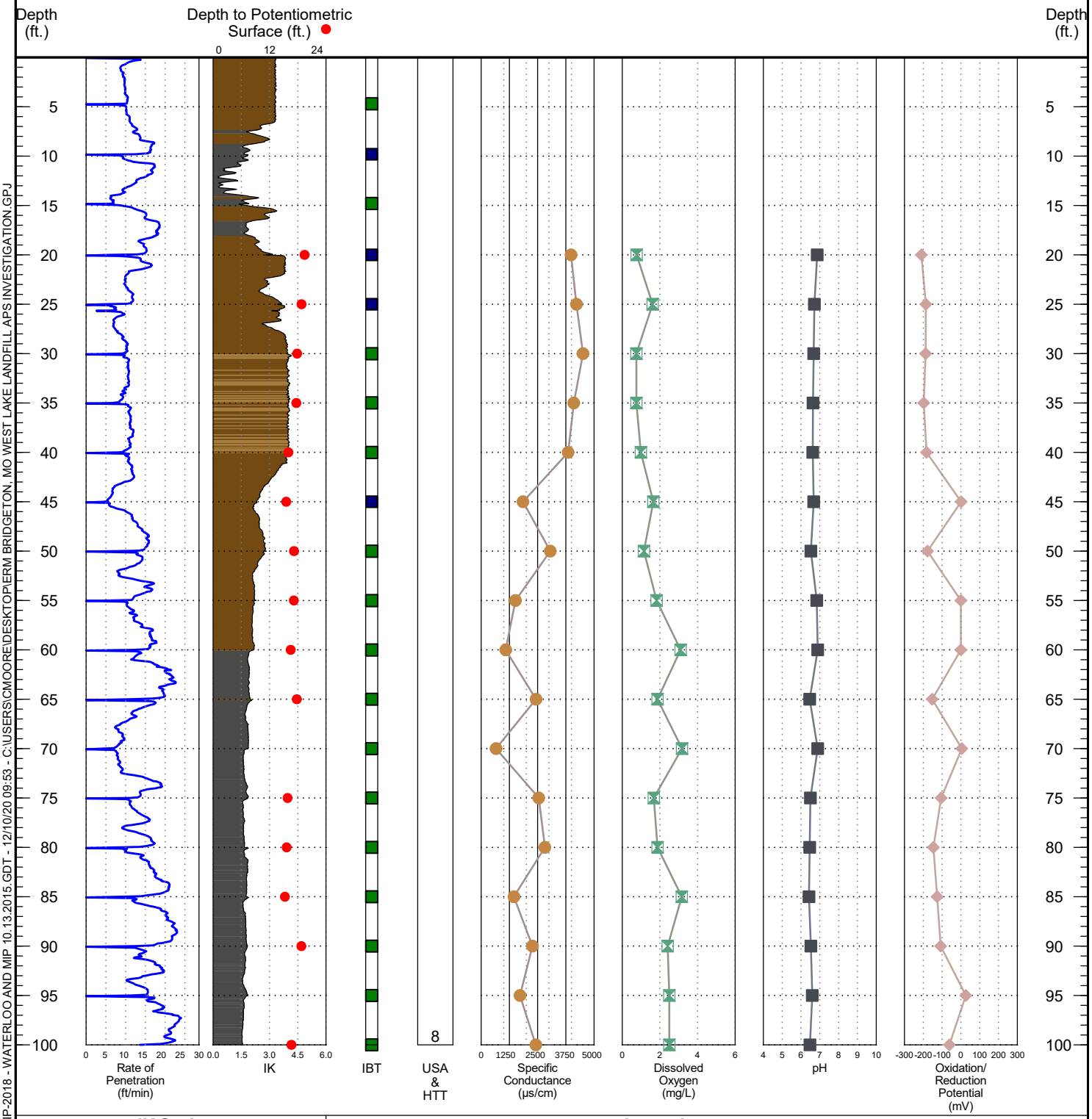
DRAFT

BORING NAME: APS-004

Total Depth 100 ft.

Waterloo APS-D™
ADVANCED PROFILING SYSTEM

Project Name West Lake Landfill APS Investigation
Date Completed 12/9/2020
Client ERM
Sampler(s) JE
Project Number 203201243
Drilling Contractor Cascade
Project Location Bridgeton, MO
Gas Drive or Peri Pump Peri Pump



WATERLOO AND MIP-2018 - WATERLOO AND MIP 10.13.2015.GDT - 12/10/20 09:53 - C:\USERS\CMOORE\DESKTOP\ERM BRIDGETON, MO WEST LAKE LANDFILL APS INVESTIGATION.GPJ

IK Scale

0 to 0.1
0.1 to 2
2 to 4
4 to 6
>6

Legend

IBT = IK Behavior Type
- = IK increase when hammer stops
- = IK decrease when hammer stops
- = No change when hammer stops

USA = Unsuccessful Sample Attempt
- ✳ = Could not produce water
- ▲ = Yield deemed too slow
- ■ = Equipment issue

HTT = Hole Termination Type
- 7 = Broken downhole equipment
- 8 = Reached Target Depth
- 9 = ROP dropped below threshold
- 10 = Sudden Hard Refusal

DRAFT

GROUNDWATER PROFILE LOG

Client: ERM

CASCADE DRILLING | TECHNICAL SERVICES

Profile Location: APS-005

	Started	Completed					
Dates:	01-12-20	06-12-20	KPRO Box Serial # / Acquisition Laptop:	481APS05	Gas Drive or Peri Pump:	Peri Pump
Location:	Bridgeton, MO		Sonde Serial #:	ZCRQT7063	Atmospheric Pressure:	36.21
CTS #:	203201243		Drilling Contractor:	Cascade	KPRO N_2 Pressure (set via P transducer):	69.14
Sampler(s):	JE		Average Depth to Water:	-18.21	Gas Drive Pump N_2 Pressure:	NA

PHYSICOCHEMICAL PARAMETERS

Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	pH	ORP (mV)	COMMENTS
-23.90	12/01/2020:14:08:07	800	-17.63	1421	1.15	6.27	-158	Purge Time=50m, Total Pump Time=82m
-29.00	12/01/2020:15:28:45	600	-17.49	2570	1.16	6.12	-140	PGT=28m, TPT=65m
-34.00	12/03/2020:10:52:56	600	-18.16	2210	1.35	6.23	-48	PGT=40m, TPT=75
-39.00	12/03/2020:12:14:41	1000	-19.17	3600	0.87	6.44	-199	PGT=40m, TPT=75
-44.00	12/03/2020:13:52:25	1000	-18.29	3680	0.81	6.45	-200	PGT=40m, TPT=80m
-49.10	12/03/2020:15:25:34	1000	-18.70	3720	0.83	6.46	-196	PGT=45m, TPT=85m
-54.10	12/03/2020:16:50:19	1000	-18.01	3410	0.82	6.46	-195	PGT=40m, TPT=65m
-58.90	12/04/2020:08:58:16	800	-18.67	3340	1.05	6.51	-198	PGT=45m, TPT=83m
-64.00	12/04/2020:10:29:19	800	-18.56	3420	0.76	6.56	-210	PGT=43m, TPT=85m
-69.00	12/04/2020:11:59:15	800	-19.32	3360	1.03	6.48	-196	PGT=45m, TPT=85m
-73.90	12/04/2020:13:38:03	800	-19.62	3410	1.03	6.52	-191	PGT=45m, TPT=85m
-79.00	12/04/2020:15:17:12	700	-18.23	3430	1.59	6.46	-188	PGT=45m, TPT=85m
-83.90	12/05/2020:09:43:42	1000	-17.50	1930	1.38	6.55	-117	Pumped until within time constraints for lab
-89.00	12/05/2020:11:09:10	1200	-18.88	3150	1.18	6.49	-189	PGT=28m, TPT=55m
-94.00	12/05/2020:12:27:50	1400	-18.36	2860	0.69	6.58	-203	PGT=25m, TPT=55m
-99.00	12/05/2020:13:38:42	1000	-17.83	2860	2.39	6.55	-166	PGT=30m, TPT=55m
-104.00	12/05/2020:14:56:10	1000	-18.41	2640	1.36	6.59	-180	PGT=35m, TPT=60m
-109.00	12/05/2020:16:23:12	900	-16.42	2840	4.72	6.56	-152	PGT=40m, TPT=80m
-114.50	12/06/2020:09:08:38	1500	-16.72	2470	1.04	6.62	-128	PGT=30m, TPT=53m

DRAFT

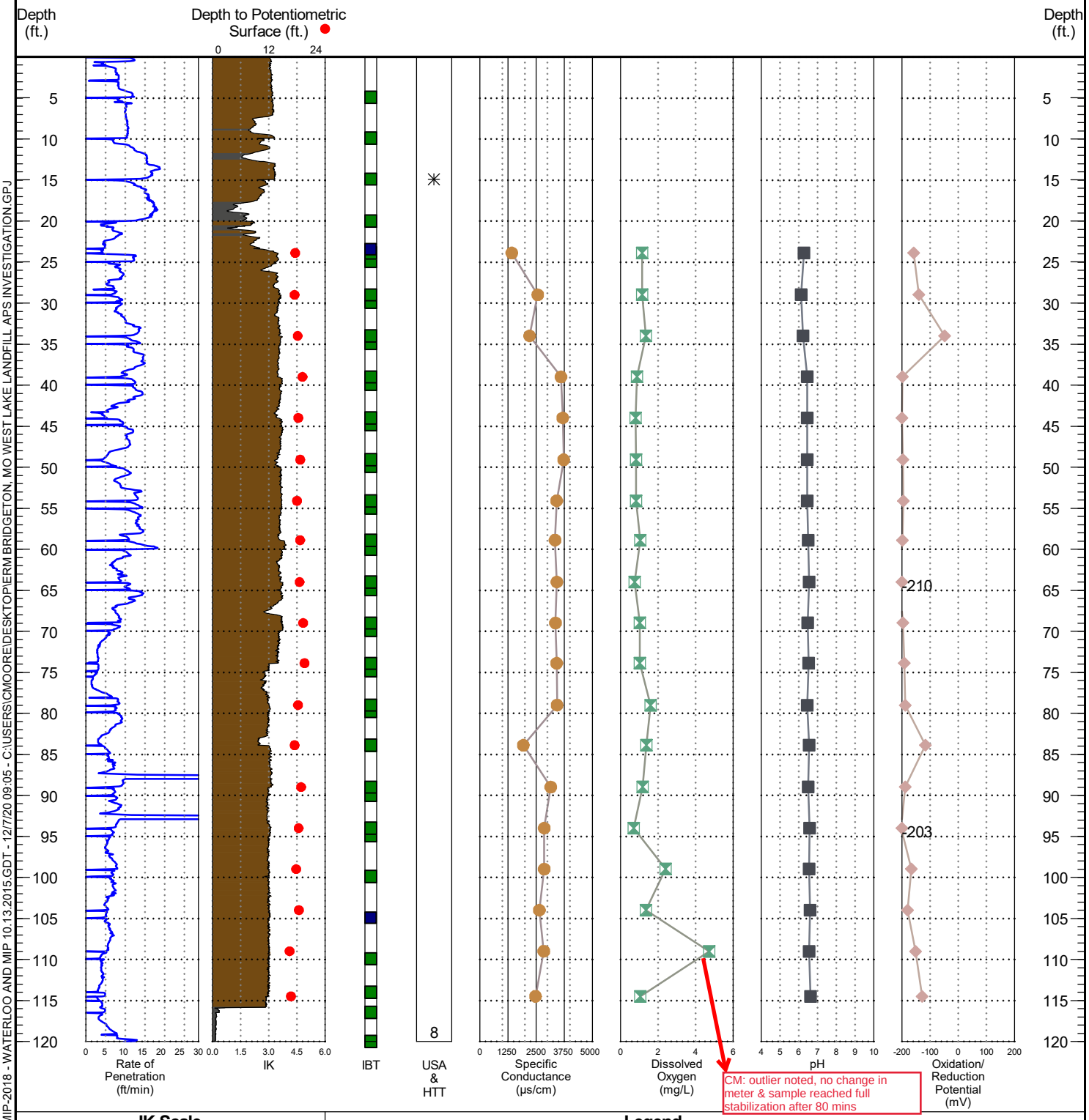
BORING NAME: APS-005

Total Depth 120 ft.

Waterloo APS-D™
ADVANCED PROFILING SYSTEM

Project Name West Lake Landfill APS Investigation
Client ERM
Project Number 203201243
Project Location Bridgeton, MO

Date Completed 12/6/2020
Sampler(s) JE
Drilling Contractor Cascade
Gas Drive or Peri Pump Peri Pump



WATERLOO AND MIP-2018 - WATERLOO AND MIP 10.13.2015.GDT - 12/7/20 09:05 - C:\USERS\CMOORE\DESKTOP\ERM BRIDGETON, MO WEST LAKE LANDFILL APS INVESTIGATION.GPJ

IK Scale

0 to 0.1
0.1 to 2
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4 to 6
>6

Legend

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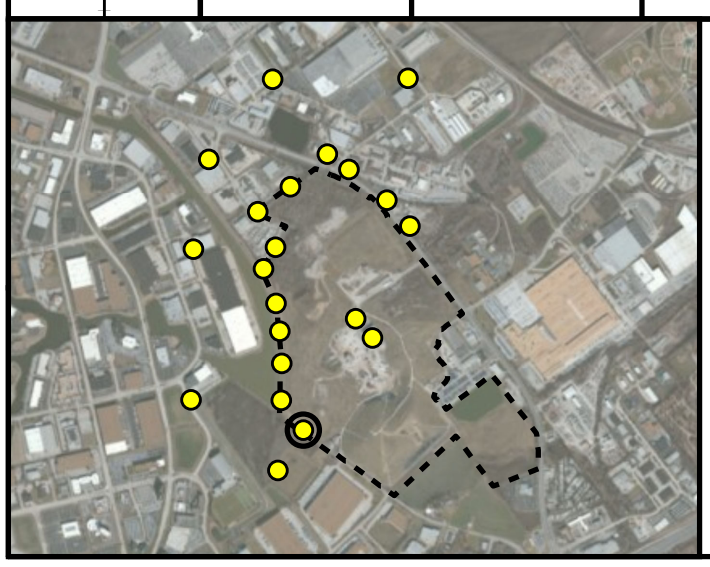
APPENDIX D WATERLOO APS COMBINED LOGS

Elevation (ft amsl)	Specific Conductivity (uS/cm)	ORP (mV)	VOCs (ug/L)	Total Metals (mg/L)					Chloride (mg/L)
				Barium	Calcium	Iron	Magnesium	Manganese	
490									
480									
470									
460									
450	APS-001								
440									
433.56	1,374	-88	342	0.537	142	89.9	45.8	4.92	19.8
430	1,510	-150	225	0.593	143	57.1	52.8	1.53	41.3
	1,720	-146	187	0.811	192	30.7	61.5	3.63	28.4
420	1,660	-140	2.69	0.92	202	5.5	73	1.42	17.9
	270	19	145	0.899	164	1.03	47.6	0.245	13
410	1,590	28	507	0.628	211	35	62	5.9	21.4
	1,770	-91	431	0.523	213	5.92	60	6.91	18.5
400	1,860	-120	194	0.563	197	65.9	68	4.01	20.5
	1,960	-158	443	0.538	238	37	63.5	2.3	21.1
390	2,170	-156	74.1	0.421	264	17.3	68.5	5.35	77.1
	2,520	-144	139	0.573	296	41.2	74.6	3.97	186
380	3,370	-85	122	0.798	341	47.2	94.8	7.13	378
	5,610	-96	1,020	1.85	462	105	141	3.24	1070
370	6,540	-130	936	2.06	480	118	145	3.09	1150
	6,880	-148	680	1.73	477	81.5	150	5.65	1240
360	2,940	-155	205	2.22	518	64.8	149	5.33	1110
350									
340									
330									
320									
310									

NOTES:
- Oxic/suboxic and nitrate/manganese reducing cannot be distinguished by ORP alone
- amsl = Above Mean Sea Level
- APS ground surface elevation is an estimate based on local digital elevation models



Legend

APS Ground Surface Location

Water Level

ORP (mV)

- > 150 Oxic/Suboxic
- 0 - 150 Anoxic (NO3/Mn)
- -50 - 0 Anoxic (FeIII)
- -200 - -50 Anoxic (SO4)
- < -200 Anoxic (Methanogenic)

Total VOCs (ug/L)

< 1 | 1 - 10 | 10 - 100 | 100 - 1,000 | > 1,000

- Tetrachloroethene
- Trichloroethene
- cis-1,2-Dichloroethene
- trans-1,2-Dichloroethene
- Vinyl chloride
- 1,1,1-Trichloroethane
- VOC exceedance of tap water RSL

- 1,1-Dichloroethane
- 1,1-Dichloroethene
- Chloroethane
- Chlorobenzene
- Dichlorodifluoromethane (Freon 12)
- Methyl tert-butyl ether
- Benzene
- Toluene
- Ethylbenzene
- Xylene, Total
- Non-Detect

APS-001
West Lake Landfill
Bridgeton,
Missouri

ERM

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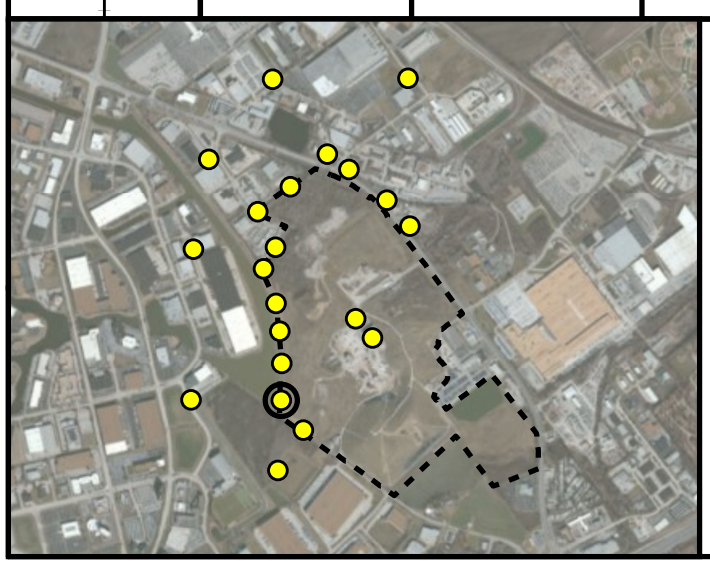
Elevation (ft amsl)	Specific Conductivity (uS/cm)	ORP (mV)	VOCs (ug/L)	Total Metals (mg/L)					Chloride (mg/L)
				Barium	Calcium	Iron	Magnesium	Manganese	
490									
480									
470									
460									
450	APS-002								
440									
	430.08								
420	1,960	-57	56.6	0.998	197	71.3	67.2	0.478	76.6
	2,190	-187	28.6	0.78	229	60.9	71.6	3.08	161
	1,990	-205	17.2	0.87	285	39.2	70.3	2.45	217
410	2,240	-192	40.7	0.708	247	43.2	69.5	1.6	192
	2,310	-196	40.5	0.855	268	42.6	69.5	1.97	196
400	2,400	-198	28.8	0.822	270	31.9	69.5	1.21	205
	2,300	-199	10.8	0.731	242	40.8	65.8	0.984	162
390	2,270	-196	14.9	0.796	237	35.7	69.9	0.954	156
	2,150	-185	21.1	0.84	238	37.8	72.1	0.965	109
380	2,370	-144	34.2	1.01	261	47.1	75.7	0.905	171
	2,160	-193	18.8	0.88	254	37.5	67.6	0.78	109
370	2,180	-192	11.1	1	249	42.1	66.5	0.853	110
	2,000	-196	10.1	0.919	226	43	60	0.832	119
360									
350									
340									
330									
320									
310									

NOTES:
- Oxic/suboxic and nitrate/manganese reducing cannot be distinguished by ORP alone
- amsl = Above Mean Sea Level
- APS ground surface elevation is an estimate based on local digital elevation models



Legend

APS Ground Surface Location

Water Level

ORP (mV)

- > 150 Oxic/Suboxic
- 0 - 150 Anoxic (NO3/Mn)
- -50 - 0 Anoxic (FeIII)
- -200 - -50 Anoxic (SO4)
- < -200 Anoxic (Methanogenic)

Total VOCs (ug/L)

< 1 | 1 - 10 | 10 - 100 | 100 - 1,000 | > 1,000

- Tetrachloroethene
- Trichloroethene
- cis-1,2-Dichloroethene
- trans-1,2-Dichloroethene
- Vinyl chloride
- 1,1,1-Trichloroethane
- VOC exceedance of tap water RSL

- 1,1-Dichloroethane
- 1,1-Dichloroethene
- Chloroethane
- Chlorobenzene
- Dichlorodifluoromethane (Freon 12)
- Methyl tert-butyl ether
- Benzene
- Toluene
- Ethylbenzene
- Xylene, Total
- Non-Detect

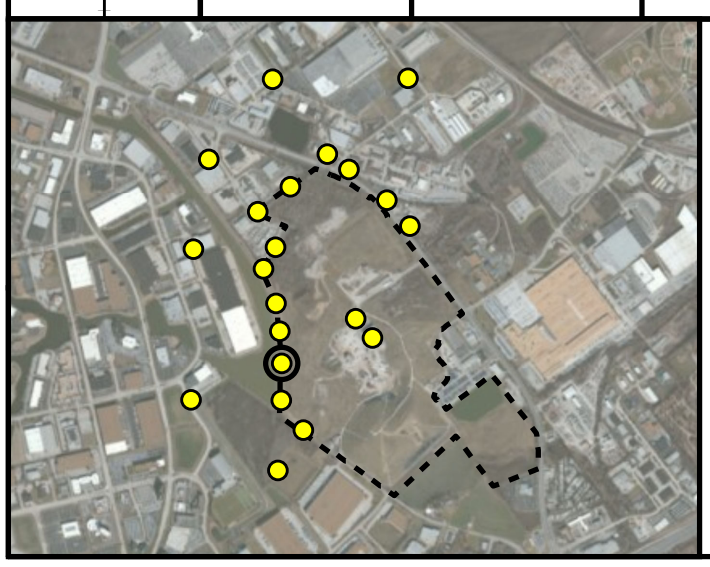
APS-002
West Lake Landfill
Bridgeton,
Missouri

ERM

Q:\Boston1\team\DMMV\Clients_V_Z\WestLake\WestLakeLandfill_MO\MXD\2020_12_APS_Sampling\APS_Logs_Example2_20201124.mxd - Sarah.Poulin - 2/2/2021

Elevation (ft amsl)	Specific Conductivity (uS/cm)	ORP (mV)	VOCs (ug/L)	Total Metals (mg/L)					Chloride (mg/L)
				Barium	Calcium	Iron	Magnesium	Manganese	
490									
480									
470									
460									
APS-003 450									
440									
431.32	3,690	-178	76.0	1.4	190	46.8	91.5	0.556	446
420	2,980	-203	14.7	0.745	234	51.2	80.4	1.13	407
	2,770	-190	16.2	0.949	210	42.1	60.3	2.92	361
410	2,550	-90	9.96	1.48	241	30.5	55.1	2.25	358
	2,480	-151	13.7	1.48	254	22.7	62.4	2.12	337
400	2,600	-165	4.98	2	263	22.4	66.4	2.26	380
	2,570	-175	11.0	1.58	251	18.2	62.6	1.5	333
390	2,690	-180	16.2	1.17	258	19.9	65.1	0.76	367
	2,750	-187	9.96	1.42	259	23.2	70.8	2.53	375
380	2,810	-177	13.0	1.58	266	24.8	75.5	1.75	400
	2,360	-68	25.8	0.0658	124		45.9	0.0074	243
	2,310	-160	30.0	0.0444	103		32.7		229
370	2,380	-174	21.0	0.0724	115	2.93	42.2	0.068	285
	2,270	-165	24.2	0.0981	135	1.88	42.4	0.0839	247
360	2,350	-170	23.2	0.127	125	0.506	39.6	0.0306	196
	2,270	-157	18.4	0.044	103		32.7		172
350	2,350	-160	13.4	0.843	257	13.5	70.6	0.202	207
340	2,380	22	8.10	1.59	289	15.3	77.1	0.38	362
	2,980	-100	4.63	1.31	292	12.8	75.6	0.232	342
330	3,450	-168	7.52	1.65	304	13.3	80.5	0.278	430
	3,780	-170	3.39	1.9	329	18	88.2	0.46	520
320									
310									

NOTES:
- Oxic/suboxic and nitrate/manganese reducing cannot be distinguished by ORP alone
- amsl = Above Mean Sea Level
- APS ground surface elevation is an estimate based on local digital elevation models



Legend

- APS Ground Surface Location
- Water Level

ORP (mV)

- > 150 Oxic/Suboxic
- 0 - 150 Anoxic (NO3/Mn)
- -50 - 0 Anoxic (FeIII)
- -200 - -50 Anoxic (SO4)
- < -200 Anoxic (Methanogenic)

Total VOCs (ug/L)

< 1 | 1 - 10 | 10 - 100 | 100 - 1,000 | > 1,000

- Tetrachloroethene
- Trichloroethene
- cis-1,2-Dichloroethene
- trans-1,2-Dichloroethene
- Vinyl chloride
- 1,1,1-Trichloroethane
- VOC exceedance of tap water RSL

- 1,1-Dichloroethane
- 1,1-Dichloroethene
- Chloroethane
- Chlorobenzene
- Dichlorodifluoromethane (Freon 12)
- Methyl tert-butyl ether
- Benzene
- Toluene
- Ethylbenzene
- Xylene, Total
- Non-Detect

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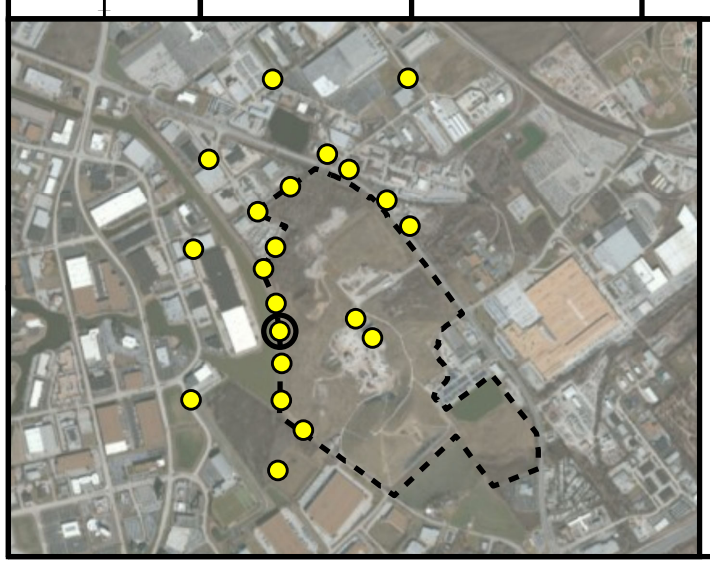
Elevation (ft amsl)	Specific Conductivity (uS/cm)	ORP (mV)	VOCs (ug/L)	Total Metals (mg/L)					Chloride (mg/L)
				Barium	Calcium	Iron	Magnesium	Manganese	
490									
480									
470									
460									
450	APS-004								
440									
	431.67								
	3,980	-210	49.8	0.856	109	22.6	91.1	0.373	254
	4,220	-186	62.3	0.535	74.1	12.4	91.8	0.105	265
420	4,510	-187	148	0.757	70.3	9.86	94.6	0.158	275
	4,100	-197	134	1.93	197	25	92.3	0.933	393
410	3,850	-183	132	2.67	334	23.5	85.8	0.96	463
	1,850	1	28.4	1.25	244	9.83	79.1	0.874	328
400	3,060	-177	42.0	1.02	316	24.7	76.5	0.462	368
	1,520	0	48.4	0.677	306	23.2	72.3	0.601	242
390	1,088	0	41.9	0.532	297	22.7	72.4	0.462	233
	2,430	-152	53.6	0.559	281	20.1	70.8	0.331	245
380	657	5	38.6	0.757	276	15.8	71.2	0.554	247
	2,550	-105	11.3	1.07	279	9.15	76.4	0.201	289
370	2,820	-146	23.8	1.25	287	16.2	79	0.3	342
	1,451	-126	5.94	1.64	276	10.7	76.2	0.269	421
360	2,270	-107	7.40	1.66	282	11.9	77.8	0.256	381
	1,720	26	11.6	1.37	275	11.7	73.6	0.378	407
350	2,420	-61	5.27	1.93	287	11.5	82.1	0.377	467
340									
330									
320									
310									

NOTES:
- Oxic/suboxic and nitrate/manganese reducing cannot be distinguished by ORP alone
- amsl = Above Mean Sea Level
- APS ground surface elevation is an estimate based on local digital elevation models



Legend

- APS Ground Surface Location
- Water Level

ORP (mV)

- > 150 Oxic/Suboxic
- 0 - 150 Anoxic (NO3/Mn)
- -50 - 0 Anoxic (FeIII)
- -200 - -50 Anoxic (SO4)
- < -200 Anoxic (Methanogenic)

Total VOCs (ug/L)

< 1 | 1 - 10 | 10 - 100 | 100 - 1,000 | > 1,000

- Tetrachloroethene
- Trichloroethene
- cis-1,2-Dichloroethene
- trans-1,2-Dichloroethene
- Vinyl chloride
- 1,1,1-Trichloroethane
- VOC exceedance of tap water RSL

- 1,1-Dichloroethane
- 1,1-Dichloroethene
- Chloroethane
- Chlorobenzene
- Dichlorodifluoromethane (Freon 12)
- Methyl tert-butyl ether
- Benzene
- Toluene
- Ethylbenzene
- Xylene, Total
- Non-Detect

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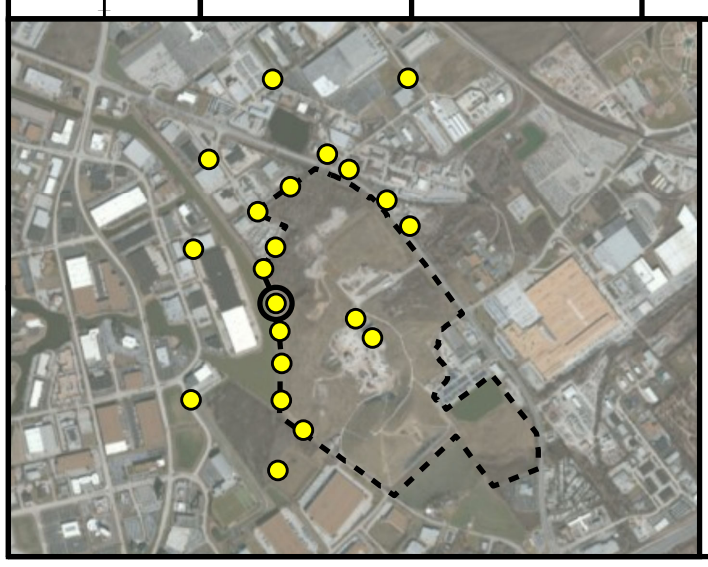
Elevation (ft amsl)	Specific Conductivity (uS/cm)	ORP (mV)	VOCs (ug/L)	Total Metals (mg/L)					Chloride (mg/L)
				Barium	Calcium	Iron	Magnesium	Manganese	
490									
480									
470									
460									
450									
440									
431.18									
430	1,421	-158	1.70	0.347	191	17.7	70.2	4.95	7.1
420	2,570	-140	18.3	0.581	271	12.2	90.8	4.45	310
410	2,210	-48	0.860	1.09	295	24.1	92.9	2.69	522
400	3,600	-199	0.290	1.6	326	25.4	87.8	1.88	462
390	3,680	-200	0.580	1.47	311	30.7	84.6	1.14	474
380	3,720	-196	1.48	1.94	321	28.7	87.8	0.958	512
370	3,410	-195	2.11	2.28	263	29.7	73.2	0.639	375
360	3,340	-198	2.06	2.01	255	23	70.4	0.484	345
350	3,420	-210	0.680	2.04	265	26.8	71.1	0.532	367
340	3,360	-196	0.270	1.86	284	27.6	76.9	0.588	400
330	3,410	-191	0.300	1.82	290	29.1	78	0.641	452
320	3,430	-188	0.730	1.9	295	33.3	74.9	0.76	422
310	1,930	-117	4.98	1.55	227	14.3	58.7	0.483	297
	3,150	-189	4.39	1.9	261	21.1	70.8	0.305	373
	2,860	-203	1.58	2.09	230	19.2	66.2	0.223	303
	2,860	-166	1.55	2.08	237	15.8	68.2	0.221	306
	2,640	-180	1.24	1.88	229	18.3	65.6	0.263	283
	2,840	-152	2.68	2.3	244	17.8	70.1	0.288	374
	2,470	-128	0.685	2.02	226	10.6	65.1	0.256	326

APS-005

NOTES:
- Oxic/suboxic and nitrate/manganese reducing cannot be distinguished by ORP alone
- amsl = Above Mean Sea Level
- APS ground surface elevation is an estimate based on local digital elevation models



Legend

APS Ground Surface Location

Water Level

ORP (mV)

- > 150 Oxic/Suboxic
- 0 - 150 Anoxic (NO3/Mn)
- -50 - 0 Anoxic (FeIII)
- -200 - -50 Anoxic (SO4)
- < -200 Anoxic (Methanogenic)

Total VOCs (ug/L)

< 1 | 1 - 10 | 10 - 100 | 100 - 1,000 | > 1,000

- Tetrachloroethene
- Trichloroethene
- cis-1,2-Dichloroethene
- trans-1,2-Dichloroethene
- Vinyl chloride
- 1,1,1-Trichloroethane
- VOC exceedance of tap water RSL

- 1,1-Dichloroethane
- 1,1-Dichloroethene
- Chloroethane
- Chlorobenzene
- Dichlorodifluoromethane (Freon 12)
- Methyl tert-butyl ether
- Benzene
- Toluene
- Ethylbenzene
- Xylene, Total
- Non-Detect

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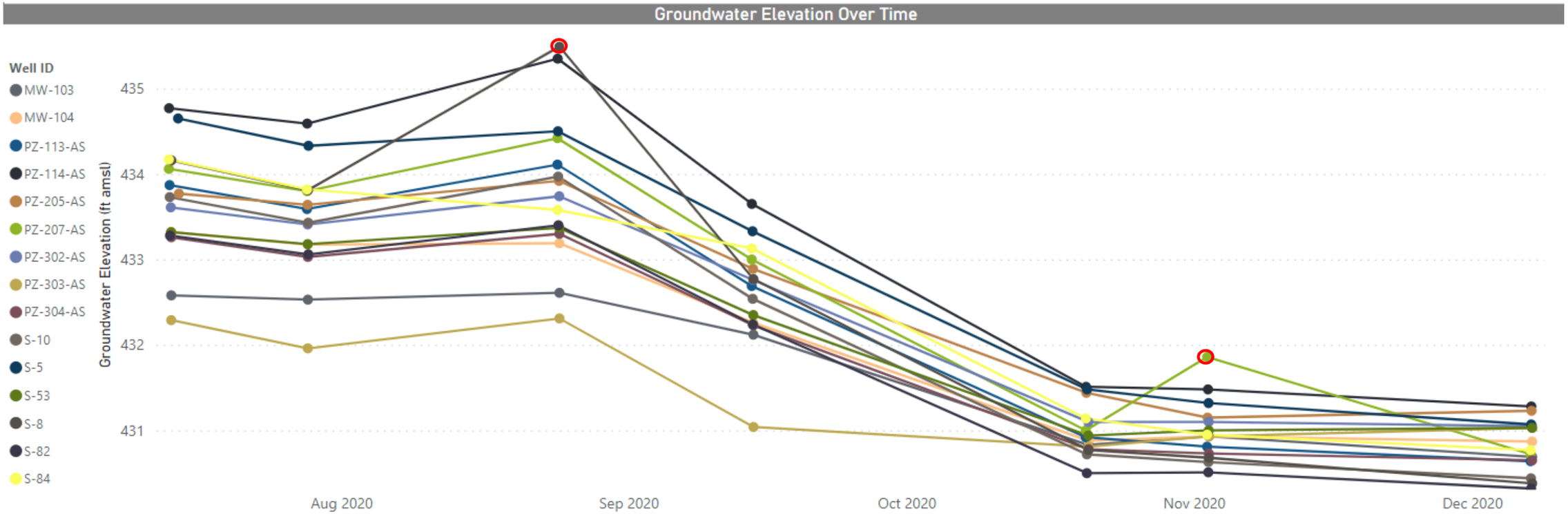
APPENDIX E OU-3 HYDROGRAPH TIME SERIES PLOTS

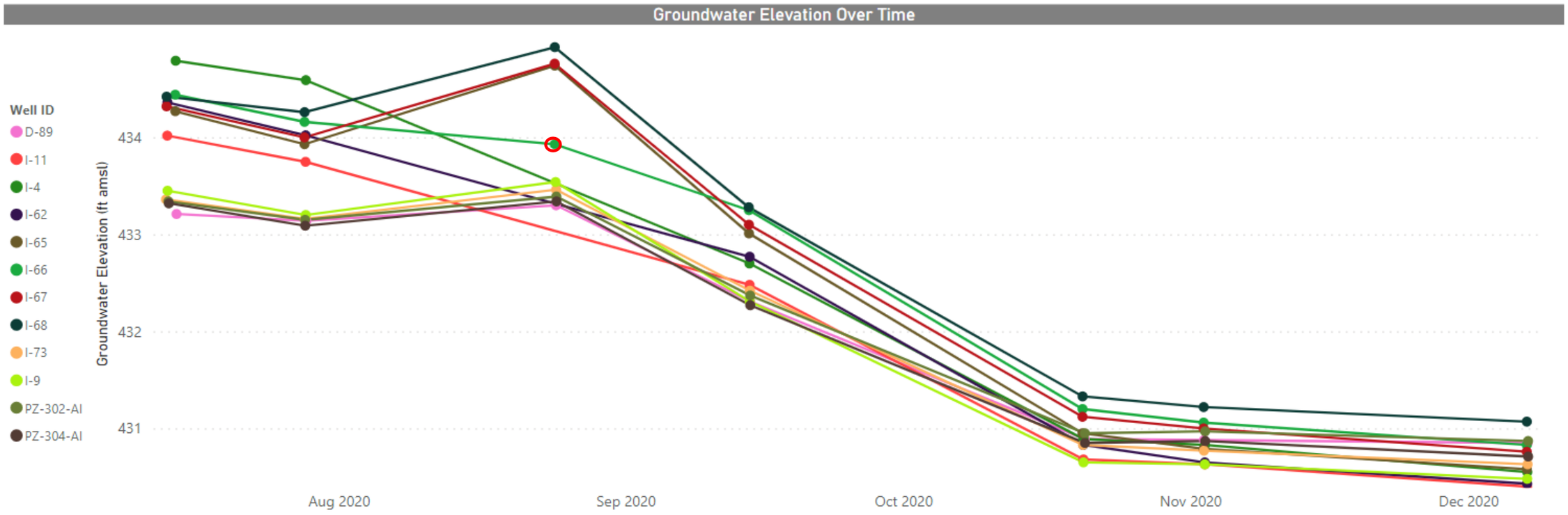
Appendix E: Q3 and Q4 Hydrograph Time Series Plots

Figure E-1: Shallow Alluvium Hydrograph



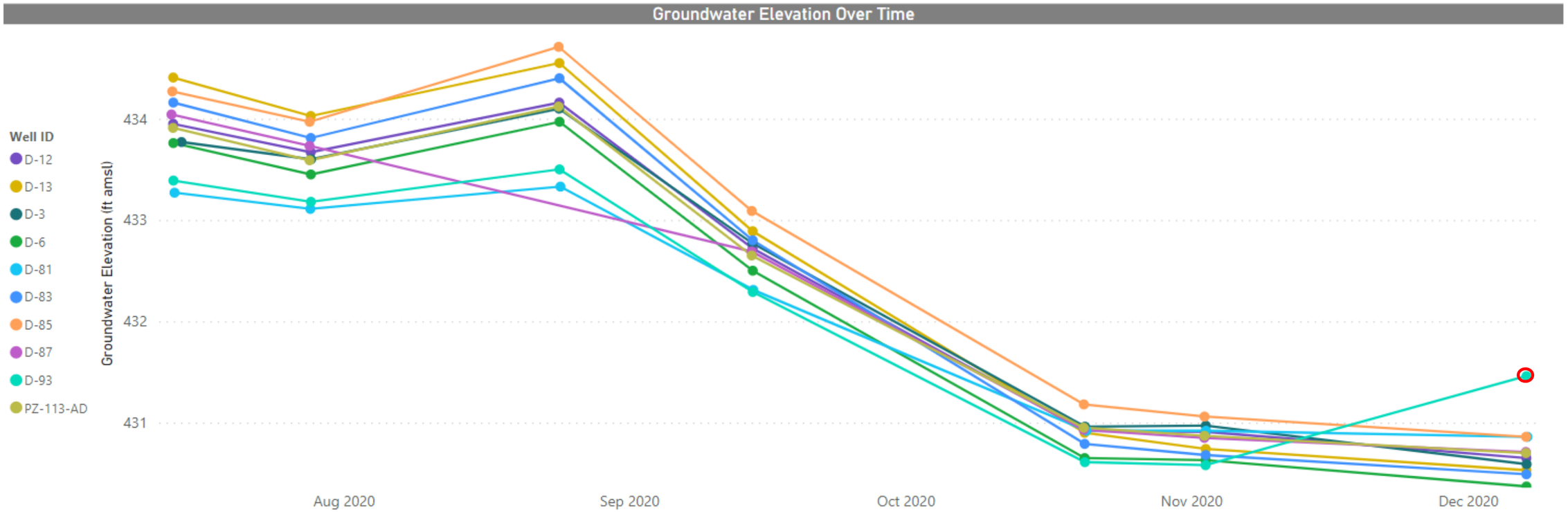
Red circle indicates where water levels deviated from previous data trends.

Figure E-2: Intermediate Alluvium Hydrograph



Red circle indicates where water levels deviated from previous data trends.

Figure E-3: Deep Alluvium Hydrograph



Red circle indicates where water levels deviated from previous data trends.

ALLUVIUM PAIRS:

Figure E-4: AL1 Alluvium Pair Hydrograph

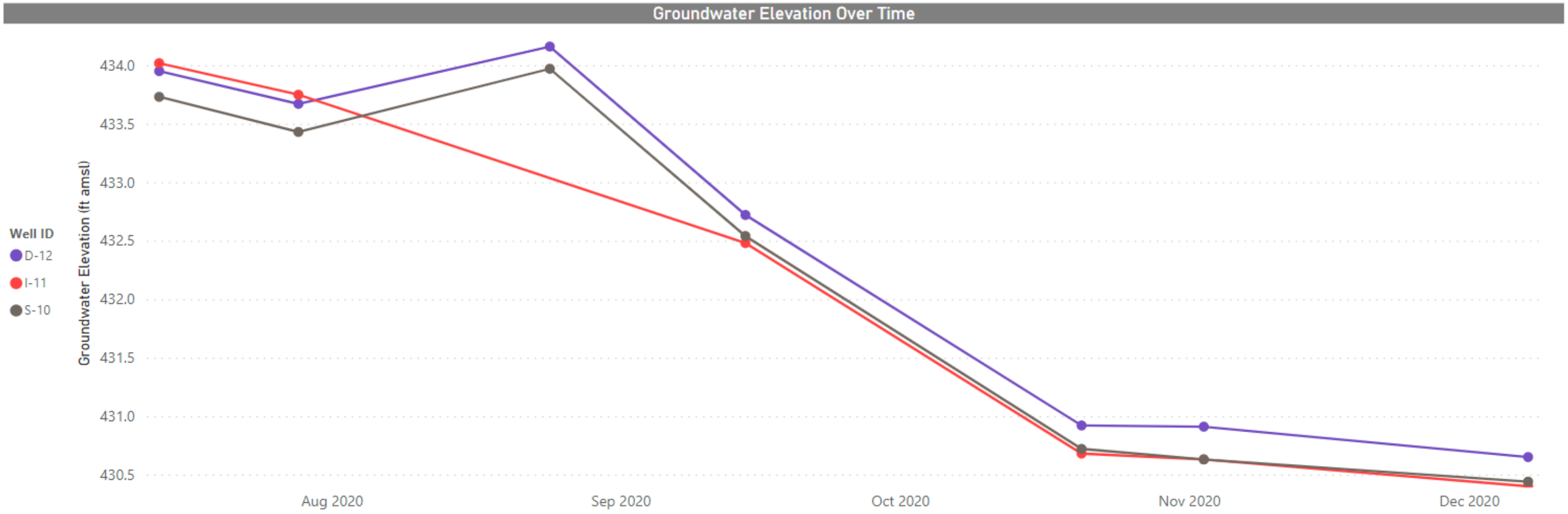
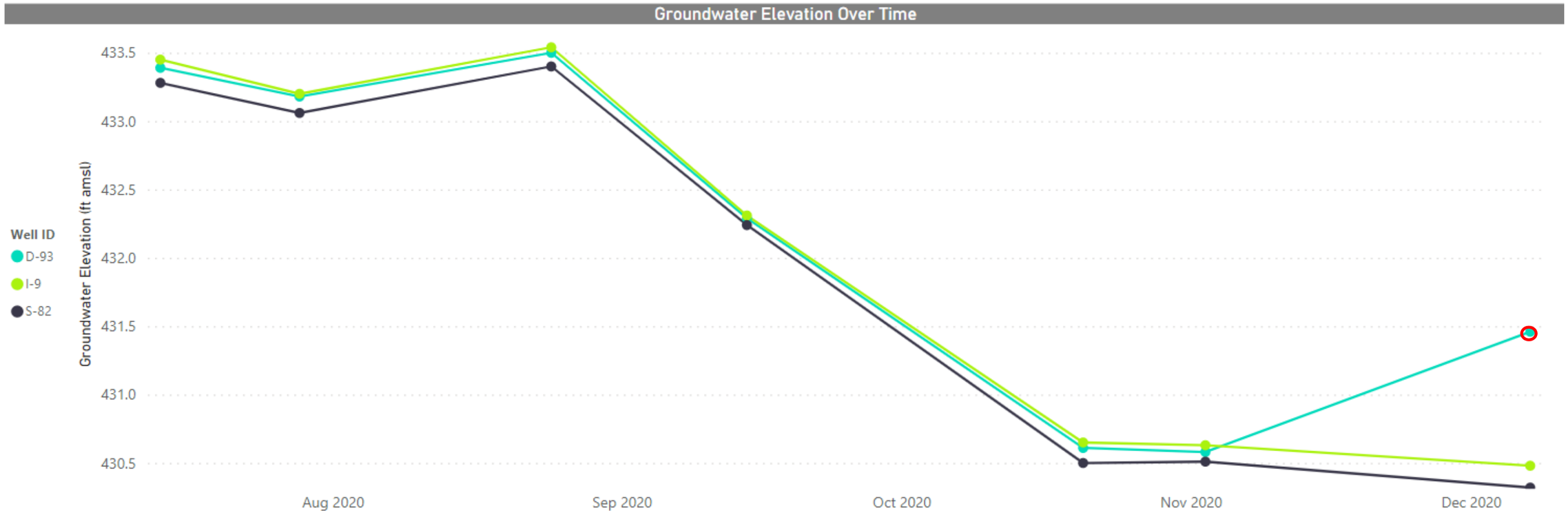
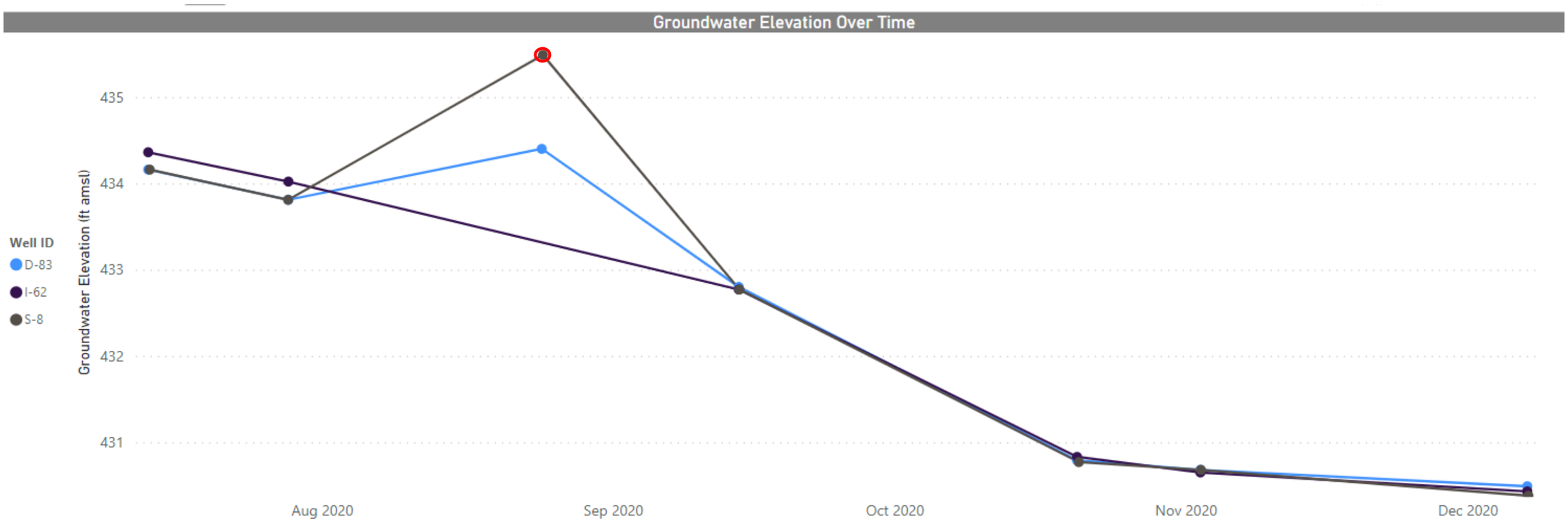


Figure E-5: AL2 Alluvium Pair Hydrograph



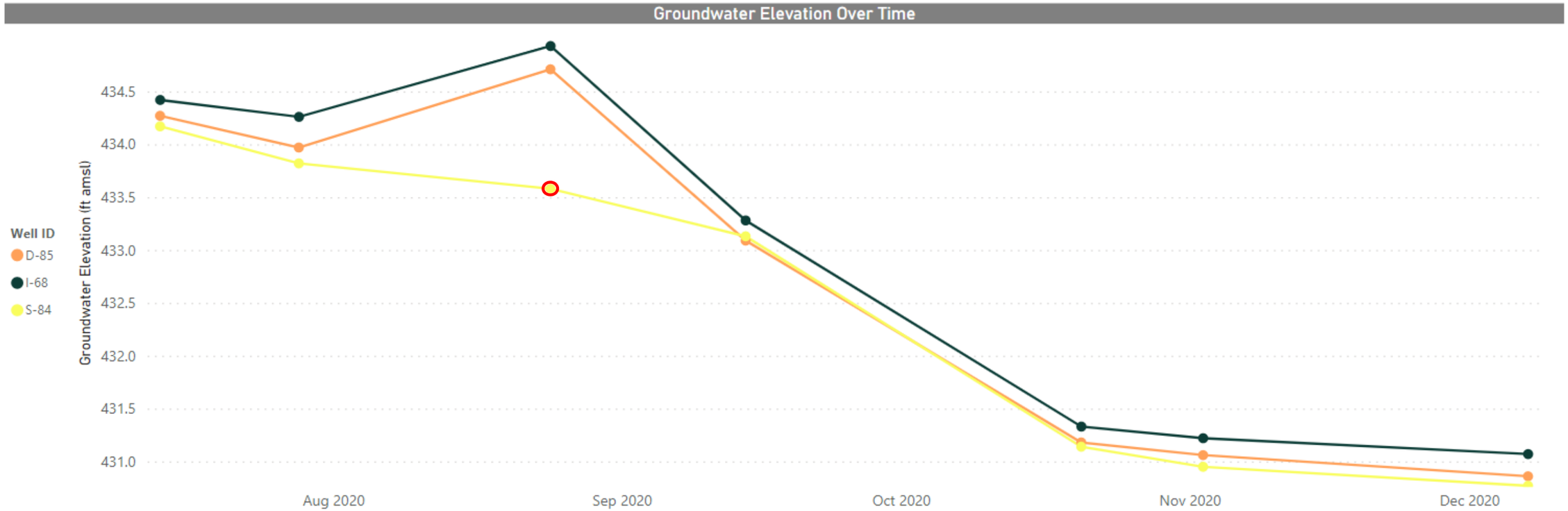
Red circle indicates where water levels deviated from previous data trends.

Figure E-6: AL3 Alluvium Pair Hydrograph



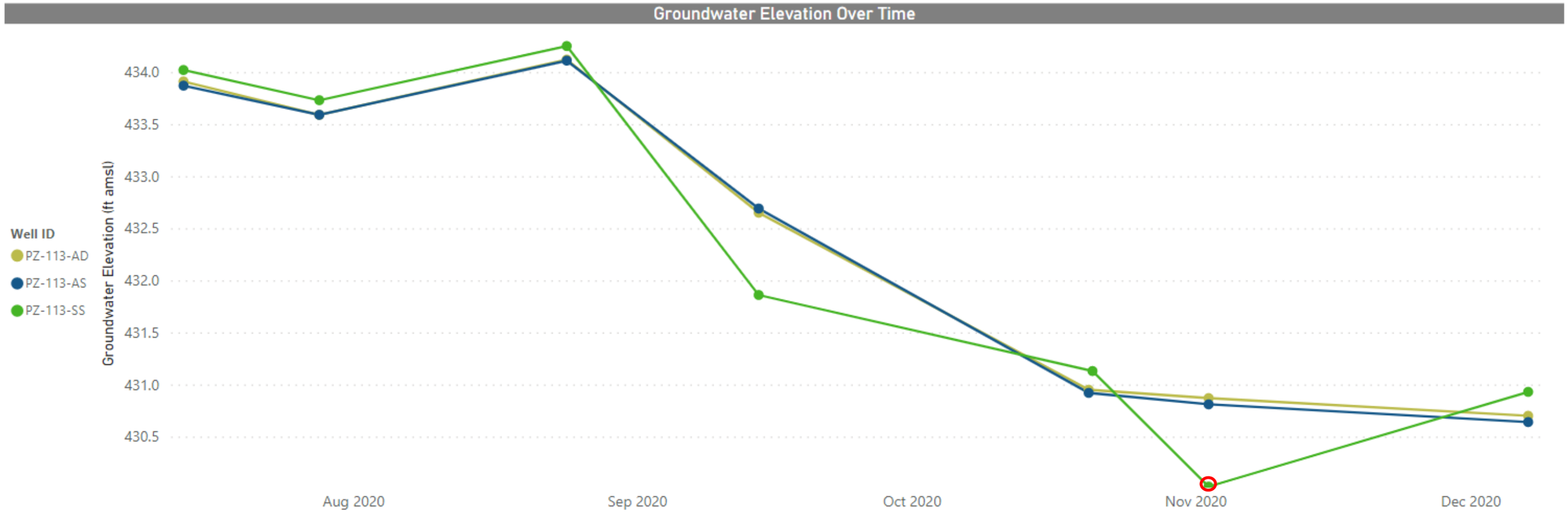
Red circle indicates where water levels deviated from previous data trends.

Figure E-7: AL4 Alluvium Pair Hydrograph



Red circle indicates where water levels deviated from previous data trends.

Figure E-9: AL5 Alluvium Pair Hydrograph



Red circle indicates where water levels deviated from previous data trends.

Figure E-10: AL6 Alluvium Pair Hydrograph

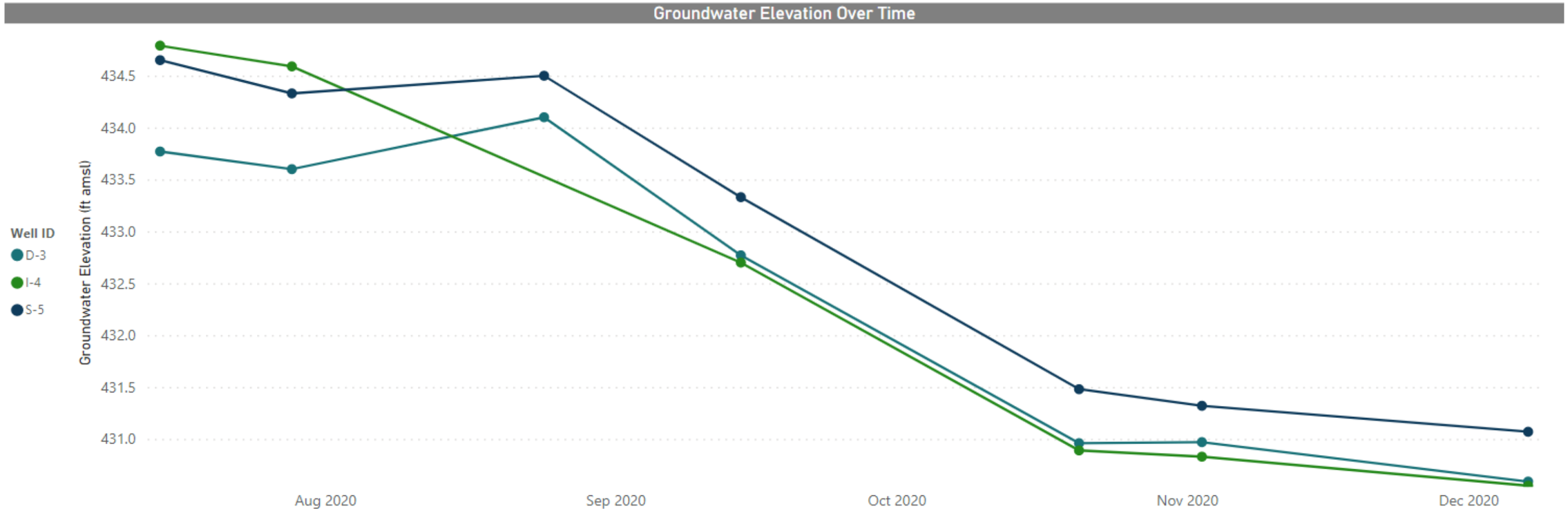


Figure E-11: AL7 Alluvium Pair Hydrograph

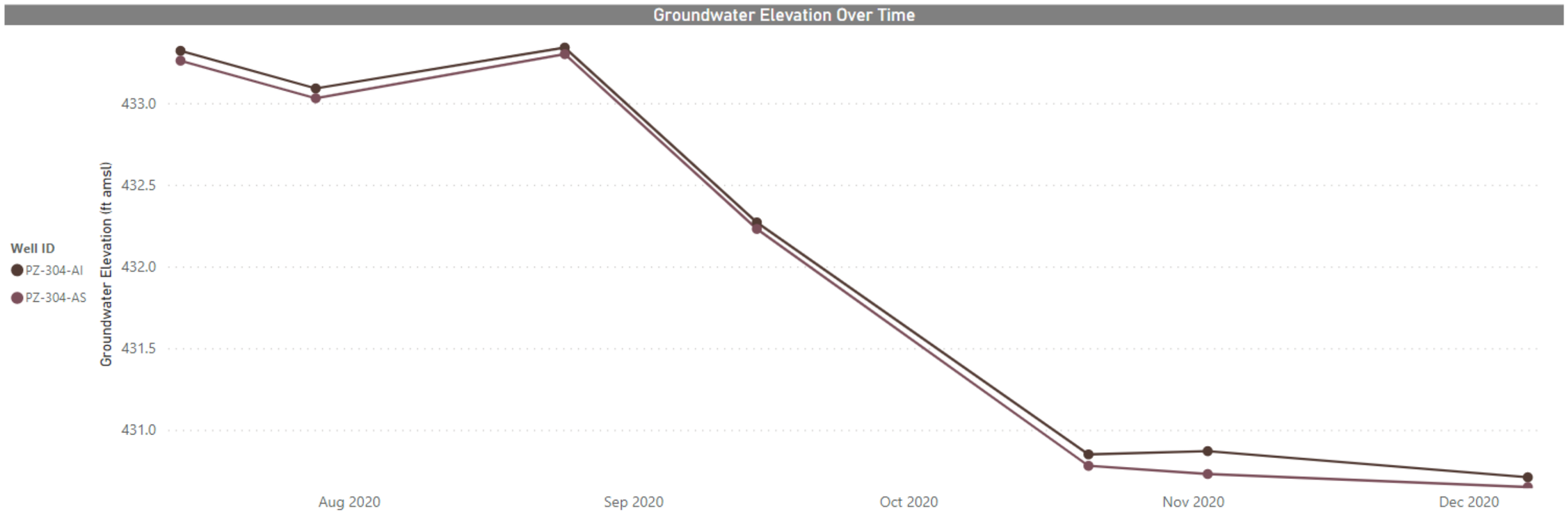


Figure E-12: AL8 Alluvium Pair Hydrograph

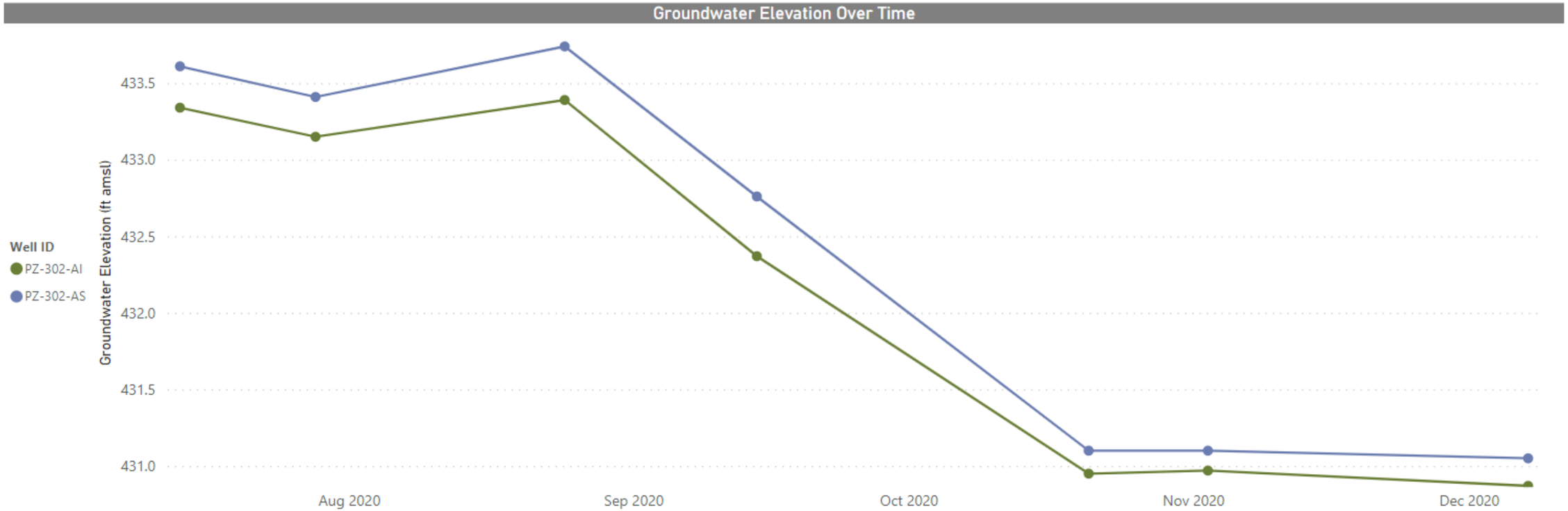
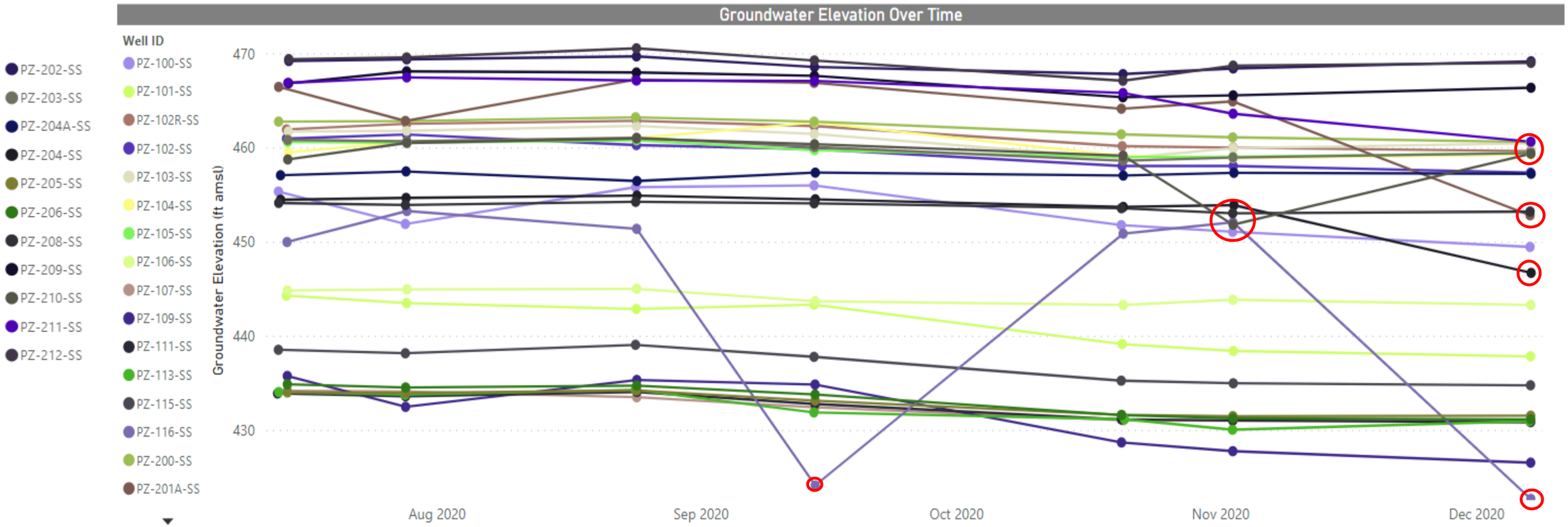


Figure E-13: St Louis Formation Hydrograph



Red circle indicates where water levels deviated from previous data trends.

Figure E-14: Salem Formation Hydrograph

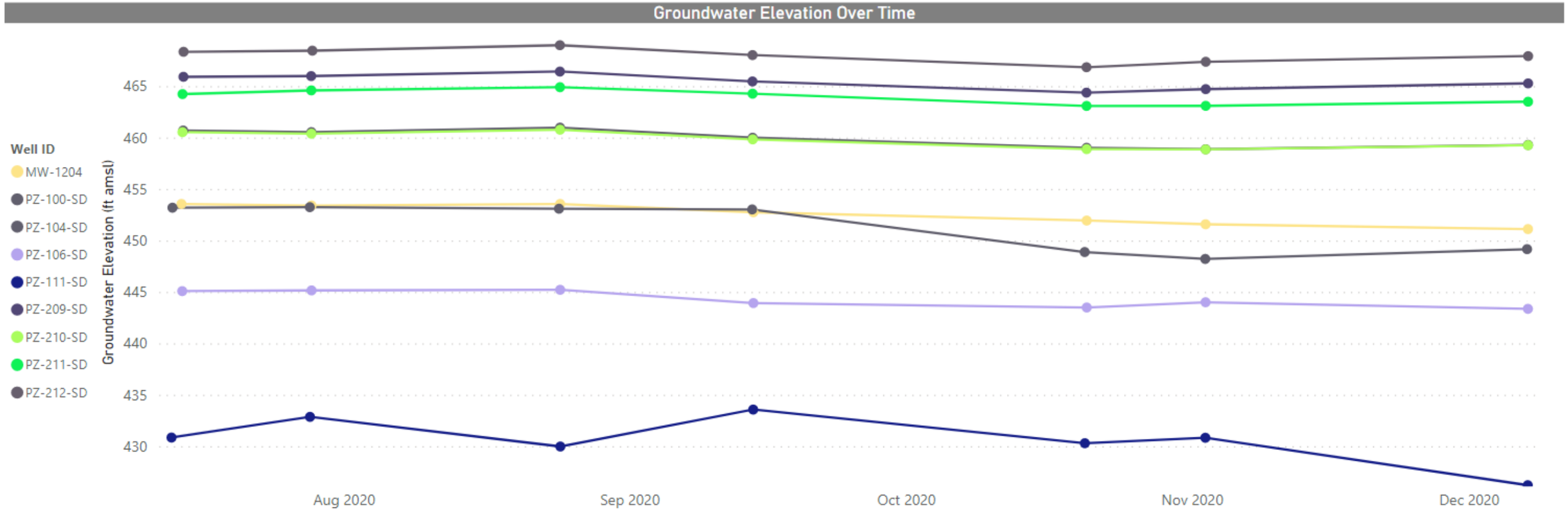
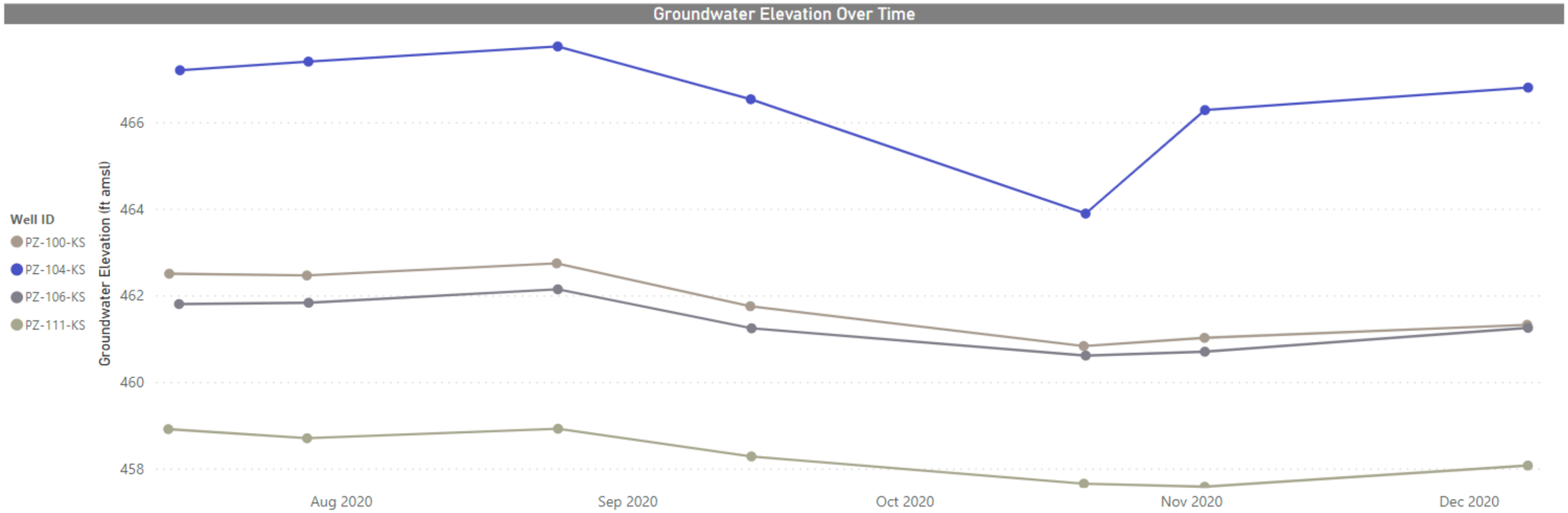
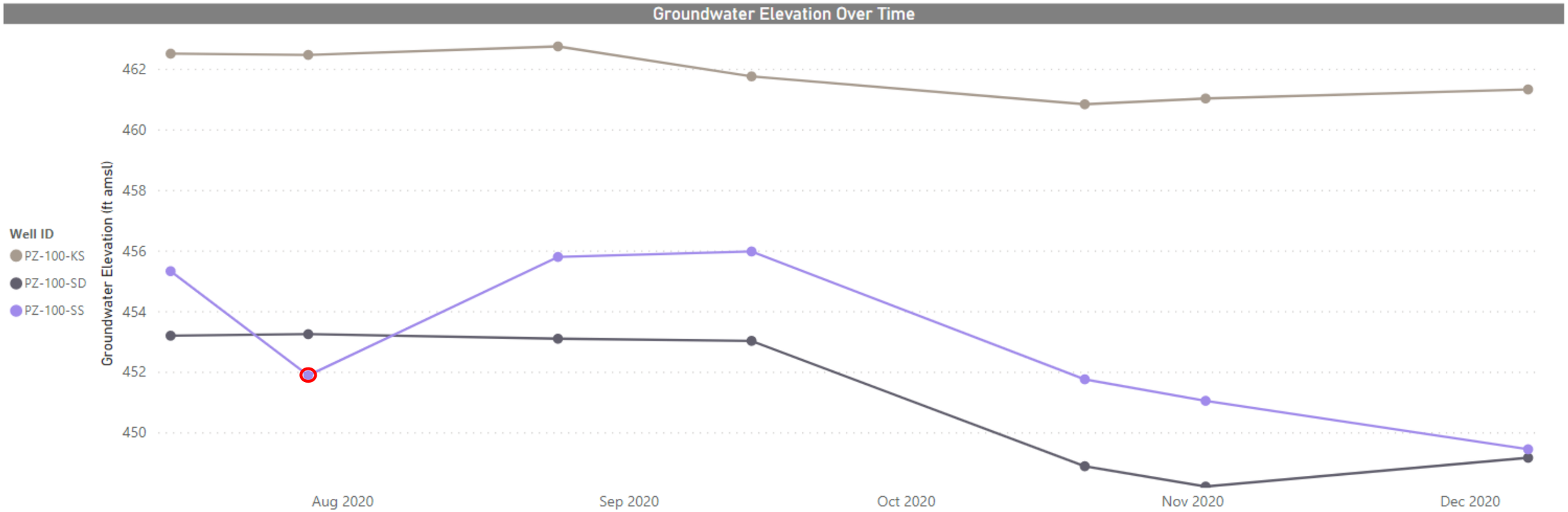


Figure E-15: Keokuk Formation Hydrograph



SALEM–KEOKUK PAIRS:

Figure E-16: SK1 Pair Hydrograph



Red circle indicates where water levels deviated from previous data trends.

Figure E-17: SK2 Pair Hydrograph

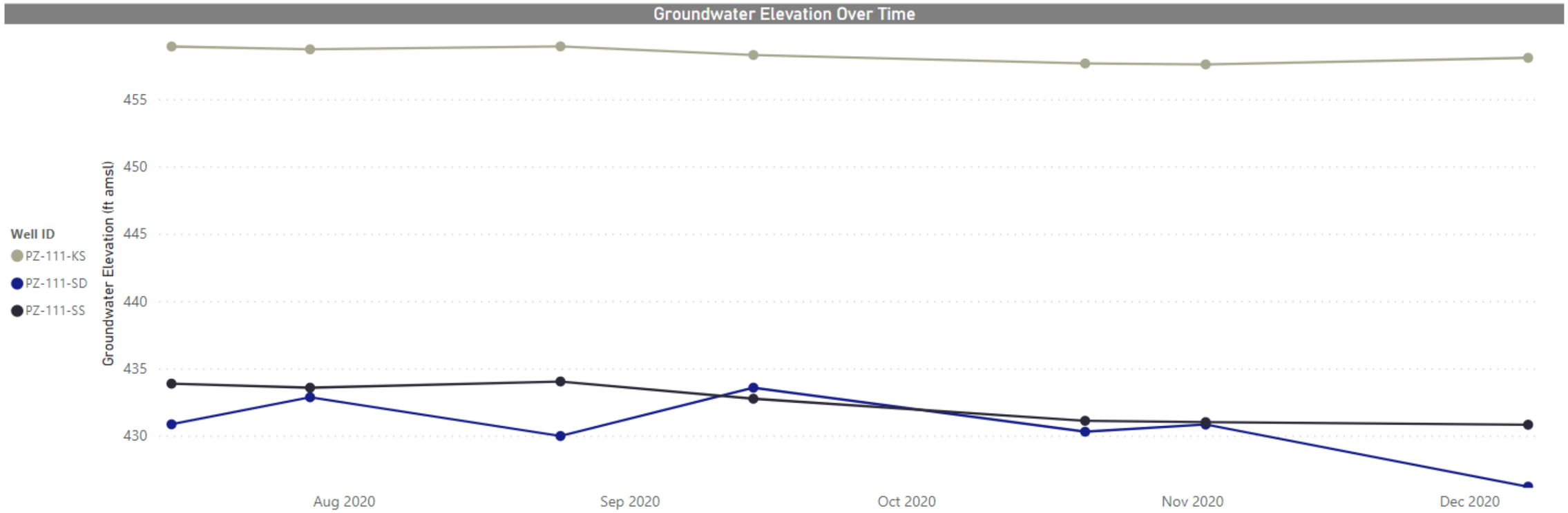


Figure E-18: SK3 Pair Hydrograph

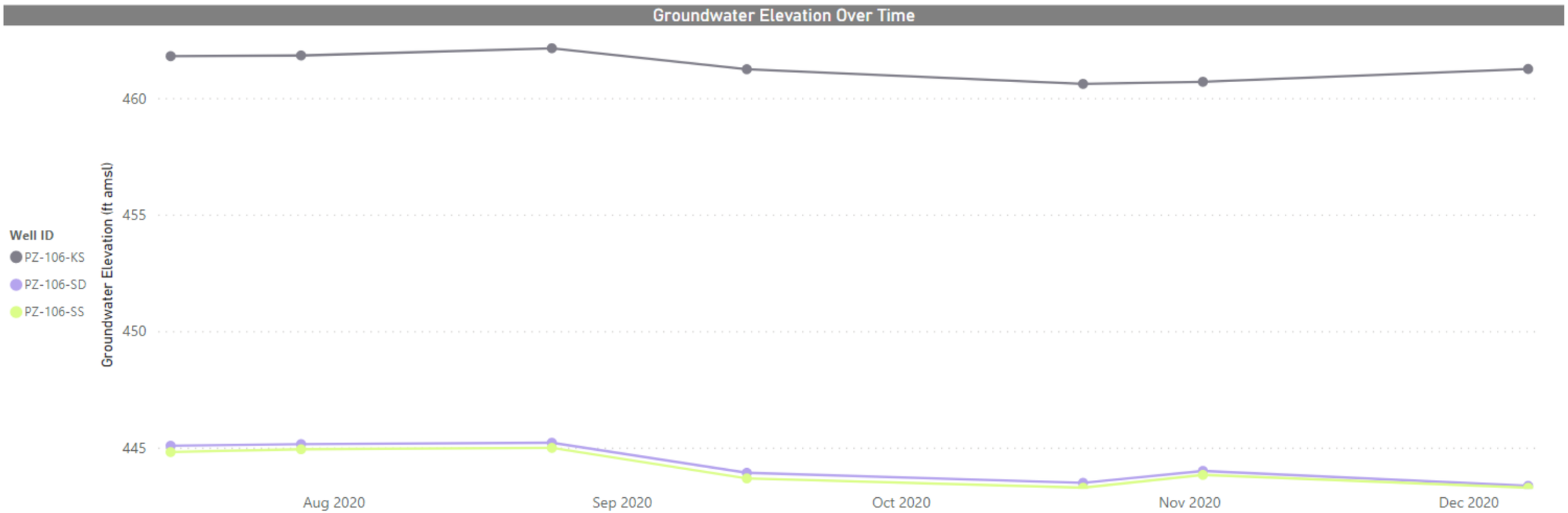
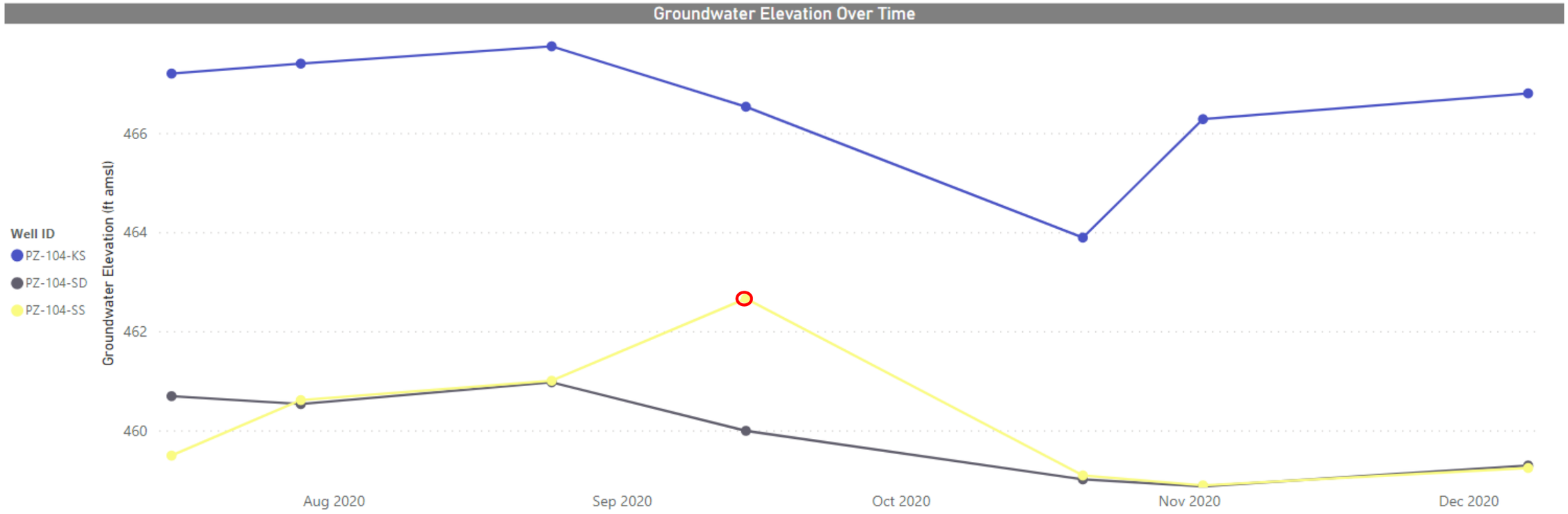


Figure E-19: SK4 Pair Hydrograph



Red circle indicates where water levels deviated from previous data trends.

APPENDIX F DATA VALIDATION REPORTS

ERM

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Memorandum

To	Alice Sandzen
From	Rachel James
Date	2021-06-18
Reference	0579381
Subject	Revised Data Review of West Lake OU-3 RI/FS Routine Groundwater Samples Collected 11/03/2020: Pace Data Package 50272078.

This memorandum was revised to address changes to the initial calibration verification data for Gas Chromatography/Mass Spectrometry methods issued by the laboratory after the initial validation was complete. Table 6 has been revised as needed.

The data quality was assessed and any necessary qualifiers were applied following the Quality Assurance Project Plan (QAPP) for West Lake OU-3 Remediation Investigation/Feasibility Study, Revision 3, December 2020, USEPA Contract Laboratory Program (CLP) NFGs for Organic Superfund Methods Data Review, document number EPA-540-R-2017-002, January 2017, USEPA CLP NFGs for Inorganic Superfund Methods Data Review, document number EPA-540-R-2017-001, January 2017, USEPA Region 1—New England Environmental Data Review Supplement for Region 1 Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement1, June 2018, the protocols and quality control (QC) requirements of the analytical methods, and the reviewer's professional judgement.

A Stage 2B data validation was performed on 100% of the laboratory data.

The following items were reviewed as part of the data validation:

- **Chain of Custody:** The chains of custody were reviewed for proper completion and that the laboratory performed the requested methods and reported the requested target analytes for each sample.
- **Dilutions and Reanalysis:** Dilutions, calibration ranges, and reanalyses were reviewed as applicable. The best result was chosen when more than one result was reported as final.
- **Sample Preservation:** The appropriate temperature and chemical preservation requirements were reviewed. Headspace for volatile sample analysis was reviewed.
- **Holding Times:** The period of time between collection of the sample and preparation/analysis of the sample was evaluated.
- **Instrument Tuning:** Instrument tuning and performance check frequency and results were reviewed.
- **Calibration:** The initial calibration type, fit, number of standards, and minimum response factors were evaluated. Additionally, the frequency and percent recoveries for initial and continuing calibration verification standards and blanks were evaluated.
- **Laboratory Blank Samples:** The preparation and analysis of reagent (contaminant-free) water was evaluated, along with the required frequency.

- **Field Blank Samples:** The collection and analysis of field blanks was evaluated. The reviewed data package(s) included the following associated field blanks: trip, filter, and equipment
- **Spike Samples:** Laboratory control, matrix spike, and post digestion spike sample preparation frequency and recoveries were reviewed as applicable.
- **Serial Dilutions:** Serial dilution sample preparation frequency and recoveries were reviewed as applicable.
- **Surrogate Spikes:** The addition of appropriate surrogates and their recoveries were evaluated.
- **Internal standards:** The presence and recoveries of internal standards and their appropriate association to target analytes were reviewed.
- **Laboratory Duplicate Samples:** Laboratory duplicate frequencies and recoveries were reviewed as applicable.
- **Field Duplicate Samples:** Field duplicate recoveries and absolute differences were reviewed as applicable.
- **Column Agreement:** Column agreements were reviewed for relevant methods.

Findings of the data validation are summarized in the sections below. As necessary, the following data quality flags were applied during validation.

J = estimated concentration
J+ = the result is an estimated concentration, but may be biased high
J- = the result is an estimated concentration, but may be biased low
UJ = estimated reporting limit
U = evaluated to be non-detected at the reporting limit
R = rejected, data not usable
NJ = tentative identification and estimated concentration

Validation outliers and any necessary data qualifications are summarized in outlier tables at the end of this memo. The table below indicates the included validation tables with findings. Tables without findings have been omitted.

Table Number	Table Name	Included
Table 1	Samples with Non-Preferred Results	No
Table 2	Samples with Exceeded Preservation Requirements	No
Table 3	**Samples with Exceeded Holding Times**	**Yes**
Table 4	Instrument Tuning Outside of Acceptable Limits	No
Table 5	**Initial Calibration Outside of Acceptable Limits**	**Yes**
Table 6	**Calibration Verification Outside of Acceptable Limits**	**Yes**
Table 7	**Laboratory Blank and Associated Suspect Sample Detections**	**Yes**
Table 8	**Field Blank and Associated Suspect Sample Detections**	**Yes**
Table 9	**Spike Recoveries Outside of Acceptable Limits**	**Yes**
Table 10	Serial Dilution Recoveries Outside of Acceptable Limits	No
Table 11	Surrogate Recovery Results out of Acceptable Limits	No
Table 12	Internal Standard Recovery Results out of Acceptable Limits	No

Table Number	Table Name	Included
Table 13	Laboratory Duplicate Result Outliers	No
Table 14	Field Duplicate Result Outliers	No
Table 15	Column Agreement Outliers	No
Table 16	Calibration Range Exceedances	No
Table 17	Professional Judgement Qualifiers	No

Findings of the data validation are summarized in the sections below.

CASE NARRATIVE NOTES AND CHAIN-OF-CUSTODY DISCREPANCIES

The laboratory indicated that it does not hold NELAC/TNI accreditation for the methods and parameters in non-potable water listed below. No qualifiers were applied based on accreditation status. Supporting calibrations and quality control data was provided for these analytes and reviewed as part of the data validation.

Method	Analyte without NELAC/TNI Accreditation	
	CAS	Analyte Name
EPA SW 6020	7440-29-1	Thorium
	7440-61-1	Uranium
EPA SW 6010	7440-21-3	Silicon
EPA SW 8082	1336-36-3	Total PCBs
EPA SW 8270	92-52-4	Biphenyl
	99-35-4	1,3,5-Trinitrobenzene
	1912-24-9	Atrazine
	106-50-3	p-Phenylenediamine
	105-60-2	Caprolactam
	95-53-4	o-Toluidine
	100-52-7	Benzaldehyde
EPA SW 8260	110-82-7	Cyclohexane
	108-87-2	Methylcyclohexane
	78-83-1	Isobutyl alcohol
	79-20-9	Methyl acetate
	126-99-8	beta-Chloroprene
EPA SW 9056	20461-54-5	Iodide

No discrepancies between the chains-of-custody and the sample containers received were noted by the laboratory.

PRESERVATION AND HOLDING TIME EVALUATION

The laboratory received the sample shipments within the method-prescribed temperature preservation requirements of less than 6 degrees Celsius, with acceptable sample pH values, and

all vials for volatile analysis were received in good condition with headspace of less than 6 millimeters.

The samples were prepared and analyzed within the method-prescribed time period from the date of collection, with the exceptions and any necessary qualifications noted in Table 3.

INSTRUMENT TUNING EVALUATION

All tuning criteria met method acceptance criteria.

INITIAL CALIBRATION

The initial calibrations met the minimum number of calibration standards, project required percent standard deviation (%RSD), relative correlation coefficient, and minimum relative response factor (RRF) limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 5.

INITIAL CALIBRATION VERIFICATION (ICV) AND CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION

The initial and continuing calibration verifications were within project-specified percent difference (%D) or percent recoveries (%R) and RRF limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 6.

Situations that required additional professional judgement are detailed below:

- SVOC analytes acetophenone, atrazine, benzaldehyde, biphenyl (diphenyl), caprolactam, N-nitrosodiphenylamine, and 1,2,4,5-tetrachlorobenzene were not reported for the ICV samples. These analytes were present in the initial calibrations and CCV samples and were within control limits. The non-detected results in associated samples have been qualified UJ.

LABORATORY BLANK EVALUATION

The laboratory blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 7. The blank results indicate that contaminants may have been introduced to the samples during processing or analysis in the laboratory.

Situations that required additional professional judgement are detailed below:

- Sample results above the reporting limit but less than five times the associated method blank contamination for hydrocarbon range C7-C8-Aromatics reported by method TX1006 were qualified U at the reported result. There were no detections in any blanks or field samples for the C6-C12 hydrocarbon range reported by method TX1005, suggesting C7-C8-Aromatic detections were due to process contamination.

FIELD BLANK EVALUATION

The trip, filter, and equipment blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 8. Any field blank detections associated with laboratory blank contamination and qualified as non-detected (U) are

not included in Table 8. The blank results indicate that contaminants may have been introduced to the samples during collection, shipment, handling, and storage.

BLANK AND MATRIX SPIKE EVALUATION

The laboratory control sample (LCS), laboratory control sample duplicate (LCSD) recoveries, and relative percent differences (RPDs) were within the laboratory's limits of acceptance, with the exceptions and any necessary qualifications noted in Table 9. Data were not qualified if a high recovery was associated with a non-detected result.

The matrix spike (MS), matrix spike duplicate (MSD) recoveries, and RPDs were within the laboratory's limits of acceptance for target analytes for spiked project samples, with the exceptions and any necessary qualifications noted in Table 9. MS/MSDs performed on non-project samples were not reviewed. Data were not qualified if the analyte concentration in the parent sample was greater than four times the spike amount, if the spike amount was diluted out prior to analysis, or if a high recovery was associated with a non-detected result.

SERIAL DILUTION EVALUATION

Where performed on project samples, the metals serial dilution percent differences were within laboratory limits of acceptance. Serial dilutions performed on non-project samples were not reviewed.

SURROGATE SPIKE EVALUATION

The surrogate recoveries were within the laboratory limits of acceptance. The acceptable surrogate recoveries indicate minimal matrix interference in the samples.

INTERNAL STANDARD EVALUATION

The internal standard responses for reported results were within acceptable limits. The acceptable internal standard responses indicate that the instrument sensitivity and response were stable during each analysis.

LABORATORY DUPLICATE EVALUATION

The laboratory prepared at least one project sample as a laboratory duplicate. Laboratory duplicates performed on non-project samples were not reviewed. The RPDs between the primary sample and the duplicate were within laboratory control limits, indicating acceptable laboratory precision.

FIELD DUPLICATE EVALUATION

No field duplicates were submitted to the laboratory.

COLUMN AGREEMENT EVALUATION

Column agreements met method criteria for dual column analysis.

CALIBRATION RANGE EVALUATION

All results were reported within each instrument's calibration range.

SENSITIVITY

The sample results were reported down to the method detection limit. Results between the method detection limit and the reporting limit were flagged as estimated (J) by the laboratory. All non-detected results were reported from undiluted samples.

COMPLETENESS

The complete data package consisted of 603 reportable data points excluding field blank samples. 2 data points were rejected. The data completeness measure for this data package is calculated to be 99.7%. The project laboratory completeness goal of 95% was met.

OVERALL ASSESSMENT

All qualified data, excluding rejected data, can be used for decision-making purposes; however, the limitation identified by the applied qualifier should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

Table 3

Samples with Exceeded Holding Times

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Extraction Holding Time	Total Time	Analysis Holding Time	Total Time	Affected Analyte	ERM Qualifier
50272078	EB-001-WQ-20201103	SM4500-H-B	--	--	15 min.	4613 min.	pH	J
50272078	EB-002-WQ-20201103	SM4500-H-B	--	--	15 min.	4608 min.	pH	J
50272078	PZ-210-SS-WG-20201103	SM4500-H-B	--	--	15 min.	4319 min.	pH	J

Notes:

min. = minutes

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272078	8260 Instrument 50MVDB 10/27/2020	Iodomethane	24	--	20				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ
50272078						TB-001-WQ-20201103	ND	ug/L	UJ
50272078	8270 Instrument 50MSS6 10/07/2020	Famphur	34	--	20				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ
50272078	8270 Instrument 50MSS6 10/07/2020	Hexachlorophene	25	--	20				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ
50272078	8270 Instrument 50MSS6 10/07/2020	Kepone	26	--	20				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272078	8270 Instrument 50MSS6 10/07/2020	3,3'-Dimethylbenzidine	21	--	20				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ

Notes:

IC = Initial calibration

RSD = Relative standard deviation

RRF = Relative response factor

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272078	18004176ICV	Iodomethane	146 %R	--	75-125				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ
50272078						TB-001-WQ-20201103	ND	ug/L	UJ
50272078	18004176ICV	Acetonitrile	8.7 %R	--	75-125				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	R
50272078						PZ-211-SD-WG-20201103	ND	ug/L	R
50272078						EB-001-WQ-20201103	ND	ug/L	R
50272078						EB-002-WQ-20201103	ND	ug/L	R
50272078						TB-001-WQ-20201103	ND	ug/L	R
50272078	18004176ICV	Allyl chloride	61 %R	--	75-125				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ
50272078						TB-001-WQ-20201103	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272078	18004176ICV	Methylcyclohexane	519 %R	--	75-125				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ
50272078						TB-001-WQ-20201103	ND	ug/L	UJ
50272078	18004176ICV	1,4-Dioxane	263 %R	--	75-125				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ
50272078						TB-001-WQ-20201103	ND	ug/L	UJ
50272078	17873843ICV	p-Phenylenediamine	139 %R	--	75-125				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ
50272078	17873843ICV	1,3,5-Trinitrobenzene	128 %R	--	75-125				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272078	17873843ICV	P-Dimethylaminoazobenzene	128 %R	--	75-125				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ
50272078	17873843ICV	3,3'-Dimethylbenzidine	135 %R	--	75-125				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ
50272078	17873843ICV	Famphur	161 %R	--	75-125				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ
50272078	Not present in ICV	Acetophenone	--	--	--				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272078	Not present in ICV	Atrazine	--	--	--				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ
50272078	Not present in ICV	Benzaldehyde	--	--	--				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ
50272078	Not present in ICV	Biphenyl (Diphenyl)	--	--	--				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ
50272078	Not present in ICV	Caprolactam	--	--	--				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272078	Not present in ICV	N-Nitrosodiphenylamin	--	--	--				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ
50272078	Not present in ICV	1,2,4,5-Tetrachlorobenzene	--	--	--				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ
50272078	18067857CCV	Bromomethane	46 %D	--	± 30				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ
50272078						TB-001-WQ-20201103	ND	ug/L	UJ
50272078	18067857CCV	Iodomethane	-33 %D	--	± 25				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ
50272078						TB-001-WQ-20201103	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272078	18060052CCV	Famphur	30 %D	--	± 25				
50272078						PZ-210-SS-WG-20201103	ND	ug/L	UJ
50272078						PZ-211-SD-WG-20201103	ND	ug/L	UJ
50272078						EB-001-WQ-20201103	ND	ug/L	UJ
50272078						EB-002-WQ-20201103	ND	ug/L	UJ

Notes:
CCV = Continuing calibration verification
%D = Percent Difference
ICV = Initial calibration verification
RRF = relative response factor
%R = Percent Recovery

Table 7

Laboratory Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272078	R3592525-4BLANK-50272078	C7-C8-Aromatics	544 J	1000				ug/L	
50272078		C7-C8-Aromatics			PZ-210-SS-WG-20201103	1330	1050	ug/L	1330 U
50272078		C7-C8-Aromatics			PZ-211-SD-WG-20201103	992	1050	ug/L	1050 U
50272078		C7-C8-Aromatics			EB-001-WQ-20201103	1030	1020	ug/L	1030 U
50272078		C7-C8-Aromatics			EB-002-WQ-20201103	659	1020	ug/L	1020 U
50272078		C7-C8-Aromatics			TB-001-WQ-20201103	1010	1060	ug/L	1060 U
50272078	2725414BLANK-50272078	Copper, Total	0.26 J	1.0				ug/L	
50272078		Copper, Total			PZ-210-SS-WG-20201103	1.1	1.0	ug/L	J+
50272078		Copper, Total			PZ-211-SD-WG-20201103	1.1	1.0	ug/L	J+
50272078		Copper, Total			EB-002-WQ-20201103	0.18	1.0	ug/L	1.0 U
50272078	2728585BLANK-50272078	Barium, Total	0.69 J	10.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272078	2728585BLANK-50272078	Manganese, Total	1.6 J	5.0				ug/L	
50272078		Manganese, Total			PZ-211-SD-WG-20201103	4.2	5.0	ug/L	5.0 U
50272078		Manganese, Total			EB-002-WQ-20201103	0.45	5.0	ug/L	5.0 U
50272078	2730284BLANK-50272078	Manganese, Dissolved	0.33 J	5.0				ug/L	
50272078		Manganese, Dissolved			PZ-211-SD-WG-20201103	3.3	5.0	ug/L	5.0 U
50272078		Manganese, Dissolved			FILTB-003-WQ-20201103	2.3	5.0	ug/L	5.0 U
50272078		Manganese, Dissolved			FILTB-004-WQ-20201103	0.56	5.0	ug/L	5.0 U
50272078	2110933BLANK-50272078	Methane	3.7 J	5.0				ug/L	
50272078		Methane			PZ-211-SD-WG-20201103	9.7	5.0	ug/L	J+
50272078		Methane			EB-001-WQ-20201103	4.1	5.0	ug/L	5.0 U
50272078		Methane			EB-002-WQ-20201103	3.9	5.0	ug/L	5.0 U

Notes:

RL = Reporting Limit

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272078	FILTB-003-WQ-20201103	Calcium, Dissolved	413 J	500	None for qualification, associated sample > 5x blank	--	--	ug/L	--
50272078	FILTB-003-WQ-20201103	Copper, Dissolved	0.32 J	1.0				ug/L	
50272078		Copper, Dissolved			PZ-211-SD-WG-20201103	0.98	1.0	ug/L	1.0 U
50272078	FILTB-003-WQ-20201103	Iron, Dissolved	26.2 J	50.0	None for qualification, associated sample ND	--	--	ug/L	--
50272078	FILTB-003-WQ-20201103	Magnesium, Dissolved	172 J	500	None for qualification, associated sample > 5x blank	--	--	ug/L	--
50272078	FILTB-003-WQ-20201103	Titanium, Dissolved	0.78 J	10.0	None for qualification, associated sample is ND	--	--	ug/L	--
50272078	FILTB-004-WQ-20201103	Barium, Dissolved	0.58 J	10.0	None for qualification, associated sample > 5x blank	--	--	ug/L	--
50272078	FILTB-004-WQ-20201103	Calcium, Dissolved	232 J	500	None for qualification, associated sample > 5x blank	--	--	ug/L	--
50272078	FILTB-004-WQ-20201103	Chromium, Dissolved	0.12 J	2.0	None for qualification, associated sample > 5x blank	--	--	ug/L	--
50272078	FILTB-004-WQ-20201103	Copper, Dissolved	0.22 J	1.0				ug/L	
50272078		Copper, Dissolved			PZ-210-SS-WG-20201103	0.28	1.0	ug/L	1.0 U
50272078	FILTB-004-WQ-20201103	Dissolved Organic Carbon	0.80 J	1.0	None for qualification, associated sample > 5x blank	--	--	ug/L	--
50272078	FILTB-004-WQ-20201103	Magnesium, Dissolved	57.9 J	500	None for qualification, associated sample > 5x blank	--	--	ug/L	--
50272078	EB-001-WQ-20201103	Nitrate as N	0.020 J	0.050	None for qualification, no associated sample	--	--	mg/L	--
50272078	EB-001-WQ-20201103	Nitrite + Nitrate as N	0.020 J	0.10	None for qualification, no associated sample	--	--	mg/L	--

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272078	EB-002-WQ-20201103	Nitrate as N	0.018 J	0.050				mg/L	
50272078		Nitrate as N			PZ-210-SS-WG-20201103	0.019	0.050	mg/L	0.050 U
50272078	EB-002-WQ-20201103	Nitrite + Nitrate as N	0.019 J	0.10				mg/L	
50272078		Nitrite + Nitrate as N			PZ-210-SS-WG-20201103	0.019	0.10	mg/L	0.10 U

Notes:

RL = Reporting Limit

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
LCS/LCSD										
50272078	2727495LCS-50272078/		Acetonitrile	8/	50-150					
50272078		EB-001-WQ-20201103	Acetonitrile					<100	ug/L	R
50272078		EB-002-WQ-20201103	Acetonitrile					<100	ug/L	R
50272078		PZ-210-SS-WG-20201103	Acetonitrile					<100	ug/L	R
50272078		PZ-211-SD-WG-20201103	Acetonitrile					<100	ug/L	R
50272078		TB-001-WQ-20201103	Acetonitrile					<100	ug/L	R
50272078	2727495LCS-50272078/	None for qualification, samples ND	Methylcyclohexane	497/	70-129	--	--	--	--	--
MS/MSD										
50272078	PZ-211-SD-WG-20201103MS/ PZ-211-SD-WG-		Carbon dioxide	-3/13.0	38.0-147	Pass	40			
50272078		PZ-211-SD-WG-20201103	Carbon dioxide					29200	ug/L	J-

Notes:

LCS/LCSD = Laboratory control sample/laboratory control sample duplicate

MS/MSD - Matrix spike/matrix spike duplicate

RPD = Relative percent difference

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Memorandum

To	Alice Sandzen
From	Rachel James
Date	2021-06-18
Reference	0579381
Subject	Revised Data Review of West Lake OU-3 RI/FS Routine Groundwater Samples Collected 11/04/2020: Pace Data Package 50272235.

This memorandum was revised to address changes to the initial calibration verification data for Gas Chromatography/Mass Spectrometry methods issued by the laboratory after the initial validation was complete. Table 6 has been revised as needed.

The data quality was assessed and any necessary qualifiers were applied following the Quality Assurance Project Plan (QAPP) for West Lake OU-3 Remediation Investigation/Feasibility Study, Revision 3, December 2020, USEPA Contract Laboratory Program (CLP) NFGs for Organic Superfund Methods Data Review, document number EPA-540-R-2017-002, January 2017, USEPA CLP NFGs for Inorganic Superfund Methods Data Review, document number EPA-540-R-2017-001, January 2017, and USEPA Region 1—New England Environmental Data Review Supplement for Region 1 Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement1, June 2018., the protocols and quality control (QC) requirements of the analytical methods, and the reviewer's professional judgement.

A Stage 2B data validation was performed on 100% of the laboratory data.

The following items were reviewed as part of the data validation:

- **Chain of Custody:** The chains of custody were reviewed for proper completion and that the laboratory performed the requested methods and reported the requested target analytes for each sample.
- **Dilutions and Reanalysis:** Dilutions, calibration ranges, and reanalyses were reviewed as applicable. The best result was chosen when more than one result was reported as final.
- **Sample Preservation:** The appropriate temperature and chemical preservation requirements were reviewed. Headspace for volatile sample analysis was reviewed.
- **Holding Times:** The period of time between collection of the sample and preparation/analysis of the sample was evaluated.
- **Instrument Tuning:** Instrument tuning and performance check frequency and results were reviewed.
- **Calibration:** The initial calibration type, fit, number of standards, and minimum response factors were evaluated. Additionally, the frequency and percent recoveries for initial and continuing calibration verification standards and blanks were evaluated.
- **Laboratory Blank Samples:** The preparation and analysis of reagent (contaminant-free) water was evaluated, along with the required frequency.

- **Field Blank Samples:** The collection and analysis of field blanks was evaluated. The reviewed data package(s) included the following associated field blanks: trip, filter, and equipment
- **Spike Samples:** Laboratory control, matrix spike, and post digestion spike sample preparation frequency and recoveries were reviewed as applicable.
- **Serial Dilutions:** Serial dilution sample preparation frequency and recoveries were reviewed as applicable.
- **Surrogate Spikes:** The addition of appropriate surrogates and their recoveries were evaluated.
- **Internal standards:** The presence and recoveries of internal standards and their appropriate association to target analytes were reviewed.
- **Laboratory Duplicate Samples:** Laboratory duplicate frequencies and recoveries were reviewed as applicable.
- **Field Duplicate Samples:** Field duplicate recoveries and absolute differences were reviewed as applicable.
- **Column Agreement:** Column agreements were reviewed for relevant methods.

Findings of the data validation are summarized in the sections below. As necessary, the following data quality flags were applied during validation.

J = estimated concentration
J+ = the result is an estimated concentration, but may be biased high
J- = the result is an estimated concentration, but may be biased low
UJ = estimated reporting limit
U = evaluated to be non-detected at the reporting limit
R = rejected, data not usable
NJ = tentative identification and estimated concentration

Validation outliers and any necessary data qualifications are summarized in outlier tables at the end of this memo. The table below indicates the included validation tables with findings. Tables without findings have been omitted.

Table Number	Table Name	Included
Table 1	Samples with Non-Preferred Results	No
Table 2	Samples with Exceeded Preservation Requirements	No
Table 3	**Samples with Exceeded Holding Times**	**Yes**
Table 4	Instrument Tuning Outside of Acceptable Limits	No
Table 5	**Initial Calibration Outside of Acceptable Limits**	**Yes**
Table 6	**Calibration Verification Outside of Acceptable Limits**	**Yes**
Table 7	**Laboratory Blank and Associated Suspect Sample Detections**	**Yes**
Table 8	**Field Blank and Associated Suspect Sample Detections**	**Yes**
Table 9	**Spike Recoveries Outside of Acceptable Limits**	**Yes**
Table 10	Serial Dilution Recoveries Outside of Acceptable Limits	No
Table 11	Surrogate Recovery Results out of Acceptable Limits	No
Table 12	Internal Standard Recovery Results out of Acceptable Limits	No

Table Number	Table Name	Included
Table 13	Laboratory Duplicate Result Outliers	No
Table 14	Field Duplicate Result Outliers	No
Table 15	Column Agreement Outliers	No
Table 16	Calibration Range Exceedances	No
Table 17	Professional Judgement Qualifiers	No

Findings of the data validation are summarized in the sections below.

CASE NARRATIVE NOTES AND CHAIN-OF-CUSTODY DISCREPANCIES

The laboratory indicated that it does not hold NELAC/TNI accreditation for the methods and parameters in non-potable water listed below. No qualifiers were applied based on accreditation status. Supporting calibrations and quality control data was provided for these analytes and reviewed as part of the data validation.

Method	Analyte without NELAC/TNI Accreditation	
	CAS	Analyte Name
EPA SW 6020	7440-29-1	Thorium
	7440-61-1	Uranium
EPA SW 6010	7440-21-3	Silicon
EPA SW 8082	1336-36-3	Total PCBs
EPA SW 8270	92-52-4	Biphenyl
	99-35-4	1,3,5-Trinitrobenzene
	1912-24-9	Atrazine
	106-50-3	p-Phenylenediamine
	105-60-2	Caprolactam
	95-53-4	o-Toluidine
	100-52-7	Benzaldehyde
EPA SW 8260	110-82-7	Cyclohexane
	108-87-2	Methylcyclohexane
	78-83-1	Isobutyl alcohol
	79-20-9	Methyl acetate
	126-99-8	beta-Chloroprene
EPA SW 9056	20461-54-5	Iodide

No discrepancies between the chains-of-custody and the sample containers received were noted by the laboratory.

PRESERVATION AND HOLDING TIME EVALUATION

The laboratory received the sample shipments within the method-prescribed temperature preservation requirements of less than 6 degrees Celsius, with acceptable sample pH values, and

all vials for volatile analysis were received in good condition with headspace of less than 6 millimeters.

The samples were prepared and analyzed within the method-prescribed time period from the date of collection, with the exceptions and any necessary qualifications noted in Table 3.

INSTRUMENT TUNING EVALUATION

All tuning criteria met method acceptance criteria.

INITIAL CALIBRATION

The initial calibrations met the minimum number of calibration standards, project required percent standard deviation (%RSD), relative correlation coefficient, and minimum relative response factor (RRF) limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 5.

INITIAL CALIBRATION VERIFICATION (ICV) AND CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION

The initial and continuing calibration verifications were within project-specified percent difference (%D) or percent recoveries (%R) and RRF limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 6.

Situations that required additional professional judgement are detailed below:

- SVOC analytes acetophenone, atrazine, benzaldehyde, biphenyl (diphenyl), caprolactam, N-nitrosodiphenylamine, and 1,2,4,5-tetrachlorobenzene were not reported for the ICV samples. These analytes were present in the initial calibrations and CCV samples and were within control limits. The non-detected results in associated samples have been qualified UJ.

LABORATORY BLANK EVALUATION

The laboratory blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 7. The blank results indicate that contaminants may have been introduced to the samples during processing or analysis in the laboratory.

Situations that required additional professional judgement are detailed below:

- The trip blank result above the reporting limit but less than five times the associated method blank contamination for hydrocarbon range C7-C8-Aromatics reported by method TX1006 was qualified U at the reported result. There were no detections in any blanks or field samples for the C6-C12 hydrocarbon range reported by method TX1005, suggesting C7-C8-Aromatic detections were due to process contamination.

FIELD BLANK EVALUATION

The trip, filter, and equipment blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 8. Any field blank detections associated with laboratory blank contamination and qualified as non-detected (U) are

not included in Table 8. The blank results indicate that contaminants may have been introduced to the samples during collection, shipment, handling, and storage.

BLANK AND MATRIX SPIKE EVALUATION

The laboratory control sample (LCS), laboratory control sample duplicate (LCSD) recoveries, and relative percent differences (RPDs) were within the laboratory's limits of acceptance, with the exceptions and any necessary qualifications noted in Table 9. Data were not qualified if a high recovery was associated with a non-detected result.

The matrix spike (MS), matrix spike duplicate (MSD) recoveries, and RPDs were within the laboratory's limits of acceptance for target analytes for spiked project samples, with the exceptions and any necessary qualifications noted in Table 9. MS/MSDs performed on non-project samples were not reviewed. Data were not qualified if the analyte concentration in the parent sample was greater than four times the spike amount, if the spike amount was diluted out prior to analysis, or if a high recovery was associated with a non-detected result.

SERIAL DILUTION EVALUATION

The laboratory did not perform serial dilutions on any project samples. Serial dilutions performed on non-project samples were not reviewed.

SURROGATE SPIKE EVALUATION

The surrogate recoveries were within the laboratory limits of acceptance. The acceptable surrogate recoveries indicate minimal matrix interference in the samples.

INTERNAL STANDARD EVALUATION

The internal standard responses for reported results were within acceptable limits. The acceptable internal standard responses indicate that the instrument sensitivity and response were stable during each analysis.

LABORATORY DUPLICATE EVALUATION

The laboratory prepared at least one project sample as a laboratory duplicate. Laboratory duplicates performed on non-project samples were not reviewed. The RPDs between the primary sample and the duplicate were within laboratory control limits, indicating acceptable laboratory precision.

FIELD DUPLICATE EVALUATION

No field duplicates were submitted to the laboratory.

COLUMN AGREEMENT EVALUATION

Column agreements met method criteria for dual column analysis.

CALIBRATION RANGE EVALUATION

All results were reported within each instrument's calibration range.

SENSITIVITY

The sample results were reported down to the method detection limit. Results between the method detection limit and the reporting limit were flagged as estimated (J) by the laboratory. All non-detected results were reported from undiluted samples.

COMPLETENESS

The complete data package consisted of 954 reportable data points excluding field blank samples. 3 data points were rejected. The data completeness measure for this data package is calculated to be 99.7%. The project laboratory completeness goal of 95% was met.

OVERALL ASSESSMENT

All qualified data, excluding rejected data, can be used for decision-making purposes; however, the limitation identified by the applied qualifier should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

Table 3

Samples with Exceeded Holding Times

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Extraction Holding Time	Total Time	Analysis Holding Time	Total Time	Affected Analyte	ERM Qualifier
50272235	PZ-104-SD-WG-20201104	SM4500-H-B	--	--	15 min.	7458 min.	pH	J
50272235	PZ-113-AS-WG-20201104	SM4500-H-B	--	--	15 min.	7438 min.	pH	J
50272235	PZ-209-SS-WG-20201104	SM4500-H-B	--	--	15 min.	7594 min.	pH	J

Notes:

min. = minutes

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272235	8260 Instrument 50MVDB 10/27/2020	Iodomethane	24	--	20				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235						TB-002-WQ-20201104	ND	ug/L	UJ
50272235	8270 Instrument 50MSS6 10/07/2020	Famphur	34	--	20				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235	8270 Instrument 50MSS6 10/07/2020	Hexachlorophene	25	--	20				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235	8270 Instrument 50MSS6 10/07/2020	Kepone	26	--	20				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272235	8270 Instrument 50MSS6 10/07/2020	3,3'-Dimethylbenzidine	21	--	20				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ

Notes:

IC = Initial calibration

RSD = Relative standard deviation

RRF = Relative response factor

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272235	18004176ICV	Iodomethane	146 %R	--	75-125				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235						TB-002-WQ-20201104	ND	ug/L	UJ
50272235	18004176ICV	Acetonitrile	8.7 %R	--	75-125				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	R
50272235						PZ-113-AS-WG-20201104	ND	ug/L	R
50272235						PZ-209-SS-WG-20201104	ND	ug/L	R
50272235						TB-002-WQ-20201104	ND	ug/L	R
50272235	18004176ICV	Allyl chloride	61 %R	--	75-125				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235						TB-002-WQ-20201104	ND	ug/L	UJ
50272235	18004176ICV	Methylcyclohexane	519 %R	--	75-125				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235						TB-002-WQ-20201104	ND	ug/L	UJ
50272235	18004176ICV	1,4-Dioxane	263 %R	--	75-125				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235						TB-002-WQ-20201104	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272235	17873843ICV	p-Phenylenediamine	139 %R	--	75-125				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235	17873843ICV	1,3,5-Trinitrobenzene	128 %R	--	75-125				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235	17873843ICV	P-Dimethylaminoazobenzene	128 %R	--	75-125				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235	17873843ICV	3,3'-Dimethylbenzidine	135 %R	--	75-125				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235	17873843ICV	Famphur	161 %R	--	75-125				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235	Not present in ICV	Acetophenone	--	--	--				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272235	Not present in ICV	Atrazine	--	--	--				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235	Not present in ICV	Benzaldehyde	--	--	--				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235	Not present in ICV	Biphenyl (Diphenyl)	--	--	--				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235	Not present in ICV	Caprolactam	--	--	--				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235	Not present in ICV	N-Nitrosodiphenylamine	--	--	--				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235	Not present in ICV	1,2,4,5-Tetrachlorobenzene	--	--	--				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272235	18088430CCV	Acetonitrile	-31 %D	--	± 25				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235						TB-002-WQ-20201104	ND	ug/L	UJ
50272235	18088430CCV	Chloroethane	-28 %D	--	± 25				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235						TB-002-WQ-20201104	ND	ug/L	UJ
50272235	18088430CCV	Chloromethane	-42 %D	--	± 30				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235						TB-002-WQ-20201104	ND	ug/L	UJ
50272235	18088430CCV	1,4-Dioxane	22 %D	--	± 25				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235						TB-002-WQ-20201104	ND	ug/L	UJ
50272235	18088430CCV	Iodomethane	-74 %D	--	± 25				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235						TB-002-WQ-20201104	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272235	18088430CCV	Vinyl chloride	-28 %D	--	± 25				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235						TB-002-WQ-20201104	ND	ug/L	UJ
50272235	18082693CCV	Famphur	39 %D	--	± 25				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ
50272235	18082693CCV	Hexachlorophene	-28 %D	--	± 25				
50272235						PZ-104-SD-WG-20201104	ND	ug/L	UJ
50272235						PZ-113-AS-WG-20201104	ND	ug/L	UJ
50272235						PZ-209-SS-WG-20201104	ND	ug/L	UJ

Notes:
ICV = Initial calibration verification
%D = Percent Difference
CCV = Continuing calibration verification
RRF = relative response factor
%R = Percent Recovery

Table 7

Laboratory Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272235	R3592525-4BLANK-50272235	C7-C8-Aromatics	544 J	1000				ug/L	
50272235		C7-C8-Aromatics			PZ-104-SD-WG-20201104	969	1030	ug/L	1030 U
50272235		C7-C8-Aromatics			PZ-113-AS-WG-20201104	895	1010	ug/L	1010 U
50272235		C7-C8-Aromatics			PZ-209-SS-WG-20201104	970	1020	ug/L	1020 U
50272235		C7-C8-Aromatics			TB-002-WQ-20201104	1120	1010	ug/L	1120 U
50272235	2728585BLANK-50272235	Barium, Total	0.69 J	10.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272235	2728585BLANK-50272235	Manganese, Total	1.6 J	5.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272235	2730284BLANK-50272235	Manganese, Dissolved	0.33 J	5.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272235	2110933BLANK-50272235	Methane	3.7 J	5.0				ug/L	
50272235		Methane			PZ-209-SS-WG-20201104	7.1	5.0	ug/L	J+

Notes:

RL = Reporting Limit

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272235	FILTB-003-WQ-20201103	Calcium, Dissolved	413 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272235	FILTB-003-WQ-20201103	Copper, Dissolved	0.32 J	1.0				ug/L	
50272235		Copper, Dissolved			PZ-104-SD-WG-20201104	0.39	1.0	ug/L	1.0 U
50272235		Copper, Dissolved			PZ-209-SS-WG-20201104	0.24	1.0	ug/L	1.0 U
50272235	FILTB-003-WQ-20201103	Iron, Dissolved	26.2 J	50.0	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272235	FILTB-003-WQ-20201103	Magnesium, Dissolved	172 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272235	FILTB-003-WQ-20201103	Titanium, Dissolved	0.78 J	10.0	None for qualification, associated samples ND	--	--	ug/L	--
50272235	FILTB-004-WQ-20201103	Barium, Dissolved	0.58 J	10.0	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272235	FILTB-004-WQ-20201103	Calcium, Dissolved	232 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272235	FILTB-004-WQ-20201103	Chromium, Dissolved	0.12 J	2.0				ug/L	
50272235		Chromium, Dissolved			PZ-113-AS-WG-20201104	0.32	2.0	ug/L	2.0 U
50272235	FILTB-004-WQ-20201103	Copper, Dissolved	0.22 J	1.0				ug/L	
50272235		Copper, Dissolved			PZ-113-AS-WG-20201104	0.50	1.0	ug/L	1.0 U

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272235	FILTB-004-WQ-20201103	Dissolved Organic Carbon	0.80 J	1.0	None for qualification, associated sample > 5x blank	--	--	ug/L	--
50272235	FILTB-004-WQ-20201103	Magnesium, Dissolved	57.9 J	500	None for qualification, associated sample > 5x blank	--	--	ug/L	--
50272235	EB-001-WQ-20201103	Nitrate as N	0.020 J	0.050	None for qualification, associated samples ND	--	--	mg/L	--
50272235	EB-001-WQ-20201103	Nitrite + Nitrate as N	0.020 J	0.10				mg/L	
50272235		Nitrite + Nitrate as N			PZ-104-SD-WG-20201104	0.024	0.10	mg/L	0.10 U
50272235		Nitrite + Nitrate as N			PZ-209-SS-WG-20201104	0.024	0.10	mg/L	0.10 U
50272235	EB-002-WQ-20201103	Nitrate as N	0.018 J	0.050	None for qualification, associated sample ND	--	--	mg/L	--
50272235	EB-002-WQ-20201103	Nitrite + Nitrate as N	0.019 J	0.10				mg/L	
50272235		Nitrite + Nitrate as N			PZ-113-AS-WG-20201104	0.016	0.10	mg/L	0.10 U

Notes:

RL = Reporting Limit

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
LCS/LCSD										
50272235	2730619LCS-50272235/		Acetonitrile	8/	50-150					
50272235		PZ-104-SD-WG-20201104	Acetonitrile					<100	ug/L	R
50272235		PZ-113-AS-WG-20201104	Acetonitrile					<100	ug/L	R
50272235		PZ-209-SS-WG-20201104	Acetonitrile					<100	ug/L	R
50272235		TB-002-WQ-20201104	Acetonitrile					<100	ug/L	R
50272235	2730619LCS-50272235/	None for qualification, samples ND	Methylcyclohexane	474/	70-129	--	--	--	--	--
MS/MSD										
50272235	PZ-113-AS-WG-20201104MS/ PZ-113-AS-WG-20201104MSD	None for qualification, sample ND	Nitrite as N	147/150	80-120	Pass	15	--	--	--

Notes:

LCS/LCSD = Laboratory control sample/laboratory control sample duplicate

MS/MSD - Matrix spike/matrix spike duplicate

RPD = Relative percent difference

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Memorandum

To	Alice Sandzen
From	Rachel James
Date	2021-06-18
Reference	0579381
Subject	Revised Data Review of West Lake OU-3 RI/FS Routine Groundwater Samples Collected 11/05/2020: Pace Data Package 50272391.

This memorandum was revised to address changes to the initial calibration verification data for Gas Chromatography/Mass Spectrometry methods issued by the laboratory after the initial validation was complete. Table 6 has been revised as needed.

The data quality was assessed and any necessary qualifiers were applied following the Quality Assurance Project Plan (QAPP) for West Lake OU-3 Remediation Investigation/Feasibility Study, Revision 3, December 2020, USEPA Contract Laboratory Program (CLP) NFGs for Organic Superfund Methods Data Review, document number EPA-540-R-2017-002, January 2017, USEPA CLP NFGs for Inorganic Superfund Methods Data Review, document number EPA-540-R-2017-001, January 2017, and USEPA Region 1—New England Environmental Data Review Supplement for Region 1 Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement1, June 2018., the protocols and quality control (QC) requirements of the analytical methods, and the reviewer's professional judgement.

A Stage 2B data validation was performed on 100% of the laboratory data.

The following items were reviewed as part of the data validation:

- **Chain of Custody:** The chains of custody were reviewed for proper completion and that the laboratory performed the requested methods and reported the requested target analytes for each sample.
- **Dilutions and Reanalysis:** Dilutions, calibration ranges, and reanalyses were reviewed as applicable. The best result was chosen when more than one result was reported as final.
- **Sample Preservation:** The appropriate temperature and chemical preservation requirements were reviewed. Headspace for volatile sample analysis was reviewed.
- **Holding Times:** The period of time between collection of the sample and preparation/analysis of the sample was evaluated.
- **Instrument Tuning:** Instrument tuning and performance check frequency and results were reviewed.
- **Calibration:** The initial calibration type, fit, number of standards, and minimum response factors were evaluated. Additionally, the frequency and percent recoveries for initial and continuing calibration verification standards and blanks were evaluated.
- **Laboratory Blank Samples:** The preparation and analysis of reagent (contaminant-free) water was evaluated, along with the required frequency.

- **Field Blank Samples:** The collection and analysis of field blanks was evaluated. The reviewed data package(s) included the following associated field blanks: trip, filter, field, and equipment
- **Spike Samples:** Laboratory control, matrix spike, and post digestion spike sample preparation frequency and recoveries were reviewed as applicable.
- **Serial Dilutions:** Serial dilution sample preparation frequency and recoveries were reviewed as applicable.
- **Surrogate Spikes:** The addition of appropriate surrogates and their recoveries were evaluated.
- **Internal standards:** The presence and recoveries of internal standards and their appropriate association to target analytes were reviewed.
- **Laboratory Duplicate Samples:** Laboratory duplicate frequencies and recoveries were reviewed as applicable.
- **Field Duplicate Samples:** Field duplicate recoveries and absolute differences were reviewed as applicable.
- **Column Agreement:** Column agreements were reviewed for relevant methods.

Findings of the data validation are summarized in the sections below. As necessary, the following data quality flags were applied during validation.

J = estimated concentration
J+ = the result is an estimated concentration, but may be biased high
J- = the result is an estimated concentration, but may be biased low
UJ = estimated reporting limit
U = evaluated to be non-detected at the reporting limit
R = rejected, data not usable
NJ = tentative identification and estimated concentration

Validation outliers and any necessary data qualifications are summarized in outlier tables at the end of this memo. The table below indicates the included validation tables with findings. Tables without findings have been omitted.

Table Number	Table Name	Included
Table 1	Samples with Non-Preferred Results	No
Table 2	Samples with Exceeded Preservation Requirements	No
Table 3	**Samples with Exceeded Holding Times**	**Yes**
Table 4	Instrument Tuning Outside of Acceptable Limits	No
Table 5	**Initial Calibration Outside of Acceptable Limits**	**Yes**
Table 6	**Calibration Verification Outside of Acceptable Limits**	**Yes**
Table 7	**Laboratory Blank and Associated Suspect Sample Detections**	**Yes**
Table 8	**Field Blank and Associated Suspect Sample Detections**	**Yes**
Table 9	**Spike Recoveries Outside of Acceptable Limits**	**Yes**
Table 10	**Serial Dilution Recoveries Outside of Acceptable Limits**	**Yes**
Table 11	Surrogate Recovery Results out of Acceptable Limits	No
Table 12	Internal Standard Recovery Results out of Acceptable Limits	No

Table Number	Table Name	Included
Table 13	Laboratory Duplicate Result Outliers	No
Table 14	Field Duplicate Result Outliers	No
Table 15	Column Agreement Outliers	No
Table 16	Calibration Range Exceedances	No
Table 17	Professional Judgement Qualifiers	No

Findings of the data validation are summarized in the sections below.

CASE NARRATIVE NOTES AND CHAIN-OF-CUSTODY DISCREPANCIES

The laboratory indicated that it does not hold NELAC/TNI accreditation for the methods and parameters in non-potable water listed below. No qualifiers were applied based on accreditation status. Supporting calibrations and quality control data was provided for these analytes and reviewed as part of the data validation.

Method	Analyte without NELAC/TNI Accreditation	
	CAS	Analyte Name
EPA SW 6020	7440-29-1	Thorium
	7440-61-1	Uranium
EPA SW 6010	7440-21-3	Silicon
EPA SW 8082	1336-36-3	Total PCBs
EPA SW 8270	92-52-4	Biphenyl
	99-35-4	1,3,5-Trinitrobenzene
	1912-24-9	Atrazine
	106-50-3	p-Phenylenediamine
	105-60-2	Caprolactam
	95-53-4	o-Toluidine
	100-52-7	Benzaldehyde
EPA SW 8260	110-82-7	Cyclohexane
	108-87-2	Methylcyclohexane
	78-83-1	Isobutyl alcohol
	79-20-9	Methyl acetate
	126-99-8	beta-Chloroprene
EPA SW 9056	20461-54-5	Iodide

No discrepancies between the chains-of-custody and the sample containers received were noted by the laboratory.

PRESERVATION AND HOLDING TIME EVALUATION

The laboratory received the sample shipments within the method-prescribed temperature preservation requirements of less than 6 degrees Celsius, with acceptable sample pH values, and

all vials for volatile analysis were received in good condition with headspace of less than 6 millimeters.

The samples were prepared and analyzed within the method-prescribed time period from the date of collection, with the exceptions and any necessary qualifications noted in Table 3.

INSTRUMENT TUNING EVALUATION

All tuning criteria met method acceptance criteria.

INITIAL CALIBRATION

The initial calibrations met the minimum number of calibration standards, project required percent standard deviation (%RSD), relative correlation coefficient, and minimum relative response factor (RRF) limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 5.

INITIAL CALIBRATION VERIFICATION (ICV) AND CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION

The initial and continuing calibration verifications were within project-specified percent difference (%D) or percent recoveries (%R) and RRF limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 6.

Situations that required additional professional judgement are detailed below:

- SVOC analytes acetophenone, atrazine, benzaldehyde, biphenyl (diphenyl), caprolactam, N-nitrosodiphenylamine, and 1,2,4,5-tetrachlorobenzene were not reported for the ICV samples. These analytes were present in the initial calibrations and CCV samples and were within control limits. The non-detected results in associated samples have been qualified UJ.

LABORATORY BLANK EVALUATION

The laboratory blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 7. The blank results indicate that contaminants may have been introduced to the samples during processing or analysis in the laboratory.

FIELD BLANK EVALUATION

The trip, filter, field, and equipment blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 8. Any field blank detections associated with laboratory blank contamination and qualified as non-detected (U) are not included in Table 8. The blank results indicate that contaminants may have been introduced to the samples during collection, shipment, handling, and storage.

BLANK AND MATRIX SPIKE EVALUATION

The laboratory control sample (LCS), laboratory control sample duplicate (LCSD) recoveries, and relative percent differences (RPDs) were within the laboratory's limits of acceptance, with the

exceptions and any necessary qualifications noted in Table 9. Data were not qualified if a high recovery was associated with a non-detected result.

The matrix spike (MS), matrix spike duplicate (MSD) recoveries, and RPDs were within the laboratory's limits of acceptance for target analytes for spiked project samples, with the exceptions and any necessary qualifications noted in Table 9. MS/MSDs performed on non-project samples were not reviewed. Data were not qualified if the analyte concentration in the parent sample was greater than four times the spike amount, if the spike amount was diluted out prior to analysis, or if a high recovery was associated with a non-detected result.

SERIAL DILUTION EVALUATION

The metals serial dilution sample percent differences were within laboratory limits of acceptance, with the exceptions and any necessary qualifications noted in Table 10. Results were not qualified if the analyte concentration in the original sample was less than 50 times the detection limit. Serial dilutions performed on non-project samples were not reviewed.

SURROGATE SPIKE EVALUATION

The surrogate recoveries were within the laboratory limits of acceptance. The acceptable surrogate recoveries indicate minimal matrix interference in the samples.

INTERNAL STANDARD EVALUATION

The internal standard responses for reported results were within acceptable limits. The acceptable internal standard responses indicate that the instrument sensitivity and response were stable during each analysis.

LABORATORY DUPLICATE EVALUATION

The laboratory prepared at least one project sample as a laboratory duplicate. Laboratory duplicates performed on non-project samples were not reviewed. The RPDs between the primary sample and the duplicate were within laboratory control limits, indicating acceptable laboratory precision.

FIELD DUPLICATE EVALUATION

One field sample was submitted to the laboratory as a blind duplicate. RPDs and absolute differences were calculated as appropriate and compared to the limits established in the QAPP. The QAPP states that the RPDs must be less than or equal to 30 percent for aqueous samples when analytes are detected in both samples and these results are greater than or equal to five times the reporting limit. If one or both results are less than five times the reporting limit, or one result is detected and one is non-detected, the absolute difference between the results must be less than two times the reporting limit (if the reporting limits are not the same between the parent and field duplicate samples, the lower of the two was used for the control limit determination). The reporting limit was used for non-detected analytes when calculating absolute difference.

All RPDs and/or absolute differences were within QAPP criteria.

COLUMN AGREEMENT EVALUATION

Column agreements met method criteria for dual column analysis.

CALIBRATION RANGE EVALUATION

All results were reported within each instrument's calibration range.

SENSITIVITY

The sample results were reported down to the method detection limit. Results between the method detection limit and the reporting limit were flagged as estimated (J) by the laboratory. All non-detected results were reported from undiluted samples.

COMPLETENESS

The complete data package consisted of 1305 reportable data points excluding field blank samples. 4 data points were rejected. The data completeness measure for this data package is calculated to be 99.7%. The project laboratory completeness goal of 95% was met.

OVERALL ASSESSMENT

All qualified data, excluding rejected data, can be used for decision-making purposes; however, the limitation identified by the applied qualifier should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

Table 3

Samples with Exceeded Holding Times

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Extraction Holding Time	Total Time	Analysis Holding Time	Total Time	Affected Analyte	ERM Qualifier
50272391	DUP-001-WG-20201105	SM4500-H-B	--	--	15 min.	8122 min.	pH	J
50272391	I-66-WG-20201105	SM4500-H-B	--	--	15 min.	7503 min.	pH	J
50272391	PZ-113-AD-WG-20201105	SM4500-H-B	--	--	15 min.	7458 min.	pH	J
50272391	PZ-113-SS-WG-20201105	SM4500-H-B	--	--	15 min.	7277 min.	pH	J
50272391	PZ-211-SD-WG-20201105	SM4500-H-B	--	--	15 min.	7632 min.	pH	J

Notes:

min. = minutes

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272391	8260 Instrument 50MVDB 10/27/2020	Iodomethane	24	--	20				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391						TB-003-WQ-20201105	ND	ug/L	UJ
50272391						TB-004-WQ-20201105	ND	ug/L	UJ
50272391	8270 Instrument 50MSS6 10/07/2020	Famphur	34	--	20				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391	8270 Instrument 50MSS6 10/07/2020	Hexachlorophene	25	--	20				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272391	8270 Instrument 50MSS6 10/07/2020	Kepone	26	--	20				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391	8270 Instrument 50MSS6 10/07/2020	3,3'-Dimethylbenzidine	21	--	20				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ

Notes:

IC = Initial calibration

RSD = Relative standard deviation

RRF = Relative response factor

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272391	18004176ICV	Iodomethane	146 %R	--	75-125				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391						TB-003-WQ-20201105	ND	ug/L	UJ
50272391						TB-004-WQ-20201105	ND	ug/L	UJ
50272391	18004176ICV	Acetonitrile	8.7 %R	--	75-125				
50272391						DUP-001-WG-20201105	ND	ug/L	R
50272391						FB-001-WQ-20201105	ND	ug/L	R
50272391						I-66-WG-20201105	ND	ug/L	R
50272391						PZ-113-AD-WG-20201105	ND	ug/L	R
50272391						PZ-113-SS-WG-20201105	ND	ug/L	R
50272391						TB-003-WQ-20201105	ND	ug/L	R
50272391						TB-004-WQ-20201105	ND	ug/L	R
50272391	18004176ICV	Allyl chloride	61 %R	--	75-125				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391						TB-003-WQ-20201105	ND	ug/L	UJ
50272391						TB-004-WQ-20201105	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272391	18004176ICV	Methylcyclohexane	519 %R	--	75-125				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391						TB-003-WQ-20201105	ND	ug/L	UJ
50272391						TB-004-WQ-20201105	ND	ug/L	UJ
50272391	18004176ICV	1,4-Dioxane	263 %R	--	75-125				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391						TB-003-WQ-20201105	ND	ug/L	UJ
50272391						TB-004-WQ-20201105	ND	ug/L	UJ
50272391	17873843ICV	p-Phenylenediamine	139 %R	--	75-125				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272391	17873843ICV	1,3,5-Trinitrobenzene	128 %R	--	75-125				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391	17873843ICV	P-Dimethylaminoazobenzene	128 %R	--	75-125				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391	17873843ICV	3,3'-Dimethylbenzidine	135 %R	--	75-125				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391	17873843ICV	Famphur	161 %R	--	75-125				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272391	Not present in ICV	Acetophenone	--	--	--				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391	Not present in ICV	Atrazine	--	--	--				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391	Not present in ICV	Benzaldehyde	--	--	--				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391	Not present in ICV	Biphenyl (Diphenyl)	--	--	--				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272391	Not present in ICV	Caprolactam	--	--	--				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391	Not present in ICV	N-Nitrosodiphenylamine	--	--	--				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391	Not present in ICV	1,2,4,5-Tetrachlorobenzene	--	--	--				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272391	18088430CCV	Acetonitrile	-31 %D	--	± 25				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391						TB-003-WQ-20201105	ND	ug/L	UJ
50272391						TB-004-WQ-20201105	ND	ug/L	UJ
50272391	18088430CCV	Chloroethane	-28 %D	--	± 25				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391						TB-003-WQ-20201105	ND	ug/L	UJ
50272391						TB-004-WQ-20201105	ND	ug/L	UJ
50272391	18088430CCV	Chloromethane	-42 %D	--	± 30				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391						TB-003-WQ-20201105	ND	ug/L	UJ
50272391						TB-004-WQ-20201105	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272391	18088430CCV	1,4-Dioxane	22 %D	--	± 25				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391						TB-003-WQ-20201105	ND	ug/L	UJ
50272391						TB-004-WQ-20201105	ND	ug/L	UJ
50272391	18088430CCV	Iodomethane	-74 %D	--	± 25				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391						TB-003-WQ-20201105	ND	ug/L	UJ
50272391						TB-004-WQ-20201105	ND	ug/L	UJ
50272391	18088430CCV	Vinyl chloride	-28 %D	--	± 25				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391						TB-003-WQ-20201105	ND	ug/L	UJ
50272391						TB-004-WQ-20201105	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272391	18138857CCV	2,4,5-TP	21 %D	--	± 20				
50272391						DUP-001-WG-20201105	ND	ug/L	UJ
50272391						FB-001-WQ-20201105	ND	ug/L	UJ
50272391						I-66-WG-20201105	ND	ug/L	UJ
50272391						PZ-113-SS-WG-20201105	ND	ug/L	UJ
50272391						PZ-211-SD-WG-20201105	ND	ug/L	UJ
50272391	18187196CCV	2,4-D	22 %D	--	± 20				
50272391	18182830CCV	2,4-D	23 %D	--	± 20				
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391	18187196CCV	2,4,5-T	36 %D	--	± 20				
50272391	18182830CCV	2,4,5-T	36 %D	--	± 20				
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ
50272391	18187196CCV	2,4,5-TP	38 %D	--	± 20				
50272391	18182830CCV	2,4,5-TP	41 %D	--	± 20				
50272391						PZ-113-AD-WG-20201105	ND	ug/L	UJ

Notes:
ICV = Initial calibration verification
%D = Percent Difference
CCV = Continuing calibration verification
RRF = relative response factor
%R = Percent Recovery

Table 7
Laboratory Blank and Associated Suspect Sample Detections
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272391	2728585BLANK-50272391	Barium, Total	0.69 J	10.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272391	2728585BLANK-50272391	Manganese, Total	1.6 J	5.0				ug/L	
50272391		Manganese, Total			FB-001-WQ-20201105	0.38	5.0	ug/L	5.0 U
50272391	2730284BLANK-50272391	Manganese, Dissolved	0.33 J	5.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272391	2111914BLANK-50272391	Methane	2.8 J	5.0				ug/L	
50272391		Methane			I-66-WG-20201105	3.7	5.0	ug/L	5.0 U
50272391		Methane			PZ-113-SS-WG-20201105	7.6	5.0	ug/L	J+
50272391		Methane			FB-001-WQ-20201105	4.2	5.0	ug/L	5.0 U

Notes:
RL = Reporting Limit

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272391	FILTB-003-WQ-20201103	Calcium, Dissolved	413 J	500	None for qualification, associated sample > 5x blank	--	--	ug/L	--
50272391	FILTB-003-WQ-20201103	Copper, Dissolved	0.32 J	1.0				ug/L	
50272391					I-66-WG-20201105	0.56	1.0	ug/L	1.0 U
50272391	FILTB-003-WQ-20201103	Iron, Dissolved	26.2 J	50.0	None for qualification, associated sample > 5x blank	--	--	ug/L	--
50272391	FILTB-003-WQ-20201103	Magnesium, Dissolved	172 J	500	None for qualification, associated sample > 5x blank	--	--	ug/L	--
50272391	FILTB-003-WQ-20201103	Titanium, Dissolved	0.78 J	10.0	None for qualification, associated sample ND	--	--	ug/L	--
50272391	FILTB-004-WQ-20201103	Barium, Dissolved	0.58 J	10.0	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272391	FILTB-004-WQ-20201103	Calcium, Dissolved	232 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272391	FILTB-004-WQ-20201103	Chromium, Dissolved	0.12 J	2.0				ug/L	
50272391		Chromium, Dissolved			DUP-001-WG-20201105	0.52	2.0	ug/L	2.0 U
50272391		Chromium, Dissolved			PZ-113-AD-WG-20201105	0.49	2.0	ug/L	2.0 U
50272391		Chromium, Dissolved			PZ-113-SS-WG-20201105	0.46	2.0	ug/L	2.0 U
50272391	FILTB-004-WQ-20201103	Copper, Dissolved	0.22 J	1.0				ug/L	
50272391		Copper, Dissolved			DUP-001-WG-20201105	0.57	1.0	ug/L	1.0 U
50272391		Copper, Dissolved			PZ-113-AD-WG-20201105	0.64	1.0	ug/L	1.0 U
50272391		Copper, Dissolved			PZ-113-SS-WG-20201105	0.35	1.0	ug/L	1.0 U
50272391	FILTB-004-WQ-20201103	Dissolved Organic Carbon	0.80 J	1.0				ug/L	
50272391		Dissolved Organic Carbon			PZ-113-SS-WG-20201105	0.73	1.0	ug/L	1.0 U

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272391	FILTB-004-WQ-20201103	Magnesium, Dissolved	57.9 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272391	EB-001-WQ-20201103	Nitrate as N	0.020 J	0.050	None for qualification, samples ND or > 5x blank	--	--	mg/L	--
50272391	EB-001-WQ-20201103	Nitrite + Nitrate as N	0.020 J	0.10				mg/L	
50272391		Nitrite + Nitrate as N			I-66-WG-20201105	0.024	0.10	mg/L	0.10 U
50272391	EB-002-WQ-20201103	Nitrate as N	0.018 J	0.050	None for qualification, samples ND	--	--	mg/L	--
50272391	EB-002-WQ-20201103	Nitrite + Nitrate as N	0.019 J	0.10				mg/L	
50272391		Nitrite + Nitrate as N			PZ-113-AD-WG-20201105	0.019	0.10	mg/L	0.10 U
50272391		Nitrite + Nitrate as N			PZ-113-SS-WG-20201105	0.064	0.10	mg/L	0.10 U
50272391		Nitrite + Nitrate as N			DUP-001-WG-20201105	0.020	0.10	mg/L	0.10 U

Notes:

RL = Reporting Limit

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
			LCS/LCSD							
50272391	2730619LCS-50272391/		Acetonitrile	8/	50-150					
50272391		DUP-001-WG-20201105	Acetonitrile					<100	ug/L	R
50272391		FB-001-WQ-20201105	Acetonitrile					<100	ug/L	R
50272391		I-66-WG-20201105	Acetonitrile					<100	ug/L	R
50272391		PZ-113-AD-WG-20201105	Acetonitrile					<100	ug/L	R
50272391		PZ-113-SS-WG-20201105	Acetonitrile					<100	ug/L	R
50272391		TB-003-WQ-20201105	Acetonitrile					<100	ug/L	R
50272391		TB-004-WQ-20201105	Acetonitrile					<100	ug/L	R
50272391	2730619LCS-50272391/	None for qualification, samples ND	Methylcyclohexane	474/	70-129	--	--	--	--	--
			MS/MSD							
50272391	I-66-WG-20201105MS/ I-66-WG-20201105MSD	None for qualification, sample result ND	2-Chlorophenol	Pass/Pass	10-113	26	20	--	--	--
50272391	I-66-WG-20201105MS/ I-66-WG-20201105MSD	None for qualification, sample result ND	2,4-Dichlorophenol	Pass/Pass	10-143	22	20	--	--	--
50272391	I-66-WG-20201105MS/ I-66-WG-20201105MSD	None for qualification, sample result ND	2,4-Dimethylphenol	Pass/Pass	10-148	32	20	--	--	--
50272391	I-66-WG-20201105MS/ I-66-WG-20201105MSD	None for qualification, sample result ND	4-Chloro-3-methylphenol	Pass/Pass	10-146	23	20	--	--	--
50272391	I-66-WG-20201105MS/ I-66-WG-20201105MSD		Acetonitrile	9/8	50-150	NC	20			
50272391		I-66-WG-20201105	Acetonitrile					<100	ug/L	R
50272391	I-66-WG-20201105MS/ I-66-WG-20201105MSD	None for qualification, sample result ND	Acrolein	Pass/Pass	28-122	22	20	--	--	--

Table 9
Spike Recoveries Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
50272391	I-66-WG-20201105MS/ I-66-WG-20201105MSD	None for qualification, recovery high and sample result ND	Allyl chloride	133/Pass	70-130	Pass	20	--	--	--
50272391	I-66-WG-20201105MS/ I-66-WG-20201105MSD		C6-C35-Total	55.8/Pass	60.0-140	Pass	20			
50272391		I-66-WG-20201105	Aliphatic (C6)					<909	ug/L	UJ
50272391		I-66-WG-20201105	Aliphatic (>C06-C08)					<1010	ug/L	UJ
50272391		I-66-WG-20201105	Aliphatic (>C08-C10)					<1010	ug/L	UJ
50272391		I-66-WG-20201105	Aliphatic (>C10-C12)					<1010	ug/L	UJ
50272391		I-66-WG-20201105	Aliphatic (>C12-C16)					<1010	ug/L	UJ
50272391		I-66-WG-20201105	Aliphatic (>C16-C21)					<1010	ug/L	UJ
50272391		I-66-WG-20201105	Aliphatic (>C21-C35)					<2020	ug/L	UJ
50272391		I-66-WG-20201105	Aromatic (>C07-C08)					<1010	ug/L	UJ
50272391		I-66-WG-20201105	Aromatic (>C08-C10)					<1010	ug/L	UJ
50272391		I-66-WG-20201105	Aromatic (>C10-C12)					<1010	ug/L	UJ
50272391		I-66-WG-20201105	Aromatic (>C12-C16)					<1010	ug/L	UJ
50272391		I-66-WG-20201105	Aromatic (>C16-C21)					<1010	ug/L	UJ
50272391		I-66-WG-20201105	Aromatic (>C21-C35)					<2020	ug/L	UJ
50272391	I-66-WG-20201105MS/ I-66-WG-20201105MSD	None for qualification, sample result > 4x spike	Calcium, Dissolved	58/Pass	75-125	Pass	20	--	--	--
50272391	I-66-WG-20201105MS/ I-66-WG-20201105MSD	None for qualification, sample result > 4x spike	Calcium, Total	62/170	75-125	Pass	20	--	--	--
50272391	I-66-WG-20201105MS/ I-66-WG-20201105MSD		Cyanide CN-	86/Pass	90-110	Pass	20			
50272391		I-66-WG-20201105	Cyanide CN-					<0.0050	mg/L	UJ

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
50272391	I-66-WG-20201105MS/ I-66-WG-20201105MSD	None for qualification, sample result ND	Hexachlorocyclopentadiene	Pass/Pass	10-103	29	20	--	--	--
50272391	I-66-WG-20201105MS/ I-66-WG-20201105MSD	None for qualification, sample result ND	m,p-cresol	Pass/Pass	10-120	29	20	--	--	--
50272391	I-66-WG-20201105MS/ I-66-WG-20201105MSD	None for qualification, sample result ND	Methyl iodide	Pass/Pass	10-186	37	20	--	--	--
50272391	I-66-WG-20201105MS/ I-66-WG-20201105MSD	None for qualification, sample result ND	Methylcyclohexane	581/513	58-121	Pass	20	--	--	--
50272391	I-66-WG-20201105MS/ I-66-WG-20201105MSD	None for qualification, sample result ND	o-Cresol	Pass/Pass	10-121	30	20	--	--	--
50272391	I-66-WG-20201105MS/ I-66-WG-20201105MSD	None for qualification, sample result ND	Phenol	Pass/Pass	10-64	22	20	--	--	--
50272391	I-66-WG-20201105MS/ I-66-WG-20201105MSD	None for qualification, sample result > 4x spike	Sodium, Total	65/Pass	75-125	Pass	20	--	--	--
50272391	I-66-WG-20201105MS/ I-66-WG-20201105MSD		Sulfide	75/80	90-110	Pass	20			
50272391		I-66-WG-20201105	Sulfide					<1.0	mg/L	UJ
50272391	I-66-WG-20201105MS/ I-66-WG-20201105MSD		Silicon, Dissolved	Pass/70	75-125	Pass	20		ug/L	
50272391		I-66-WG-20201105	Silicon, Dissolved					10600	ug/L	J-

Notes:

LCS/LCSD = Laboratory control sample/laboratory control sample duplicate

NC = Not Calculated. The laboratory does not calculate RPDs when one or both results are below the reporting limit.

MS/MSD - Matrix spike/matrix spike duplicate

RPD = Relative percent difference

Table 10
Serial Dilution Recoveries Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Dilution		Concentration		Units	Instrmt. DL	Result/ DL	%D	%D Limit	ERM Qualifier
	Sample ID	Analyte	Sample	Dilution						
50272391	I-66-WG-20201105	Barium, Dissolved	177	148	ug/L	0.56	316	16.6	10	J
50272391	I-66-WG-20201105	Boron, Dissolved	517	448	ug/L	6.7	77	13.5	10	J
50272391	I-66-WG-20201105	Iron, Dissolved	1300	1160	ug/L	25.7	51	11.1	10	J
50272391	I-66-WG-20201105	Manganese, Dissolved	2380	2120	ug/L	0.33	7212	10.9	10	J
50272391	I-66-WG-20201105	Potassium, Dissolved	6570	5490	ug/L	113	58	16.5	10	J
50272391	I-66-WG-20201105	Silicon, Dissolved	10600	8960	ug/L	30.4	349	15.1	10	J
50272391	I-66-WG-20201105	Sodium, Dissolved	119000	100000	ug/L	86.2	1381	17.7	10	J
50272391	I-66-WG-20201105	Strontium, Dissolved	944	786	ug/L	0.77	1226	16.7	10	J

Notes:
%D = Percent Difference
DL = Detection Limit

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Memorandum

To	Alice Sandzen
From	Rachel James
Date	2021-06-18
Reference	0579381
Subject	Revised Data Review of West Lake OU-3 RI/FS Routine Groundwater Samples Collected 11/06/2020: Pace Data Package 50272555.

This memorandum was revised to address changes to the initial calibration verification data for Gas Chromatography/Mass Spectrometry methods issued by the laboratory after the initial validation was complete. Table 6 has been revised as needed.

The data quality was assessed and any necessary qualifiers were applied following the Quality Assurance Project Plan (QAPP) for West Lake OU-3 Remediation Investigation/Feasibility Study, Revision 3, December 2020, USEPA Contract Laboratory Program (CLP) NFGs for Organic Superfund Methods Data Review, document number EPA-540-R-2017-002, January 2017, USEPA CLP NFGs for Inorganic Superfund Methods Data Review, document number EPA-540-R-2017-001, January 2017, and USEPA Region 1—New England Environmental Data Review Supplement for Region 1 Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement1, June 2018., the protocols and quality control (QC) requirements of the analytical methods, and the reviewer's professional judgement.

A Stage 2B data validation was performed on 100% of the laboratory data.

The following items were reviewed as part of the data validation:

- **Chain of Custody:** The chains of custody were reviewed for proper completion and that the laboratory performed the requested methods and reported the requested target analytes for each sample.
- **Dilutions and Reanalysis:** Dilutions, calibration ranges, and reanalyses were reviewed as applicable. The best result was chosen when more than one result was reported as final.
- **Sample Preservation:** The appropriate temperature and chemical preservation requirements were reviewed. Headspace for volatile sample analysis was reviewed.
- **Holding Times:** The period of time between collection of the sample and preparation/analysis of the sample was evaluated.
- **Instrument Tuning:** Instrument tuning and performance check frequency and results were reviewed.
- **Calibration:** The initial calibration type, fit, number of standards, and minimum response factors were evaluated. Additionally, the frequency and percent recoveries for initial and continuing calibration verification standards and blanks were evaluated.
- **Laboratory Blank Samples:** The preparation and analysis of reagent (contaminant-free) water was evaluated, along with the required frequency.

- **Field Blank Samples:** The collection and analysis of field blanks was evaluated. The reviewed data package(s) included the following associated field blanks: trip, filter, and equipment
- **Spike Samples:** Laboratory control, matrix spike, and post digestion spike sample preparation frequency and recoveries were reviewed as applicable.
- **Serial Dilutions:** Serial dilution sample preparation frequency and recoveries were reviewed as applicable.
- **Surrogate Spikes:** The addition of appropriate surrogates and their recoveries were evaluated.
- **Internal standards:** The presence and recoveries of internal standards and their appropriate association to target analytes were reviewed.
- **Laboratory Duplicate Samples:** Laboratory duplicate frequencies and recoveries were reviewed as applicable.
- **Field Duplicate Samples:** Field duplicate recoveries and absolute differences were reviewed as applicable.
- **Column Agreement:** Column agreements were reviewed for relevant methods.

Findings of the data validation are summarized in the sections below. As necessary, the following data quality flags were applied during validation.

J = estimated concentration
J+ = the result is an estimated concentration, but may be biased high
J- = the result is an estimated concentration, but may be biased low
UJ = estimated reporting limit
U = evaluated to be non-detected at the reporting limit
R = rejected, data not usable
NJ = tentative identification and estimated concentration

Validation outliers and any necessary data qualifications are summarized in outlier tables at the end of this memo. The table below indicates the included validation tables with findings. Tables without findings have been omitted.

Table Number	Table Name	Included
Table 1	Samples with Non-Preferred Results	No
Table 2	Samples with Exceeded Preservation Requirements	No
Table 3	**Samples with Exceeded Holding Times**	**Yes**
Table 4	Instrument Tuning Outside of Acceptable Limits	No
Table 5	**Initial Calibration Outside of Acceptable Limits**	**Yes**
Table 6	**Calibration Verification Outside of Acceptable Limits**	**Yes**
Table 7	**Laboratory Blank and Associated Suspect Sample Detections**	**Yes**
Table 8	**Field Blank and Associated Suspect Sample Detections**	**Yes**
Table 9	**Spike Recoveries Outside of Acceptable Limits**	**Yes**
Table 10	Serial Dilution Recoveries Outside of Acceptable Limits	No
Table 11	Surrogate Recovery Results out of Acceptable Limits	No
Table 12	Internal Standard Recovery Results out of Acceptable Limits	No

Table Number	Table Name	Included
Table 13	Laboratory Duplicate Result Outliers	No
Table 14	Field Duplicate Result Outliers	No
Table 15	Column Agreement Outliers	No
Table 16	Calibration Range Exceedances	No
Table 17	Professional Judgement Qualifiers	No

Findings of the data validation are summarized in the sections below.

CASE NARRATIVE NOTES AND CHAIN-OF-CUSTODY DISCREPANCIES

The laboratory indicated that it does not hold NELAC/TNI accreditation for the methods and parameters in non-potable water listed below. No qualifiers were applied based on accreditation status. Supporting calibrations and quality control data was provided for these analytes and reviewed as part of the data validation.

Method	Analyte without NELAC/TNI Accreditation	
	CAS	Analyte Name
EPA SW 6020	7440-29-1	Thorium
	7440-61-1	Uranium
EPA SW 6010	7440-21-3	Silicon
EPA SW 8082	1336-36-3	Total PCBs
EPA SW 8270	92-52-4	Biphenyl
	99-35-4	1,3,5-Trinitrobenzene
	1912-24-9	Atrazine
	106-50-3	p-Phenylenediamine
	105-60-2	Caprolactam
	95-53-4	o-Toluidine
	100-52-7	Benzaldehyde
EPA SW 8260	110-82-7	Cyclohexane
	108-87-2	Methylcyclohexane
	78-83-1	Isobutyl alcohol
	79-20-9	Methyl acetate
	126-99-8	beta-Chloroprene
EPA SW 9056	20461-54-5	Iodide

No discrepancies between the chains-of-custody and the sample containers received were noted by the laboratory.

PRESERVATION AND HOLDING TIME EVALUATION

The laboratory received the sample shipments within the method-prescribed temperature preservation requirements of less than 6 degrees Celsius, with acceptable sample pH values, and

all vials for volatile analysis were received in good condition with headspace of less than 6 millimeters.

The samples were prepared and analyzed within the method-prescribed time period from the date of collection, with the exceptions and any necessary qualifications noted in Table 3.

INSTRUMENT TUNING EVALUATION

All tuning criteria met method acceptance criteria.

INITIAL CALIBRATION

The initial calibrations met the minimum number of calibration standards, project required percent standard deviation (%RSD), relative correlation coefficient, and minimum relative response factor (RRF) limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 5.

INITIAL CALIBRATION VERIFICATION (ICV) AND CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION

The initial and continuing calibration verifications were within project-specified percent difference (%D) or percent recoveries (%R) and RRF limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 6.

Situations that required additional professional judgement are detailed below:

- SVOC analytes acetophenone, atrazine, benzaldehyde, biphenyl (diphenyl), caprolactam, N-nitrosodiphenylamine, and 1,2,4,5-tetrachlorobenzene were not reported in the ICV samples. These analytes were present in the initial calibrations and CCV samples and were within control limits. The detect and non-detected results in associated samples have been qualified J or UJ.

LABORATORY BLANK EVALUATION

The laboratory blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 7. The blank results indicate that contaminants may have been introduced to the samples during processing or analysis in the laboratory.

FIELD BLANK EVALUATION

The trip, filter, and equipment blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 8. Any field blank detections associated with laboratory blank contamination and qualified as non-detected (U) are not included in Table 8. The blank results indicate that contaminants may have been introduced to the samples during collection, shipment, handling, and storage.

BLANK AND MATRIX SPIKE EVALUATION

The laboratory control sample (LCS), laboratory control sample duplicate (LCSD) recoveries, and relative percent differences (RPDs) were within the laboratory's limits of acceptance, with the

exceptions and any necessary qualifications noted in Table 9. Data were not qualified if a high recovery was associated with a non-detected result.

The matrix spike (MS), matrix spike duplicate (MSD) recoveries, and RPDs were within the laboratory's limits of acceptance for target analytes for spiked project samples, with the exceptions and any necessary qualifications noted in Table 9. MS/MSDs performed on non-project samples were not reviewed. Data were not qualified if the analyte concentration in the parent sample was greater than four times the spike amount, if the spike amount was diluted out prior to analysis, or if a high recovery was associated with a non-detected result.

SERIAL DILUTION EVALUATION

The laboratory did not perform serial dilutions on any project samples. Serial dilutions performed on non-project samples were not reviewed.

SURROGATE SPIKE EVALUATION

The surrogate recoveries were within the laboratory limits of acceptance. The acceptable surrogate recoveries indicate minimal matrix interference in the samples.

INTERNAL STANDARD EVALUATION

The internal standard responses for reported results were within acceptable limits. The acceptable internal standard responses indicate that the instrument sensitivity and response were stable during each analysis.

LABORATORY DUPLICATE EVALUATION

The laboratory prepared at least one project sample as a laboratory duplicate. Laboratory duplicates performed on non-project samples were not reviewed. The RPDs between the primary sample and the duplicate were within laboratory control limits, indicating acceptable laboratory precision.

FIELD DUPLICATE EVALUATION

One field sample was submitted to the laboratory as a blind duplicate. RPDs and absolute differences were calculated as appropriate and compared to the limits established in the QAPP. The QAPP states that the RPDs must be less than or equal to 30 percent for aqueous samples when analytes are detected in both samples and these results are greater than or equal to five times the reporting limit. If one or both results are less than five times the reporting limit, or one result is detected and one is non-detected, the absolute difference between the results must be less than two times the reporting limit (if the reporting limits are not the same between the parent and field duplicate samples, the lower of the two was used for the control limit determination). The reporting limit was used for non-detected analytes when calculating absolute difference.

All RPDs and/or absolute differences were within QAPP criteria.

COLUMN AGREEMENT EVALUATION

Column agreements met method criteria for dual column analysis.

CALIBRATION RANGE EVALUATION

All results were reported within each instrument's calibration range.

SENSITIVITY

The sample results were reported down to the method detection limit. Results between the method detection limit and the reporting limit were flagged as estimated (J) by the laboratory. All non-detected results were reported from undiluted samples.

COMPLETENESS

The complete data package consisted of 1590 reportable data points excluding field blank samples. 5 data points were rejected. The data completeness measure for this data package is calculated to be 99.7%. The project laboratory completeness goal of 95% was met.

OVERALL ASSESSMENT

All qualified data, excluding rejected data, can be used for decision-making purposes; however, the limitation identified by the applied qualifier should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

Table 3

Samples with Exceeded Holding Times

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Extraction Holding Time	Total Time	Analysis Holding Time	Total Time	Affected Analyte	ERM Qualifier
50272555	DUP-002-WG-20201106	SM4500-H-B	--	--	15 min.	7919 min.	pH	J
50272555	MW-1204-WG-20201106	SM4500-H-B	--	--	15 min.	7222 min.	pH	J
50272555	PZ-102R-SS-WG-20201106	SM4500-H-B	--	--	15 min.	7223 min.	pH	J
50272555	PZ-102-SS-WG-20201106	SM4500-H-B	--	--	15 min.	7345 min.	pH	J
50272555	PZ-105-SS-WG-20201106	SM4500-H-B	--	--	15 min.	7329 min.	pH	J

Notes:

min. = minutes

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272555	8260 Instrument 50MVDB 10/27/2020	Iodomethane	24	--	20				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555						TB-005-WQ-20201106	ND	ug/L	UJ
50272555	8270 Instrument 50MSS6 10/07/2020	Famphur	34	--	20				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555	8270 Instrument 50MSS6 10/07/2020	Hexachlorophene	25	--	20				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272555	8270 Instrument 50MSS6 10/07/2020	Kepone	26	--	20				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555	8270 Instrument 50MSS6 10/07/2020	3,3'-Dimethylbenzidine	21	--	20				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ

Notes:

IC = Initial calibration

RSD = Relative standard deviation

RRF = Relative response factor

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272555	18004176ICV	Iodomethane	146 %R	--	75-125				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555						TB-005-WQ-20201106	ND	ug/L	UJ
50272555	18004176ICV	Acetonitrile	8.7 %R	--	75-125				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	R
50272555						PZ-105-SS-WG-20201106	ND	ug/L	R
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	R
50272555						MW-1204-WG-20201106	ND	ug/L	R
50272555						DUP-002-WG-20201106	ND	ug/L	R
50272555						TB-005-WQ-20201106	ND	ug/L	R
50272555	18004176ICV	Allyl chloride	61 %R	--	75-125				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555						TB-005-WQ-20201106	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272555	18004176ICV	Methylcyclohexane	519 %R	--	75-125				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555						TB-005-WQ-20201106	ND	ug/L	UJ
50272555	18004176ICV	1,4-Dioxane	263 %R	--	75-125				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555						TB-005-WQ-20201106	ND	ug/L	UJ
50272555	17873843ICV	p-Phenylenediamine	139 %R	--	75-125				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555	17873843ICV	1,3,5-Trinitrobenzene	128 %R	--	75-125				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272555	17873843ICV	P-Dimethylaminoazobenzene	128 %R	--	75-125				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555	17873843ICV	3,3'-Dimethylbenzidine	135 %R	--	75-125				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555	17873843ICV	Famphur	161 %R	--	75-125				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555	Not present in ICV	Acetophenone	--	--	--				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272555	Not present in ICV	Atrazine	--	--	--				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555	Not present in ICV	Benzaldehyde	--	--	--				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555	Not present in ICV	Biphenyl (Diphenyl)	--	--	--				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555	Not present in ICV	Caprolactam	--	--	--				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	41.4	ug/L	J
50272555						DUP-002-WG-20201106	45.0	ug/L	J

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272555	Not present in ICV	N-Nitrosodiphenylamine	--	--	--				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555	Not present in ICV	1,2,4,5-Tetrachlorobenzene	--	--	--				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555	18088430CCV	Acetonitrile	-31 %D	--	± 25				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555						TB-005-WQ-20201106	ND	ug/L	UJ
50272555	18088430CCV	Chloroethane	-28 %D	--	± 25				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555						TB-005-WQ-20201106	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272555	18088430CCV	Chloromethane	-42 %D	--	± 30				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555						TB-005-WQ-20201106	ND	ug/L	UJ
50272555	18088430CCV	1,4-Dioxane	22 %D	--	± 25				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555						TB-005-WQ-20201106	ND	ug/L	UJ
50272555	18088430CCV	Iodomethane	-74 %D	--	± 25				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555						TB-005-WQ-20201106	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272555	18088430CCV	Vinyl chloride	-28 %D	--	± 25				
50272555						PZ-102-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-105-SS-WG-20201106	ND	ug/L	UJ
50272555						PZ-102R-SS-WG-20201106	ND	ug/L	UJ
50272555						MW-1204-WG-20201106	ND	ug/L	UJ
50272555						DUP-002-WG-20201106	ND	ug/L	UJ
50272555						TB-005-WQ-20201106	ND	ug/L	UJ

Notes:
ICV = Initial calibration verification
%D = Percent Difference
CCV = Continuing calibration verification
RRF = relative response factor
%R = Percent Recovery

Table 7

Laboratory Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272555	2730284BLANK-50272555	Manganese, Dissolved	0.33 J	5.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272555	2735801BLANK-50272555	Barium, Total	1.3 J	10.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272555	2735801BLANK-50272555	Iron, Total	35.7 J	50.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272555	2735801BLANK-50272555	Manganese, Total	1.2 J	5.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272555	2736007BLANK-50272555	Nitrite + Nitrate as N	0.015 J	0.10				mg/L	
50272555		Nitrite + Nitrate as N			PZ-102R-SS-WG-20201106	0.035	0.10	mg/L	0.10 U
50272555		Nitrite + Nitrate as N			PZ-102-SS-WG-20201106	0.019	0.10	mg/L	0.10 U
50272555		Nitrite + Nitrate as N			PZ-105-SS-WG-20201106	0.085	0.10	mg/L	0.10 U
50272555		Nitrite + Nitrate as N			DUP-002-WG-20201106	0.034	0.10	mg/L	0.10 U
50272555	2111914BLANK-50272555	Methane	2.8 J	5.0				ug/L	
50272555		Methane			PZ-102R-SS-WG-20201106	13	5.0	ug/L	J+
50272555		Methane			PZ-105-SS-WG-20201106	9.8	5.0	ug/L	J+

Notes:

RL = Reporting Limit

Table 8
Field Blank and Associated Suspect Sample Detections
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272555	FILTB-003-WQ-20201103	Calcium, Dissolved	413 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272555	FILTB-003-WQ-20201103	Copper, Dissolved	0.32 J	1.0				ug/L	
50272555		Copper, Dissolved			MW-1204-WG-20201106	1.5	1.0	ug/L	J+
50272555		Copper, Dissolved			DUP-002-WG-20201106	1.5	1.0	ug/L	J+
50272555	FILTB-003-WQ-20201103	Iron, Dissolved	26.2 J	50.0	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272555	FILTB-003-WQ-20201103	Magnesium, Dissolved	172 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272555	FILTB-003-WQ-20201103	Titanium, Dissolved	0.78 J	10.0	None for qualification, associated samples ND	--	--	ug/L	--
50272555	FILTB-004-WQ-20201103	Barium, Dissolved	0.58 J	10.0	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272555	FILTB-004-WQ-20201103	Calcium, Dissolved	232 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272555	FILTB-004-WQ-20201103	Chromium, Dissolved	0.12 J	2.0				ug/L	
50272555		Chromium, Dissolved			PZ-102-SS-WG-20201106	0.24	2.0	ug/L	2.0 U
50272555		Chromium, Dissolved			PZ-102R-SS-WG-20201106	0.28	2.0	ug/L	2.0 U
50272555	FILTB-004-WQ-20201103	Copper, Dissolved	0.22 J	1.0				ug/L	
50272555		Copper, Dissolved			PZ-102-SS-WG-20201106	0.28	1.0	ug/L	1.0 U
50272555		Copper, Dissolved			PZ-102R-SS-WG-20201106	1.1	1.0	ug/L	J+
50272555	FILTB-004-WQ-20201103	Dissolved Organic Carbon	0.80 J	1.0				ug/L	
50272555		Dissolved Organic Carbon			PZ-102-SS-WG-20201106	1.2	1.0	ug/L	J+
50272555		Dissolved Organic Carbon			PZ-102R-SS-WG-20201106	1.0	1.0	ug/L	1.0 U

Table 8
Field Blank and Associated Suspect Sample Detections
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272555	FILTB-004-WQ-20201103	Magnesium, Dissolved	57.9 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272555	EB-001-WQ-20201103	Nitrate as N	0.020 J	0.050				mg/L	
50272555					PZ-105-SS-WG-20201106	0.042	0.050	mg/L	0.050 U
50272555	EB-001-WQ-20201103	Nitrite + Nitrate as N	0.020 J	0.10				mg/L	
50272555		Nitrite + Nitrate as N			PZ-105-SS-WG-20201106	0.085	0.10	mg/L	0.10 U
50272555		Nitrite + Nitrate as N			DUP-002-WG-20201106	0.034	0.10	mg/L	0.10 U
50272555	EB-002-WQ-20201103	Nitrate as N	0.018 J	0.050	None for qualification, associated samples ND	--	--	mg/L	--
50272555	EB-002-WQ-20201103	Nitrite + Nitrate as N	0.019 J	0.10				mg/L	
50272555		Nitrite + Nitrate as N			PZ-102-SS-WG-20201106	0.019	0.10	mg/L	0.10 U
50272555		Nitrite + Nitrate as N			PZ-102R-SS-WG-20201106	0.035	0.10	mg/L	0.10 U

Notes:
RL = Reporting Limit

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
LCS/LCSD										
50272555	2730619LCS-50272555/		Acetonitrile	8/	50-150					
50272555		DUP-002-WG-20201106	Acetonitrile					<100	ug/L	R
50272555		MW-1204-WG-20201106	Acetonitrile					<100	ug/L	R
50272555		PZ-102R-SS-WG-20201106	Acetonitrile					<100	ug/L	R
50272555		PZ-102-SS-WG-20201106	Acetonitrile					<100	ug/L	R
50272555		PZ-105-SS-WG-20201106	Acetonitrile					<100	ug/L	R
50272555		TB-005-WQ-20201106	Acetonitrile					<100	ug/L	R
50272555	2730619LCS-50272555/	None for qualification, samples ND	Methylcyclohexane	474/	70-129	--	--	--	--	--
MS/MSD										
50272555	PZ-102-SS-WG-20201106MS/		Sulfide	88/	90-110					
50272555		PZ-102-SS-WG-20201106	Sulfide					0.29	mg/L	J-

Notes:

LCS/LCSD = Laboratory control sample/laboratory control sample duplicate

MS/MSD - Matrix spike/matrix spike duplicate

RPD = Relative percent difference

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Memorandum

To	Alice Sandzen
From	Rachel James
Date	2021-06-18
Reference	0579381
Subject	Revised Data Review of West Lake OU-3 RI/FS Routine Groundwater Samples Collected 11/9/2020: Pace Data Package 50272639.

This memorandum was revised to address changes to the initial calibration verification data for Gas Chromatography/Mass Spectrometry methods issued by the laboratory after the initial validation was complete. Table 6 has been revised as needed.

The data quality was assessed and any necessary qualifiers were applied following the Quality Assurance Project Plan (QAPP) for West Lake OU-3 Remediation Investigation/Feasibility Study, Revision 3, December 2020, USEPA Contract Laboratory Program (CLP) NFGs for Organic Superfund Methods Data Review, document number EPA-540-R-2017-002, January 2017, USEPA CLP NFGs for Inorganic Superfund Methods Data Review, document number EPA-540-R-2017-001, January 2017, and USEPA Region 1—New England Environmental Data Review Supplement for Region 1 Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement1, June 2018, the protocols and quality control (QC) requirements of the analytical methods, and the reviewer's professional judgement.

A Stage 2B data validation was performed on 100% of the laboratory data.

The following items were reviewed as part of the data validation:

- **Chain of Custody:** The chains of custody were reviewed for proper completion and that the laboratory performed the requested methods and reported the requested target analytes for each sample.
- **Dilutions and Reanalysis:** Dilutions, calibration ranges, and reanalyses were reviewed as applicable. The best result was chosen when more than one result was reported as final.
- **Sample Preservation:** The appropriate temperature and chemical preservation requirements were reviewed. Headspace for volatile sample analysis was reviewed.
- **Holding Times:** The period of time between collection of the sample and preparation/analysis of the sample was evaluated.
- **Instrument Tuning:** Instrument tuning and performance check frequency and results were reviewed.
- **Calibration:** The initial calibration type, fit, number of standards, and minimum response factors were evaluated. Additionally, the frequency and percent recoveries for initial and continuing calibration verification standards and blanks were evaluated.
- **Laboratory Blank Samples:** The preparation and analysis of reagent (contaminant-free) water was evaluated, along with the required frequency.

- **Field Blank Samples:** The collection and analysis of field blanks was evaluated. The reviewed data package(s) included the following associated field blanks: trip, filter, and equipment
- **Spike Samples:** Laboratory control, matrix spike, and post digestion spike sample preparation frequency and recoveries were reviewed as applicable.
- **Serial Dilutions:** Serial dilution sample preparation frequency and recoveries were reviewed as applicable.
- **Surrogate Spikes:** The addition of appropriate surrogates and their recoveries were evaluated.
- **Internal standards:** The presence and recoveries of internal standards and their appropriate association to target analytes were reviewed.
- **Laboratory Duplicate Samples:** Laboratory duplicate frequencies and recoveries were reviewed as applicable.
- **Field Duplicate Samples:** Field duplicate recoveries and absolute differences were reviewed as applicable.
- **Column Agreement:** Column agreements were reviewed for relevant methods.

Findings of the data validation are summarized in the sections below. As necessary, the following data quality flags were applied during validation.

J = estimated concentration
J+ = the result is an estimated concentration, but may be biased high
J- = the result is an estimated concentration, but may be biased low
UJ = estimated reporting limit
U = evaluated to be non-detected at the reporting limit
R = rejected, data not usable
NJ = tentative identification and estimated concentration

Validation outliers and any necessary data qualifications are summarized in outlier tables at the end of this memo. The table below indicates the included validation tables with findings. Tables without findings have been omitted.

Table Number	Table Name	Included
Table 1	Samples with Non-Preferred Results	No
Table 2	Samples with Exceeded Preservation Requirements	No
Table 3	**Samples with Exceeded Holding Times**	**Yes**
Table 4	Instrument Tuning Outside of Acceptable Limits	No
Table 5	**Initial Calibration Outside of Acceptable Limits**	**Yes**
Table 6	**Calibration Verification Outside of Acceptable Limits**	**Yes**
Table 7	**Laboratory Blank and Associated Suspect Sample Detections**	**Yes**
Table 8	**Field Blank and Associated Suspect Sample Detections**	**Yes**
Table 9	**Spike Recoveries Outside of Acceptable Limits**	**Yes**
Table 10	Serial Dilution Recoveries Outside of Acceptable Limits	No
Table 11	Surrogate Recovery Results out of Acceptable Limits	No
Table 12	Internal Standard Recovery Results out of Acceptable Limits	No

Table Number	Table Name	Included
Table 13	Laboratory Duplicate Result Outliers	No
Table 14	Field Duplicate Result Outliers	No
Table 15	Column Agreement Outliers	No
Table 16	Calibration Range Exceedances	No
Table 17	Professional Judgement Qualifiers	No

Findings of the data validation are summarized in the sections below.

CASE NARRATIVE NOTES AND CHAIN-OF-CUSTODY DISCREPANCIES

The laboratory indicated that it does not hold NELAC/TNI accreditation for the methods and parameters in non-potable water listed below. No qualifiers were applied based on accreditation status. Supporting calibrations and quality control data was provided for these analytes and reviewed as part of the data validation.

Method	Analyte without NELAC/TNI Accreditation	
	CAS	Analyte Name
EPA SW 6020	7440-29-1	Thorium
	7440-61-1	Uranium
EPA SW 6010	7440-21-3	Silicon
EPA SW 8082	1336-36-3	Total PCBs
EPA SW 8270	92-52-4	Biphenyl
	99-35-4	1,3,5-Trinitrobenzene
	1912-24-9	Atrazine
	106-50-3	p-Phenylenediamine
	105-60-2	Caprolactam
	95-53-4	o-Toluidine
	100-52-7	Benzaldehyde
EPA SW 8260	110-82-7	Cyclohexane
	108-87-2	Methylcyclohexane
	78-83-1	Isobutyl alcohol
	79-20-9	Methyl acetate
	126-99-8	beta-Chloroprene
EPA SW 9056	20461-54-5	Iodide

No discrepancies between the chains-of-custody and the sample containers received were noted by the laboratory.

PRESERVATION AND HOLDING TIME EVALUATION

The laboratory received the sample shipments within the method-prescribed temperature preservation requirements of less than 6 degrees Celsius, with acceptable sample pH values, and

all vials for volatile analysis were received in good condition with headspace of less than 6 millimeters.

The samples were prepared and analyzed within the method-prescribed time period from the date of collection, with the exceptions and any necessary qualifications noted in Table 3.

INSTRUMENT TUNING EVALUATION

All tuning criteria met method acceptance criteria.

INITIAL CALIBRATION

The initial calibrations met the minimum number of calibration standards, project required percent standard deviation (%RSD), relative correlation coefficient, and minimum relative response factor (RRF) limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 5.

INITIAL CALIBRATION VERIFICATION (ICV) AND CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION

The initial and continuing calibration verifications were within project-specified percent difference (%D) or percent recoveries (%R) and RRF limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 6.

Situations that required additional professional judgement are detailed below:

- SVOC analytes acetophenone, atrazine, benzaldehyde, biphenyl (diphenyl), caprolactam, N-nitrosodiphenylamine, and 1,2,4,5-tetrachlorobenzene were not reported in the ICV samples. These analytes were present in the initial calibrations and CCV samples and were within control limits. The non-detected results in associated samples have been qualified UJ.

LABORATORY BLANK EVALUATION

The laboratory blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 7. The blank results indicate that contaminants may have been introduced to the samples during processing or analysis in the laboratory.

FIELD BLANK EVALUATION

The trip, filter, and equipment blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 8. Any field blank detections associated with laboratory blank contamination and qualified as non-detected (U) are not included in Table 8. The blank results indicate that contaminants may have been introduced to the samples during collection, shipment, handling, and storage.

BLANK AND MATRIX SPIKE EVALUATION

The laboratory control sample (LCS), laboratory control sample duplicate (LCSD) recoveries, and relative percent differences (RPDs) were within the laboratory's limits of acceptance, with the

exceptions and any necessary qualifications noted in Table 9. Data were not qualified if a high recovery was associated with a non-detected result.

The matrix spike (MS), matrix spike duplicate (MSD) recoveries, and RPDs were within the laboratory's limits of acceptance for target analytes for spiked project samples, with the exceptions and any necessary qualifications noted in Table 9. MS/MSDs performed on non-project samples were not reviewed. Data were not qualified if the analyte concentration in the parent sample was greater than four times the spike amount, if the spike amount was diluted out prior to analysis, or if a high recovery was associated with a non-detected result.

SERIAL DILUTION EVALUATION

The laboratory did not perform serial dilutions on any project samples. Serial dilutions performed on non-project samples were not reviewed.

SURROGATE SPIKE EVALUATION

The surrogate recoveries were within the laboratory limits of acceptance. The acceptable surrogate recoveries indicate minimal matrix interference in the samples.

INTERNAL STANDARD EVALUATION

The internal standard responses for reported results were within acceptable limits. The acceptable internal standard responses indicate that the instrument sensitivity and response were stable during each analysis.

LABORATORY DUPLICATE EVALUATION

The laboratory prepared at least one project sample as a laboratory duplicate. Laboratory duplicates performed on non-project samples were not reviewed. The RPDs between the primary sample and the duplicate were within laboratory control limits, indicating acceptable laboratory precision.

FIELD DUPLICATE EVALUATION

No field duplicates were submitted to the laboratory.

COLUMN AGREEMENT EVALUATION

Column agreements met method criteria for dual column analysis.

CALIBRATION RANGE EVALUATION

All results were reported within each instrument's calibration range.

SENSITIVITY

The sample results were reported to the method detection limit. Results between the method detection limit and the reporting limit were flagged as estimated (J) by the laboratory. A number of sample analyses were performed at a dilution factor, resulting in non-detected results reported at elevated reporting limits due to the presence of high levels of non-target analytes or other matrix interference.

COMPLETENESS

The complete data package consisted of 954 reportable data points excluding field blank samples. 3 data points were rejected. The data completeness measure for this data package is calculated to be 99.7%. The project laboratory completeness goal of 95% was met.

OVERALL ASSESSMENT

All qualified data, excluding rejected data, can be used for decision-making purposes; however, the limitation identified by the applied qualifier should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

Table 3

Samples with Exceeded Holding Times

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Extraction Holding Time	Total Time	Analysis Holding Time	Total Time	Affected Analyte	ERM Qualifier
50272639	PZ-111-KS-WG-20201109	SM4500-H-B	--	--	15 min.	2835 min.	pH	J
50272639	PZ-111-SD-WG-20201109	SM4500-H-B	--	--	15 min.	3059 min.	pH	J
50272639	PZ-111-SS-WG-20201109	SM4500-H-B	--	--	15 min.	3162 min.	pH	J

Notes:

min. = minutes

Table 5
Initial Calibration Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272639	8260 Instrument 50MVDB 10/27/2020	Iodomethane	24	--	20				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639						TB-006-WQ-20201109	ND	ug/L	UJ
50272639	8270 Instrument 50MSS6 10/07/2020	Famphur	34	--	20				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639	8270 Instrument 50MSS6 10/07/2020	Hexachlorophene	25	--	20				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639	8270 Instrument 50MSS6 10/07/2020	Kepone	26	--	20				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272639	8270 Instrument 50MSS6 10/07/2020	3,3'-Dimethylbenzidine	21	--	20				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ

Notes:

IC = Initial calibration

RSD = Relative standard deviation

RRF = Relative response factor

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272639	18004176ICV	Iodomethane	146 %R	--	75-125				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639						TB-006-WQ-20201109	ND	ug/L	UJ
50272639	18004176ICV	Acetonitrile	8.7 %R	--	75-125				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	R
50272639						PZ-111-SD-WG-20201109	ND	ug/L	R
50272639						PZ-111-SS-WG-20201109	ND	ug/L	R
50272639						TB-006-WQ-20201109	ND	ug/L	R
50272639	18004176ICV	Allyl chloride	61 %R	--	75-125				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639						TB-006-WQ-20201109	ND	ug/L	UJ
50272639	18004176ICV	Methylcyclohexane	519 %R	--	75-125				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639						TB-006-WQ-20201109	ND	ug/L	UJ
50272639	18004176ICV	1,4-Dioxane	263 %R	--	75-125				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639						TB-006-WQ-20201109	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272639	17873843ICV	p-Phenylenediamine	139 %R	--	75-125				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639	17873843ICV	1,3,5-Trinitrobenzene	128 %R	--	75-125				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639	17873843ICV	P-Dimethylaminoazobenzene	128 %R	--	75-125				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639	17873843ICV	3,3'-Dimethylbenzidine	135 %R	--	75-125				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639	17873843ICV	Famphur	161 %R	--	75-125				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639	Not present in ICV	Acetophenone	--	--	--				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272639	Not present in ICV	Atrazine	--	--	--				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639	Not present in ICV	Benzaldehyde	--	--	--				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639	Not present in ICV	Biphenyl (Diphenyl)	--	--	--				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639	Not present in ICV	Caprolactam	--	--	--				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639	Not present in ICV	N-Nitrosodiphenylamine	--	--	--				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639	Not present in ICV	1,2,4,5-Tetrachlorobenzene	--	--	--				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272639	18101542CCV	Acetonitrile	-36 %D	--	± 25				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639						TB-006-WQ-20201109	ND	ug/L	UJ
50272639	18101542CCV	Chloroethane	-32 %D	--	± 25				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639						TB-006-WQ-20201109	ND	ug/L	UJ
50272639	18101542CCV	Chloromethane	-46 %D	--	± 30				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639						TB-006-WQ-20201109	ND	ug/L	UJ
50272639	18101542CCV	Dichlorodifluoromethane	-76 %D	--	± 40				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639						TB-006-WQ-20201109	ND	ug/L	UJ
50272639	18101542CCV	2,2-Dichloropropane	-33 %D	--	± 25				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639						TB-006-WQ-20201109	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272639	18101542CCV	n-Hexane	-26 %D	--	± 25				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639						TB-006-WQ-20201109	ND	ug/L	UJ
50272639	18101542CCV	Iodomethane	-52 %D	--	± 25				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639						TB-006-WQ-20201109	ND	ug/L	UJ
50272639	18101542CCV	Vinyl chloride	-33 %D	--	± 25				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639						TB-006-WQ-20201109	ND	ug/L	UJ
50272639	18187196CCV	2,4-D	22 %D	--	± 20				
50272639	18182830CCV	2,4-D	23 %D	--	± 20				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272639	18187196CCV	2,4,5-T	36 %D	--	± 20				
50272639	18182830CCV	2,4,5-T	36 %D	--	± 20				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639	18187196CCV	2,4,5-TP	38 %D	--	± 20				
50272639	18182830CCV	2,4,5-TP	41 %D	--	± 20				
50272639						PZ-111-KS-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SD-WG-20201109	ND	ug/L	UJ
50272639						PZ-111-SS-WG-20201109	ND	ug/L	UJ
50272639	18179094CCV	Magnesium, Dissolved	87.4 %R	--	90-110				
50272639						PZ-111-KS-WG-20201109	5070	ug/L	J-
50272639						PZ-111-SD-WG-20201109	47800	ug/L	J-
50272639						PZ-111-SS-WG-20201109	104000	ug/L	J-

Notes:
CCV = Continuing calibration verification
%D = Percent Difference
ICV = Initial calibration verification
RRF = relative response factor
%R = Percent Recovery

Table 7
Laboratory Blank and Associated Suspect Sample Detections
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272639	2735387BLANK-50272639	Chromium, Total	0.18 J	2.0				ug/L	
50272639		Chromium, Total			PZ-111-KS-WG-20201109	0.32	2.0	ug/L	2.0 U
50272639		Chromium, Total			PZ-111-SD-WG-20201109	0.22	2.0	ug/L	2.0 U
50272639		Chromium, Total			PZ-111-SS-WG-20201109	0.76	2.0	ug/L	2.0 U
50272639	2735801BLANK-50272639	Barium, Total	1.3 J	10.0				ug/L	
50272639		Barium, Total			PZ-111-KS-WG-20201109	7.9	10.0	ug/L	10.0 U
50272639	2735801BLANK-50272639	Iron, Total	35.7 J	50.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272639	2735801BLANK-50272639	Manganese, Total	1.2 J	5.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272639	2736007BLANK-50272639	Nitrite + Nitrate as N	0.015 J	0.10				mg/L	
50272639		Nitrite + Nitrate as N			PZ-111-KS-WG-20201109	0.026	0.10	mg/L	0.10 U
50272639		Nitrite + Nitrate as N			PZ-111-SD-WG-20201109	0.022	0.10	mg/L	0.10 U
50272639		Nitrite + Nitrate as N			PZ-111-SS-WG-20201109	0.022	0.10	mg/L	0.10 U
50272639	2736828BLANK-50272639	Barium, Dissolved	0.64 J	10.0				ug/L	
50272639		Barium, Dissolved			PZ-111-KS-WG-20201109	7.8	10.0	ug/L	10.0 U
50272639	2736828BLANK-50272639	Boron, Dissolved	12.9 J	100				ug/L	
50272639		Boron, Dissolved			PZ-111-SD-WG-20201109	72.2	100	ug/L	100 U
50272639	2736828BLANK-50272639	Manganese, Dissolved	1.3 J	5.0				ug/L	
50272639		Manganese, Dissolved			PZ-111-KS-WG-20201109	6.1	5.0	ug/L	J+

Table 7

Laboratory Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272639	2736828BLANK-50272639	Molybdenum, Dissolved	2.3 J	10.0				ug/L	
50272639		Molybdenum, Dissolved			PZ-111-KS-WG-20201109	2.1	10.0	ug/L	10.0 U
50272639		Molybdenum, Dissolved			PZ-111-SD-WG-20201109	3.7	10.0	ug/L	10.0 U
50272639		Molybdenum, Dissolved			PZ-111-SS-WG-20201109	1.0	10.0	ug/L	10.0 U
50272639	2736828BLANK-50272639	Silicon, Dissolved	67.4 J	200	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272639	2736828BLANK-50272639	Sodium, Dissolved	201 J	1000	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272639	2736828BLANK-50272639	Titanium, Dissolved	1.0 J	10.0	None for qualification, sample results ND	--	--	ug/L	--
50272639	2111914BLANK-50272639	Methane	2.8 J	5.0	None for qualification, sample results > 5x blank	--	--	ug/L	--

Notes:

RL = Reporting Limit

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272639	FILTB-004-WQ-20201103	Barium, Dissolved	0.58 J	10.0				ug/L	
50272639		Barium, Dissolved			PZ-111-KS-WG-20201109	7.8	10.0	ug/L	10.0 U
50272639	FILTB-004-WQ-20201103	Calcium, Dissolved	232 J	500	None for qualification, associated samples > 5x	--	--	ug/L	--
50272639	FILTB-004-WQ-20201103	Chromium, Dissolved	0.12 J	2.0				ug/L	
50272639		Chromium, Dissolved			PZ-111-KS-WG-20201109	0.20	2.0	ug/L	2.0 U
50272639		Chromium, Dissolved			PZ-111-SD-WG-20201109	0.29	2.0	ug/L	2.0 U
50272639		Chromium, Dissolved			PZ-111-SS-WG-20201109	0.80	2.0	ug/L	2.0 U
50272639	FILTB-004-WQ-20201103	Copper, Dissolved	0.22 J	1.0				ug/L	
50272639		Copper, Dissolved			PZ-111-KS-WG-20201109	0.37	1.0	ug/L	1.0 U
50272639		Copper, Dissolved			PZ-111-SD-WG-20201109	0.44	1.0	ug/L	1.0 U
50272639		Copper, Dissolved			PZ-111-SS-WG-20201109	0.52	1.0	ug/L	1.0 U
50272639	FILTB-004-WQ-20201103	Dissolved Organic Carbon	0.80 J	1.0				ug/L	
50272639		Dissolved Organic Carbon			PZ-111-KS-WG-20201109	0.66	1.0	ug/L	1.0 U
50272639		Dissolved Organic Carbon			PZ-111-SD-WG-20201109	1.2	1.0	ug/L	J+

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272639	FILTB-004-WQ-20201103	Magnesium, Dissolved	57.9 J	500	None for qualification, associated samples > 5x	--	--	ug/L	--
50272639	EB-002-WQ-20201103	Nitrate as N	0.018 J	0.050	None for qualification, associated samples ND	--	--	mg/L	--
50272639	EB-002-WQ-20201103	Nitrite + Nitrate as N	0.019 J	0.10				mg/L	
50272639		Nitrite + Nitrate as N			PZ-111-KS-WG-20201109	0.026	0.10	mg/L	0.10 U
50272639		Nitrite + Nitrate as N			PZ-111-SD-WG-20201109	0.022	0.10	mg/L	0.10 U
50272639		Nitrite + Nitrate as N			PZ-111-SS-WG-20201109	0.022	0.10	mg/L	0.10 U

Notes:

RL = Reporting Limit

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
LCS/LCSD										
50272639	2731900LCS-50272639/	None for qualification, samples ND	1,4-Dioxane	160/	50-150	--	--	--	--	--
50272639	2731900LCS-50272639/		Acetonitrile	7/	50-150					
50272639		PZ-111-KS-WG-20201109	Acetonitrile					<100	ug/L	R
50272639		PZ-111-SD-WG-20201109	Acetonitrile					<100	ug/L	R
50272639		PZ-111-SS-WG-20201109	Acetonitrile					<100	ug/L	R
50272639		TB-006-WQ-20201109	Acetonitrile					<100	ug/L	R
50272639	2731900LCS-50272639/	None for qualification, samples ND	Methylcyclohexane	483/	70-129	--	--	--	--	--
MS/MSD										
50272639	PZ-111-SS-WG-20201109MS/		Acetonitrile	8/	50-150					
50272639		PZ-111-SS-WG-20201109	Acetonitrile					<100	ug/L	R
50272639	PZ-111-SS-WG-20201109MS/	None for qualification, parent sample ND	Methylcyclohexane	508/	58-121	--	--	--	--	--

Notes:

LCS/LCSD = Laboratory control sample/laboratory control sample duplicate

MS/MSD = Matrix spike/matrix spike duplicate

RPD = Relative percent difference

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Memorandum

To	Alice Sandzen
From	Rachel James
Date	2021-06-18
Reference	0579381
Subject	Revised Data Review of West Lake OU-3 RI/FS Routine Groundwater Samples Collected 11/10/2020: Pace Data Package 50272796.

This memorandum was revised to address changes to the initial calibration verification data for Gas Chromatography/Mass Spectrometry methods issued by the laboratory after the initial validation was complete. Table 6 has been revised as needed.

The data quality was assessed and any necessary qualifiers were applied following the Quality Assurance Project Plan (QAPP) for West Lake OU-3 Remediation Investigation/Feasibility Study, Revision 3, December 2020, USEPA Contract Laboratory Program (CLP) NFGs for Organic Superfund Methods Data Review, document number EPA-540-R-2017-002, January 2017, USEPA CLP NFGs for Inorganic Superfund Methods Data Review, document number EPA-540-R-2017-001, January 2017, and USEPA Region 1—New England Environmental Data Review Supplement for Region 1 Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement1, June 2018, the protocols and quality control (QC) requirements of the analytical methods, and the reviewer's professional judgement.

A Stage 2B data validation was performed on 100% of the laboratory data.

The following items were reviewed as part of the data validation:

- **Chain of Custody:** The chains of custody were reviewed for proper completion and that the laboratory performed the requested methods and reported the requested target analytes for each sample.
- **Dilutions and Reanalysis:** Dilutions, calibration ranges, and reanalyses were reviewed as applicable. The best result was chosen when more than one result was reported as final.
- **Sample Preservation:** The appropriate temperature and chemical preservation requirements were reviewed. Headspace for volatile sample analysis was reviewed.
- **Holding Times:** The period of time between collection of the sample and preparation/analysis of the sample was evaluated.
- **Instrument Tuning:** Instrument tuning and performance check frequency and results were reviewed.
- **Calibration:** The initial calibration type, fit, number of standards, and minimum response factors were evaluated. Additionally, the frequency and percent recoveries for initial and continuing calibration verification standards and blanks were evaluated.
- **Laboratory Blank Samples:** The preparation and analysis of reagent (contaminant-free) water was evaluated, along with the required frequency.

- **Field Blank Samples:** The collection and analysis of field blanks was evaluated. The reviewed data package(s) included the following associated field blanks: trip, filter, and equipment
- **Spike Samples:** Laboratory control, matrix spike, and post digestion spike sample preparation frequency and recoveries were reviewed as applicable.
- **Serial Dilutions:** Serial dilution sample preparation frequency and recoveries were reviewed as applicable.
- **Surrogate Spikes:** The addition of appropriate surrogates and their recoveries were evaluated.
- **Internal standards:** The presence and recoveries of internal standards and their appropriate association to target analytes were reviewed.
- **Laboratory Duplicate Samples:** Laboratory duplicate frequencies and recoveries were reviewed as applicable.
- **Field Duplicate Samples:** Field duplicate recoveries and absolute differences were reviewed as applicable.
- **Column Agreement:** Column agreements were reviewed for relevant methods.

Findings of the data validation are summarized in the sections below. As necessary, the following data quality flags were applied during validation.

J = estimated concentration
J+ = the result is an estimated concentration, but may be biased high
J- = the result is an estimated concentration, but may be biased low
UJ = estimated reporting limit
U = evaluated to be non-detected at the reporting limit
R = rejected, data not usable
NJ = tentative identification and estimated concentration

Validation outliers and any necessary data qualifications are summarized in outlier tables at the end of this memo. The table below indicates the included validation tables with findings. Tables without findings have been omitted.

Table Number	Table Name	Included
Table 1	Samples with Non-Preferred Results	No
Table 2	Samples with Exceeded Preservation Requirements	No
Table 3	**Samples with Exceeded Holding Times**	**Yes**
Table 4	Instrument Tuning Outside of Acceptable Limits	No
Table 5	**Initial Calibration Outside of Acceptable Limits**	**Yes**
Table 6	**Calibration Verification Outside of Acceptable Limits**	**Yes**
Table 7	**Laboratory Blank and Associated Suspect Sample Detections**	**Yes**
Table 8	**Field Blank and Associated Suspect Sample Detections**	**Yes**
Table 9	**Spike Recoveries Outside of Acceptable Limits**	**Yes**
Table 10	**Serial Dilution Recoveries Outside of Acceptable Limits**	**Yes**
Table 11	Surrogate Recovery Results out of Acceptable Limits	No
Table 12	Internal Standard Recovery Results out of Acceptable Limits	No

Table Number	Table Name	Included
Table 13	Laboratory Duplicate Result Outliers	No
Table 14	Field Duplicate Result Outliers	No
Table 15	Column Agreement Outliers	No
Table 16	Calibration Range Exceedances	No
Table 17	Professional Judgement Qualifiers	No

Findings of the data validation are summarized in the sections below.

CASE NARRATIVE NOTES AND CHAIN-OF-CUSTODY DISCREPANCIES

The laboratory indicated that it does not hold NELAC/TNI accreditation for the methods and parameters in non-potable water listed below. No qualifiers were applied based on accreditation status. Supporting calibrations and quality control data was provided for these analytes and reviewed as part of the data validation.

Method	Analyte without NELAC/TNI Accreditation	
	CAS	Analyte Name
EPA SW 6020	7440-29-1	Thorium
	7440-61-1	Uranium
EPA SW 6010	7440-21-3	Silicon
EPA SW 8082	1336-36-3	Total PCBs
EPA SW 8270	92-52-4	Biphenyl
	99-35-4	1,3,5-Trinitrobenzene
	1912-24-9	Atrazine
	106-50-3	p-Phenylenediamine
	105-60-2	Caprolactam
	95-53-4	o-Toluidine
	100-52-7	Benzaldehyde
EPA SW 8260	110-82-7	Cyclohexane
	108-87-2	Methylcyclohexane
	78-83-1	Isobutyl alcohol
	79-20-9	Methyl acetate
	126-99-8	beta-Chloroprene
EPA SW 9056	20461-54-5	Iodide

No discrepancies between the chains-of-custody and the sample containers received were noted by the laboratory.

PRESERVATION AND HOLDING TIME EVALUATION

The laboratory received the sample shipments within the method-prescribed temperature preservation requirements of less than 6 degrees Celsius, with acceptable sample pH values, and

all vials for volatile analysis were received in good condition with headspace of less than 6 millimeters.

The samples were prepared and analyzed within the method-prescribed time period from the date of collection, with the exceptions and any necessary qualifications noted in Table 3.

INSTRUMENT TUNING EVALUATION

All tuning criteria met method acceptance criteria.

INITIAL CALIBRATION

The initial calibrations met the minimum number of calibration standards, project required percent standard deviation (%RSD), relative correlation coefficient, and minimum relative response factor (RRF) limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 5.

INITIAL CALIBRATION VERIFICATION (ICV) AND CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION

The initial and continuing calibration verifications were within project-specified percent difference (%D) or percent recoveries (%R) and RRF limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 6.

Situations that required additional professional judgement are detailed below:

- SVOC analytes acetophenone, atrazine, benzaldehyde, biphenyl (diphenyl), caprolactam, N-nitrosodiphenylamine, and 1,2,4,5-tetrachlorobenzene were not reported in the ICV samples. These analytes were present in the initial calibrations and CCV samples and were within control limits unless otherwise noted in Table 6. The non-detected results in associated samples have been qualified UJ.

LABORATORY BLANK EVALUATION

The laboratory blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 7. The blank results indicate that contaminants may have been introduced to the samples during processing or analysis in the laboratory.

FIELD BLANK EVALUATION

The trip, filter, and equipment blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 8. Any field blank detections associated with laboratory blank contamination and qualified as non-detected (U) are not included in Table 8. The blank results indicate that contaminants may have been introduced to the samples during collection, shipment, handling, and storage.

BLANK AND MATRIX SPIKE EVALUATION

The laboratory control sample (LCS), laboratory control sample duplicate (LCSD) recoveries, and relative percent differences (RPDs) were within the laboratory's limits of acceptance, with the

exceptions and any necessary qualifications noted in Table 9. Data were not qualified if a high recovery was associated with a non-detected result.

The matrix spike (MS), matrix spike duplicate (MSD) recoveries, and RPDs were within the laboratory's limits of acceptance for target analytes for spiked project samples, with the exceptions and any necessary qualifications noted in Table 9. MS/MSDs performed on non-project samples were not reviewed. Data were not qualified if the analyte concentration in the parent sample was greater than four times the spike amount, if the spike amount was diluted out prior to analysis, or if a high recovery was associated with a non-detected result.

SERIAL DILUTION EVALUATION

The metals serial dilution sample percent differences were within laboratory limits of acceptance, with the exceptions and any necessary qualifications noted in Table 10. Results were not qualified if the analyte concentration in the original sample was less than 50 times the detection limit. Serial dilutions performed on non-project samples were not reviewed.

SURROGATE SPIKE EVALUATION

The surrogate recoveries were within the laboratory limits of acceptance. The acceptable surrogate recoveries indicate minimal matrix interference in the samples.

INTERNAL STANDARD EVALUATION

The internal standard responses for reported results were within acceptable limits. The acceptable internal standard responses indicate that the instrument sensitivity and response were stable during each analysis.

LABORATORY DUPLICATE EVALUATION

The laboratory prepared at least one project sample as a laboratory duplicate. Laboratory duplicates performed on non-project samples were not reviewed. The RPDs between the primary sample and the duplicate were within laboratory control limits, indicating acceptable laboratory precision.

FIELD DUPLICATE EVALUATION

One field sample was submitted to the laboratory as a blind duplicate. RPDs and absolute differences were calculated as appropriate and compared to the limits established in the QAPP. The QAPP states that the RPDs must be less than or equal to 30 percent for aqueous samples when analytes are detected in both samples and these results are greater than or equal to five times the reporting limit. If one or both results are less than five times the reporting limit, or one result is detected and one is non-detected, the absolute difference between the results must be less than two times the reporting limit (if the reporting limits are not the same between the parent and field duplicate samples, the lower of the two was used for the control limit determination). The reporting limit was used for non-detected analytes when calculating absolute difference.

All RPDs and/or absolute differences were within QAPP criteria.

COLUMN AGREEMENT EVALUATION

Column agreements met method criteria for dual column analysis.

CALIBRATION RANGE EVALUATION

All results were reported within each instrument's calibration range.

SENSITIVITY

The sample results were reported down to the method detection limit. Results between the method detection limit and the reporting limit were flagged as estimated (J) by the laboratory. All non-detected results were reported from undiluted samples.

COMPLETENESS

The complete data package consisted of 1590 reportable data points excluding field blank samples. 5 data points were rejected. The data completeness measure for this data package is calculated to be 99.7%. The project laboratory completeness goal of 95% was met.

OVERALL ASSESSMENT

All qualified data, excluding rejected data, can be used for decision-making purposes; however, the limitation identified by the applied qualifier should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

Table 3

Samples with Exceeded Holding Times

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Extraction Holding Time	Total Time	Analysis Holding Time	Total Time	Affected Analyte	ERM Qualifier
50272796	DUP-003-WG-20201110	SM4500-H-B	--	--	15 min.	2341 min.	pH	J
50272796	I-67-WG-20201110	SM4500-H-B	--	--	15 min.	1751 min.	pH	J
50272796	PZ-109-SS-WG-20201110	SM4500-H-B	--	--	15 min.	1823 min.	pH	J
50272796	PZ-206-SS-WG-20201110	SM4500-H-B	--	--	15 min.	1554 min.	pH	J
50272796	S-84-WG-20201110	SM4500-H-B	--	--	15 min.	1631 min.	pH	J

Notes:

min. = minutes

Table 5
Initial Calibration Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272796	8260 Instrument 50MVDB 10/27/2020	Iodomethane	24	--	20				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ
50272796						TB-007-WQ-20201110	ND	ug/L	UJ
50272796						TB-008-WQ-20201110	ND	ug/L	UJ
50272796	8270 Instrument 50MSS2 10/07/2020	Hexachlorophene	40	--	20				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ

Notes:
IC = Initial calibration
RSD = Relative standard deviation
RRF = Relative response factor

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272796	18004176ICV	Iodomethane	146 %R	--	75-125				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ
50272796						TB-007-WQ-20201110	ND	ug/L	UJ
50272796						TB-008-WQ-20201110	ND	ug/L	UJ
50272796	18004176ICV	Acetonitrile	8.7 %R	--	75-125				
50272796						DUP-003-WG-20201110	ND	ug/L	R
50272796						I-67-WG-20201110	ND	ug/L	R
50272796						PZ-109-SS-WG-20201110	ND	ug/L	R
50272796						PZ-206-SS-WG-20201110	ND	ug/L	R
50272796						S-84-WG-20201110	ND	ug/L	R
50272796						TB-007-WQ-20201110	ND	ug/L	R
50272796						TB-008-WQ-20201110	ND	ug/L	R
50272796	18004176ICV	Allyl chloride	61 %R	--	75-125				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ
50272796						TB-007-WQ-20201110	ND	ug/L	UJ
50272796						TB-008-WQ-20201110	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272796	18004176ICV	Methylcyclohexane	519 %R	--	75-125				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ
50272796						TB-007-WQ-20201110	ND	ug/L	UJ
50272796						TB-008-WQ-20201110	ND	ug/L	UJ
50272796	18004176ICV	1,4-Dioxane	263 %R	--	75-125				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ
50272796						TB-007-WQ-20201110	ND	ug/L	UJ
50272796						TB-008-WQ-20201110	ND	ug/L	UJ
50272796	17876511ICV	3,3'-Dimethylbenzidine	138 %R	--	75-125				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272796	17876511ICV	Kepone	132 %R	--	75-125				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ
50272796	17876511ICV	Famphur	132 %R	--	75-125				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ
50272796	Not present in ICV	Acetophenone	--	--	--				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ
50272796	Not present in ICV	Atrazine	--	--	--				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272796	Not present in ICV	Benzaldehyde	--	--	--				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ
50272796	Not present in ICV	Biphenyl (Diphenyl)	--	--	--				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ
50272796	Not present in ICV	Caprolactam	--	--	--				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ
50272796	Not present in ICV	N-Nitrosodiphenylamine	--	--	--				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272796	Not present in ICV	1,2,4,5-Tetrachlorobenzene	--	--	--				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ
50272796	18115858CCV	Acetonitrile	-30 %D	--	± 25				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ
50272796						TB-007-WQ-20201110	ND	ug/L	UJ
50272796						TB-008-WQ-20201110	ND	ug/L	UJ
50272796	18115858CCV	Bromomethane	98 %D	--	± 30				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ
50272796						TB-007-WQ-20201110	ND	ug/L	UJ
50272796						TB-008-WQ-20201110	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272796	18115858CCV	Iodomethane	-40 %D	--	± 25				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ
50272796						TB-007-WQ-20201110	ND	ug/L	UJ
50272796						TB-008-WQ-20201110	ND	ug/L	UJ
50272796	18139078CCV	Butylbenzylphthalate	27 %D	--	± 25				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ
50272796	18139078CCV	Caprolactam	45 %D	--	± 30				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ
50272796	18139078CCV	Carbazole	35 %D	--	± 20				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272796	18139153CCV	Hexachlorophene	-26 %D	--	± 25				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ
50272796	18139153CCV	Kepone	-50 %D	--	± 25				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ
50272796	18183611CCV	2,4,5-T	25 %D	--	± 20				
50272796	18195751CCV	2,4,5-T	23 %D	--	± 20				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272796	18183611CCV	2,4,5-TP	29 %D	--	± 20				
50272796	18195751CCV	2,4,5-TP	27 %D	--	± 20				
50272796						DUP-003-WG-20201110	ND	ug/L	UJ
50272796						I-67-WG-20201110	ND	ug/L	UJ
50272796						PZ-109-SS-WG-20201110	ND	ug/L	UJ
50272796						PZ-206-SS-WG-20201110	ND	ug/L	UJ
50272796						S-84-WG-20201110	ND	ug/L	UJ

Notes:
CCV = Continuing calibration verification
%D = Percent difference
ICV = Initial calibration verification
RRF = Relative response factor
%R = Percent recovery

Table 7

Laboratory Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272796	2735387BLANK-50272796	Chromium, Total	0.18 J	2.0				ug/L	
50272796		Chromium, Total			I-67-WG-20201110	1.1	2.0	ug/L	2.0 U
50272796		Chromium, Total			PZ-109-SS-WG-20201110	0.22	2.0	ug/L	2.0 U
50272796		Chromium, Total			PZ-206-SS-WG-20201110	0.47	2.0	ug/L	2.0 U
50272796		Chromium, Total			S-84-WG-20201110	0.26	2.0	ug/L	2.0 U
50272796		Chromium, Total			DUP-003-WG-20201110	0.20	2.0	ug/L	2.0 U
50272796	2735801BLANK-50272796	Barium, Total	1.3 J	10.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272796	2735801BLANK-50272796	Iron, Total	35.7 J	50.0				ug/L	
50272796		Iron, Total			PZ-109-SS-WG-20201110	107	50.0	ug/L	J+
50272796		Iron, Total			DUP-003-WG-20201110	114	50.0	ug/L	J+
50272796	2735801BLANK-50272796	Manganese, Total	1.2 J	5.0				ug/L	
50272796		Manganese, Total			PZ-109-SS-WG-20201110	1.9	5.0	ug/L	5.0 U
50272796		Manganese, Total			DUP-003-WG-20201110	2.3	5.0	ug/L	5.0 U
50272796	2736828BLANK-50272796	Barium, Dissolved	0.64 J	10.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272796	2736828BLANK-50272796	Boron, Dissolved	12.9 J	100	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272796	2736828BLANK-50272796	Manganese, Dissolved	1.3 J	5.0				ug/L	
50272796		Manganese, Dissolved			PZ-109-SS-WG-20201110	1.9	5.0	ug/L	5.0 U
50272796		Manganese, Dissolved			DUP-003-WG-20201110	1.7	5.0	ug/L	5.0 U

Table 7

Laboratory Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272796	2736828BLANK-50272796	Molybdenum, Dissolved	2.3 J	10.0				ug/L	
50272796		Molybdenum, Dissolved			I-67-WG-20201110	2.7	10.0	ug/L	10.0 U
50272796		Molybdenum, Dissolved			PZ-109-SS-WG-20201110	2.7	10.0	ug/L	10.0 U
50272796		Molybdenum, Dissolved			PZ-206-SS-WG-20201110	1.6	10.0	ug/L	10.0 U
50272796		Molybdenum, Dissolved			S-84-WG-20201110	10.6	10.0	ug/L	J+
50272796		Molybdenum, Dissolved			DUP-003-WG-20201110	3.3	10.0	ug/L	10.0 U
50272796	2736828BLANK-50272796	Silicon, Dissolved	67.4 J	200	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272796	2736828BLANK-50272796	Sodium, Dissolved	201 J	1000	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272796	2736828BLANK-50272796	Titanium, Dissolved	1.0 J	10.0				ug/L	
50272796		Titanium, Dissolved			PZ-206-SS-WG-20201110	0.64	10.0	ug/L	10.0 U
50272796	2111914BLANK-50272796	Methane	2.8 J	5.0				ug/L	
50272796		Methane			PZ-109-SS-WG-20201110	4.9	5.0	ug/L	5.0 U
50272796	2113105BLANK-50272796	Methane	4.4 J	5.0				ug/L	
50272796		Methane			DUP-003-WG-20201110	4.8	5.0	ug/L	5.0 U
50272796	2113881BLANK-50272796	Methane	3.9 J	5.0	None for qualification, sample > 5x blank	--	--	ug/L	--

Notes:

RL = Reporting Limit

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272796	FILTB-003-WQ-20201103	Calcium, Dissolved	413 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272796	FILTB-003-WQ-20201103	Copper, Dissolved	0.32 J	1.0				ug/L	
50272796		Copper, Dissolved			I-67-WG-20201110	0.67	1.0	ug/L	1.0 U
50272796		Copper, Dissolved			S-84-WG-20201110	0.65	1.0	ug/L	1.0 U
50272796	FILTB-003-WQ-20201103	Iron, Dissolved	26.2 J	50.0	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272796	FILTB-003-WQ-20201103	Magnesium, Dissolved	172 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272796	FILTB-003-WQ-20201103	Titanium, Dissolved	0.78 J	10.0	None for qualification, associated samples ND	--	--	ug/L	--
50272796	FILTB-004-WQ-20201103	Barium, Dissolved	0.58 J	10.0	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272796	FILTB-004-WQ-20201103	Calcium, Dissolved	232 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272796	FILTB-004-WQ-20201103	Chromium, Dissolved	0.12 J	2.0				ug/L	
50272796		Chromium, Dissolved			DUP-003-WG-20201110	0.32	2.0	ug/L	2.0 U
50272796		Chromium, Dissolved			PZ-109-SS-WG-20201110	0.20	2.0	ug/L	2.0 U
50272796		Chromium, Dissolved			PZ-206-SS-WG-20201110	0.43	2.0	ug/L	2.0 U
50272796	FILTB-004-WQ-20201103	Copper, Dissolved	0.22 J	1.0				ug/L	
50272796		Copper, Dissolved			DUP-003-WG-20201110	1.1	1.0	ug/L	J+
50272796		Copper, Dissolved			PZ-206-SS-WG-20201110	0.37	1.0	ug/L	1.0 U

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272796	FILTB-004-WQ-20201103	Dissolved Organic Carbon	0.80 J	1.0				ug/L	
50272796		Dissolved Organic Carbon			DUP-003-WG-20201110	1.1	1.0	ug/L	J+
50272796		Dissolved Organic Carbon			PZ-109-SS-WG-20201110	1.2	1.0	ug/L	J+
50272796	FILTB-004-WQ-20201103	Magnesium, Dissolved	57.9 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272796	EB-001-WQ-20201103	Nitrate as N	0.020 J	0.050	None for qualification, associated samples ND	--	--	mg/L	--
50272796	EB-001-WQ-20201103	Nitrite + Nitrate as N	0.020 J	0.10				mg/L	
50272796		Nitrite + Nitrate as N			I-67-WG-20201110	0.025	0.10	mg/L	0.10 U
50272796		Nitrite + Nitrate as N			S-84-WG-20201110	0.020	0.10	mg/L	0.10 U
50272796	EB-002-WQ-20201103	Nitrate as N	0.018 J	0.050	None for qualification, associated samples ND or > 5x	--	--	mg/L	--
50272796	EB-002-WQ-20201103	Nitrite + Nitrate as N	0.019 J	0.10				mg/L	
50272796		Nitrite + Nitrate as N			PZ-206-SS-WG-20201110	0.049	0.10	mg/L	0.10 U

Notes:

RL = Reporting Limit

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
LCS/LCSD										
50272796	2733214LCS-50272796/		Acetonitrile	7/	50-150					
50272796		DUP-003-WG-20201110	Acetonitrile					<100	ug/L	R
50272796		I-67-WG-20201110	Acetonitrile					<100	ug/L	R
50272796		PZ-109-SS-WG-20201110	Acetonitrile					<100	ug/L	R
50272796		PZ-206-SS-WG-20201110	Acetonitrile					<100	ug/L	R
50272796		S-84-WG-20201110	Acetonitrile					<100	ug/L	R
50272796		TB-007-WQ-20201110	Acetonitrile					<100	ug/L	R
50272796		TB-008-WQ-20201110	Acetonitrile					<100	ug/L	R
50272796	2733214LCS-50272796/	None for qualification, samples ND	Methylcyclohexane	457/	70-129	--	--	--	--	--
50272796	2736671LCS-50272796/	None for qualification, samples ND	Carbazole	128/	66-127	--	--	--	--	--
MS/MSD										
50272796	S-84-WG-20201110MS/ S-84-WG-20201110MSD		Acetonitrile	9/8	50-150	NC	20			
50272796		S-84-WG-20201110	Acetonitrile					<100	ug/L	R
50272796	S-84-WG-20201110MS/ S-84-WG-20201110MSD	None for qualification, spike > 4x sample concentration	Arsenic, Total	134/129	75-125	Pass	20	--	--	--
50272796	S-84-WG-20201110MS/ S-84-WG-20201110MSD	None for qualification, sample ND	Carbazole	135/142	69-127	Pass	20	--	--	--

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
50272796	S-84-WG-20201110MS/ S-84-WG-20201110MSD	None for qualification, spike > 4x sample concentration	Carbon dioxide	-23/-11	38.0-147	Pass	40	--	--	--
50272796	S-84-WG-20201110MS/ S-84-WG-20201110MSD	None for qualification, sample ND	Chloromethane	Pass/Pass	17-129	22	20	--	--	--
50272796	S-84-WG-20201110MS/ S-84-WG-20201110MSD		Chromium (VI)	87.3/Pass	90.0-110	Pass	20			
50272796		S-84-WG-20201110	Chromium (VI)					<0.100	ug/L	UJ
50272796	S-84-WG-20201110MS/ S-84-WG-20201110MSD	None for qualification, sample ND	Dinoseb	Pass/Pass	10-140	26	20	--	--	--
50272796	S-84-WG-20201110MS/ S-84-WG-20201110MSD	None for qualification, sample ND	Methylcyclohexane	520/484	58-121	Pass	20	--	--	--
50272796	S-84-WG-20201110MS/ S-84-WG-20201110MSD		Nitrite + Nitrate as N	35/34	90-110	Pass	20			
50272796		S-84-WG-20201110	Nitrite + Nitrate as N					0.020	mg/L	J-
50272796	S-84-WG-20201110MS/ S-84-WG-20201110MSD	None for qualification, sample ND	Sulfide	133/134	90-110	Pass	20	--	--	--
50272796	S-84-WG-20201110MS/ S-84-WG-20201110MSD	None for qualification, sample ND	2-Nitroaniline	Pass/118	27-117	Pass	20	--	--	--
50272796	S-84-WG-20201110MS/ S-84-WG-20201110MSD	None for qualification, spike > 4x sample concentration	Calcium, Dissolved	Pass/138	75-125	Pass	20	--	--	--

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
50272796	S-84-WG-20201110MS/ S-84-WG-20201110MSD		Methane	Pass/145	70-130	Pass	30			
50272796		S-84-WG-20201110	Methane					1800	ug/L	J+
50272796	S-84-WG-20201110MS/ S-84-WG-20201110MSD		Phosphorus	Pass/117	90-110	Pass	20			
50272796		S-84-WG-20201110	Phosphorus					1.1	mg/L	J+
50272796	S-84-WG-20201110MS/ S-84-WG-20201110MSD	None for qualification, spike > 4x sample concentration	Silicon, Dissolved	Pass/150	75-125	Pass	20	--	--	--

Notes:

LCS/LCSD = Laboratory control sample/laboratory control sample duplicate

MS/MSD - Matrix spike/matrix spike duplicate

RPD = Relative percent difference

Table 10
Serial Dilution Recoveries Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Dilution		Concentration		Units	Instrmt. DL	Result/ DL	%D	%D Limit	ERM Qualifier
	Sample ID	Analyte	Sample	Dilution						
50272796	S-84-WG-20201110	Arsenic, Total	395	78.8	ug/L	1.0	395	79.5	10	J

Notes:
%D = Percent Difference
DL = Detection Limit

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Memorandum

To	Alice Sandzen
From	Rachel James
Date	2021-06-18
Reference	0579381
Subject	Revised Data Review of West Lake OU-3 RI/FS Routine Groundwater Samples Collected 11/11/2020: Pace Data Package 50272955.

This memorandum was revised to address changes to the initial calibration verification data for Gas Chromatography/Mass Spectrometry methods issued by the laboratory after the initial validation was complete. Table 6 has been revised as needed.

The data quality was assessed and any necessary qualifiers were applied following the Quality Assurance Project Plan (QAPP) for West Lake OU-3 Remediation Investigation/Feasibility Study, Revision 3, December 2020, USEPA Contract Laboratory Program (CLP) NFGs for Organic Superfund Methods Data Review, document number EPA-540-R-2017-002, January 2017, USEPA CLP NFGs for Inorganic Superfund Methods Data Review, document number EPA-540-R-2017-001, January 2017, and USEPA Region 1—New England Environmental Data Review Supplement for Region 1 Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement1, June 2018, the protocols and quality control (QC) requirements of the analytical methods, and the reviewer's professional judgement.

A Stage 2B data validation was performed on 100% of the laboratory data.

The following items were reviewed as part of the data validation:

- **Chain of Custody:** The chains of custody were reviewed for proper completion and that the laboratory performed the requested methods and reported the requested target analytes for each sample.
- **Dilutions and Reanalysis:** Dilutions, calibration ranges, and reanalyses were reviewed as applicable. The best result was chosen when more than one result was reported as final.
- **Sample Preservation:** The appropriate temperature and chemical preservation requirements were reviewed. Headspace for volatile sample analysis was reviewed.
- **Holding Times:** The period of time between collection of the sample and preparation/analysis of the sample was evaluated.
- **Instrument Tuning:** Instrument tuning and performance check frequency and results were reviewed.
- **Calibration:** The initial calibration type, fit, number of standards, and minimum response factors were evaluated. Additionally, the frequency and percent recoveries for initial and continuing calibration verification standards and blanks were evaluated.
- **Laboratory Blank Samples:** The preparation and analysis of reagent (contaminant-free) water was evaluated, along with the required frequency.

- **Field Blank Samples:** The collection and analysis of field blanks was evaluated. The reviewed data package(s) included the following associated field blanks: trip, filter, field, and equipment
- **Spike Samples:** Laboratory control, matrix spike, and post digestion spike sample preparation frequency and recoveries were reviewed as applicable.
- **Serial Dilutions:** Serial dilution sample preparation frequency and recoveries were reviewed as applicable.
- **Surrogate Spikes:** The addition of appropriate surrogates and their recoveries were evaluated.
- **Internal standards:** The presence and recoveries of internal standards and their appropriate association to target analytes were reviewed.
- **Laboratory Duplicate Samples:** Laboratory duplicate frequencies and recoveries were reviewed as applicable.
- **Field Duplicate Samples:** Field duplicate recoveries and absolute differences were reviewed as applicable.
- **Column Agreement:** Column agreements were reviewed for relevant methods.

Findings of the data validation are summarized in the sections below. As necessary, the following data quality flags were applied during validation.

J = estimated concentration
J+ = the result is an estimated concentration, but may be biased high
J- = the result is an estimated concentration, but may be biased low
UJ = estimated reporting limit
U = evaluated to be non-detected at the reporting limit
R = rejected, data not usable
NJ = tentative identification and estimated concentration

Validation outliers and any necessary data qualifications are summarized in outlier tables at the end of this memo. The table below indicates the included validation tables with findings. Tables without findings have been omitted.

Table Number	Table Name	Included
Table 1	Samples with Non-Preferred Results	No
Table 2	**Samples with Exceeded Preservation Requirements**	**Yes**
Table 3	**Samples with Exceeded Holding Times**	**Yes**
Table 4	Instrument Tuning Outside of Acceptable Limits	No
Table 5	**Initial Calibration Outside of Acceptable Limits**	**Yes**
Table 6	**Calibration Verification Outside of Acceptable Limits**	**Yes**
Table 7	**Laboratory Blank and Associated Suspect Sample Detections**	**Yes**
Table 8	**Field Blank and Associated Suspect Sample Detections**	**Yes**
Table 9	**Spike Recoveries Outside of Acceptable Limits**	**Yes**
Table 10	Serial Dilution Recoveries Outside of Acceptable Limits	No
Table 11	**Surrogate Recovery Results out of Acceptable Limits**	**Yes**
Table 12	Internal Standard Recovery Results out of Acceptable Limits	No

Table Number	Table Name	Included
Table 13	**Laboratory Duplicate Result Outliers**	**Yes**
Table 14	Field Duplicate Result Outliers	No
Table 15	Column Agreement Outliers	No
Table 16	Calibration Range Exceedances	No
Table 17	Professional Judgement Qualifiers	No

Findings of the data validation are summarized in the sections below.

CASE NARRATIVE NOTES AND CHAIN-OF-CUSTODY DISCREPANCIES

The laboratory indicated that it does not hold NELAC/TNI accreditation for the methods and parameters in non-potable water listed below. No qualifiers were applied based on accreditation status. Supporting calibrations and quality control data was provided for these analytes and reviewed as part of the data validation.

Method	Analyte without NELAC/TNI Accreditation	
	CAS	Analyte Name
EPA SW 6020	7440-29-1	Thorium
	7440-61-1	Uranium
EPA SW 6010	7440-21-3	Silicon
EPA SW 8082	1336-36-3	Total PCBs
EPA SW 8270	92-52-4	Biphenyl
	99-35-4	1,3,5-Trinitrobenzene
	1912-24-9	Atrazine
	106-50-3	p-Phenylenediamine
	105-60-2	Caprolactam
	95-53-4	o-Toluidine
	100-52-7	Benzaldehyde
EPA SW 8260	110-82-7	Cyclohexane
	108-87-2	Methylcyclohexane
	78-83-1	Isobutyl alcohol
	79-20-9	Methyl acetate
	126-99-8	beta-Chloroprene
EPA SW 9056	20461-54-5	Iodide

No discrepancies between the chains-of-custody and the sample containers received were noted by the laboratory, with the following exceptions:

- Data Package 50272955: The field team notified the laboratory after shipment that the chain of custody was not signed in error, and confirmed by email the coolers had custody seals and were transferred to the courier. The laboratory noted that all coolers contained intact custody seals upon receipt. Data quality was not impacted.

PRESERVATION AND HOLDING TIME EVALUATION

The sample shipments were received at the laboratory within the method-prescribed temperature preservation requirements of less than 6°C, with acceptable pH values, and all vials for volatile analysis were received in good condition with headspace of less than 6mm, with the exceptions and any necessary qualifications noted in Table 2.

The samples were prepared and analyzed within the method-prescribed time period from the date of collection, with the exceptions and any necessary qualifications noted in Table 3.

INSTRUMENT TUNING EVALUATION

All tuning criteria met method acceptance criteria.

INITIAL CALIBRATION

The initial calibrations met the minimum number of calibration standards, project required percent standard deviation (%RSD), relative correlation coefficient, and minimum relative response factor (RRF) limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 5.

INITIAL CALIBRATION VERIFICATION (ICV) AND CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION

The initial and continuing calibration verifications were within project-specified percent difference (%D) or percent recoveries (%R) and RRF limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 6.

Situations that required additional professional judgement are detailed below:

- SVOC analytes acetophenone, atrazine, benzaldehyde, biphenyl (diphenyl), caprolactam, N-nitrosodiphenylamine, and 1,2,4,5-tetrachlorobenzene were not reported in the ICV samples. These analytes were present in the initial calibrations and CCV samples and were within control limits. The non-detected results in associated samples have been qualified UJ.

LABORATORY BLANK EVALUATION

The laboratory blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 7. The blank results indicate that contaminants may have been introduced to the samples during processing or analysis in the laboratory.

FIELD BLANK EVALUATION

The trip, filter, field, and equipment blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 8. Any field blank detections associated with laboratory blank contamination and qualified as non-detected (U) are not included in Table 8. The blank results indicate that contaminants may have been introduced to the samples during collection, shipment, handling, and storage.

BLANK AND MATRIX SPIKE EVALUATION

The laboratory control sample (LCS), laboratory control sample duplicate (LCSD) recoveries, and relative percent differences (RPDs) were within the laboratory's limits of acceptance, with the exceptions and any necessary qualifications noted in Table 9. Data were not qualified if a high recovery was associated with a non-detected result.

The matrix spike (MS), matrix spike duplicate (MSD) recoveries, and RPDs were within the laboratory's limits of acceptance for target analytes for spiked project samples, with the exceptions and any necessary qualifications noted in Table 9. MS/MSDs performed on non-project samples were not reviewed. Data were not qualified if the analyte concentration in the parent sample was greater than four times the spike amount, if the spike amount was diluted out prior to analysis, or if a high recovery was associated with a non-detected result.

SERIAL DILUTION EVALUATION

The laboratory did not perform serial dilutions on any project samples. Serial dilutions performed on non-project samples were not reviewed.

SURROGATE SPIKE EVALUATION

The surrogate recoveries were within the laboratory limits of acceptance, with the exceptions and any necessary qualifications noted in Table 11. Semivolatile results were only qualified if two or more acid or base/neutral surrogates were outside of laboratory limits. Data were not qualified if the surrogate spike amount was diluted out prior to analysis or if a high recovery was associated with a non-detected result.

INTERNAL STANDARD EVALUATION

The internal standard responses for reported results were within acceptable limits. The acceptable internal standard responses indicate that the instrument sensitivity and response were stable during each analysis.

LABORATORY DUPLICATE EVALUATION

The laboratory prepared at least one project sample as a laboratory duplicate. Laboratory duplicates performed on non-project samples were not reviewed. The RPDs between the primary sample and the duplicate were within laboratory control limits, with the exceptions and any necessary qualifications noted in Table 13. Results were not qualified if the results in the primary and/or duplicate sample were less than five times the reporting limit.

FIELD DUPLICATE EVALUATION

No field duplicates were submitted to the laboratory.

COLUMN AGREEMENT EVALUATION

Column agreements met method criteria for dual column analysis.

CALIBRATION RANGE EVALUATION

All results were reported within each instrument's calibration range.

SENSITIVITY

The sample results were reported to the method detection limit. Results between the method detection limit and the reporting limit were flagged as estimated (J) by the laboratory. A number of sample analyses were performed at a dilution factor, resulting in non-detected results reported at elevated reporting limits due to the presence of high levels of non-target analytes or other matrix interference.

COMPLETENESS

The complete data package consisted of 1272 reportable data points excluding field blank samples. 7 data points were rejected. The data completeness measure for this data package is calculated to be 99.4%. The project laboratory completeness goal of 95% was met.

OVERALL ASSESSMENT

All qualified data, excluding rejected data, can be used for decision-making purposes; however, the limitation identified by the applied qualifier should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

Table 2
Samples with Exceeded Preservation Requirements
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Analysis Method	Sample Condition	Preservation Requirement	ERM Qualifier
50272955	PZ-205-AS-WG-20201111	SM 4500-S2-D	pH < 9	pH > 9	UJ

Table 3

Samples with Exceeded Holding Times

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Extraction Holding Time	Total Time	Analysis Holding Time	Total Time	Affected Analyte	ERM Qualifier
50272955	PZ-106-SS-WG-20201111	SM4500-H-B	--	--	15 min.	2768 min.	pH	J
50272955	PZ-114-AS-WG-20201111	SM4500-H-B	--	--	15 min.	2895 min.	pH	J
50272955	PZ-205-AS-WG-20201111	SM4500-H-B	--	--	15 min.	2841 min.	pH	J
50272955	PZ-205-SS-WG-20201111	SM4500-H-B	--	--	15 min.	2710 min.	pH	J

Notes:

min. = minutes

Table 5
Initial Calibration Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272955	8260 Instrument 50MVDB 10/27/2020	Iodomethane	24	--	20				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ
50272955						TB-009-WQ-20201111	ND	ug/L	UJ
50272955	8270 Instrument 50MSS2 10/07/2020	Hexachlorophene	40	--	20				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ

Notes:
IC = Initial calibration
RSD = Relative standard deviation
RRF = Relative response factor

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272955	18004176ICV	Iodomethane	146 %R	--	75-125				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ
50272955						TB-009-WQ-20201111	ND	ug/L	UJ
50272955	18004176ICV	Acetonitrile	8.7 %R	--	75-125				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	R
50272955						PZ-205-AS-WG-20201111	ND	ug/L	R
50272955						PZ-106-SS-WG-20201111	ND	ug/L	R
50272955						PZ-205-SS-WG-20201111	ND	ug/L	R
50272955						FB-002-WQ-20201111	ND	ug/L	R
50272955						TB-009-WQ-20201111	ND	ug/L	R
50272955	18004176ICV	Allyl chloride	61 %R	--	75-125				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ
50272955						TB-009-WQ-20201111	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272955	18004176ICV	Methylcyclohexane	519 %R	--	75-125				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ
50272955						TB-009-WQ-20201111	ND	ug/L	UJ
50272955	18004176ICV	1,4-Dioxane	263 %R	--	75-125				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ
50272955						TB-009-WQ-20201111	ND	ug/L	UJ
50272955	17876511ICV	3,3'-Dimethylbenzidine	138 %R	--	75-125				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ
50272955	17876511ICV	Kepone	132 %R	--	75-125				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272955	17876511ICV	Famphur	132 %R	--	75-125				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ
50272955	Not present in ICV	Acetophenone	--	--	--				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ
50272955	Not present in ICV	Atrazine	--	--	--				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ
50272955	Not present in ICV	Benzaldehyde	--	--	--				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272955	Not present in ICV	Biphenyl (Diphenyl)	--	--	--				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ
50272955	Not present in ICV	Caprolactam	--	--	--				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	607	ug/L	J
50272955						FB-002-WQ-20201111	ND	ug/L	UJ
50272955	Not present in ICV	N-Nitrosodiphenylamine	--	--	--				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ
50272955	Not present in ICV	1,2,4,5-Tetrachlorobenzene	--	--	--				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272955	18130105CCV	Acetonitrile	-33 %D	--	± 25				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ
50272955						TB-009-WQ-20201111	ND	ug/L	UJ
50272955	18130105CCV	Bromomethane	55 %D	--	± 30				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ
50272955						TB-009-WQ-20201111	ND	ug/L	UJ
50272955	18130105CCV	1,4-Dioxane	-33 %D	--	± 25				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ
50272955						TB-009-WQ-20201111	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272955	18130105CCV	Iodomethane	-58 %D	--	± 25				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ
50272955						TB-009-WQ-20201111	ND	ug/L	UJ
50272955	18139078CCV	Butylbenzylphthalate	27 %D	--	± 25				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ
50272955	18139078CCV	Caprolactam	45 %D	--	± 30				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	607	ug/L	J
50272955						FB-002-WQ-20201111	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272955	18139078CCV	Carbazole	35 %D	--	± 20				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ
50272955	18139153CCV	Hexachlorophene	-26 %D	--	± 25				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ
50272955	18139153CCV	Kepone	-50 %D	--	± 25				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ
50272955	18183611CCV	2,4,5-T	25 %D	--	± 20				

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50272955	18195751CCV	2,4,5-T	23 %D	--	± 20				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ
50272955	18183611CCV	2,4,5-TP	29 %D	--	± 20				
50272955	18195751CCV	2,4,5-TP	27 %D	--	± 20				
50272955						PZ-114-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-AS-WG-20201111	ND	ug/L	UJ
50272955						PZ-106-SS-WG-20201111	ND	ug/L	UJ
50272955						PZ-205-SS-WG-20201111	ND	ug/L	UJ
50272955						FB-002-WQ-20201111	ND	ug/L	UJ

Notes:

CCV = Continuing calibration verification

%D = Percent difference

ICV = Initial calibration verification

RRF = Relative response factor

%R = Percent recovery

Table 7

Laboratory Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272955	2735387BLANK-50272955	Chromium, Total	0.18 J	2.0				ug/L	
50272955		Chromium, Total			PZ-106-SS-WG-20201111	0.65	2.0	ug/L	2.0 U
50272955		Chromium, Total			PZ-114-AS-WG-20201111	0.33	2.0	ug/L	2.0 U
50272955		Chromium, Total			PZ-205-SS-WG-20201111	0.21	2.0	ug/L	2.0 U
50272955	2735801BLANK-50272955	Barium, Total	1.3 J	10.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272955	2735801BLANK-50272955	Iron, Total	35.7 J	50.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272955	2735801BLANK-50272955	Manganese, Total	1.2 J	5.0				ug/L	
50272955		Manganese, Total			PZ-205-SS-WG-20201111	4.5	5.0	ug/L	5.0 U
50272955	2736828BLANK-50272955	Barium, Dissolved	0.64 J	10.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272955	2736828BLANK-50272955	Boron, Dissolved	12.9 J	100				ug/L	
50272955		Boron, Dissolved			PZ-205-SS-WG-20201111	54.6	100	ug/L	100 U
50272955	2736828BLANK-50272955	Manganese, Dissolved	1.3 J	5.0				ug/L	
50272955		Manganese, Dissolved			PZ-205-SS-WG-20201111	1.2	5.0	ug/L	5.0 U
50272955	2736828BLANK-50272955	Molybdenum, Dissolved	2.3 J	10.0				ug/L	
50272955		Molybdenum, Dissolved			PZ-106-SS-WG-20201111	7.1	10.0	ug/L	10.0 U
50272955		Molybdenum, Dissolved			PZ-114-AS-WG-20201111	0.69	10.0	ug/L	10.0 U
50272955		Molybdenum, Dissolved			PZ-205-SS-WG-20201111	3.0	10.0	ug/L	10.0 U
50272955	2736828BLANK-50272955	Silicon, Dissolved	67.4 J	200	None for qualification, sample results > 5x blank	--	--	ug/L	--
50272955	2736828BLANK-50272955	Sodium, Dissolved	201 J	1000	None for qualification, sample results > 5x blank	--	--	ug/L	--

Table 7

Laboratory Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272955	2736828BLANK-50272955	Titanium, Dissolved	1.0 J	10.0				ug/L	
50272955		Titanium, Dissolved			PZ-205-AS-WG-20201111	4.6	10.0	ug/L	10.0 U
50272955	2113105BLANK-50272955	Methane	4.4 J	5.0				ug/L	
50272955		Methane			PZ-205-SS-WG-20201111	11	5.0	ug/L	J+
50272955	2113881BLANK-50272955	Methane	3.9 J	5.0				ug/L	
50272955		Methane			FB-002-WQ-20201111	4.3	5.0	ug/L	5.0 U
50272955	18193403ICB-50272955	Nitrite + Nitrate as N	0.015 J	0.10				mg/L	
50272955	18193408CCB-50272955	Nitrite + Nitrate as N	0.017 J	0.10				mg/L	
50272955	18193410CCB-50272955	Nitrite + Nitrate as N	0.015 J	0.10				mg/L	
50272955		Nitrite + Nitrate as N			PZ-205-SS-WG-20201111	0.089	0.10	mg/L	0.10 U

Notes:

RL = Reporting Limit

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272955	FILTB-003-WQ-20201103	Calcium, Dissolved	413 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272955	FILTB-003-WQ-20201103	Copper, Dissolved	0.32 J	1.0				ug/L	
50272955		Copper, Dissolved			PZ-114-AS-WG-20201111	0.53	1.0	ug/L	1.0 U
50272955		Copper, Dissolved			PZ-106-SS-WG-20201111	0.50	1.0	ug/L	1.0 U
50272955	FILTB-003-WQ-20201103	Iron, Dissolved	26.2 J	50.0	None for qualification, associated sample ND	--	--	ug/L	--
50272955	FILTB-003-WQ-20201103	Magnesium, Dissolved	172 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272955	FILTB-003-WQ-20201103	Titanium, Dissolved	0.78 J	10.0	None for qualification, associated samples ND	--	--	ug/L	--
50272955	FILTB-004-WQ-20201103	Barium, Dissolved	0.58 J	10.0	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272955	FILTB-004-WQ-20201103	Calcium, Dissolved	232 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272955	FILTB-004-WQ-20201103	Chromium, Dissolved	0.12 J	2.0	None for qualification, associated samples ND or > 5x blank	--	--	ug/L	--
50272955	FILTB-004-WQ-20201103	Copper, Dissolved	0.22 J	1.0				ug/L	
50272955		Copper, Dissolved			PZ-205-SS-WG-20201111	1.1	1.0	ug/L	J+
50272955	FILTB-004-WQ-20201103	Dissolved Organic Carbon	0.80 J	1.0				ug/L	
50272955		Dissolved Organic Carbon			PZ-205-SS-WG-20201111	1.1	1.0	ug/L	J+

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50272955	FILTB-004-WQ-20201103	Magnesium, Dissolved	57.9 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272955	EB-001-WQ-20201103	Nitrate as N	0.020 J	0.050	None for qualification, associated samples ND	--	--	mg/L	--
50272955	EB-001-WQ-20201103	Nitrite + Nitrate as N	0.020 J	0.10	None for qualification, associated samples ND	--	--	mg/L	--
50272955	EB-002-WQ-20201103	Nitrate as N	0.018 J	0.050				mg/L	
50272955		Nitrate as N			PZ-205-SS-WG-20201111	0.075	0.050	mg/L	J+
50272955	EB-002-WQ-20201103	Nitrite + Nitrate as N	0.019 J	0.10				mg/L	
50272955		Nitrite + Nitrate as N			PZ-205-SS-WG-20201111	0.089	0.10	mg/L	0.10 U
50272955	FB-002-WQ-20201111	Chromium (VI)	0.0861	0.100				ug/L	
50272956		Chromium (VI)			PZ-205-SS-WG-20201111	0.0736	0.100	ug/L	0.100 U
50272955	FB-002-WQ-20201111	Silicon, Total	46.1	200	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50272955	FB-002-WQ-20201111	Sodium, Total	73.1	1000	None for qualification, associated samples > 5x blank	--	--	ug/L	--

Notes:

RL = Reporting Limit

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
LCS/LCSD										
50272955	2734607LCS-50272955/	None for qualification, samples ND	1,4-Dioxane	176/	50-150	--	--	--	--	--
50272955	2734607LCS-50272955/		Acetonitrile	7/	50-150					
50272955		FB-002-WQ-20201111	Acetonitrile					<100	ug/L	R
50272955		PZ-106-SS-WG-20201111	Acetonitrile					<100	ug/L	R
50272955		PZ-114-AS-WG-20201111	Acetonitrile					<100	ug/L	R
50272955		PZ-205-AS-WG-20201111	Acetonitrile					<1000	ug/L	R
50272955		PZ-205-SS-WG-20201111	Acetonitrile					<100	ug/L	R
50272955		TB-009-WQ-20201111	Acetonitrile					<100	ug/L	R
50272955	2734607LCS-50272955/	None for qualification, samples ND	Methylcyclohexane	476/	70-129	--	--	--	--	--
50272955	2737210LCS-50272955/	None for qualification, samples ND	Carbazole	131/	66-127	--	--	--	--	--
50272955	2739334LCS-50272955/		Cyanide CN-	1/	90-110					
50272955		PZ-106-SS-WG-20201111	Cyanide CN-					<0.0050	mg/L	R
50272955		PZ-114-AS-WG-20201111	Cyanide CN-					<0.0050	mg/L	R
50272955		PZ-205-AS-WG-20201111	Cyanide CN-					0.0028	mg/L	J-
50272955		PZ-205-SS-WG-20201111	Cyanide CN-					<0.0050	mg/L	R

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
MS/MSD										
50272955	PZ-114-AS-WG-20201111MS/		Chemical Oxygen Demand	50/	90-110					
50272955		PZ-114-AS-WG-20201111	Chemical Oxygen Demand					53.6	mg/L	J-
50272955	PZ-114-AS-WG-20201111MS/		Phosphorus	62/	90-110					
50272955		PZ-114-AS-WG-20201111	Phosphorus					2.0	mg/L	J-
50272955	PZ-205-SS-WG-20201111MS/		Acetonitrile	8/	50-150					
50272955		PZ-205-SS-WG-20201111	Acetonitrile					<100	ug/L	R
50272955	PZ-205-SS-WG-20201111MS/	None for qualification, parent sample ND	Methylcyclohexane	507/	58-121	--	--	--	--	--

Notes:

LCS/LCSD = Laboratory control sample/laboratory control sample duplicate

MS/MSD - Matrix spike/matrix spike duplicate

RPD = Relative percent difference

Table 11

Surrogate Recovery Results out of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Surrogate	Recovery (%)	Limit (%)	Affected Analyte	Dilution Factor	ERM Qualifier
50272955	PZ-205-AS-WG-20201111	SW8270C-SIM	p-Terphenyl-d14	37	68-138	All PAHs	1	J-/UJ

Notes:

PAHs = Polycyclic Aromatic Hydrocarbons

Table 13

Laboratory Duplicate Result Outliers

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Primary/Duplicate Sample ID	Analyte	Concentration		Report Limit		Units	AbD	RPD	Limit	ERM Qualifier
			Sample	Duplicate	Sample	Duplicate					
50272955	PZ-114-AS-WG-20201111	Chromium, Hexavalent	0.152	0.121	0.100	0.100	ug/L	--	23.2	20	None, results < 5x RL

Notes:

AbD = Absolute Difference

RPD = Relative percent difference

ERM

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Memorandum

To	Alice Sandzen
From	Rachel James
Date	2021-06-18
Reference	0579381
Subject	Revised Data Review of West Lake OU-3 RI/FS Routine Groundwater Samples Collected 11/12/2020: Pace Data Package 50273142.

This memorandum was revised to address changes to the initial calibration verification data for Gas Chromatography/Mass Spectrometry methods issued by the laboratory after the initial validation was complete. Table 6 has been revised as needed.

The data quality was assessed and any necessary qualifiers were applied following the Quality Assurance Project Plan (QAPP) for West Lake OU-3 Remediation Investigation/Feasibility Study, Revision 3, December 2020, USEPA Contract Laboratory Program (CLP) NFGs for Organic Superfund Methods Data Review, document number EPA-540-R-2017-002, January 2017, USEPA CLP NFGs for Inorganic Superfund Methods Data Review, document number EPA-540-R-2017-001, January 2017, and USEPA Region 1—New England Environmental Data Review Supplement for Region 1 Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement1, June 2018, the protocols and quality control (QC) requirements of the analytical methods, and the reviewer's professional judgement.

A Stage 2B data validation was performed on 100% of the laboratory data.

The following items were reviewed as part of the data validation:

- **Chain of Custody:** The chains of custody were reviewed for proper completion and that the laboratory performed the requested methods and reported the requested target analytes for each sample.
- **Dilutions and Reanalysis:** Dilutions, calibration ranges, and reanalyses were reviewed as applicable. The best result was chosen when more than one result was reported as final.
- **Sample Preservation:** The appropriate temperature and chemical preservation requirements were reviewed. Headspace for volatile sample analysis was reviewed.
- **Holding Times:** The period of time between collection of the sample and preparation/analysis of the sample was evaluated.
- **Instrument Tuning:** Instrument tuning and performance check frequency and results were reviewed.
- **Calibration:** The initial calibration type, fit, number of standards, and minimum response factors were evaluated. Additionally, the frequency and percent recoveries for initial and continuing calibration verification standards and blanks were evaluated.
- **Laboratory Blank Samples:** The preparation and analysis of reagent (contaminant-free) water was evaluated, along with the required frequency.

- **Field Blank Samples:** The collection and analysis of field blanks was evaluated. The reviewed data package(s) included the following associated field blanks: trip, filter, and equipment
- **Spike Samples:** Laboratory control, matrix spike, and post digestion spike sample preparation frequency and recoveries were reviewed as applicable.
- **Serial Dilutions:** Serial dilution sample preparation frequency and recoveries were reviewed as applicable.
- **Surrogate Spikes:** The addition of appropriate surrogates and their recoveries were evaluated.
- **Internal standards:** The presence and recoveries of internal standards and their appropriate association to target analytes were reviewed.
- **Laboratory Duplicate Samples:** Laboratory duplicate frequencies and recoveries were reviewed as applicable.
- **Field Duplicate Samples:** Field duplicate recoveries and absolute differences were reviewed as applicable.
- **Column Agreement:** Column agreements were reviewed for relevant methods.

Findings of the data validation are summarized in the sections below. As necessary, the following data quality flags were applied during validation.

J = estimated concentration
J+ = the result is an estimated concentration, but may be biased high
J- = the result is an estimated concentration, but may be biased low
UJ = estimated reporting limit
U = evaluated to be non-detected at the reporting limit
R = rejected, data not usable
NJ = tentative identification and estimated concentration

Validation outliers and any necessary data qualifications are summarized in outlier tables at the end of this memo. The table below indicates the included validation tables with findings. Tables without findings have been omitted.

Table Number	Table Name	Included
Table 1	Samples with Non-Preferred Results	No
Table 2	Samples with Exceeded Preservation Requirements	No
Table 3	**Samples with Exceeded Holding Times**	**Yes**
Table 4	Instrument Tuning Outside of Acceptable Limits	No
Table 5	**Initial Calibration Outside of Acceptable Limits**	**Yes**
Table 6	**Calibration Verification Outside of Acceptable Limits**	**Yes**
Table 7	**Laboratory Blank and Associated Suspect Sample Detections**	**Yes**
Table 8	**Field Blank and Associated Suspect Sample Detections**	**Yes**
Table 9	**Spike Recoveries Outside of Acceptable Limits**	**Yes**
Table 10	Serial Dilution Recoveries Outside of Acceptable Limits	No
Table 11	Surrogate Recovery Results out of Acceptable Limits	No
Table 12	Internal Standard Recovery Results out of Acceptable Limits	No

Table Number	Table Name	Included
Table 13	Laboratory Duplicate Result Outliers	No
Table 14	Field Duplicate Result Outliers	No
Table 15	Column Agreement Outliers	No
Table 16	Calibration Range Exceedances	No
Table 17	Professional Judgement Qualifiers	No

Findings of the data validation are summarized in the sections below.

CASE NARRATIVE NOTES AND CHAIN-OF-CUSTODY DISCREPANCIES

The laboratory indicated that it does not hold NELAC/TNI accreditation for the methods and parameters in non-potable water listed below. No qualifiers were applied based on accreditation status. Supporting calibrations and quality control data was provided for these analytes and reviewed as part of the data validation.

Method	Analyte without NELAC/TNI Accreditation	
	CAS	Analyte Name
EPA SW 6020	7440-29-1	Thorium
	7440-61-1	Uranium
EPA SW 6010	7440-21-3	Silicon
EPA SW 8082	1336-36-3	Total PCBs
EPA SW 8270	92-52-4	Biphenyl
	99-35-4	1,3,5-Trinitrobenzene
	1912-24-9	Atrazine
	106-50-3	p-Phenylenediamine
	105-60-2	Caprolactam
	95-53-4	o-Toluidine
	100-52-7	Benzaldehyde
EPA SW 8260	110-82-7	Cyclohexane
	108-87-2	Methylcyclohexane
	78-83-1	Isobutyl alcohol
	79-20-9	Methyl acetate
	126-99-8	beta-Chloroprene
EPA SW 9056	20461-54-5	Iodide

No discrepancies between the chains-of-custody and the sample containers received were noted by the laboratory.

PRESERVATION AND HOLDING TIME EVALUATION

The laboratory received the sample shipments within the method-prescribed temperature preservation requirements of less than 6 degrees Celsius, with acceptable sample pH values, and

all vials for volatile analysis were received in good condition with headspace of less than 6 millimeters.

The samples were prepared and analyzed within the method-prescribed time period from the date of collection, with the exceptions and any necessary qualifications noted in Table 3.

INSTRUMENT TUNING EVALUATION

All tuning criteria met method acceptance criteria.

INITIAL CALIBRATION

The initial calibrations met the minimum number of calibration standards, project required percent standard deviation (%RSD), relative correlation coefficient, and minimum relative response factor (RRF) limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 5.

INITIAL CALIBRATION VERIFICATION (ICV) AND CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION

The initial and continuing calibration verifications were within project-specified percent difference (%D) or percent recoveries (%R) and RRF limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 6.

Situations that required additional professional judgement are detailed below:

- SVOC analytes acetophenone, atrazine, benzaldehyde, biphenyl (diphenyl), caprolactam, N-nitrosodiphenylamine, and 1,2,4,5-tetrachlorobenzene were not reported in the ICV samples. These analytes were present in the initial calibrations and CCV samples and were within control limits. The non-detected results in associated samples have been qualified UJ.

LABORATORY BLANK EVALUATION

The laboratory blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 7. The blank results indicate that contaminants may have been introduced to the samples during processing or analysis in the laboratory.

FIELD BLANK EVALUATION

The trip, filter, and equipment blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 8. Any field blank detections associated with laboratory blank contamination and qualified as non-detected (U) are not included in Table 8. The blank results indicate that contaminants may have been introduced to the samples during collection, shipment, handling, and storage.

BLANK AND MATRIX SPIKE EVALUATION

The laboratory control sample (LCS), laboratory control sample duplicate (LCSD) recoveries, and relative percent differences (RPDs) were within the laboratory's limits of acceptance, with the

exceptions and any necessary qualifications noted in Table 9. Data were not qualified if a high recovery was associated with a non-detected result.

The matrix spike (MS), matrix spike duplicate (MSD) recoveries, and RPDs were within the laboratory's limits of acceptance for target analytes for spiked project samples, with the exceptions and any necessary qualifications noted in Table 9. MS/MSDs performed on non-project samples were not reviewed. Data were not qualified if the analyte concentration in the parent sample was greater than four times the spike amount, if the spike amount was diluted out prior to analysis, or if a high recovery was associated with a non-detected result.

SERIAL DILUTION EVALUATION

The laboratory did not perform serial dilutions on any project samples. Serial dilutions performed on non-project samples were not reviewed.

SURROGATE SPIKE EVALUATION

The surrogate recoveries were within the laboratory limits of acceptance. The acceptable surrogate recoveries indicate minimal matrix interference in the samples.

INTERNAL STANDARD EVALUATION

The internal standard responses for reported results were within acceptable limits. The acceptable internal standard responses indicate that the instrument sensitivity and response were stable during each analysis.

LABORATORY DUPLICATE EVALUATION

The laboratory prepared at least one project sample as a laboratory duplicate. Laboratory duplicates performed on non-project samples were not reviewed. The RPDs between the primary sample and the duplicate were within laboratory control limits, indicating acceptable laboratory precision.

FIELD DUPLICATE EVALUATION

No field duplicates were submitted to the laboratory.

COLUMN AGREEMENT EVALUATION

Column agreements met method criteria for dual column analysis.

CALIBRATION RANGE EVALUATION

All results were reported within each instrument's calibration range.

SENSITIVITY

The sample results were reported down to the method detection limit. Results between the method detection limit and the reporting limit were flagged as estimated (J) by the laboratory. All non-detected results were reported from undiluted samples.

COMPLETENESS

The complete data package consisted of 1590 reportable data points excluding field blank samples. 5 data points were rejected. The data completeness measure for this data package is calculated to be 99.7%. The project laboratory completeness goal of 95% was met.

OVERALL ASSESSMENT

All qualified data, excluding rejected data, can be used for decision-making purposes; however, the limitation identified by the applied qualifier should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

Table 3

Samples with Exceeded Holding Times

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Extraction Holding Time	Total Time	Analysis Holding Time	Total Time	Affected Analyte	ERM Qualifier
50273142	D-12-WG-20201112	SM4500-H-B	--	--	15 min.	8720 min.	pH	J
50273142	D-6-WG-20201112	SM4500-H-B	--	--	15 min.	8577 min.	pH	J
50273142	I-11-WG-20201112	SM4500-H-B	--	--	15 min.	8831 min.	pH	J
50273142	PZ-101-SS-WG-20201112	SM4500-H-B	--	--	15 min.	8831 min.	pH	J
50273142	PZ-104-SS-WG-20201112	SM4500-H-B	--	--	15 min.	8581 min.	pH	J

Notes:

min. = minutes

Table 5
Initial Calibration Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273142	8260 Instrument 50MVDB 10/27/2020	Iodomethane	24	--	20				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142						TB-010-WQ-20201112	ND	ug/L	UJ
50273142	8270 Instrument 50MSS6 10/07/2020	Famphur	34	--	20				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142	8270 Instrument 50MSS6 10/07/2020	Hexachlorophene	25	--	20				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ

Table 5
Initial Calibration Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273142	8270 Instrument 50MSS6 10/07/2020	Kepone	26	--	20				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142	8270 Instrument 50MSS6 10/07/2020	3,3'-Dimethylbenzidine	21	--	20				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ

Notes:
IC = Initial calibration
RSD = Relative standard deviation
RRF = Relative response factor

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273142	18004176ICV	Iodomethane	146 %R	--	75-125				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142						TB-010-WQ-20201112	ND	ug/L	UJ
50273142	18004176ICV	Acetonitrile	8.7 %R	--	75-125				
50273142						I-11-WG-20201112	ND	ug/L	R
50273142						PZ-101-SS-WG-20201112	ND	ug/L	R
50273142						D-12-WG-20201112	ND	ug/L	R
50273142						D-6-WG-20201112	ND	ug/L	R
50273142						PZ-104-SS-WG-20201112	ND	ug/L	R
50273142						TB-010-WQ-20201112	ND	ug/L	R
50273142	18004176ICV	Allyl chloride	61 %R	--	75-125				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142						TB-010-WQ-20201112	ND	ug/L	UJ
50273142	18004176ICV	Methylcyclohexane	519 %R	--	75-125				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142						TB-010-WQ-20201112	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273142	18004176ICV	1,4-Dioxane	263 %R	--	75-125				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142						TB-010-WQ-20201112	ND	ug/L	UJ
50273142	17873843ICV	p-Phenylenediamine	139 %R	--	75-125				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142	17873843ICV	1,3,5-Trinitrobenzene	128 %R	--	75-125				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142	17873843ICV	P-Dimethylaminoazobenzene	128 %R	--	75-125				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273142	17873843ICV	3,3'-Dimethylbenzidine	135 %R	--	75-125				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142	17873843ICV	Famphur	161 %R	--	75-125				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142	Not present in ICV	Acetophenone	--	--	--				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142	Not present in ICV	Atrazine	--	--	--				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273142	Not present in ICV	Benzaldehyde	--	--	--				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142	Not present in ICV	Biphenyl (Diphenyl)	--	--	--				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142	Not present in ICV	Caprolactam	--	--	--				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142	Not present in ICV	N-Nitrosodiphenylamine	--	--	--				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273142	Not present in ICV	1,2,4,5-Tetrachlorobenzene	--	--	--				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142	18137443CCV	Acetonitrile	-35 %D	--	± 25				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142						TB-010-WQ-20201112	ND	ug/L	UJ
50273142	18137443CCV	Bromomethane	33 %D	--	± 30				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142						TB-010-WQ-20201112	ND	ug/L	UJ
50273142	18137443CCV	Dichlorodifluoromethane	-77 %D	--	± 40				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142						TB-010-WQ-20201112	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273142	18137443CCV	Iodomethane	-60 %D	--	± 25				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142						TB-010-WQ-20201112	ND	ug/L	UJ
50273142	18156719CCV	Hexachlorophene	-31 %D	--	± 25				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142	18232158CCV	2,4-D	32 %D	--	± 20				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142	18232156CCV	Dinoseb	39 %D	--	± 20				
50273142	18232158CCV	Dinoseb	37 %D	--	± 20				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273142	18232156CCV	2,4,5-T	32 %D	--	± 20				
50273142	18232158CCV	2,4,5-T	43 %D	--	± 20				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ
50273142	18232156CCV	2,4,5-TP	33 %D	--	± 20				
50273142	18232158CCV	2,4,5-TP	42 %D	--	± 20				
50273142						I-11-WG-20201112	ND	ug/L	UJ
50273142						PZ-101-SS-WG-20201112	ND	ug/L	UJ
50273142						D-12-WG-20201112	ND	ug/L	UJ
50273142						D-6-WG-20201112	ND	ug/L	UJ
50273142						PZ-104-SS-WG-20201112	ND	ug/L	UJ

Notes:
CCV = Continuing calibration verification
%D = Percent difference
ICV = Initial calibration verification
RRF = Relative response factor
%R = Percent recovery

Table 7

Laboratory Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50273142	2735387BLANK-50273142	Chromium, Total	0.18 J	2.0				ug/L	
50273142		Chromium, Total			D-12-WG-20201112	0.59	2.0	ug/L	2.0 U
50273142		Chromium, Total			D-6-WG-20201112	0.61	2.0	ug/L	2.0 U
50273142		Chromium, Total			I-11-WG-20201112	0.52	2.0	ug/L	2.0 U
50273142		Chromium, Total			PZ-101-SS-WG-20201112	1.4	2.0	ug/L	2.0 U
50273142		Chromium, Total			PZ-104-SS-WG-20201112	0.37	2.0	ug/L	2.0 U
50273142	2736357BLANK-50273142	Methylene chloride	1.0 J	5.0	None for qualification, samples ND	--	--	ug/L	--
50273142	2736828BLANK-50273142	Barium, Dissolved	0.64 J	10.0	None for qualification, samples > 5x blank	--	--	ug/L	--
50273142	2736828BLANK-50273142	Boron, Dissolved	12.9 J	100	None for qualification, samples > 5x blank	--	--	ug/L	--
50273142	2736828BLANK-50273142	Manganese, Dissolved	1.3 J	5.0	None for qualification, samples > 5x blank	--	--	ug/L	--
50273142	2736828BLANK-50273142	Molybdenum, Dissolved	2.3 J	10.0				ug/L	
50273142		Molybdenum, Dissolved			D-12-WG-20201112	0.83	10.0	ug/L	10.0 U
50273142		Molybdenum, Dissolved			D-6-WG-20201112	2.2	10.0	ug/L	10.0 U
50273142		Molybdenum, Dissolved			I-11-WG-20201112	1.7	10.0	ug/L	10.0 U
50273142		Molybdenum, Dissolved			PZ-101-SS-WG-20201112	0.96	10.0	ug/L	10.0 U
50273142		Molybdenum, Dissolved			PZ-104-SS-WG-20201112	11.4	10.0	ug/L	J+
50273142	2736828BLANK-50273142	Silicon, Dissolved	67.4 J	200	None for qualification, samples > 5x blank	--	--	ug/L	--
50273142	2736828BLANK-50273142	Sodium, Dissolved	201 J	1000	None for qualification, samples > 5x blank	--	--	ug/L	--

Table 7
Laboratory Blank and Associated Suspect Sample Detections
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50273142	2736828BLANK-50273142	Titanium, Dissolved	1.0 J	10.0				ug/L	
50273142		Titanium, Dissolved			D-12-WG-20201112	0.63	10.0	ug/L	10.0 U
50273142		Titanium, Dissolved			PZ-104-SS-WG-20201112	0.74	10.0	ug/L	10.0 U
50273142	2741809BLANK-50273142	Boron, Total	14.3 J	100	None for qualification, samples > 5x blank	--	--	ug/L	--
50273142	2741809BLANK-50273142	Iron, Total	36.3 J	50.0	None for qualification, samples > 5x blank	--	--	ug/L	--
50273142	2744740BLANK-50273142	Nitrite + Nitrate as N	0.019 J	0.10				mg/L	
50273142		Nitrite + Nitrate as N			PZ-101-SS-WG-20201112	0.023	0.10	mg/L	0.10 U
50273142		Nitrite + Nitrate as N			PZ-104-SS-WG-20201112	0.070	0.10	mg/L	0.10 U
50273142	2115654BLANK-50273142	Methane	3.5 J	5.0				ug/L	
50273142		Methane			PZ-104-SS-WG-20201112	3.6	5.0	ug/L	5.0 U
50273142	18193403ICB-50273142	Nitrite + Nitrate as N	0.015 J	0.10				mg/L	
50273142	18193410CCB-50273142	Nitrite + Nitrate as N	0.015 J	0.10				mg/L	
50273142	18193413CCB-50273142	Nitrite + Nitrate as N	0.020 J	0.10				mg/L	
50273142	18193415CCB-50273142	Nitrite + Nitrate as N	0.019 J	0.10				mg/L	
50273142	18193417CCB-50273142	Nitrite + Nitrate as N	0.013 J	0.10				mg/L	
50273142		Nitrite + Nitrate as N			PZ-101-SS-WG-20201112	0.023	0.10	mg/L	0.10 U
50273142		Nitrite + Nitrate as N			PZ-104-SS-WG-20201112	0.070	0.10	mg/L	0.10 U

Notes:
RL = Reporting Limit

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50273142	FILTB-003-WQ-20201103	Calcium, Dissolved	413 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50273142	FILTB-003-WQ-20201103	Copper, Dissolved	0.32 J	1.0				ug/L	
50273142		Copper, Dissolved			I-11-WG-20201112	0.41	1.0	ug/L	1.0 U
50273142		Copper, Dissolved			D-12-WG-20201112	1.2	1.0	ug/L	J+
50273142		Copper, Dissolved			D-6-WG-20201112	0.68	1.0	ug/L	1.0 U
50273142	FILTB-003-WQ-20201103	Iron, Dissolved	26.2 J	50.0	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50273142	FILTB-003-WQ-20201103	Magnesium, Dissolved	172 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50273142	FILTB-003-WQ-20201103	Titanium, Dissolved	0.78 J	10.0				ug/L	
50273142		Titanium, Dissolved			D-12-WG-20201112	0.63	10.0	ug/L	10.0 U
50273142	FILTB-004-WQ-20201103	Barium, Dissolved	0.58 J	10.0	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50273142	FILTB-004-WQ-20201103	Calcium, Dissolved	232 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50273142	FILTB-004-WQ-20201103	Chromium, Dissolved	0.12 J	2.0				ug/L	
50273142		Chromium, Dissolved			PZ-101-SS-WG-20201112	1.2	2.0	ug/L	2.0 U
50273142	FILTB-004-WQ-20201103	Copper, Dissolved	0.22 J	1.0				ug/L	
50273142		Copper, Dissolved			PZ-101-SS-WG-20201112	0.64	1.0	ug/L	1.0 U
50273142	FILTB-004-WQ-20201103	Dissolved Organic Carbon	0.80 J	1.0				ug/L	
50273142		Dissolved Organic Carbon			PZ-104-SS-WG-20201112	1.1	1.0	ug/L	J+

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50273142	FILTB-004-WQ-20201103	Magnesium, Dissolved	57.9 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50273142	EB-001-WQ-20201103	Nitrate as N	0.020 J	0.050	None for qualification, samples ND	--	--	mg/L	--
50273142	EB-001-WQ-20201103	Nitrite + Nitrate as N	0.020 J	0.10	None for qualification, samples ND	--	--	mg/L	--
50273142	EB-002-WQ-20201103	Nitrate as N	0.018 J	0.050				mg/L	
50273142		Nitrate as N			PZ-104-SS-WG-20201112	0.082	0.050	mg/L	J+
50273142	EB-002-WQ-20201103	Nitrite + Nitrate as N	0.019 J	0.10				mg/L	
50273142		Nitrite + Nitrate as N			PZ-101-SS-WG-20201112	0.023	0.10	mg/L	0.10 U
50273142		Nitrite + Nitrate as N			PZ-104-SS-WG-20201112	0.070	0.10	mg/L	0.10 U

Notes:

RL = Reporting Limit

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
LCS/LCSD										
50273142	2736358LCS-50273142/		Acetonitrile	7/	50-150					
50273142		D-12-WG-20201112	Acetonitrile					<100	ug/L	R
50273142		D-6-WG-20201112	Acetonitrile					<100	ug/L	R
50273142		I-11-WG-20201112	Acetonitrile					<100	ug/L	R
50273142		PZ-101-SS-WG-20201112	Acetonitrile					<100	ug/L	R
50273142		PZ-104-SS-WG-20201112	Acetonitrile					<100	ug/L	R
50273142		TB-010-WQ-20201112	Acetonitrile					<100	ug/L	R
50273142	2736358LCS-50273142/	None for qualification, samples ND	Methylcyclohexane	452/	70-129	--	--	--	--	--
MS/MSD										
50273142	I-11-WG-20201112MS/		Sulfide	56/	90-110					
50273142		I-11-WG-20201112	Sulfide					<1.0	mg/L	UJ

Notes:

LCS/LCSD = Laboratory control sample/laboratory control sample duplicate

MS/MSD - Matrix spike/matrix spike duplicate

RPD = Relative percent difference

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Memorandum

To	Alice Sandzen
From	Jack James
Date	2021-06-18
Reference	0579381
Subject	Revised Data Review of West Lake OU-3 RI/FS Routine Groundwater Samples Collected 11/13/2020: Pace Data Package 50273293.

This memorandum was revised to address changes to the initial calibration verification data for Gas Chromatography/Mass Spectrometry methods issued by the laboratory after the initial validation was complete. Table 6 has been revised as needed.

The data quality was assessed and any necessary qualifiers were applied following the Quality Assurance Project Plan (QAPP) for West Lake OU-3 Remediation Investigation/Feasibility Study, Revision 3, December 2020, USEPA Contract Laboratory Program (CLP) NFGs for Organic Superfund Methods Data Review, document number EPA-540-R-2017-002, January 2017, USEPA CLP NFGs for Inorganic Superfund Methods Data Review, document number EPA-540-R-2017-001, January 2017, and USEPA Region 1—New England Environmental Data Review Supplement for Region 1 Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement1, June 2018, the protocols and quality control (QC) requirements of the analytical methods, and the reviewer's professional judgement.

A Stage 2B data validation was performed on 100% of the laboratory data.

The following items were reviewed as part of the data validation:

- **Chain of Custody:** The chains of custody were reviewed for proper completion and that the laboratory performed the requested methods and reported the requested target analytes for each sample.
- **Dilutions and Reanalysis:** Dilutions, calibration ranges, and reanalyses were reviewed as applicable. The best result was chosen when more than one result was reported as final.
- **Sample Preservation:** The appropriate temperature and chemical preservation requirements were reviewed. Headspace for volatile sample analysis was reviewed.
- **Holding Times:** The period of time between collection of the sample and preparation/analysis of the sample was evaluated.
- **Instrument Tuning:** Instrument tuning and performance check frequency and results were reviewed.
- **Calibration:** The initial calibration type, fit, number of standards, and minimum response factors were evaluated. Additionally, the frequency and percent recoveries for initial and continuing calibration verification standards and blanks were evaluated.
- **Laboratory Blank Samples:** The preparation and analysis of reagent (contaminant-free) water was evaluated, along with the required frequency.

- **Field Blank Samples:** The collection and analysis of field blanks was evaluated. The reviewed data package(s) included the following associated field blanks: trip, filter, and equipment
- **Spike Samples:** Laboratory control, matrix spike, and post digestion spike sample preparation frequency and recoveries were reviewed as applicable.
- **Serial Dilutions:** Serial dilution sample preparation frequency and recoveries were reviewed as applicable.
- **Surrogate Spikes:** The addition of appropriate surrogates and their recoveries were evaluated.
- **Internal standards:** The presence and recoveries of internal standards and their appropriate association to target analytes were reviewed.
- **Laboratory Duplicate Samples:** Laboratory duplicate frequencies and recoveries were reviewed as applicable.
- **Field Duplicate Samples:** Field duplicate recoveries and absolute differences were reviewed as applicable.
- **Column Agreement:** Column agreements were reviewed for relevant methods.

Findings of the data validation are summarized in the sections below. As necessary, the following data quality flags were applied during validation.

J = estimated concentration
J+ = the result is an estimated concentration, but may be biased high
J- = the result is an estimated concentration, but may be biased low
UJ = estimated reporting limit
U = evaluated to be non-detected at the reporting limit
R = rejected, data not usable
NJ = tentative identification and estimated concentration

Validation outliers and any necessary data qualifications are summarized in outlier tables at the end of this memo. The table below indicates the included validation tables with findings. Tables without findings have been omitted.

Table Number	Table Name	Included
Table 1	Samples with Non-Preferred Results	No
Table 2	Samples with Exceeded Preservation Requirements	No
Table 3	**Samples with Exceeded Holding Times**	**Yes**
Table 4	Instrument Tuning Outside of Acceptable Limits	No
Table 5	**Initial Calibration Outside of Acceptable Limits**	**Yes**
Table 6	**Calibration Verification Outside of Acceptable Limits**	**Yes**
Table 7	**Laboratory Blank and Associated Suspect Sample Detections**	**Yes**
Table 8	**Field Blank and Associated Suspect Sample Detections**	**Yes**
Table 9	**Spike Recoveries Outside of Acceptable Limits**	**Yes**
Table 10	**Serial Dilution Recoveries Outside of Acceptable Limits**	**Yes**
Table 11	Surrogate Recovery Results out of Acceptable Limits	No
Table 12	Internal Standard Recovery Results out of Acceptable Limits	No

Table Number	Table Name	Included
Table 13	Laboratory Duplicate Result Outliers	No
Table 14	Field Duplicate Result Outliers	No
Table 15	**Column Agreement Outliers**	**Yes**
Table 16	Calibration Range Exceedances	No
Table 17	Professional Judgement Qualifiers	No

Findings of the data validation are summarized in the sections below.

CASE NARRATIVE NOTES AND CHAIN-OF-CUSTODY DISCREPANCIES

The laboratory indicated that it does not hold NELAC/TNI accreditation for the methods and parameters in non-potable water listed below. No qualifiers were applied based on accreditation status. Supporting calibrations and quality control data was provided for these analytes and reviewed as part of the data validation.

Method	Analyte without NELAC/TNI Accreditation	
	CAS	Analyte Name
EPA SW 6020	7440-29-1	Thorium
	7440-61-1	Uranium
EPA SW 6010	7440-21-3	Silicon
EPA SW 8082	1336-36-3	Total PCBs
EPA SW 8270	92-52-4	Biphenyl
	99-35-4	1,3,5-Trinitrobenzene
	1912-24-9	Atrazine
	106-50-3	p-Phenylenediamine
	105-60-2	Caprolactam
	95-53-4	o-Toluidine
	100-52-7	Benzaldehyde
EPA SW 8260	110-82-7	Cyclohexane
	108-87-2	Methylcyclohexane
	78-83-1	Isobutyl alcohol
	79-20-9	Methyl acetate
	126-99-8	beta-Chloroprene
EPA SW 9056	20461-54-5	Iodide

No discrepancies between the chains-of-custody and the sample containers received were noted by the laboratory.

PRESERVATION AND HOLDING TIME EVALUATION

The laboratory received the sample shipments within the method-prescribed temperature preservation requirements of less than 6 degrees Celsius, with acceptable sample pH values, and

all vials for volatile analysis were received in good condition with headspace of less than 6 millimeters.

The samples were prepared and analyzed within the method-prescribed time period from the date of collection, with the exceptions and any necessary qualifications noted in Table 3.

INSTRUMENT TUNING EVALUATION

All tuning criteria met method acceptance criteria.

INITIAL CALIBRATION

The initial calibrations met the minimum number of calibration standards, project required percent standard deviation (%RSD), relative correlation coefficient, and minimum relative response factor (RRF) limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 5.

INITIAL CALIBRATION VERIFICATION (ICV) AND CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION

The initial and continuing calibration verifications were within project-specified percent difference (%D) or percent recoveries (%R) and RRF limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 6.

Situations that required additional professional judgement are detailed below:

- SVOC analytes acetophenone, atrazine, benzaldehyde, biphenyl (diphenyl), caprolactam, N-nitrosodiphenylamine, and 1,2,4,5-tetrachlorobenzene were not reported in the ICV samples. These analytes were present in the initial calibrations and CCV samples and were within control limits. The non-detected results in associated samples have been qualified UJ.

LABORATORY BLANK EVALUATION

The laboratory blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 7. The blank results indicate that contaminants may have been introduced to the samples during processing or analysis in the laboratory.

FIELD BLANK EVALUATION

The trip, filter, and equipment blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 8. Any field blank detections associated with laboratory blank contamination and qualified as non-detected (U) are not included in Table 8. The blank results indicate that contaminants may have been introduced to the samples during collection, shipment, handling, and storage.

BLANK AND MATRIX SPIKE EVALUATION

The laboratory control sample (LCS), laboratory control sample duplicate (LCSD) recoveries, and relative percent differences (RPDs) were within the laboratory's limits of acceptance, with the

exceptions and any necessary qualifications noted in Table 9. Data were not qualified if a high recovery was associated with a non-detected result.

The matrix spike (MS), matrix spike duplicate (MSD) recoveries, and RPDs were within the laboratory's limits of acceptance for target analytes for spiked project samples, with the exceptions and any necessary qualifications noted in Table 9. MS/MSDs performed on non-project samples were not reviewed. Data were not qualified if the analyte concentration in the parent sample was greater than four times the spike amount, if the spike amount was diluted out prior to analysis, or if a high recovery was associated with a non-detected result.

SERIAL DILUTION EVALUATION

The metals serial dilution sample percent differences were within laboratory limits of acceptance, with the exceptions and any necessary qualifications noted in Table 10. Results were not qualified if the analyte concentration in the original sample was less than 50 times the detection limit. Serial dilutions performed on non-project samples were not reviewed.

SURROGATE SPIKE EVALUATION

The surrogate recoveries were within the laboratory limits of acceptance. The acceptable surrogate recoveries indicate minimal matrix interference in the samples.

INTERNAL STANDARD EVALUATION

The internal standard responses for reported results were within acceptable limits. The acceptable internal standard responses indicate that the instrument sensitivity and response were stable during each analysis.

LABORATORY DUPLICATE EVALUATION

The laboratory prepared at least one project sample as a laboratory duplicate. Laboratory duplicates performed on non-project samples were not reviewed. The RPDs between the primary sample and the duplicate were within laboratory control limits, indicating acceptable laboratory precision.

FIELD DUPLICATE EVALUATION

One field sample was submitted to the laboratory as a blind duplicate. RPDs and absolute differences were calculated as appropriate and compared to the limits established in the QAPP. The QAPP states that the RPDs must be less than or equal to 30 percent for aqueous samples when analytes are detected in both samples and these results are greater than or equal to five times the reporting limit. If one or both results are less than five times the reporting limit, or one result is detected and one is non-detected, the absolute difference between the results must be less than two times the reporting limit (if the reporting limits are not the same between the parent and field duplicate samples, the lower of the two was used for the control limit determination). The reporting limit was used for non-detected analytes when calculating absolute difference.

All RPDs and/or absolute differences were within QAPP criteria.

COLUMN AGREEMENT EVALUATION

Column agreements met method criteria for dual column analysis, with the exceptions and any necessary qualifications noted in Table 15.

CALIBRATION RANGE EVALUATION

All results were reported within each instrument's calibration range.

SENSITIVITY

The sample results were reported to the method detection limit. Results between the method detection limit and the reporting limit were flagged as estimated (J) by the laboratory. A number of sample analyses were performed at a dilution factor, resulting in non-detected results reported at elevated reporting limits due to the presence of high levels of non-target analytes or other matrix interference.

COMPLETENESS

The complete data package consisted of 1590 reportable data points excluding field blank samples. 5 data points were rejected. The data completeness measure for this data package is calculated to be 99.7%. The project laboratory completeness goal of 95% was met.

OVERALL ASSESSMENT

All qualified data, excluding rejected data, can be used for decision-making purposes; however, the limitation identified by the applied qualifier should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

Table 3

Samples with Exceeded Holding Times

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Extraction Holding Time	Total Time	Analysis Holding Time	Total Time	Affected Analyte	ERM Qualifier
50273293	D-13-WG-20201113	SM4500-H-B	--	--	15 min.	7147 min.	pH	J
50273293	DUP-004-WG-20201113	SM4500-H-B	--	--	15 min.	8020 min.	pH	J
50273293	EB-003-WQ-20201113	SM4500-H-B	--	--	15 min.	7084 min.	pH	J
50273293	PZ-106-KS-WG-20201113	SM4500-H-B	--	--	15 min.	7191 min.	pH	J
50273293	PZ-106-SD-WG-20201113	SM4500-H-B	--	--	15 min.	7409 min.	pH	J
50273293	S-10-WG-20201113	SM4500-H-B	--	--	15 min.	7411 min.	pH	J

Notes:

min. = minutes

Table 5
Initial Calibration Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273293	8260 Instrument 50MVDB 11/17/20	Iodomethane	52	--	20				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293						TB-011-WQ-20201113	ND	ug/L	UJ
50273293	8270 Instrument 50MSS6 10/07/2020	Famphur	34	--	20				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293	8270 Instrument 50MSS6 10/07/2020	Hexachlorophene	25	--	20				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273293	8270 Instrument 50MSS6 10/07/2020	Kepone	26	--	20				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293	8270 Instrument 50MSS6 10/07/2020	3,3'-Dimethylbenzidine	21	--	20				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ

Notes:

IC = Initial calibration

RSD = Relative standard deviation

RRF = Relative response factor

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273293	18155724ICV	Vinyl chloride	71 %R	--	75-125				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293						TB-011-WQ-20201113	ND	ug/L	UJ
50273293	18155724ICV	Chloromethane	59 %R	--	70-130				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293						TB-011-WQ-20201113	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273293	18155724ICV	Acetonitrile	8.8 %R	--	75-125				
50273293						D-13-WG-20201113	ND	ug/L	R
50273293						DUP-004-WG-20201113	ND	ug/L	R
50273293						EB-003-WQ-20201113	ND	ug/L	R
50273293						PZ-106-KS-WG-20201113	ND	ug/L	R
50273293						PZ-106-SD-WG-20201113	ND	ug/L	R
50273293						S-10-WG-20201113	ND	ug/L	R
50273293						TB-011-WQ-20201113	ND	ug/L	R
50273293	18155724ICV	Allyl chloride	56 %R	--	75-125				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293						TB-011-WQ-20201113	ND	ug/L	UJ
50273293	18155724ICV	Vinyl acetate	65 %R	--	75-125				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293						TB-011-WQ-20201113	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273293	18155724ICV	Methylcyclohexane	516 %R	--	75-125				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293						TB-011-WQ-20201113	ND	ug/L	UJ
50273293	17873843ICV	p-Phenylenediamine	139 %R	--	75-125				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293	17873843ICV	1,3,5-Trinitrobenzene	128 %R	--	75-125				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273293	17873843ICV	P-Dimethylaminoazobenzene	128 %R	--	75-125				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293	17873843ICV	3,3'-Dimethylbenzidine	135 %R	--	75-125				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293	17873843ICV	Famphur	161 %R	--	75-125				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273293	Not present in ICV	Acetophenone	--	--	--				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293	Not present in ICV	Atrazine	--	--	--				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293	Not present in ICV	Benzaldehyde	--	--	--				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273293	Not present in ICV	Biphenyl (Diphenyl)	--	--	--				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293	Not present in ICV	Caprolactam	--	--	--				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293	Not present in ICV	N-Nitrosodiphenylamine	--	--	--				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273293	Not present in ICV	1,2,4,5-Tetrachlorobenzene	--	--	--				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293	18163986CCV	Bromomethane	63 %D	--	± 30				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293						TB-011-WQ-20201113	ND	ug/L	UJ
50273293	18163986CCV	Dichlorodifluoromethane	-67 %D	--	± 40				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293						TB-011-WQ-20201113	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273293	18163986CCV	Iodomethane	-48 %D	--	± 25				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293						TB-011-WQ-20201113	ND	ug/L	UJ
50273293	18156719CCV	Hexachlorophene	-31 %D	--	± 25				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293	18232157CCV	2,4,5-TP (Silvex)	24 %D	--	± 20				
50273293	18232160CCV	2,4,5-TP (Silvex)	30 %D	--	± 20				
50273293						D-13-WG-20201113	ND	ug/L	UJ
50273293	18232158CCV	2,4-D	32 %D	--	± 20				
50273293	18232161CCV	2,4-D	31 %D	--	± 20				
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273293	18232158CCV	Dinoseb	37 %D	--	± 20				
50273293	18232161CCV	Dinoseb	30 %D	--	± 20				
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293	18232158CCV	2,4,5-T	43 %D	--	± 20				
50273293	18232161CCV	2,4,5-T	43 %D	--	± 20				
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ
50273293	18232158CCV	2,4,5-TP (Silvex)	42 %D	--	± 20				
50273293	18232161CCV	2,4,5-TP (Silvex)	39 %D	--	± 20				
50273293						DUP-004-WG-20201113	ND	ug/L	UJ
50273293						EB-003-WQ-20201113	ND	ug/L	UJ
50273293						PZ-106-KS-WG-20201113	ND	ug/L	UJ
50273293						PZ-106-SD-WG-20201113	ND	ug/L	UJ
50273293						S-10-WG-20201113	ND	ug/L	UJ

Notes:
CCV = Continuing calibration verification
%D = Percent difference
ICV = Initial calibration verification
RRF = Relative response factor
%R = Percent recovery

Table 7

Laboratory Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50273293	2741809BLANK-50273293	Boron, Total	14.3 J	100				ug/L	
50273293		Boron, Total			PZ-106-SD-WG-20201113	89.4	100	ug/L	100 U
50273293		Boron, Total			DUP-004-WG-20201113	86.5	100	ug/L	100 U
50273293		Boron, Total			EB-003-WQ-20201113	7.9	100	ug/L	100 U
50273293	2741809BLANK-50273293	Iron, Total	36.3 J	50.0	None for qualification, sample results > 5x blank or ND	--	--	ug/L	--
50273293	2742581BLANK-50273293	Manganese, Dissolved	0.79 J	5.0				ug/L	
50273293		Manganese, Dissolved			PZ-106-KS-WG-20201113	4.9	5.0	ug/L	5.0 U
50273293	2744740BLANK-50273293	Nitrite + Nitrate as N	0.019 J	0.10				mg/L	
50273293		Nitrite + Nitrate as N			PZ-106-KS-WG-20201113	0.014	0.10	mg/L	0.10 U
50273293		Nitrite + Nitrate as N			PZ-106-SD-WG-20201113	0.019	0.10	mg/L	0.10 U
50273293		Nitrite + Nitrate as N			DUP-004-WG-20201113	0.021	0.10	mg/L	0.10 U
50273293		Nitrite + Nitrate as N			EB-003-WQ-20201113	0.023	0.10	mg/L	0.10 U
50273293	2115654BLANK-50273293	Methane	3.5 J	5.0				ug/L	
50273293		Methane			EB-003-WQ-20201113	3.2	5.0	ug/L	5.0 U
50273293	18206149CCB	Tin, Dissolved	9.2	10.0	None for qualification, analytes ND in associated samples	--	--	ug/L	--
50273293	18193403ICB	Nitrite + Nitrate as N	0.015	0.10				mg/L	
50273293	18193415CCB	Nitrite + Nitrate as N	0.019	0.10				mg/L	
50273293	18193417CCB	Nitrite + Nitrate as N	0.013	0.10				mg/L	
50273293	18194413CCB	Nitrite + Nitrate as N	0.013	0.10				mg/L	

Table 7

Laboratory Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50273293	18194415CCB	Nitrite + Nitrate as N	0.013	0.10				mg/L	
50273293		Nitrite + Nitrate as N			PZ-106-KS-WG-20201113	0.014	0.10	mg/L	0.10 U
50273293		Nitrite + Nitrate as N			PZ-106-SD-WG-20201113	0.019	0.10	mg/L	0.10 U
50273293		Nitrite + Nitrate as N			DUP-004-WG-20201113	0.021	0.10	mg/L	0.10 U
50273293		Nitrite + Nitrate as N			EB-003-WQ-20201113	0.023	0.10	mg/L	0.10 U
50273293	18194745CCB	Nitrite + Nitrate as N	0.012	0.10	None for qualification, analyte ND in associated samples	--	--	mg/L	--
50273293	18194755CCB	Nitrite + Nitrate as N	0.014	0.10	None for qualification, analyte ND in associated samples	--	--	mg/L	--

Notes:

RL = Reporting Limit

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50273293	FILTB-003-WQ-20201103	Calcium, Dissolved	413 J	500	None for qualification, sample results > 5x blank	--	--	ug/L	--
50273293	FILTB-003-WQ-20201103	Copper, Dissolved	0.32 J	1.0				ug/L	
50273293		Copper, Dissolved			D-13-WG-20201113	0.47	1.0	ug/L	1.0 U
50273293	FILTB-003-WQ-20201103	Iron, Dissolved	26.2 J	50.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50273293	FILTB-003-WQ-20201103	Magnesium, Dissolved	172 J	500	None for qualification, sample results > 5x blank	--	--	ug/L	--
50273293	FILTB-003-WQ-20201103	Titanium, Dissolved	0.78 J	10.0	None for qualification, analyte ND in associated sample	--	--	ug/L	--
50273293	FILTB-004-WQ-20201103	Barium, Dissolved	0.58 J	10.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50273293	FILTB-004-WQ-20201103	Calcium, Dissolved	232 J	500	None for qualification, sample results > 5x blank	--	--	ug/L	--
50273293	FILTB-004-WQ-20201103	Chromium, Dissolved	0.12 J	2.0				ug/L	
50273293		Chromium, Dissolved			DUP-004-WG-20201113	0.24	2.0	ug/L	2.0 U
50273293		Chromium, Dissolved			PZ-106-SD-WG-20201113	0.27	2.0	ug/L	2.0 U
50273293	FILTB-004-WQ-20201103	Copper, Dissolved	0.22 J	1.0				ug/L	
50273293		Copper, Dissolved			DUP-004-WG-20201113	0.5	1.0	ug/L	1.0 U
50273293		Copper, Dissolved			PZ-106-KS-WG-20201113	0.28	1.0	ug/L	1.0 U
50273293		Copper, Dissolved			PZ-106-SD-WG-20201113	0.85	1.0	ug/L	1.0 U

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50273293	FILTB-004-WQ-20201103	Dissolved Organic Carbon	0.80 J	1.0				ug/L	
50273293		Dissolved Organic Carbon			DUP-004-WG-20201113	2.8	1.0	ug/L	J+
50273293		Dissolved Organic Carbon			PZ-106-KS-WG-20201113	0.68	1.0	ug/L	1.0 U
50273293		Dissolved Organic Carbon			PZ-106-SD-WG-20201113	2.9	1.0	ug/L	J+
50273293	FILTB-004-WQ-20201103	Magnesium, Dissolved	57.9 J	500	None for qualification, sample results > 5x blank	--	--	ug/L	--
50273293	EB-001-WQ-20201103	Nitrate as N	0.020 J	0.050	None for qualification, analyte ND in associated sample	--	--	mg/L	--
50273293	EB-001-WQ-20201103	Nitrite + Nitrate as N	0.020 J	0.10	None for qualification, analyte ND in associated sample	--	--	mg/L	--
50273293	EB-003-WQ-20201113	Chloride	0.064 J	0.25	None for qualification, sample results > 5x blank	--	--	mg/L	--
50273293	EB-003-WQ-20201113	Chromium (VI)	0.0447 J	0.100				ug/L	
50273293		Chromium (VI)			DUP-004-WG-20201113	0.0462	0.100	ug/L	0.100 U
50273293	EB-003-WQ-20201113	Chromium, Total	0.22 J	2.0				ug/L	
50273293		Chromium, Total			DUP-004-WG-20201113	0.35	2.0	ug/L	2.0 U
50273293		Chromium, Total			PZ-106-KS-WG-20201113	0.30	2.0	ug/L	2.0 U
50273293		Chromium, Total			PZ-106-SD-WG-20201113	0.34	2.0	ug/L	2.0 U
50273293	EB-003-WQ-20201113	Copper, Total	0.27 J	1.0				ug/L	
50273293		Copper, Total			DUP-004-WG-20201113	1.2	1.0	ug/L	J+
50273293		Copper, Total			PZ-106-KS-WG-20201113	0.62	1.0	ug/L	1.0 U
50273293		Copper, Total			PZ-106-SD-WG-20201113	0.95	1.0	ug/L	1.0 U

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50273293	EB-003-WQ-20201113	Thorium, Total	0.10 J	1.0				ug/L	
50273293		Thorium, Total			DUP-004-WG-20201113	0.11	1.0	ug/L	1.0 U
50273293		Thorium, Total			PZ-106-KS-WG-20201113	0.21	1.0	ug/L	1.0 U
50273293		Thorium, Total			PZ-106-SD-WG-20201113	0.22	1.0	ug/L	1.0 U
50273293	EB-003-WQ-20201113	Uranium, Total	0.010 J	1.0				ug/L	
50273293		Uranium, Total			DUP-004-WG-20201113	0.074	1.0	ug/L	1.0 U
50273293		Uranium, Total			PZ-106-SD-WG-20201113	0.075	1.0	ug/L	1.0 U

Notes:

RL = Reporting Limit

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
LCS/LCSD										
50273293	2740242LCS-50273293/	None for qualification, sample result is ND	1,4-Dioxane	207/	50-150	--	--	--	--	--
50273293	2740242LCS-50273293/		Acetonitrile	8/	50-150					
50273293		D-13-WG-20201113	Acetonitrile					<100	ug/L	R
50273293		DUP-004-WG-20201113	Acetonitrile					<100	ug/L	R
50273293		EB-003-WQ-20201113	Acetonitrile					<100	ug/L	R
50273293		PZ-106-KS-WG-20201113	Acetonitrile					<100	ug/L	R
50273293		PZ-106-SD-WG-20201113	Acetonitrile					<100	ug/L	R
50273293		S-10-WG-20201113	Acetonitrile					<100	ug/L	R
50273293		TB-011-WQ-20201113	Acetonitrile					<100	ug/L	R
50273293	2740242LCS-50273293/	None for qualification, samples ND	Isobutyl alcohol	214/	50-150	--	--	--	--	--
50273293	2740242LCS-50273293/	None for qualification, samples ND	Methylcyclohexane	508/	70-129	--	--	--	--	--
MS/MSD										
50273293	PZ-106-KS-WG-20201113MS/		Nitrite + Nitrate as N	88/	90-110					
50273293		PZ-106-KS-WG-20201113	Nitrite + Nitrate as N					0.014	mg/L	J-
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample ND	1,4-Dioxane	228/308	50-150	30	20	--	--	--
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample ND	2-Chlorophenol	Pass/Pass	10-113	27	20	--	--	--
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample ND	3-Nitroaniline	Pass/Pass	24-133	34	20	--	--	--

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample ND	4-Chloro-3-methylphenol	Pass/Pass	10-146	24	20	--	--	--
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD		Acetonitrile	9/9	50-150	Pass	20			
50273293		S-10-WG-20201113	Acetonitrile					<100	ug/L	R
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample > 4x spike	Ammoniacal Nitrogen NH3N	133/6	90-110	12	20	--	--	--
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample ND	Benzyl alcohol	Pass/Pass	11-120	22	20	--	--	--
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample > 4x spike	Calcium, Dissolved	46/63	75-125	1	20	--	--	--
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample > 4x spike	Calcium, Total	24/26	75-125	Pass	20	--	--	--
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample > 4x spike	Carbon dioxide	-34/23.0	38.0-147	2	40	--	--	--
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample ND	Dinoseb	Pass/Pass	10-140	28	20	--	--	--
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample ND	Hexachlorobutadiene	Pass/Pass	10-87	45	20	--	--	--
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample ND	Hexachlorocyclopentadiene	Pass/Pass	10-103	30	20	--	--	--
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample > 4x spike	Iron, Dissolved	56/68	75-125	Pass	20	--	--	--
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample result is ND	Isobutyl alcohol	224/215	50-150	Pass	20	--	--	--
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample ND	m,p-cresol	Pass/Pass	10-120	36	20	--	--	--
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample > 4x spike	Magnesium, Dissolved	55/66	75-125	Pass	20	--	--	--

Table 9
Spike Recoveries Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample > 4x spike	Manganese, Dissolved	74/Pass	75-125	Pass	20	--	--	--
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample ND	Methylcyclohexane	519/534	58-121	Pass	20	--	--	--
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD		Nitrite + Nitrate as N	39/40	90-110	Pass	20			
50273293		S-10-WG-20201113	Nitrite + Nitrate as N					<0.50	mg/L	UJ
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD		Nitrite as N	77/77	80-120	Pass	15			
50273293		S-10-WG-20201113	Nitrite as N					<0.050	mg/L	UJ
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample result is ND	o-Cresol	Pass/Pass	10-121	34	20	--	--	--
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample result is ND	p-Chloroaniline	Pass/Pass	10-127	22	20	--	--	--
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample result is ND	p-Nitroaniline	Pass/Pass	39-136	27	20	--	--	--
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample result is ND	Phenol	Pass/Pass	10-64	26	20	--	--	--
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample > 4x spike	Sodium, Dissolved	-6/36	75-125	Pass	20	--	--	--

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample > 4x spike	Sodium, Total	40/32	75-125	Pass	20	--	--	--
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD		Sulfide	44/40	90-110	10	20			
50273293		S-10-WG-20201113	Sulfide					<1.0	mg/L	UJ
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD		Cyanide CN-	Pass/86	90-110	Pass	20			
		S-10-WG-20201113	Cyanide CN-					ND	mg/L	UJ
50273293	S-10-WG-20201113MS/ S-10-WG-20201113MSD	None for qualification, sample > 4x spike	Methane	Pass/65.0	70-130	8	30	--	--	--

Notes:

LCS/LCSD = Laboratory control sample/laboratory control sample duplicate

MS/MSD - Matrix spike/matrix spike duplicate

RPD = Relative percent difference

Table 10
Serial Dilution Recoveries Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Dilution		Concentration		Units	Instrmt. DL	Result/ DL	%D	%D Limit	ERM Qualifier
	Sample ID	Analyte	Sample	Dilution						
50273293	S-10-WG-20201113	Barium, Total	177	158	ug/L	0.56	316	11.1	10	J
50273293	S-10-WG-20201113	Potassium, Total	47100	40500	ug/L	113	417	14.1	10	J
50273293	S-10-WG-20201113	Strontium, Total	1140	1020	ug/L	0.77	1481	10.9	10	J

Notes:
%D = Percent Difference
DL = Detection Limit

Table 15

Column Agreement Outliers

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Analyte	Result	Units	ERM Qualifier
50273293	D-13-WG-20201113	8151A	2,4-Dichlorophenylacetic acid	0.89	ug/L	J

ERM

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Memorandum

To	Alice Sandzen
From	Rachel James
Date	2021-06-18
Reference	0579381
Subject	Revised Data Review of West Lake OU-3 RI/FS Routine Groundwater Samples Collected 11/16/2020: Pace Data Package 50273386.

This memorandum was revised to address changes to the initial calibration verification data for Gas Chromatography/Mass Spectrometry methods issued by the laboratory after the initial validation was complete. Table 6 has been revised as needed.

The data quality was assessed and any necessary qualifiers were applied following the Quality Assurance Project Plan (QAPP) for West Lake OU-3 Remediation Investigation/Feasibility Study, Revision 3, December 2020, USEPA Contract Laboratory Program (CLP) NFGs for Organic Superfund Methods Data Review, document number EPA-540-R-2017-002, January 2017, USEPA CLP NFGs for Inorganic Superfund Methods Data Review, document number EPA-540-R-2017-001, January 2017, and USEPA Region 1—New England Environmental Data Review Supplement for Region 1 Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement1, June 2018, the protocols and quality control (QC) requirements of the analytical methods, and the reviewer's professional judgement.

A Stage 2B data validation was performed on 100% of the laboratory data.

The following items were reviewed as part of the data validation:

- **Chain of Custody:** The chains of custody were reviewed for proper completion and that the laboratory performed the requested methods and reported the requested target analytes for each sample.
- **Dilutions and Reanalysis:** Dilutions, calibration ranges, and reanalyses were reviewed as applicable. The best result was chosen when more than one result was reported as final.
- **Sample Preservation:** The appropriate temperature and chemical preservation requirements were reviewed. Headspace for volatile sample analysis was reviewed.
- **Holding Times:** The period of time between collection of the sample and preparation/analysis of the sample was evaluated.
- **Instrument Tuning:** Instrument tuning and performance check frequency and results were reviewed.
- **Calibration:** The initial calibration type, fit, number of standards, and minimum response factors were evaluated. Additionally, the frequency and percent recoveries for initial and continuing calibration verification standards and blanks were evaluated.
- **Laboratory Blank Samples:** The preparation and analysis of reagent (contaminant-free) water was evaluated, along with the required frequency.

- **Field Blank Samples:** The collection and analysis of field blanks was evaluated. The reviewed data package(s) included the following associated field blanks: trip, filter, and equipment
- **Spike Samples:** Laboratory control, matrix spike, and post digestion spike sample preparation frequency and recoveries were reviewed as applicable.
- **Serial Dilutions:** Serial dilution sample preparation frequency and recoveries were reviewed as applicable.
- **Surrogate Spikes:** The addition of appropriate surrogates and their recoveries were evaluated.
- **Internal standards:** The presence and recoveries of internal standards and their appropriate association to target analytes were reviewed.
- **Laboratory Duplicate Samples:** Laboratory duplicate frequencies and recoveries were reviewed as applicable.
- **Field Duplicate Samples:** Field duplicate recoveries and absolute differences were reviewed as applicable.
- **Column Agreement:** Column agreements were reviewed for relevant methods.

Findings of the data validation are summarized in the sections below. As necessary, the following data quality flags were applied during validation.

J = estimated concentration
J+ = the result is an estimated concentration, but may be biased high
J- = the result is an estimated concentration, but may be biased low
UJ = estimated reporting limit
U = evaluated to be non-detected at the reporting limit
R = rejected, data not usable
NJ = tentative identification and estimated concentration

Validation outliers and any necessary data qualifications are summarized in outlier tables at the end of this memo. The table below indicates the included validation tables with findings. Tables without findings have been omitted.

Table Number	Table Name	Included
Table 1	Samples with Non-Preferred Results	No
Table 2	Samples with Exceeded Preservation Requirements	No
Table 3	**Samples with Exceeded Holding Times**	**Yes**
Table 4	Instrument Tuning Outside of Acceptable Limits	No
Table 5	**Initial Calibration Outside of Acceptable Limits**	**Yes**
Table 6	**Calibration Verification Outside of Acceptable Limits**	**Yes**
Table 7	**Laboratory Blank and Associated Suspect Sample Detections**	**Yes**
Table 8	**Field Blank and Associated Suspect Sample Detections**	**Yes**
Table 9	**Spike Recoveries Outside of Acceptable Limits**	**Yes**
Table 10	Serial Dilution Recoveries Outside of Acceptable Limits	No
Table 11	Surrogate Recovery Results out of Acceptable Limits	No
Table 12	Internal Standard Recovery Results out of Acceptable Limits	No

Table Number	Table Name	Included
Table 13	Laboratory Duplicate Result Outliers	No
Table 14	Field Duplicate Result Outliers	No
Table 15	Column Agreement Outliers	No
Table 16	Calibration Range Exceedances	No
Table 17	Professional Judgement Qualifiers	No

Findings of the data validation are summarized in the sections below.

CASE NARRATIVE NOTES AND CHAIN-OF-CUSTODY DISCREPANCIES

The laboratory indicated that it does not hold NELAC/TNI accreditation for the methods and parameters in non-potable water listed below. No qualifiers were applied based on accreditation status. Supporting calibrations and quality control data was provided for these analytes and reviewed as part of the data validation.

Method	Analyte without NELAC/TNI Accreditation	
	CAS	Analyte Name
EPA SW 6020	7440-29-1	Thorium
	7440-61-1	Uranium
EPA SW 6010	7440-21-3	Silicon
EPA SW 8082	1336-36-3	Total PCBs
EPA SW 8270	92-52-4	Biphenyl
	99-35-4	1,3,5-Trinitrobenzene
	1912-24-9	Atrazine
	106-50-3	p-Phenylenediamine
	105-60-2	Caprolactam
	95-53-4	o-Toluidine
	100-52-7	Benzaldehyde
EPA SW 8260	110-82-7	Cyclohexane
	108-87-2	Methylcyclohexane
	78-83-1	Isobutyl alcohol
	79-20-9	Methyl acetate
	126-99-8	beta-Chloroprene
EPA SW 9056	20461-54-5	Iodide

No discrepancies between the chains-of-custody and the sample containers received were noted by the laboratory.

PRESERVATION AND HOLDING TIME EVALUATION

The laboratory received the sample shipments within the method-prescribed temperature preservation requirements of less than 6 degrees Celsius, with acceptable sample pH values, and

all vials for volatile analysis were received in good condition with headspace of less than 6 millimeters.

The samples were prepared and analyzed within the method-prescribed time period from the date of collection, with the exceptions and any necessary qualifications noted in Table 3.

INSTRUMENT TUNING EVALUATION

All tuning criteria met method acceptance criteria.

INITIAL CALIBRATION

The initial calibrations met the minimum number of calibration standards, project required percent standard deviation (%RSD), relative correlation coefficient, and minimum relative response factor (RRF) limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 5.

INITIAL CALIBRATION VERIFICATION (ICV) AND CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION

The initial and continuing calibration verifications were within project-specified percent difference (%D) or percent recoveries (%R) and RRF limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 6.

Situations that required additional professional judgement are detailed below:

- SVOC analytes acetophenone, atrazine, benzaldehyde, biphenyl (diphenyl), caprolactam, N-nitrosodiphenylamine, and 1,2,4,5-tetrachlorobenzene were not reported in the ICV samples. These analytes were present in the initial calibrations and CCV samples and were within control limits. The non-detected results in associated samples have been qualified UJ.

LABORATORY BLANK EVALUATION

The laboratory blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 7. The blank results indicate that contaminants may have been introduced to the samples during processing or analysis in the laboratory.

FIELD BLANK EVALUATION

The trip, filter, and equipment blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 8. Any field blank detections associated with laboratory blank contamination and qualified as non-detected (U) are not included in Table 8. The blank results indicate that contaminants may have been introduced to the samples during collection, shipment, handling, and storage.

BLANK AND MATRIX SPIKE EVALUATION

The laboratory control sample (LCS), laboratory control sample duplicate (LCSD) recoveries, and relative percent differences (RPDs) were within the laboratory's limits of acceptance, with the

exceptions and any necessary qualifications noted in Table 9. Data were not qualified if a high recovery was associated with a non-detected result.

The matrix spike (MS), matrix spike duplicate (MSD) recoveries, and RPDs were within the laboratory's limits of acceptance for target analytes for spiked project samples. MS/MSDs performed on non-project samples were not reviewed.

SERIAL DILUTION EVALUATION

The laboratory did not perform serial dilutions on any project samples. Serial dilutions performed on non-project samples were not reviewed.

SURROGATE SPIKE EVALUATION

The surrogate recoveries were within the laboratory limits of acceptance. The acceptable surrogate recoveries indicate minimal matrix interference in the samples.

INTERNAL STANDARD EVALUATION

The internal standard responses for reported results were within acceptable limits. The acceptable internal standard responses indicate that the instrument sensitivity and response were stable during each analysis.

LABORATORY DUPLICATE EVALUATION

The laboratory prepared at least one project sample as a laboratory duplicate. Laboratory duplicates performed on non-project samples were not reviewed. The RPDs between the primary sample and the duplicate were within laboratory control limits, indicating acceptable laboratory precision.

FIELD DUPLICATE EVALUATION

No field duplicates were submitted to the laboratory.

COLUMN AGREEMENT EVALUATION

Column agreements met method criteria for dual column analysis.

CALIBRATION RANGE EVALUATION

All results were reported within each instrument's calibration range.

SENSITIVITY

The sample results were reported down to the method detection limit. Results between the method detection limit and the reporting limit were flagged as estimated (J) by the laboratory. All non-detected results were reported from undiluted samples.

COMPLETENESS

The complete data package consisted of 958 reportable data points excluding field blank samples. 0 data points were rejected. The data completeness measure for this data package is calculated to be 100.0%. The project laboratory completeness goal of 95% was met.

OVERALL ASSESSMENT

None of the data required rejection. All of the data, including qualified data, can be used for decision-making purposes; however, the limitations indicated by the applied qualifiers should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

Table 3

Samples with Exceeded Holding Times

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Extraction Holding Time	Total Time	Analysis Holding Time	Total Time	Affected Analyte	ERM Qualifier
50273386	D-83-WG-20201116	SM4500-H-B	--	--	15 min.	5733 min.	pH	J
50273386	I-62-WG-20201116	SM4500-H-B	--	--	15 min.	5851 min.	pH	J
50273386	PZ-203-SS-WG-20201116	SM4500-H-B	--	--	15 min.	5791 min.	pH	J

Notes:

min. = minutes

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273386	8260 Instrument 50MV2A 11/17/2020	cis-1,2-Dichloroethene	37	--	20				
50273386						I-62-WG-20201116	0.27	ug/L	J
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						TB-012-WQ-20201116	ND	ug/L	UJ
50273386	8260 Instrument 50MV2A 11/17/2020	1,4-Dioxane	97	--	20				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						TB-012-WQ-20201116	ND	ug/L	UJ
50273386	8260 Instrument 50MV2A 11/17/2020	Iodomethane	38	--	20				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						TB-012-WQ-20201116	ND	ug/L	UJ
50273386	8260 Instrument 50MV2B 11/17/20	1,4-Dioxane	41	--	20				
50273386						D-83-WG-20201116	ND	ug/L	UJ
50273386	8260 Instrument 50MV2B 11/17/20	Iodomethane	46	--	20				
50273386						D-83-WG-20201116	ND	ug/L	UJ

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273386	8270 Instrument 50MSS2 10/07/2020	Hexachlorophene	40	--	20				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						D-83-WG-20201116	ND	ug/L	UJ

Notes:

IC = Initial calibration

RSD = Relative standard deviation

RRF = Relative response factor

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273386	18159139ICV	Bromomethane	152 %R	--	70-130				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						TB-012-WQ-20201116	ND	ug/L	UJ
50273386	18159139ICV	Iodomethane	143 %R	--	75-125				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						TB-012-WQ-20201116	ND	ug/L	UJ
50273386	18159139ICV	Vinyl acetate	60 %R	--	75-125				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						TB-012-WQ-20201116	ND	ug/L	UJ
50273386	18159757ICV	Bromomethane	158 %R	--	70-130				
50273386						D-83-WG-20201116	ND	ug/L	UJ
50273386	18159757ICV	Iodomethane	170 %R	--	75-125				
50273386						D-83-WG-20201116	ND	ug/L	UJ
50273386	18159757ICV	Allyl chloride	190 %R	--	75-125				
50273386						D-83-WG-20201116	ND	ug/L	UJ
50273386	18159757ICV	Vinyl acetate	62 %R	--	75-125				
50273386						D-83-WG-20201116	ND	ug/L	UJ
50273386	17876511ICV	3,3'-Dimethylbenzidine	138 %R	--	75-125				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						D-83-WG-20201116	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273386	17876511ICV	Kepone	132 %R	--	75-125				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						D-83-WG-20201116	ND	ug/L	UJ
50273386	17876511ICV	Famphur	132 %R	--	75-125				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						D-83-WG-20201116	ND	ug/L	UJ
50273386	Not present in ICV	Acetophenone	--	--	--				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						D-83-WG-20201116	ND	ug/L	UJ
50273386	Not present in ICV	Atrazine	--	--	--				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						D-83-WG-20201116	ND	ug/L	UJ
50273386	Not present in ICV	Benzaldehyde	--	--	--				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						D-83-WG-20201116	ND	ug/L	UJ
50273386	Not present in ICV	Biphenyl (Diphenyl)	--	--	--				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						D-83-WG-20201116	ND	ug/L	UJ
50273386	Not present in ICV	Caprolactam	--	--	--				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						D-83-WG-20201116	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273386	Not present in ICV	N-Nitrosodiphenylamine	--	--	--				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						D-83-WG-20201116	ND	ug/L	UJ
50273386	Not present in ICV	1,2,4,5-Tetrachlorobenzene	--	--	--				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						D-83-WG-20201116	ND	ug/L	UJ
50273386	18193348CCV	cis-1,2-Dichloroethene	-23 %D	--	± 20				
50273386						I-62-WG-20201116	0.27	ug/L	J
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						TB-012-WQ-20201116	ND	ug/L	UJ
50273386	18193348CCV	1,4-Dioxane	-84 %D	--	± 25				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						TB-012-WQ-20201116	ND	ug/L	UJ
50273386	18193348CCV	Iodomethane	-28 %D	--	± 25				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						TB-012-WQ-20201116	ND	ug/L	UJ
50273386	18193348CCV	Isobutanol	-38 %D	--	± 25				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						TB-012-WQ-20201116	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273386	18193348CCV	Propionitrile	-41 %D	--	± 25				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						TB-012-WQ-20201116	ND	ug/L	UJ
50273386	18216639CCV	1,4-Dioxane	-87 %D	--	± 25				
50273386						D-83-WG-20201116	ND	ug/L	UJ
50273386	18216639CCV	Iodomethane	-61 %D	--	± 25				
50273386						D-83-WG-20201116	ND	ug/L	UJ
50273386	18167209CCV	Carbazole	23 %D	--	± 20				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						D-83-WG-20201116	ND	ug/L	UJ
50273386	18167209CCV	Di-n-butylphthalate	22 %D	--	± 20				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						D-83-WG-20201116	ND	ug/L	UJ
50273386	18167209CCV	2,4-Dinitrotoluene	21 %D	--	± 20				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						D-83-WG-20201116	ND	ug/L	UJ
50273386	18167209CCV	Di-n-octylphthalate	45 %D	--	± 40				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						D-83-WG-20201116	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273386	18167209CCV	bis(2-Ethylhexyl)phthalate	32 %D	--	± 25				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						D-83-WG-20201116	ND	ug/L	UJ
50273386	18167209CCV	2-Nitrophenol	23 %D	--	± 20				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						D-83-WG-20201116	ND	ug/L	UJ
50273386	18167273CCV	Chlorobenzilate	29 %D	--	± 25				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						D-83-WG-20201116	ND	ug/L	UJ
50273386	18167273CCV	Hexachlorophene	-32 %D	--	± 25				
50273386						I-62-WG-20201116	ND	ug/L	UJ
50273386						PZ-203-SS-WG-20201116	ND	ug/L	UJ
50273386						D-83-WG-20201116	ND	ug/L	UJ

Notes:
CCV = Continuing calibration verification
%D = Percent difference
ICV = Initial calibration verification
RRF = Relative response factor

Table 7

Laboratory Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50273386	2741809BLANK-50273386	Boron, Total	14.3 J	100	None for qualification, samples > 5x blank	--	--	ug/L	--
50273386	2741809BLANK-50273386	Iron, Total	36.3 J	50.0	None for qualification, samples > 5x blank	--	--	ug/L	--
50273386	2742581BLANK-50273386	Manganese, Dissolved	0.79 J	5.0	None for qualification, samples > 5x blank	--	--	ug/L	--
50273386	2115654BLANK-50273386	Methane	3.5 J	5.0	None for qualification, samples > 5x blank	--	--	ug/L	--
50273386	2116266BLANK-50273386	Methane	4.3 J	5.0	None for qualification, samples > 5x blank	--	--	ug/L	--
50273386	18193403ICB-50273386	Nitrite + Nitrate as N	0.015 J	0.10				mg/L	
50273386	18194420CCB-50273386	Nitrite + Nitrate as N	0.015 J	0.10				mg/L	
50273386	18194422CCB-50273386	Nitrite + Nitrate as N	0.016 J	0.10				mg/L	
50273386					PZ-203-SS-WG-20201116	0.019	0.10	mg/L	0.10 U

Notes:

RL = Reporting Limit

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50273386	FILTB-003-WQ-20201103	Calcium, Dissolved	413 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50273386	FILTB-003-WQ-20201103	Copper, Dissolved	0.32 J	1.0				ug/L	
50273386		Copper, Dissolved			I-62-WG-20201116	0.35	1.0	ug/L	1.0 U
50273386		Copper, Dissolved			D-83-WG-20201116	0.83	1.0	ug/L	1.0 U
50273386	FILTB-003-WQ-20201103	Iron, Dissolved	26.2 J	50.0	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50273386	FILTB-003-WQ-20201103	Magnesium, Dissolved	172 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50273386	FILTB-003-WQ-20201103	Titanium, Dissolved	0.78 J	10.0	None for qualification, associated samples ND	--	--	ug/L	--
50273386	FILTB-004-WQ-20201103	Barium, Dissolved	0.58 J	10.0	None for qualification, associated sample ND	--	--	ug/L	--
50273386	FILTB-004-WQ-20201103	Calcium, Dissolved	232 J	500	None for qualification, associated sample > 5x blank	--	--	ug/L	--
50273386	FILTB-004-WQ-20201103	Chromium, Dissolved	0.12 J	2.0	None for qualification, associated sample > 5x blank	--	--	ug/L	--
50273386	FILTB-004-WQ-20201103	Copper, Dissolved	0.22 J	1.0				ug/L	
50273386		Copper, Dissolved			PZ-203-SS-WG-20201116	0.35	1.0	ug/L	1.0 U
50273386	FILTB-004-WQ-20201103	Dissolved Organic Carbon	0.80 J	1.0	None for qualification, associated sample > 5x blank	--	--	ug/L	--
50273386	FILTB-004-WQ-20201103	Magnesium, Dissolved	57.9 J	500	None for qualification, associated sample > 5x blank	--	--	ug/L	--

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50273386	EB-001-WQ-20201103	Nitrate as N	0.020 J	0.050	None for qualification, associated samples ND	--	--	mg/L	--
50273386	EB-001-WQ-20201103	Nitrite + Nitrate as N	0.020 J	0.10	None for qualification, associated samples ND	--	--	mg/L	--
50273386	EB-003-WQ-20201113	Chloride	0.064 J	0.25	None for qualification, associated sample > 5x blank	--	--	mg/L	--
50273386	EB-003-WQ-20201113	Chromium, Total	0.22 J	2.0				ug/L	
50273386		Chromium, Total			PZ-203-SS-WG-20201116	1.6	2.0	ug/L	2.0 U
50273386	EB-003-WQ-20201113	Copper, Total	0.27 J	1.0				ug/L	
50273386		Copper, Total			PZ-203-SS-WG-20201116	0.40	1.0	ug/L	1.0 U
50273386	EB-003-WQ-20201113	Thorium, Total	0.10 J	1.0	None for qualification, associated sample ND	--	--	ug/L	--
50273386	EB-003-WQ-20201113	Uranium, Total	0.010 J	1.0				ug/L	
50273386		Uranium, Total			PZ-203-SS-WG-20201116	0.76	1.0	ug/L	1.0 U
50273386	EB-003-WQ-20201113	Chromium, Hexavalent	0.0447	0.100				ug/L	
50273386		Chromium, Hexavalent			PZ-203-SS-WG-20201116	0.0721	0.100	ug/L	0.100 U

Notes:

RL = Reporting Limit

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
LCS/LCSD										
50273386	2740409LCS-50273386/	None for qualification, samples ND	Bis(2-ethylhexyl)phthalate	284/	75-147	--	--	--	--	--
50273386	2740409LCS-50273386/	None for qualification, samples ND	Carbazole	204/	66-127	--	--	--	--	--
50273386	2742925LCS-50273386/		1,4-Dioxane	43/	50-150					
50273386		I-62-WG-20201116	1,4-Dioxane					<100	ug/L	UJ
50273386		PZ-203-SS-WG-20201116	1,4-Dioxane					<100	ug/L	UJ
50273386		TB-012-WQ-20201116	1,4-Dioxane					<100	ug/L	UJ
50273386	2742925LCS-50273386/	None for qualification, samples ND	Dichlorodifluoromethane (Freon 12)	183/	36-145	--	--	--	--	--
50273386	2744037LCS-50273386/	None for qualification, samples ND	Allyl chloride	189/	70-130	--	--	--	--	--

Notes:

LCS/LCSD = Laboratory control sample/laboratory control sample duplicate

MS/MSD - Matrix spike/matrix spike duplicate

RPD = Relative percent difference

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Memorandum

To	Alice Sandzen
From	Rachel James
Date	2021-08-23
Reference	0579381
Subject	Revised Data Review of West Lake OU-3 RI/FS Routine Groundwater Samples Collected 11/20/2020: Pace Data Package 50273972.

This memorandum was revised to address changes to total xylene method blank contamination issued by the laboratory after the first revision was complete. Table 7 has been revised as needed.

This memorandum was previously revised to address changes to the initial calibration verification data for Gas Chromatography/Mass Spectrometry methods issued by the laboratory after the initial validation was complete. Table 6 has been revised as needed.

The data quality was assessed and any necessary qualifiers were applied following the Quality Assurance Project Plan (QAPP) for West Lake OU-3 Remediation Investigation/Feasibility Study, Revision 3, December 2020, USEPA Contract Laboratory Program (CLP) NFGs for Organic Superfund Methods Data Review, document number EPA-540-R-2017-002, January 2017, USEPA CLP NFGs for Inorganic Superfund Methods Data Review, document number EPA-540-R-2017-001, January 2017, and USEPA Region 1—New England Environmental Data Review Supplement for Region 1 Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement1, June 2018, the protocols and quality control (QC) requirements of the analytical methods, and the reviewer's professional judgement.

A Stage 2B data validation was performed on 100% of the laboratory data.

The following items were reviewed as part of the data validation:

- **Chain of Custody:** The chains of custody were reviewed for proper completion and that the laboratory performed the requested methods and reported the requested target analytes for each sample.
- **Dilutions and Reanalysis:** Dilutions, calibration ranges, and reanalyses were reviewed as applicable. The best result was chosen when more than one result was reported as final.
- **Sample Preservation:** The appropriate temperature and chemical preservation requirements were reviewed. Headspace for volatile sample analysis was reviewed.
- **Holding Times:** The period of time between collection of the sample and preparation/analysis of the sample was evaluated.
- **Instrument Tuning:** Instrument tuning and performance check frequency and results were reviewed.

- **Calibration:** The initial calibration type, fit, number of standards, and minimum response factors were evaluated. Additionally, the frequency and percent recoveries for initial and continuing calibration verification standards and blanks were evaluated.
- **Laboratory Blank Samples:** The preparation and analysis of reagent (contaminant-free) water was evaluated, along with the required frequency.
- **Field Blank Samples:** The collection and analysis of field blanks was evaluated. The reviewed data package(s) included the following associated field blanks: trip, filter, and equipment
- **Spike Samples:** Laboratory control, matrix spike, and post digestion spike sample preparation frequency and recoveries were reviewed as applicable.
- **Serial Dilutions:** Serial dilution sample preparation frequency and recoveries were reviewed as applicable.
- **Surrogate Spikes:** The addition of appropriate surrogates and their recoveries were evaluated.
- **Internal standards:** The presence and recoveries of internal standards and their appropriate association to target analytes were reviewed.
- **Laboratory Duplicate Samples:** Laboratory duplicate frequencies and recoveries were reviewed as applicable.
- **Field Duplicate Samples:** Field duplicate recoveries and absolute differences were reviewed as applicable.
- **Column Agreement:** Column agreements were reviewed for relevant methods.

Findings of the data validation are summarized in the sections below. As necessary, the following data quality flags were applied during validation.

J = estimated concentration
J+ = the result is an estimated concentration, but may be biased high
J- = the result is an estimated concentration, but may be biased low
UJ = estimated reporting limit
U = evaluated to be non-detected at the reporting limit
R = rejected, data not usable
NJ = tentative identification and estimated concentration

Validation outliers and any necessary data qualifications are summarized in outlier tables at the end of this memo. The table below indicates the included validation tables with findings. Tables without findings have been omitted.

Table Number	Table Name	Included
Table 1	Samples with Non-Preferred Results	No
Table 2	Samples with Exceeded Preservation Requirements	No
Table 3	**Samples with Exceeded Holding Times**	**Yes**
Table 4	Instrument Tuning Outside of Acceptable Limits	No
Table 5	**Initial Calibration Outside of Acceptable Limits**	**Yes**
Table 6	**Calibration Verification Outside of Acceptable Limits**	**Yes**
Table 7	**Laboratory Blank and Associated Suspect Sample Detections**	**Yes**
Table 8	**Field Blank and Associated Suspect Sample Detections**	**Yes**

Table Number	Table Name	Included
Table 9	**Spike Recoveries Outside of Acceptable Limits**	**Yes**
Table 10	Serial Dilution Recoveries Outside of Acceptable Limits	No
Table 11	Surrogate Recovery Results out of Acceptable Limits	No
Table 12	Internal Standard Recovery Results out of Acceptable Limits	No
Table 13	**Laboratory Duplicate Result Outliers**	**Yes**
Table 14	Field Duplicate Result Outliers	No
Table 15	Column Agreement Outliers	No
Table 16	Calibration Range Exceedances	No
Table 17	Professional Judgement Qualifiers	No

Findings of the data validation are summarized in the sections below.

CASE NARRATIVE NOTES AND CHAIN-OF-CUSTODY DISCREPANCIES

The laboratory indicated that it does not hold NELAC/TNI accreditation for the methods and parameters in non-potable water listed below. No qualifiers were applied based on accreditation status. Supporting calibrations and quality control data was provided for these analytes and reviewed as part of the data validation.

Method	Analyte without NELAC/TNI Accreditation	
	CAS	Analyte Name
EPA SW 6020	7440-29-1	Thorium
	7440-61-1	Uranium
EPA SW 6010	7440-21-3	Silicon
EPA SW 8082	1336-36-3	Total PCBs
EPA SW 8270	92-52-4	Biphenyl
	99-35-4	1,3,5-Trinitrobenzene
	1912-24-9	Atrazine
	106-50-3	p-Phenylenediamine
	105-60-2	Caprolactam
	95-53-4	o-Toluidine
	100-52-7	Benzaldehyde
EPA SW 8260	110-82-7	Cyclohexane
	108-87-2	Methylcyclohexane
	78-83-1	Isobutyl alcohol
	79-20-9	Methyl acetate
	126-99-8	beta-Chloroprene
EPA SW 9056	20461-54-5	Iodide

No discrepancies between the chains-of-custody and the sample containers received were noted by the laboratory.

PRESERVATION AND HOLDING TIME EVALUATION

The laboratory received the sample shipments within the method-prescribed temperature preservation requirements of less than 6 degrees Celsius, with acceptable sample pH values, and all vials for volatile analysis were received in good condition with headspace of less than 6 millimeters.

The samples were prepared and analyzed within the method-prescribed time period from the date of collection, with the exceptions and any necessary qualifications noted in Table 3.

Situations that required additional professional judgement related to holding times and/or sample preservation are detailed below:

- The laboratory qualified the nitrite as N result for the blind field duplicate sample DUP-005-WG-20201120 as out of holding time; however, the laboratory used the documented false sample collection time of 00:05 to calculate the time elapsed. Considering the true sampling time of the blind field duplicate (9:23 am on 11/20/2020) the field duplicate sample was analyzed within the 48 hour holding time. No validation qualifiers were applied.

INSTRUMENT TUNING EVALUATION

All tuning criteria met method acceptance criteria.

INITIAL CALIBRATION

The initial calibrations met the minimum number of calibration standards, project required percent standard deviation (%RSD), relative correlation coefficient, and minimum relative response factor (RRF) limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 5.

INITIAL CALIBRATION VERIFICATION (ICV) AND CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION

The initial and continuing calibration verifications were within project-specified percent difference (%D) or percent recoveries (%R) and RRF limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 6.

Situations that required additional professional judgement are detailed below:

- SVOC analytes acetophenone, atrazine, benzaldehyde, biphenyl (diphenyl), caprolactam, N-nitrosodiphenylamine, and 1,2,4,5-tetrachlorobenzene were not reported in the ICV samples. These analytes were present in the initial calibrations and CCV samples and were within control limits. The non-detected results in associated samples have been qualified UJ.

LABORATORY BLANK EVALUATION

The laboratory blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 7. The blank results indicate that contaminants may have been introduced to the samples during processing or analysis in the laboratory.

FIELD BLANK EVALUATION

The trip, filter, and equipment blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 8. Any field blank detections associated with laboratory blank contamination and qualified as non-detected (U) are not included in Table 8. The blank results indicate that contaminants may have been introduced to the samples during collection, shipment, handling, and storage.

BLANK AND MATRIX SPIKE EVALUATION

The laboratory control sample (LCS), laboratory control sample duplicate (LCSD) recoveries, and relative percent differences (RPDs) were within the laboratory's limits of acceptance, with the exceptions and any necessary qualifications noted in Table 9. Data were not qualified if a high recovery was associated with a non-detected result.

The matrix spike (MS), matrix spike duplicate (MSD) recoveries, and RPDs were within the laboratory's limits of acceptance for target analytes for spiked project samples, with the exceptions and any necessary qualifications noted in Table 9. MS/MSDs performed on non-project samples were not reviewed. Data were not qualified if the analyte concentration in the parent sample was greater than four times the spike amount, if the spike amount was diluted out prior to analysis, or if a high recovery was associated with a non-detected result.

SERIAL DILUTION EVALUATION

Where performed on project samples, the metals serial dilution percent differences were within laboratory limits of acceptance. Serial dilutions performed on non-project samples were not reviewed.

SURROGATE SPIKE EVALUATION

The surrogate recoveries were within the laboratory limits of acceptance. The acceptable surrogate recoveries indicate minimal matrix interference in the samples.

INTERNAL STANDARD EVALUATION

The internal standard responses for reported results were within acceptable limits. The acceptable internal standard responses indicate that the instrument sensitivity and response were stable during each analysis.

LABORATORY DUPLICATE EVALUATION

The laboratory prepared at least one project sample as a laboratory duplicate. Laboratory duplicates performed on non-project samples were not reviewed. The RPDs between the primary sample and the duplicate were within laboratory control limits, with the exceptions and any necessary qualifications noted in Table 13. Results were not qualified if the results in the primary and/or duplicate sample were less than five times the reporting limit.

FIELD DUPLICATE EVALUATION

One field sample was submitted to the laboratory as a blind duplicate. RPDs and absolute differences were calculated as appropriate and compared to the limits established in the QAPP. The QAPP states that the RPDs must be less than or equal to 30 percent for aqueous samples

when analytes are detected in both samples and these results are greater than or equal to five times the reporting limit. If one or both results are less than five times the reporting limit, or one result is detected and one is non-detected, the absolute difference between the results must be less than two times the reporting limit (if the reporting limits are not the same between the parent and field duplicate samples, the lower of the two was used for the control limit determination). The reporting limit was used for non-detected analytes when calculating absolute difference.

All RPDs and/or absolute differences were within QAPP criteria.

COLUMN AGREEMENT EVALUATION

Column agreements met method criteria for dual column analysis.

CALIBRATION RANGE EVALUATION

All results were reported within each instrument's calibration range.

SENSITIVITY

The sample results were reported to the method detection limit. Results between the method detection limit and the reporting limit were flagged as estimated (J) by the laboratory. A number of sample analyses were performed at a dilution factor, resulting in non-detected results reported at elevated reporting limits due to the presence of high levels of non-target analytes or other matrix interference.

COMPLETENESS

The complete data package consisted of 1272 reportable data points excluding field blank samples. 4 data points were rejected. The data completeness measure for this data package is calculated to be 99.7%. The project laboratory completeness goal of 95% was met.

OVERALL ASSESSMENT

All qualified data, excluding rejected data, can be used for decision-making purposes; however, the limitation identified by the applied qualifier should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

Table 3

Samples with Exceeded Holding Times

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Extraction Holding Time	Total Time	Analysis Holding Time	Total Time	Affected Analyte	ERM Qualifier
50273972	D-3-WG-20201120	SM4500-H-B	--	--	15 min.	7341 min.	pH	J
50273972	D-87-WG-20201120	SM4500-H-B	--	--	15 min.	7187 min.	pH	J
50273972	DUP-005-WG-20201120	SM4500-H-B	--	--	15 min.	8025 min.	pH	J
50273972	S-5-WG-20201120	SM4500-H-B	--	--	15 min.	7464 min.	pH	J

Notes:

min. = minutes

Table 5
Initial Calibration Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273972	8260 Instrument 50MV2A 11/17/2020	cis-1,2-Dichloroethene	37	--	20				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	0.25	ug/L	J
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972						TB-013-WQ-20201120	ND	ug/L	UJ
50273972	8260 Instrument 50MV2A 11/17/2020	1,4-Dioxane	97	--	20				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972						TB-013-WQ-20201120	ND	ug/L	UJ
50273972	8260 Instrument 50MV2A 11/17/2020	Iodomethane	38	--	20				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972						TB-013-WQ-20201120	ND	ug/L	UJ

Table 5
Initial Calibration Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273972	8270 Instrument 50MSS6 10/07/2020	Famphur	34	--	20				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972	8270 Instrument 50MSS6 10/07/2020	Hexachlorophene	25	--	20				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972	8270 Instrument 50MSS6 10/07/2020	Kepone	26	--	20				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ

Table 5
Initial Calibration Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273972	8270 Instrument 50MSS6 10/07/2020	3,3'-Dimethylbenzidine	21	--	20				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ

Notes:
IC = Initial calibration
RSD = Relative standard deviation
RRF = Relative response factor

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273972	18159139ICV	Bromomethane	152 %R	--	70-130				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972						TB-013-WQ-20201120	ND	ug/L	UJ
50273972	18159139ICV	Iodomethane	143 %R	--	75-125				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972						TB-013-WQ-20201120	ND	ug/L	UJ
50273972	18159139ICV	Vinyl acetate	60 %R	--	75-125				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972						TB-013-WQ-20201120	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273972	17873843ICV	p-Phenylenediamine	139 %R	--	75-125				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972	17873843ICV	1,3,5-Trinitrobenzene	128 %R	--	75-125				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972	17873843ICV	P-Dimethylaminoazobenzene	128 %R	--	75-125				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972	17873843ICV	3,3'-Dimethylbenzidine	135 %R	--	75-125				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273972	17873843ICV	Famphur	161 %R	--	75-125				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972	Not present in ICV	Acetophenone	--	--	--				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972	Not present in ICV	Atrazine	--	--	--				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972	Not present in ICV	Benzaldehyde	--	--	--				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273972	Not present in ICV	Biphenyl (Diphenyl)	--	--	--				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972	Not present in ICV	Caprolactam	--	--	--				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972	Not present in ICV	N-Nitrosodiphenylamine	--	--	--				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972	Not present in ICV	1,2,4,5-Tetrachlorobenzene	--	--	--				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972	18198841CCV	cis-1,2-Dichloroethene	-21 %D	--	± 20				
50273972						D-87-WG-20201120	0.25	ug/L	J
50273972						EB-004-WQ-20201120	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273972	18198841CCV	1,4-Dioxane	-76 %D	--	± 25				
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972	18198841CCV	Isobutanol	-32 %D	--	± 25				
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972	18216832CCV	cis-1,2-Dichloroethene	-23 %D	--	± 20				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972	18216832CCV	1,4-Dioxane	-66 %D	--	± 25				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972	18216832CCV	Iodomethane	-31 %D	--	± 25				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972	18216832CCV	Isobutanol	-30 %D	--	± 25				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972	18216839CCV	cis-1,2-Dichloroethene	-23 %D	--	± 20				
50273972						TB-013-WQ-20201120	ND	ug/L	UJ
50273972	18216839CCV	1,4-Dioxane	-94 %D	--	± 25				
50273972						TB-013-WQ-20201120	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50273972	18216839CCV	Iodomethane	-33 %D	--	± 25				
50273972						TB-013-WQ-20201120	ND	ug/L	UJ
50273972	18216839CCV	Isobutanol	-40 %D	--	± 25				
50273972						TB-013-WQ-20201120	ND	ug/L	UJ
50273972	18216839CCV	Propionitrile	-33 %D	--	± 25				
50273972						TB-013-WQ-20201120	ND	ug/L	UJ
50273972	18195656CCV	Famphur	28 %D	--	± 25				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ
50273972	18195656CCV	Hexachlorophene	-54 %D	--	± 25				
50273972						D-3-WG-20201120	ND	ug/L	UJ
50273972						D-87-WG-20201120	ND	ug/L	UJ
50273972						DUP-005-WG-20201120	ND	ug/L	UJ
50273972						EB-004-WQ-20201120	ND	ug/L	UJ
50273972						S-5-WG-20201120	ND	ug/L	UJ

Notes:
CCV = Continuing calibration verification
%D = Percent difference
ICV = Initial calibration verification
RRF = relative response factor
%R = Percent recovery

Table 7

Laboratory Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50273972	2745054BLANK-50273972	1,2-Dichlorobenzene	0.30 J	1.0				ug/L	
50273972		1,2-Dichlorobenzene			S-5-WG-20201120	2.8	5.0	ug/L	5.0 U
50273972		1,2-Dichlorobenzene			DUP-005-WG-20201120	2.9	5.0	ug/L	5.0 U
50273972	2745054BLANK-50273972	1,2,3-Trichlorobenzene	0.81 J	1.0	None for qualification, samples ND	--	--	ug/L	--
50273972	2745054BLANK-50273972	1,2,4-Trichlorobenzene	0.72 J	1.0	None for qualification, samples ND	--	--	ug/L	--
50273972	2745054BLANK-50273972	1,2,4-Trimethylbenzene	0.19 J	5.0				ug/L	
50273972		1,2,4-Trimethylbenzene			S-5-WG-20201120	3.7	25.0	ug/L	25.0 U
50273972		1,2,4-Trimethylbenzene			DUP-005-WG-20201120	3.5	25.0	ug/L	25.0 U
50273972	2745054BLANK-50273972	1,3-Dichlorobenzene	0.33 J	1.0	None for qualification, samples ND	--	--	ug/L	--
50273972	2745054BLANK-50273972	1,3,5-Trimethylbenzene	0.16 J	5.0	None for qualification, samples ND	--	--	ug/L	--
50273972	2745054BLANK-50273972	1,4-Dichlorobenzene	0.35 J	1.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50273972	2745054BLANK-50273972	2-Hexanone	1.6 J	20.0	None for qualification, samples ND	--	--	ug/L	--
50273972	2745054BLANK-50273972	4-Chlorotoluene	0.17 J	1.0	None for qualification, samples ND	--	--	ug/L	--
50273972	2745054BLANK-50273972	4-Isopropyltoluene	0.20 J	1.0	None for qualification, samples ND	--	--	ug/L	--
50273972	2745054BLANK-50273972	Acrylonitrile	1.6 J	100	None for qualification, samples ND	--	--	ug/L	--

Table 7

Laboratory Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50273972	2745054BLANK-50273972	Allyl chloride	0.61 J	20.0	None for qualification, samples ND	--	--	ug/L	--
50273972	2745054BLANK-50273972	Hexachlorobutadiene	0.71 J	1.0	None for qualification, samples ND	--	--	ug/L	--
50273972	2745054BLANK-50273972	m,p-Xylenes	0.16 J	2.0				ug/L	
50273972		m,p-Xylenes			D-3-WG-20201120	0.16	2.0	ug/L	2.0 U
50273972		m,p-Xylenes			S-5-WG-20201120	3.6	10.0	ug/L	10.0 U
50273972		m,p-Xylenes			DUP-005-WG-20201120	3.8	10.0	ug/L	10.0 U
50273972	2745054BLANK-50273972	Methacrylonitrile	0.89 J	100	None for qualification, samples ND	--	--	ug/L	--
50273972	2745054BLANK-50273972	Methyl acetate	1.1 J	20.0	None for qualification, samples ND	--	--	ug/L	--
50273972	2745054BLANK-50273972	n-Butylbenzene	0.35 J	1.0	None for qualification, samples ND	--	--	ug/L	--
50273972	2745054BLANK-50273972	n-Propylbenzene	0.14 J	1.0				ug/L	
50273972		n-Propylbenzene			S-5-WG-20201120	2.1	5.0	ug/L	5.0 U
50273972	2745054BLANK-50273972	o-Xylene	0.073 J	1.0				ug/L	
50273972		o-Xylene			S-5-WG-20201120	1.1	5.0	ug/L	5.0 U
50273972		o-Xylene			DUP-005-WG-20201120	0.95	5.0	ug/L	5.0 U
50273972	2745054BLANK-50273972	Xylene, Total	0.23 J	3.0				ug/L	
50273972		Xylene, Total			D-3-WG-20201120	0.16	3.0	ug/L	3.0 U
50273972		Xylene, Total			S-5-WG-20201120	4.7	15.0	ug/L	15.0 U
50273972		Xylene, Total			DUP-005-WG-20201120	4.7	15.0	ug/L	15.0 U

Table 7
Laboratory Blank and Associated Suspect Sample Detections
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50273972	2745054BLANK-50273972	Propionitrile	3.6 J	100	None for qualification, samples ND	--	--	ug/L	--
50273972	2745054BLANK-50273972	sec-Butylbenzene	0.20 J	1.0	None for qualification, samples ND	--	--	ug/L	--
50273972	2745054BLANK-50273972	Styrene	0.12 J	1.0	None for qualification, samples ND	--	--	ug/L	--
50273972	2748367BLANK-50273972	Boron, Total	13.4 J	100				ug/L	
50273972		Boron, Total			EB-004-WQ-20201120	14.3	100	ug/L	100 U
50273972	2755960BLANK-50273972	Sodium, Dissolved	55.5 J	1000	None for qualification, sample results > 5x blank	--	--	ug/L	--
50273972	2118474BLANK-50273972	Methane	3.4 J	5.0				ug/L	
50273972		Methane			EB-004-WQ-20201120	13	5.0	ug/L	J+

Notes:
RL = Reporting Limit

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50273972	FILTB-003-WQ-20201103	Calcium, Dissolved	413 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50273972	FILTB-003-WQ-20201103	Copper, Dissolved	0.32 J	1.0				ug/L	
50273972		Copper, Dissolved			D-3-WG-20201120	1.2	1.0	ug/L	J+
50273972		Copper, Dissolved			D-87-WG-20201120	1.1	1.0	ug/L	J+
50273972		Copper, Dissolved			DUP-005-WG-20201120	0.32	1.0	ug/L	1.0 U
50273972		Copper, Dissolved			S-5-WG-20201120	0.33	1.0	ug/L	1.0 U
50273972	FILTB-003-WQ-20201103	Iron, Dissolved	26.2 J	50.0	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50273972	FILTB-003-WQ-20201103	Magnesium, Dissolved	172 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50273972	FILTB-003-WQ-20201103	Titanium, Dissolved	0.78 J	10.0				ug/L	
50273972		Titanium, Dissolved			DUP-005-WG-20201120	2.8	10.0	ug/L	10.0 U
50273972		Titanium, Dissolved			S-5-WG-20201120	2.7	10.0	ug/L	10.0 U
50273972	EB-004-WQ-20201120	Carbon disulfide	0.24 J	5.0	None for qualification, associated samples ND	--	--	ug/L	--
50273972	EB-004-WQ-20201120	Chloroform	0.40 J	1.0	None for qualification, associated samples ND	--	--	ug/L	--
50273972	EB-004-WQ-20201120	Copper, Total	0.21 J	1.0				ug/L	
50273972		Copper, Total			D-3-WG-20201120	0.52	1.0	ug/L	1.0 U
50273972		Copper, Total			D-87-WG-20201120	0.41	1.0	ug/L	1.0 U
50273972		Copper, Total			DUP-005-WG-20201120	0.63	1.0	ug/L	1.0 U
50273972		Copper, Total			S-5-WG-20201120	0.63	1.0	ug/L	1.0 U

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50273972	EB-004-WQ-20201120	Lithium, Total	3.7 J	20.0	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50273972	EB-004-WQ-20201120	Methane	13	5.0	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50273972	EB-004-WQ-20201120	Potassium, Total	280 J	1000	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50273972	EB-004-WQ-20201120	Silicon, Total	26.4 J	200	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50273972	EB-004-WQ-20201120	Sodium, Total	276 J	1000	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50273972	EB-004-WQ-20201123	Phosphorus	0.034	0.050	None for qualification, associated samples > 5x blank	--	--	mg/L	--

Notes:

RL = Reporting Limit

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
LCS/LCSD										
50273972	2744269LCS-50273972/		1,4-Dioxane	11/	50-150					
50273972		D-87-WG-20201120	1,4-Dioxane					<100	ug/L	R
50273972		EB-004-WQ-20201120	1,4-Dioxane					<100	ug/L	R
50273972	2745055LCS-50273972/		1,4-Dioxane	20/	50-150					
50273972		D-3-WG-20201120	1,4-Dioxane					<100	ug/L	R
50273972		DUP-005-WG-20201120	1,4-Dioxane					<500	ug/L	R
50273972		S-5-WG-20201120	1,4-Dioxane					<500	ug/L	R
50273972	2745149LCS-50273972/		1,4-Dioxane	40/	50-150					
50273972		TB-013-WQ-20201120	1,4-Dioxane					<100	ug/L	UJ
MS/MSD										
50273972	D-3-WG-20201120MS/ D-3-WG-20201120MSD	None for qualification, sample > 4x spike concentration	Calcium, Dissolved	151/Pass	75-125	Pass	20	--	--	--
50273972	D-3-WG-20201120MS/ D-3-WG-20201120MSD	None for qualification, sample > 4x spike concentration	Sodium, Dissolved	168/Pass	75-125	Pass	20	--	--	--
50273972	D-87-WG-20201120MS/ D-87-WG-20201120MSD	None for qualification, sample > 4x spike concentration	Calcium, Total	53/73	75-125	Pass	20	--	--	--
50273972	S-5-WG-20201120MS/ S-5-WG-20201120MSD		Cyanide CN-	Pass/89	90-110	Pass	20			
50273972		S-5-WG-20201120	Cyanide CN-					0.0026	mg/L	J-

Notes:

LCS/LCSD = Laboratory control sample/laboratory control sample duplicate

MS/MSD - Matrix spike/matrix spike duplicate

RPD = Relative percent difference

Table 13
Laboratory Duplicate Result Outliers
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Primary/ Duplicate Sample ID	Analyte	Concentration		Reporting Limit		Units	AbD	RPD	RPD Limit	ERM Qualifier
			Sample	Duplicate	Sample	Duplicate					
50273972	S-5-WG-20201120/ S-5-WG-20201120DUP	Total Suspended Solids	36	46	12.5	12.5	mg/L	10	23	10	None, results < 5x RL and AbD <1x RL

Notes:
AbD = Absolute Difference
RPD = Relative percent difference

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Memorandum

To	Alice Sandzen
From	Jack James
Date	2021-08-23
Reference	0579381
Subject	Revised Data Review of West Lake OU-3 RI/FS Routine Groundwater Samples Collected 11/23/2020: Pace Data Package 50274044.

This memorandum was revised to address changes to total xylene method blank contamination issued by the laboratory after the first revision was complete. Table 7 has been revised as needed.

This memorandum was previously revised to address changes to the initial calibration verification data for Gas Chromatography/Mass Spectrometry methods issued by the laboratory after the initial validation was complete. Table 6 has been revised as needed.

The data quality was assessed and any necessary qualifiers were applied following the Quality Assurance Project Plan (QAPP) for West Lake OU-3 Remediation Investigation/Feasibility Study, Revision 3, December 2020, USEPA Contract Laboratory Program (CLP) NFGs for Organic Superfund Methods Data Review, document number EPA-540-R-2017-002, January 2017, USEPA CLP NFGs for Inorganic Superfund Methods Data Review, document number EPA-540-R-2017-001, January 2017, and USEPA Region 1—New England Environmental Data Review Supplement for Region 1 Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement1, June 2018, the protocols and quality control (QC) requirements of the analytical methods, and the reviewer's professional judgement.

A Stage 2B data validation was performed on 100% of the laboratory data.

The following items were reviewed as part of the data validation:

- **Chain of Custody:** The chains of custody were reviewed for proper completion and that the laboratory performed the requested methods and reported the requested target analytes for each sample.
- **Dilutions and Reanalysis:** Dilutions, calibration ranges, and reanalyses were reviewed as applicable. The best result was chosen when more than one result was reported as final.
- **Sample Preservation:** The appropriate temperature and chemical preservation requirements were reviewed. Headspace for volatile sample analysis was reviewed.
- **Holding Times:** The period of time between collection of the sample and preparation/analysis of the sample was evaluated.
- **Instrument Tuning:** Instrument tuning and performance check frequency and results were reviewed.

- **Calibration:** The initial calibration type, fit, number of standards, and minimum response factors were evaluated. Additionally, the frequency and percent recoveries for initial and continuing calibration verification standards and blanks were evaluated.
- **Laboratory Blank Samples:** The preparation and analysis of reagent (contaminant-free) water was evaluated, along with the required frequency.
- **Field Blank Samples:** The collection and analysis of field blanks was evaluated. The reviewed data package(s) included the following associated field blanks: trip, filter, and equipment
- **Spike Samples:** Laboratory control, matrix spike, and post digestion spike sample preparation frequency and recoveries were reviewed as applicable.
- **Serial Dilutions:** Serial dilution sample preparation frequency and recoveries were reviewed as applicable.
- **Surrogate Spikes:** The addition of appropriate surrogates and their recoveries were evaluated.
- **Internal standards:** The presence and recoveries of internal standards and their appropriate association to target analytes were reviewed.
- **Laboratory Duplicate Samples:** Laboratory duplicate frequencies and recoveries were reviewed as applicable.
- **Field Duplicate Samples:** Field duplicate recoveries and absolute differences were reviewed as applicable.
- **Column Agreement:** Column agreements were reviewed for relevant methods.

Findings of the data validation are summarized in the sections below. As necessary, the following data quality flags were applied during validation.

J = estimated concentration
J+ = the result is an estimated concentration, but may be biased high
J- = the result is an estimated concentration, but may be biased low
UJ = estimated reporting limit
U = evaluated to be non-detected at the reporting limit
R = rejected, data not usable
NJ = tentative identification and estimated concentration

Validation outliers and any necessary data qualifications are summarized in outlier tables at the end of this memo. The table below indicates the included validation tables with findings. Tables without findings have been omitted.

Table Number	Table Name	Included
Table 1	Samples with Non-Preferred Results	No
Table 2	Samples with Exceeded Preservation Requirements	No
Table 3	**Samples with Exceeded Holding Times**	**Yes**
Table 4	Instrument Tuning Outside of Acceptable Limits	No
Table 5	**Initial Calibration Outside of Acceptable Limits**	**Yes**
Table 6	**Calibration Verification Outside of Acceptable Limits**	**Yes**
Table 7	**Laboratory Blank and Associated Suspect Sample Detections**	**Yes**
Table 8	**Field Blank and Associated Suspect Sample Detections**	**Yes**

Table Number	Table Name	Included
Table 9	**Spike Recoveries Outside of Acceptable Limits**	**Yes**
Table 10	Serial Dilution Recoveries Outside of Acceptable Limits	No
Table 11	Surrogate Recovery Results out of Acceptable Limits	No
Table 12	Internal Standard Recovery Results out of Acceptable Limits	No
Table 13	Laboratory Duplicate Result Outliers	No
Table 14	Field Duplicate Result Outliers	No
Table 15	Column Agreement Outliers	No
Table 16	Calibration Range Exceedances	No
Table 17	Professional Judgement Qualifiers	No

Findings of the data validation are summarized in the sections below.

CASE NARRATIVE NOTES AND CHAIN-OF-CUSTODY DISCREPANCIES

The laboratory indicated that it does not hold NELAC/TNI accreditation for the methods and parameters in non-potable water listed below. No qualifiers were applied based on accreditation status. Supporting calibrations and quality control data was provided for these analytes and reviewed as part of the data validation.

Method	Analyte without NELAC/TNI Accreditation	
	CAS	Analyte Name
EPA SW 6020	7440-29-1	Thorium
	7440-61-1	Uranium
EPA SW 6010	7440-21-3	Silicon
EPA SW 8082	1336-36-3	Total PCBs
EPA SW 8270	92-52-4	Biphenyl
	99-35-4	1,3,5-Trinitrobenzene
	1912-24-9	Atrazine
	106-50-3	p-Phenylenediamine
	105-60-2	Caprolactam
	95-53-4	o-Toluidine
	100-52-7	Benzaldehyde
EPA SW 8260	110-82-7	Cyclohexane
	108-87-2	Methylcyclohexane
	78-83-1	Isobutyl alcohol
	79-20-9	Methyl acetate
	126-99-8	beta-Chloroprene
EPA SW 9056	20461-54-5	Iodide

No discrepancies between the chains-of-custody and the sample containers received were noted by the laboratory.

PRESERVATION AND HOLDING TIME EVALUATION

The laboratory received the sample shipments within the method-prescribed temperature preservation requirements of less than 6 degrees Celsius, with acceptable sample pH values, and all vials for volatile analysis were received in good condition with headspace of less than 6 millimeters.

The samples were prepared and analyzed within the method-prescribed time period from the date of collection, with the exceptions and any necessary qualifications noted in Table 3.

INSTRUMENT TUNING EVALUATION

All tuning criteria met method acceptance criteria.

INITIAL CALIBRATION

The initial calibrations met the minimum number of calibration standards, project required percent standard deviation (%RSD), relative correlation coefficient, and minimum relative response factor (RRF) limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 5.

INITIAL CALIBRATION VERIFICATION (ICV) AND CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION

The initial and continuing calibration verifications were within project-specified percent difference (%D) or percent recoveries (%R) and RRF limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 6.

Situations that required additional professional judgement are detailed below:

- SVOC analytes acetophenone, atrazine, benzaldehyde, biphenyl (diphenyl), caprolactam, N-nitrosodiphenylamine, and 1,2,4,5-tetrachlorobenzene were not reported in the ICV samples. These analytes were present in the initial calibrations and CCV samples and were within control limits. The non-detected results in associated samples have been qualified UJ.

LABORATORY BLANK EVALUATION

The laboratory blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 7. The blank results indicate that contaminants may have been introduced to the samples during processing or analysis in the laboratory.

FIELD BLANK EVALUATION

The trip, filter, and equipment blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 8. Any field blank detections associated with laboratory blank contamination and qualified as non-detected (U) are not included in Table 8. The blank results indicate that contaminants may have been introduced to the samples during collection, shipment, handling, and storage.

BLANK AND MATRIX SPIKE EVALUATION

The laboratory control sample (LCS), laboratory control sample duplicate (LCSD) recoveries, and relative percent differences (RPDs) were within the laboratory's limits of acceptance, with the exceptions and any necessary qualifications noted in Table 9. Data were not qualified if a high recovery was associated with a non-detected result.

The matrix spike (MS), matrix spike duplicate (MSD) recoveries, and RPDs were within the laboratory's limits of acceptance for target analytes for spiked project samples, with the exceptions and any necessary qualifications noted in Table 9. MS/MSDs performed on non-project samples were not reviewed. Data were not qualified if the analyte concentration in the parent sample was greater than four times the spike amount, if the spike amount was diluted out prior to analysis, or if a high recovery was associated with a non-detected result.

SERIAL DILUTION EVALUATION

The laboratory did not perform serial dilutions on any project samples. Serial dilutions performed on non-project samples were not reviewed.

SURROGATE SPIKE EVALUATION

The surrogate recoveries were within the laboratory limits of acceptance. The acceptable surrogate recoveries indicate minimal matrix interference in the samples.

INTERNAL STANDARD EVALUATION

The internal standard responses for reported results were within acceptable limits. The acceptable internal standard responses indicate that the instrument sensitivity and response were stable during each analysis.

LABORATORY DUPLICATE EVALUATION

The laboratory prepared at least one project sample as a laboratory duplicate. Laboratory duplicates performed on non-project samples were not reviewed. The RPDs between the primary sample and the duplicate were within laboratory control limits, indicating acceptable laboratory precision.

FIELD DUPLICATE EVALUATION

No field duplicates were submitted to the laboratory.

COLUMN AGREEMENT EVALUATION

Column agreements met method criteria for dual column analysis.

CALIBRATION RANGE EVALUATION

All results were reported within each instrument's calibration range.

SENSITIVITY

The sample results were reported to the method detection limit. Results between the method detection limit and the reporting limit were flagged as estimated (J) by the laboratory. A number of sample analyses were performed at a dilution factor, resulting in non-detected results reported at elevated reporting limits due to the presence of high levels of non-target analytes or other matrix interference.

COMPLETENESS

The complete data package consisted of 954 reportable data points excluding field blank samples. 1 data points were rejected. The data completeness measure for this data package is calculated to be 99.9%. The project laboratory completeness goal of 95% was met.

OVERALL ASSESSMENT

All qualified data, excluding rejected data, can be used for decision-making purposes; however, the limitation identified by the applied qualifier should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

Table 3

Samples with Exceeded Holding Times

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Extraction Holding Time	Total Time	Analysis Holding Time	Total Time	Affected Analyte	ERM Qualifier
50274044	D-93-WG-20201123	SM4500-H-B	--	--	15 min.	3088 min.	pH	J
50274044	EB-004-WQ-20201123	SM4500-H-B	--	--	15 min.	3253 min.	pH	J
50274044	I-9-WG-20201123	SM4500-H-B	--	--	15 min.	3010 min.	pH	J
50274044	S-82-WG-20201123	SM4500-H-B	--	--	15 min.	3180 min.	pH	J

Notes:

min. = minutes

Table 5
Initial Calibration Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274044	8260 Instrument 50MV2A 11/17/2020	cis-1,2-Dichloroethene	37	--	20				
50274044						TB-014-WQ-20201123	ND	ug/L	UJ
50274044	8260 Instrument 50MV2A 11/17/2020	1,4-Dioxane	97	--	20				
50274044						TB-014-WQ-20201123	ND	ug/L	UJ
50274044	8260 Instrument 50MV2A 11/17/2020	Iodomethane	38	--	20				
50274044						TB-014-WQ-20201123	ND	ug/L	UJ
50274044	8260 Instrument 50MV2B 11/17/20	1,4-Dioxane	41	--	20				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	8260 Instrument 50MV2B 11/17/20	Iodomethane	46	--	20				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	8270 Instrument 50MSS2 10/07/2020	Hexachlorophene	40	--	20				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ

Notes:
IC = Initial calibration
RSD = Relative standard deviation
RRF = Relative response factor

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274044	18159139ICV	Bromomethane	152 %R	--	70-130				
50274044						TB-014-WQ-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044	18159139ICV	Iodomethane	143 %R	--	75-125				
50274044						TB-014-WQ-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044	18159139ICV	Vinyl acetate	60 %R	--	75-125				
50274044						TB-014-WQ-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044	18159757ICV	Bromomethane	158 %R	--	70-130				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	18159757ICV	Iodomethane	170 %R	--	75-125				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	18159757ICV	Allyl chloride	190 %R	--	75-125				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	18159757ICV	Vinyl acetate	62 %R	--	75-125				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	17876511ICV	3,3'-Dimethylbenzidine	138 %R	--	75-125				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274044	17876511ICV	Kepone	132 %R	--	75-125				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	17876511ICV	Famphur	132 %R	--	75-125				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	Not present in ICV	Acetophenone	--	--	--				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	Not present in ICV	Atrazine	--	--	--				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	Not present in ICV	Benzaldehyde	--	--	--				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	Not present in ICV	Biphenyl (Diphenyl)	--	--	--				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274044	Not present in ICV	Caprolactam	--	--	--				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	Not present in ICV	N-Nitrosodiphenylamine	--	--	--				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	Not present in ICV	1,2,4,5-Tetrachlorobenzene	--	--	--				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	18216832CCV	cis-1,2-Dichloroethene	-23 %D	--	± 20				
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044	18216832CCV	1,4-Dioxane	-66 %D	--	± 25				
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044	18216832CCV	Iodomethane	-31 %D	--	± 25				
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044	18216832CCV	Isobutanol	-30 %D	--	± 25				
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044	18216839CCV	cis-1,2-Dichloroethene	-23 %D	--	± 20				
50274044						TB-014-WQ-20201123	ND	ug/L	UJ
50274044	18216839CCV	1,4-Dioxane	-94 %D	--	± 25				
50274044						TB-014-WQ-20201123	ND	ug/L	UJ
50274044	18216839CCV	Iodomethane	-33 %D	--	± 25				
50274044						TB-014-WQ-20201123	ND	ug/L	UJ
50274044	18216839CCV	Isobutanol	-40 %D	--	± 25				
50274044						TB-014-WQ-20201123	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274044	18216632CCV	Bromomethane	-42 %D		± 30				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	18216632CCV	Chloromethane	-33 %D		± 30				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	18216632CCV	1,4-Dioxane	-60 %D		± 20				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	18216632CCV	Iodomethane	-49 %D		± 25				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	18216632CCV	Isobutanol	-30 %D		± 25				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	18209178CCV	Butylbenzylphthalate	34 %D		± 25				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	18209178CCV	Di-n-butylphthalate	23 %D		± 20				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	18209178CCV	Di-n-octylphthalate	43 %D		± 40				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274044	18209178CCV	bis(2-Ethylhexyl)phthalate	31 %D		± 25				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	18209178CCV	2-Nitrophenol	25 %D		± 20				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	18209222CCV	Hexachlorophene	-35 %D		± 25				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	18215832CCV	2,4-D	43 %D		± 20				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	18215832CCV	Dinoseb	58 %D		± 20				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ
50274044	18215832CCV	2,4,5-T	63 %D		± 20				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274044	18215832CCV	2,4,5-TP	39 %D		± 20				
50274044						D-93-WG-20201123	ND	ug/L	UJ
50274044						I-9-WG-20201123	ND	ug/L	UJ
50274044						S-82-WG-20201123	ND	ug/L	UJ

Notes:

CCV = Continuing calibration verification

%D = Percent difference

ICV = Initial calibration verification

RRF = relative response factor

%R = Percent recovery

Table 7
Laboratory Blank and Associated Suspect Sample Detections
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274044	2745054BLANK-50274044	1,2-Dichlorobenzene	0.30 J	1.0	None for qualification, ND in associated sample	--	--	ug/L	--
50274044	2745054BLANK-50274044	1,2,3-Trichlorobenzene	0.81 J	1.0	None for qualification, ND in associated sample	--	--	ug/L	--
50274044	2745054BLANK-50274044	1,2,4-Trichlorobenzene	0.72 J	1.0	None for qualification, ND in associated sample	--	--	ug/L	--
50274044	2745054BLANK-50274044	1,2,4-Trimethylbenzene	0.19 J	5.0	None for qualification, ND in associated sample	--	--	ug/L	--
50274044	2745054BLANK-50274044	1,3-Dichlorobenzene	0.33 J	1.0	None for qualification, ND in associated sample	--	--	ug/L	--
50274044	2745054BLANK-50274044	1,3,5-Trimethylbenzene	0.16 J	5.0	None for qualification, ND in associated sample	--	--	ug/L	--
50274044	2745054BLANK-50274044	1,4-Dichlorobenzene	0.35 J	1.0	None for qualification, ND in associated sample	--	--	ug/L	--
50274044	2745054BLANK-50274044	2-Hexanone	1.6 J	20.0	None for qualification, ND in associated sample	--	--	ug/L	--
50274044	2745054BLANK-50274044	4-Chlorotoluene	0.17 J	1.0	None for qualification, ND in associated sample	--	--	ug/L	--
50274044	2745054BLANK-50274044	4-Isopropyltoluene	0.20 J	1.0	None for qualification, ND in associated sample	--	--	ug/L	--
50274044	2745054BLANK-50274044	Acrylonitrile	1.6 J	100	None for qualification, ND in associated sample	--	--	ug/L	--

Table 7
Laboratory Blank and Associated Suspect Sample Detections
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274044	2745054BLANK-50274044	Allyl chloride	0.61 J	20.0	None for qualification, ND in associated sample	--	--	ug/L	--
50274044	2745054BLANK-50274044	Hexachlorobutadiene	0.71 J	1.0	None for qualification, ND in associated sample	--	--	ug/L	--
50274044	2745054BLANK-50274044	m,p-Xylenes	0.16 J	2.0	None for qualification, ND in associated sample	--	--	ug/L	--
50274044	2745054BLANK-50274044	Methacrylonitrile	0.89 J	100	None for qualification, ND in associated sample	--	--	ug/L	--
50274044	2745054BLANK-50274044	Methyl acetate	1.1 J	20.0	None for qualification, ND in associated sample	--	--	ug/L	--
50274044	2745054BLANK-50274044	n-Butylbenzene	0.35 J	1.0	None for qualification, ND in associated sample	--	--	ug/L	--
50274044	2745054BLANK-50274044	n-Propylbenzene	0.14 J	1.0	None for qualification, ND in associated sample	--	--	ug/L	--
50274044	2745054BLANK-50274044	o-Xylene	0.073 J	1.0	None for qualification, ND in associated sample	--	--	ug/L	--
50274044	2745054BLANK-50274044	Xylene, Total	0.23 J	3.0	None for qualification, ND in associated sample	--	--	ug/L	--
50274044	2745054BLANK-50274044	Propionitrile	3.6 J	100	None for qualification, ND in associated sample	--	--	ug/L	--
50274044	2745054BLANK-50274044	sec-Butylbenzene	0.20 J	1.0	None for qualification, ND in associated sample	--	--	ug/L	--

Table 7
Laboratory Blank and Associated Suspect Sample Detections
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274044	2745054BLANK-50274044	Styrene	0.12 J	1.0	None for qualification, ND in associated sample	--	--	ug/L	--
50274044	2748367BLANK-50274044	Boron, Total	13.4 J	100	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274044	2755960BLANK-50274044	Sodium, Dissolved	55.5 J	1000	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274044	2118474BLANK-50274044	Methane	3.4 J	5.0	None for qualification, sample results > 5x blank	--	--	ug/L	--

Notes:
RL = Reporting Limit

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274044	FILTB-003-WQ-20201103	Calcium, Dissolved	413 J	500	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274044	FILTB-003-WQ-20201103	Copper, Dissolved	0.32 J	1.0				ug/L	
50274044		Copper, Dissolved			D-93-WG-20201123	0.59	1.0	ug/L	1.0 U
50274044		Copper, Dissolved			I-9-WG-20201123	0.77	1.0	ug/L	1.0 U
50274044		Copper, Dissolved			S-82-WG-20201123	0.68	1.0	ug/L	1.0 U
50274044	FILTB-003-WQ-20201103	Iron, Dissolved	26.2 J	50.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274044	FILTB-003-WQ-20201103	Magnesium, Dissolved	172 J	500	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274044	FILTB-003-WQ-20201103	Titanium, Dissolved	0.78 J	10.0				ug/L	
50274044		Titanium, Dissolved			D-93-WG-20201123	2.7	10.0	ug/L	10.0 U
50274044	EB-004-WQ-20201120	Carbon disulfide	0.24 J	5.0	None for qualification, associated samples ND	--	--	ug/L	--
50274044	EB-004-WQ-20201120	Chloroform	0.40 J	1.0	None for qualification, associated samples ND	--	--	ug/L	--
50274044	EB-004-WQ-20201120	Copper, Total	0.21 J	1.0				ug/L	
50274044		Copper, Total			D-93-WG-20201123	0.77	1.0	ug/L	1.0 U
50274044		Copper, Total			I-9-WG-20201123	1.0	1.0	ug/L	J+
50274044		Copper, Total			S-82-WG-20201123	0.47	1.0	ug/L	1.0 U
50274044	EB-004-WQ-20201120	Lithium, Total	3.7 J	20.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274044	EB-004-WQ-20201120	Methane	13	5.0	None for qualification, sample results > 5x blank	--	--	ug/L	--

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274044	EB-004-WQ-20201120	Potassium, Total	280 J	1000	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274044	EB-004-WQ-20201120	Silicon, Total	26.4 J	200	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274044	EB-004-WQ-20201120	Sodium, Total	276 J	1000	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274044	EB-004-WQ-20201123	Phosphorus	0.034 J	0.050	None for qualification, sample results > 5x blank	--	--	mg/L	--

Notes:

RL = Reporting Limit

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
LCS/LCSD										
50274044	2745055LCS-50274044/		1,4-Dioxane	20/	50-150					
50274044		I-9-WG-20201123	1,4-Dioxane					<100	ug/L	R
50274044	2745149LCS-50274044/		1,4-Dioxane	40/	50-150					
50274044		TB-014-WQ-20201123	1,4-Dioxane					<100	ug/L	UJ
50274044	2746232LCS-50274044/	None for qualification, samples ND	Allyl chloride	190/	70-130	--	--	--	--	--
50274044	2746232LCS-50274044/	None for qualification, samples ND	tert-Butylbenzene	110/	58-106	--	--	--	--	--
MS/MSD										
50274044	S-82-WG-20201123MS/		Ammoniacal Nitrogen NH3N	80/	90-110					
50274044		S-82-WG-20201123	Ammoniacal Nitrogen NH3N					13.1	mg/L	J-

Notes:

LCS/LCSD = Laboratory control sample/laboratory control sample duplicate

MS/MSD = Matrix spike/matrix spike duplicate

RPD = Relative percent difference

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Memorandum

To	Alice Sandzen
From	Rachel James
Date	2021-06-21
Reference	0579381
Subject	Revised Data Review of West Lake OU-3 RI/FS Routine Groundwater Samples Collected 11/24/2020: Pace Data Package 50274208.

This memorandum was revised to address changes to the initial calibration verification data for Gas Chromatography/Mass Spectrometry methods issued by the laboratory after the initial validation was complete. Table 6 has been revised as needed.

The data quality was assessed and any necessary qualifiers were applied following the Quality Assurance Project Plan (QAPP) for West Lake OU-3 Remediation Investigation/Feasibility Study, Revision 3, December 2020, USEPA Contract Laboratory Program (CLP) NFGs for Organic Superfund Methods Data Review, document number EPA-540-R-2017-002, January 2017, USEPA CLP NFGs for Inorganic Superfund Methods Data Review, document number EPA-540-R-2017-001, January 2017, and USEPA Region 1—New England Environmental Data Review Supplement for Region 1 Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement1, June 2018, the protocols and quality control (QC) requirements of the analytical methods, and the reviewer's professional judgement.

A Stage 2B data validation was performed on 100% of the laboratory data.

The following items were reviewed as part of the data validation:

- **Chain of Custody:** The chains of custody were reviewed for proper completion and that the laboratory performed the requested methods and reported the requested target analytes for each sample.
- **Dilutions and Reanalysis:** Dilutions, calibration ranges, and reanalyses were reviewed as applicable. The best result was chosen when more than one result was reported as final.
- **Sample Preservation:** The appropriate temperature and chemical preservation requirements were reviewed. Headspace for volatile sample analysis was reviewed.
- **Holding Times:** The period of time between collection of the sample and preparation/analysis of the sample was evaluated.
- **Instrument Tuning:** Instrument tuning and performance check frequency and results were reviewed.
- **Calibration:** The initial calibration type, fit, number of standards, and minimum response factors were evaluated. Additionally, the frequency and percent recoveries for initial and continuing calibration verification standards and blanks were evaluated.
- **Laboratory Blank Samples:** The preparation and analysis of reagent (contaminant-free) water was evaluated, along with the required frequency.

- **Field Blank Samples:** The collection and analysis of field blanks was evaluated. The reviewed data package(s) included the following associated field blanks: trip, filter, and equipment
- **Spike Samples:** Laboratory control, matrix spike, and post digestion spike sample preparation frequency and recoveries were reviewed as applicable.
- **Serial Dilutions:** Serial dilution sample preparation frequency and recoveries were reviewed as applicable.
- **Surrogate Spikes:** The addition of appropriate surrogates and their recoveries were evaluated.
- **Internal standards:** The presence and recoveries of internal standards and their appropriate association to target analytes were reviewed.
- **Laboratory Duplicate Samples:** Laboratory duplicate frequencies and recoveries were reviewed as applicable.
- **Field Duplicate Samples:** Field duplicate recoveries and absolute differences were reviewed as applicable.
- **Column Agreement:** Column agreements were reviewed for relevant methods.

Findings of the data validation are summarized in the sections below. As necessary, the following data quality flags were applied during validation.

J = estimated concentration
J+ = the result is an estimated concentration, but may be biased high
J- = the result is an estimated concentration, but may be biased low
UJ = estimated reporting limit
U = evaluated to be non-detected at the reporting limit
R = rejected, data not usable
NJ = tentative identification and estimated concentration

Validation outliers and any necessary data qualifications are summarized in outlier tables at the end of this memo. The table below indicates the included validation tables with findings. Tables without findings have been omitted.

Table Number	Table Name	Included
Table 1	Samples with Non-Preferred Results	No
Table 2	Samples with Exceeded Preservation Requirements	No
Table 3	**Samples with Exceeded Holding Times**	**Yes**
Table 4	Instrument Tuning Outside of Acceptable Limits	No
Table 5	**Initial Calibration Outside of Acceptable Limits**	**Yes**
Table 6	**Calibration Verification Outside of Acceptable Limits**	**Yes**
Table 7	**Laboratory Blank and Associated Suspect Sample Detections**	**Yes**
Table 8	**Field Blank and Associated Suspect Sample Detections**	**Yes**
Table 9	**Spike Recoveries Outside of Acceptable Limits**	**Yes**
Table 10	Serial Dilution Recoveries Outside of Acceptable Limits	No
Table 11	**Surrogate Recovery Results out of Acceptable Limits**	**Yes**
Table 12	Internal Standard Recovery Results out of Acceptable Limits	No

Table Number	Table Name	Included
Table 13	Laboratory Duplicate Result Outliers	No
Table 14	**Field Duplicate Result Outliers**	**Yes**
Table 15	Column Agreement Outliers	No
Table 16	Calibration Range Exceedances	No
Table 17	Professional Judgement Qualifiers	No

Findings of the data validation are summarized in the sections below.

CASE NARRATIVE NOTES AND CHAIN-OF-CUSTODY DISCREPANCIES

The laboratory indicated that it does not hold NELAC/TNI accreditation for the methods and parameters in non-potable water listed below. No qualifiers were applied based on accreditation status. Supporting calibrations and quality control data was provided for these analytes and reviewed as part of the data validation.

Method	Analyte without NELAC/TNI Accreditation	
	CAS	Analyte Name
EPA SW 6020	7440-29-1	Thorium
	7440-61-1	Uranium
EPA SW 6010	7440-21-3	Silicon
EPA SW 8082	1336-36-3	Total PCBs
EPA SW 8270	92-52-4	Biphenyl
	99-35-4	1,3,5-Trinitrobenzene
	1912-24-9	Atrazine
	106-50-3	p-Phenylenediamine
	105-60-2	Caprolactam
	95-53-4	o-Toluidine
	100-52-7	Benzaldehyde
EPA SW 8260	110-82-7	Cyclohexane
	108-87-2	Methylcyclohexane
	78-83-1	Isobutyl alcohol
	79-20-9	Methyl acetate
	126-99-8	beta-Chloroprene
EPA SW 9056	20461-54-5	Iodide

No discrepancies between the chains-of-custody and the sample containers received were noted by the laboratory.

PRESERVATION AND HOLDING TIME EVALUATION

The laboratory received the sample shipments within the method-prescribed temperature preservation requirements of less than 6 degrees Celsius, with acceptable sample pH values, and

all vials for volatile analysis were received in good condition with headspace of less than 6 millimeters.

The samples were prepared and analyzed within the method-prescribed time period from the date of collection, with the exceptions and any necessary qualifications noted in Table 3.

Situations that required additional professional judgement related to holding times and/or sample preservation are detailed below:

- The laboratory qualified the nitrite as N result for the blind field duplicate sample DUP-006-WG-20201124 as out of holding time; however, the laboratory used the documented sample collection time of 00:06 to calculate the time elapsed. Using the true collection time of the parent sample PZ-115-SS-WG-20201124, the field duplicate sample was analyzed within the 48 hour holding time. No validation qualifiers were applied.

INSTRUMENT TUNING EVALUATION

All tuning criteria met method acceptance criteria.

INITIAL CALIBRATION

The initial calibrations met the minimum number of calibration standards, project required percent standard deviation (%RSD), relative correlation coefficient, and minimum relative response factor (RRF) limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 5.

INITIAL CALIBRATION VERIFICATION (ICV) AND CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION

The initial and continuing calibration verifications were within project-specified percent difference (%D) or percent recoveries (%R) and RRF limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 6.

Situations that required additional professional judgement are detailed below:

- SVOC analytes acetophenone, atrazine, benzaldehyde, biphenyl (diphenyl), caprolactam, N-nitrosodiphenylamine, and 1,2,4,5-tetrachlorobenzene were not reported in the ICV samples. These analytes were present in the initial calibrations and CCV samples and were within control limits. The non-detected results in associated samples have been qualified UJ.

LABORATORY BLANK EVALUATION

The laboratory blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 7. The blank results indicate that contaminants may have been introduced to the samples during processing or analysis in the laboratory.

FIELD BLANK EVALUATION

The trip, filter, and equipment blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 8. Any field blank

detections associated with laboratory blank contamination and qualified as non-detected (U) are not included in Table 8. The blank results indicate that contaminants may have been introduced to the samples during collection, shipment, handling, and storage.

BLANK AND MATRIX SPIKE EVALUATION

The laboratory control sample (LCS), laboratory control sample duplicate (LCSD) recoveries, and relative percent differences (RPDs) were within the laboratory's limits of acceptance, with the exceptions and any necessary qualifications noted in Table 9. Data were not qualified if a high recovery was associated with a non-detected result.

The matrix spike (MS), matrix spike duplicate (MSD) recoveries, and RPDs were within the laboratory's limits of acceptance for target analytes for spiked project samples, with the exceptions and any necessary qualifications noted in Table 9. MS/MSDs performed on non-project samples were not reviewed. Data were not qualified if the analyte concentration in the parent sample was greater than four times the spike amount, if the spike amount was diluted out prior to analysis, or if a high recovery was associated with a non-detected result.

SERIAL DILUTION EVALUATION

The laboratory did not perform serial dilutions on any project samples. Serial dilutions performed on non-project samples were not reviewed.

SURROGATE SPIKE EVALUATION

The surrogate recoveries were within the laboratory limits of acceptance, with the exceptions and any necessary qualifications noted in Table 11. Semivolatile results were only qualified if two or more acid or base/neutral surrogates were outside of laboratory limits. Data were not qualified if the surrogate spike amount was diluted out prior to analysis or if a high recovery was associated with a non-detected result.

INTERNAL STANDARD EVALUATION

The internal standard responses for reported results were within acceptable limits. The acceptable internal standard responses indicate that the instrument sensitivity and response were stable during each analysis.

LABORATORY DUPLICATE EVALUATION

The laboratory prepared at least one project sample as a laboratory duplicate. Laboratory duplicates performed on non-project samples were not reviewed. The RPDs between the primary sample and the duplicate were within laboratory control limits, indicating acceptable laboratory precision.

FIELD DUPLICATE EVALUATION

One field sample was submitted to the laboratory as a blind duplicate. RPDs and absolute differences were calculated as appropriate and compared to the limits established in the QAPP. The QAPP states that the RPDs must be less than or equal to 30 percent for aqueous samples when analytes are detected in both samples and these results are greater than or equal to five times the reporting limit. If one or both results are less than five times the reporting limit, or one result is detected and one is non-detected, the absolute difference between the results must be

less than two times the reporting limit (if the reporting limits are not the same between the parent and field duplicate samples, the lower of the two was used for the control limit determination). The reporting limit was used for non-detected analytes when calculating absolute difference.

The RPDs and/or absolute differences were within QAPP criteria, with the exceptions and any necessary qualifications noted in Table 14.

COLUMN AGREEMENT EVALUATION

Column agreements met method criteria for dual column analysis.

CALIBRATION RANGE EVALUATION

All results were reported within each instrument's calibration range.

SENSITIVITY

The sample results were reported to the method detection limit. Results between the method detection limit and the reporting limit were flagged as estimated (J) by the laboratory. A number of sample analyses were performed at a dilution factor, resulting in non-detected results reported at elevated reporting limits due to the presence of high levels of non-target analytes or other matrix interference.

COMPLETENESS

The complete data package consisted of 1272 reportable data points excluding field blank samples. 0 data points were rejected. The data completeness measure for this data package is calculated to be 100.0%. The project laboratory completeness goal of 95% was met.

OVERALL ASSESSMENT

None of the data required rejection. All of the data, including qualified data, can be used for decision-making purposes; however, the limitations indicated by the applied qualifiers should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

Table 3

Samples with Exceeded Holding Times

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Extraction Holding Time	Total Time	Analysis Holding Time	Total Time	Affected Analyte	ERM Qualifier
50274208	DUP-006-WG-20201124	SM4500-H-B	--	--	15 min.	9517 min.	pH	J
50274208	I-65-WG-20201124	SM4500-H-B	--	--	15 min.	8714 min.	pH	J
50274208	I-68-WG-20201124	SM4500-H-B	--	--	15 min.	8839 min.	pH	J
50274208	PZ-115-SS-WG-20201124	SM4500-H-B	--	--	15 min.	8970 min.	pH	J

Notes:

min. = minutes

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274208	8260 Instrument 50MV2A 11/17/2020	cis-1,2-Dichloroethene	37	--	20				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ
50274208						TB-015-WQ-20201124	ND	ug/L	UJ
50274208	8260 Instrument 50MV2A 11/17/2020	1,4-Dioxane	97	--	20				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ
50274208						TB-015-WQ-20201124	ND	ug/L	UJ
50274208	8260 Instrument 50MV2A 11/17/2020	Iodomethane	38	--	20				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ
50274208						TB-015-WQ-20201124	ND	ug/L	UJ

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274208	8270 Instrument 50MSS2 10/07/2020	Hexachlorophene	40	--	20				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ

Notes:

IC = Initial calibration

RSD = Relative standard deviation

RRF = Relative response factor

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274208	18159139ICV	Bromomethane	152 %R	--	70-130				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ
50274208						TB-015-WQ-20201124	ND	ug/L	UJ
50274208	18159139ICV	Iodomethane	143 %R	--	75-125				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ
50274208						TB-015-WQ-20201124	ND	ug/L	UJ
50274208	18159139ICV	Vinyl acetate	60 %R	--	75-125				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ
50274208						TB-015-WQ-20201124	ND	ug/L	UJ
50274208	17876511ICV	3,3'-Dimethylbenzidine	138 %R	--	75-125				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274208	17876511ICV	Kepone	132 %R	--	75-125				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ
50274208	17876511ICV	Famphur	132 %R	--	75-125				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ
50274208	Not present in ICV	Acetophenone	--	--	--				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ
50274208	Not present in ICV	Atrazine	--	--	--				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ
50274208	Not present in ICV	Benzaldehyde	--	--	--				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274208	Not present in ICV	Biphenyl (Diphenyl)	--	--	--				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ
50274208	Not present in ICV	Caprolactam	--	--	--				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ
50274208	Not present in ICV	N-Nitrosodiphenylamine	--	--	--				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ
50274208	Not present in ICV	1,2,4,5-Tetrachlorobenzene	--	--	--				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ
50274208	18217296CCV	1,4-Dioxane	-57 %D	--	± 25				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ
50274208						TB-015-WQ-20201124	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274208	18209178CCV	Butylbenzylphthalate	34 %D	--	± 25				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ
50274208	18209178CCV	Di-n-butylphthalate	23 %D	--	± 20				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ
50274208	18209178CCV	Di-n-octylphthalate	43 %D	--	± 40				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ
50274208	18209178CCV	bis(2-Ethylhexyl)phthalate	31 %D	--	± 25				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ
50274208	18209178CCV	2-Nitrophenol	25 %D	--	± 20				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274208	18209222CCV	Hexachlorophene	-35 %D	--	± 25				
50274208						PZ-115-SS-WG-20201124	ND	ug/L	UJ
50274208						I-68-WG-20201124	ND	ug/L	UJ
50274208						I-65-WG-20201124	ND	ug/L	UJ
50274208						DUP-006-WG-20201124	ND	ug/L	UJ

Notes:
CCV = Continuing calibration verification
%D = Percent difference
ICV = Initial calibration verification
RRF = Relative response factor
%R = Percent recovery

Table 7

Laboratory Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274208	2748367BLANK-50274208	Boron, Total	13.4 J	100	None for qualification, samples > 5x blank	--	--	ug/L	--
50274208	2755960BLANK-50274208	Sodium, Dissolved	55.5 J	1000	None for qualification, samples > 5x blank	--	--	ug/L	--
50274208	2118474BLANK-50274208	Methane	3.4 J	5.0				ug/L	
50274208		Methane			I-68-WG-20201124	9.0	5.0	ug/L	J+
50274208	18279725CCB-50274208	Nitrogen, Ammonia	-0.053	0.10	None for qualification, samples > 5x blank	--	--	mg/L	--

Notes:

RL = Reporting Limit

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274208	FILTB-003-WQ-20201103	Calcium, Dissolved	413 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50274208	FILTB-003-WQ-20201103	Copper, Dissolved	0.32 J	1.0				ug/L	
50274208		Copper, Dissolved			PZ-115-SS-WG-20201124	0.61	1.0	ug/L	1.0 U
50274208		Copper, Dissolved			I-68-WG-20201124	1.1	1.0	ug/L	J+
50274208		Copper, Dissolved			I-65-WG-20201124	0.65	1.0	ug/L	1.0 U
50274208		Copper, Dissolved			DUP-006-WG-20201124	0.50	1.0	ug/L	1.0 U
50274208	FILTB-003-WQ-20201103	Iron, Dissolved	26.2 J	50.0	None for qualification, associated samples > 5x blank or ND	--	--	ug/L	--
50274208	FILTB-003-WQ-20201103	Magnesium, Dissolved	172 J	500	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50274208	FILTB-003-WQ-20201103	Titanium, Dissolved	0.78 J	10.0	None for qualification, associated samples ND	--	--	ug/L	--
50274208	EB-004-WQ-20201120	Carbon disulfide	0.24 J	5.0	None for qualification, associated samples ND	--	--	ug/L	--
50274208	EB-004-WQ-20201120	Chloroform	0.40 J	1.0	None for qualification, associated samples ND	--	--	ug/L	--
50274208	EB-004-WQ-20201120	Copper, Total	0.21 J	1.0				ug/L	
50274208		Copper, Total			PZ-115-SS-WG-20201124	1.1	1.0	ug/L	J+
50274208		Copper, Total			I-68-WG-20201124	0.84	1.0	ug/L	1.0 U
50274208		Copper, Total			I-65-WG-20201124	0.58	1.0	ug/L	1.0 U
50274208		Copper, Total			DUP-006-WG-20201124	1.1	1.0	ug/L	J+
50274208	EB-004-WQ-20201120	Lithium, Total	3.7 J	20.0				ug/L	
50274208		Lithium, Total			I-65-WG-20201124	15.0	20.0	ug/L	20.0 U

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274208	EB-004-WQ-20201120	Methane	13	5.0				ug/L	
50274208		Methane			I-68-WG-20201124	9.0	5.0	ug/L	J+
50274208	EB-004-WQ-20201120	Potassium, Total	280 J	1000	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50274208	EB-004-WQ-20201120	Silicon, Total	26.4 J	200	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50274208	EB-004-WQ-20201120	Sodium, Total	276 J	1000	None for qualification, associated samples > 5x blank	--	--	ug/L	--
50274208	EB-004-WQ-20201123	Phosphorus	0.034	0.050				mg/L	
50274208		Phosphorus			I-68-WG-20201124	0.056	0.050	mg/L	J+
50274208		Phosphorus			I-65-WG-20201124	0.048	0.050	mg/L	0.050 U

Notes:

RL = Reporting Limit

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
LCS/LCSD										
50274208	2747353LCS-50274208/		1,4-Dioxane	35/	50-150					
50274208		DUP-006-WG-20201124	1,4-Dioxane					<100	ug/L	UJ
50274208		I-65-WG-20201124	1,4-Dioxane					<100	ug/L	UJ
50274208		I-68-WG-20201124	1,4-Dioxane					<100	ug/L	UJ
50274208		PZ-115-SS-WG-20201124	1,4-Dioxane					<100	ug/L	UJ
50274208		TB-015-WQ-20201124	1,4-Dioxane					<100	ug/L	UJ
MS/MSD										
50274208	PZ-115-SS-WG-20201124MS/ PZ-115-SS-WG-20201124MSD		Bromide	73/141	80-120	31	15			
50274208		PZ-115-SS-WG-20201124	Bromide					0.56	mg/L	J
50274208	PZ-115-SS-WG-20201124MS/ PZ-115-SS-WG-20201124MSD		Fluoride	67/133	80-120	38	15			
50274208		PZ-115-SS-WG-20201124	Fluoride					0.37	mg/L	J
50274208	PZ-115-SS-WG-20201124MS/ PZ-115-SS-WG-20201124MSD		Nitrate as N	67/Pass	80-120	32	15			
50274208		PZ-115-SS-WG-20201124	Nitrate as N					<0.050	mg/L	UJ
50274208	PZ-115-SS-WG-20201124MS/ PZ-115-SS-WG-20201124MSD		Sulfate	60/126	80-120	41	15			
50274208		PZ-115-SS-WG-20201124	Sulfate					1.7	mg/L	J

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
50274208	PZ-115-SS-WG-20201124MS/ PZ-115-SS-WG-20201124MSD		Sulfide	43/38	90-110	Pass	20			
50274208		PZ-115-SS-WG-20201124	Sulfide					<1.0	mg/L	UJ
50274208	PZ-115-SS-WG-20201124MS/ PZ-115-SS-WG-20201124MSD		Chloride	Pass/121	80-120	Pass	15			
50274208		PZ-115-SS-WG-20201124	Chloride					505	mg/L	J+

Notes:

LCS/LCSD = Laboratory control sample/laboratory control sample duplicate

MS/MSD - Matrix spike/matrix spike duplicate

RPD = Relative percent difference

Table 11

Surrogate Recovery Results out of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Surrogate	Recovery (%)	Limit (%)	Affected Analyte	Dilution Factor	ERM Qualifier
50274208	PZ-115-SS-WG-20201124	SW8151A	2,4-Dichlorophenylacetic acid	16	30-140	All herbicides	1	UJ

Table 14

Field Duplicate Result Outliers

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Primary/Duplicate Sample ID	Analyte	Concentration		Reporting Limit		Units	AbD	RPD	Limit	ERM Qualifier
			Sample	Duplicate	Sample	Duplicate					
50274208	DUP-006-WG-20201124/ PZ-115-SS-WG-20201124	Dissolved Organic Carbon	45.7	9.1	5.0	1.0	mg/L	36.6	--	2.0	J
50274208	DUP-006-WG-20201124/ PZ-115-SS-WG-20201124	Sulfate	1.7	2.7	0.25	0.25	mg/L	--	45.5	30	J
50274208	DUP-006-WG-20201124/ PZ-115-SS-WG-20201124	Bromide	0.56	0.78	0.050	0.050	mg/L	--	32.8	30	J

Notes:

AbD = Absolute Difference

RPD = Relative percent difference

ERM

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Memorandum

To	Alice Sandzen
From	Jack James
Date	2021-06-21
Reference	0579381
Subject	Revised Data Review of West Lake OU-3 RI/FS Routine Groundwater Samples Collected 11/30/2020: Pace Data Package 50274420.

This memorandum was revised to address changes to the initial calibration verification data for Gas Chromatography/Mass Spectrometry methods issued by the laboratory after the initial validation was complete. Table 6 has been revised as needed.

The data quality was assessed and any necessary qualifiers were applied following the Quality Assurance Project Plan (QAPP) for West Lake OU-3 Remediation Investigation/Feasibility Study, Revision 3, December 2020, USEPA Contract Laboratory Program (CLP) NFGs for Organic Superfund Methods Data Review, document number EPA-540-R-2017-002, January 2017, USEPA CLP NFGs for Inorganic Superfund Methods Data Review, document number EPA-540-R-2017-001, January 2017, and USEPA Region 1—New England Environmental Data Review Supplement for Region 1 Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement1, June 2018, the protocols and quality control (QC) requirements of the analytical methods, and the reviewer's professional judgement.

A Stage 2B data validation was performed on 100% of the laboratory data.

The following items were reviewed as part of the data validation:

- **Chain of Custody:** The chains of custody were reviewed for proper completion and that the laboratory performed the requested methods and reported the requested target analytes for each sample.
- **Dilutions and Reanalysis:** Dilutions, calibration ranges, and reanalyses were reviewed as applicable. The best result was chosen when more than one result was reported as final.
- **Sample Preservation:** The appropriate temperature and chemical preservation requirements were reviewed. Headspace for volatile sample analysis was reviewed.
- **Holding Times:** The period of time between collection of the sample and preparation/analysis of the sample was evaluated.
- **Instrument Tuning:** Instrument tuning and performance check frequency and results were reviewed.
- **Calibration:** The initial calibration type, fit, number of standards, and minimum response factors were evaluated. Additionally, the frequency and percent recoveries for initial and continuing calibration verification standards and blanks were evaluated.
- **Laboratory Blank Samples:** The preparation and analysis of reagent (contaminant-free) water was evaluated, along with the required frequency.

- **Field Blank Samples:** The collection and analysis of field blanks was evaluated. The reviewed data package(s) included the following associated field blanks: trip, filter, and equipment
- **Spike Samples:** Laboratory control, matrix spike, and post digestion spike sample preparation frequency and recoveries were reviewed as applicable.
- **Serial Dilutions:** Serial dilution sample preparation frequency and recoveries were reviewed as applicable.
- **Surrogate Spikes:** The addition of appropriate surrogates and their recoveries were evaluated.
- **Internal standards:** The presence and recoveries of internal standards and their appropriate association to target analytes were reviewed.
- **Laboratory Duplicate Samples:** Laboratory duplicate frequencies and recoveries were reviewed as applicable.
- **Field Duplicate Samples:** Field duplicate recoveries and absolute differences were reviewed as applicable.
- **Column Agreement:** Column agreements were reviewed for relevant methods.

Findings of the data validation are summarized in the sections below. As necessary, the following data quality flags were applied during validation.

J = estimated concentration
J+ = the result is an estimated concentration, but may be biased high
J- = the result is an estimated concentration, but may be biased low
UJ = estimated reporting limit
U = evaluated to be non-detected at the reporting limit
R = rejected, data not usable
NJ = tentative identification and estimated concentration

Validation outliers and any necessary data qualifications are summarized in outlier tables at the end of this memo. The table below indicates the included validation tables with findings. Tables without findings have been omitted.

Table Number	Table Name	Included
Table 1	Samples with Non-Preferred Results	No
Table 2	Samples with Exceeded Preservation Requirements	No
Table 3	**Samples with Exceeded Holding Times**	**Yes**
Table 4	Instrument Tuning Outside of Acceptable Limits	No
Table 5	**Initial Calibration Outside of Acceptable Limits**	**Yes**
Table 6	**Calibration Verification Outside of Acceptable Limits**	**Yes**
Table 7	**Laboratory Blank and Associated Suspect Sample Detections**	**Yes**
Table 8	**Field Blank and Associated Suspect Sample Detections**	**Yes**
Table 9	**Spike Recoveries Outside of Acceptable Limits**	**Yes**
Table 10	Serial Dilution Recoveries Outside of Acceptable Limits	No
Table 11	**Surrogate Recovery Results out of Acceptable Limits**	**Yes**
Table 12	Internal Standard Recovery Results out of Acceptable Limits	No

Table Number	Table Name	Included
Table 13	Laboratory Duplicate Result Outliers	No
Table 14	Field Duplicate Result Outliers	No
Table 15	Column Agreement Outliers	No
Table 16	**Calibration Range Exceedances**	**Yes**
Table 17	Professional Judgement Qualifiers	No

Findings of the data validation are summarized in the sections below.

CASE NARRATIVE NOTES AND CHAIN-OF-CUSTODY DISCREPANCIES

The laboratory indicated that it does not hold NELAC/TNI accreditation for the methods and parameters in non-potable water listed below. No qualifiers were applied based on accreditation status. Supporting calibrations and quality control data was provided for these analytes and reviewed as part of the data validation.

Method	Analyte without NELAC/TNI Accreditation	
	CAS	Analyte Name
EPA SW 6020	7440-29-1	Thorium
	7440-61-1	Uranium
EPA SW 6010	7440-21-3	Silicon
EPA SW 8082	1336-36-3	Total PCBs
EPA SW 8270	92-52-4	Biphenyl
	99-35-4	1,3,5-Trinitrobenzene
	1912-24-9	Atrazine
	106-50-3	p-Phenylenediamine
	105-60-2	Caprolactam
	95-53-4	o-Toluidine
	100-52-7	Benzaldehyde
EPA SW 8260	110-82-7	Cyclohexane
	108-87-2	Methylcyclohexane
	78-83-1	Isobutyl alcohol
	79-20-9	Methyl acetate
	126-99-8	beta-Chloroprene
EPA SW 9056	20461-54-5	Iodide

No discrepancies between the chains-of-custody and the sample containers received were noted by the laboratory.

PRESERVATION AND HOLDING TIME EVALUATION

The laboratory received the sample shipments within the method-prescribed temperature preservation requirements of less than 6 degrees Celsius, with acceptable sample pH values, and

all vials for volatile analysis were received in good condition with headspace of less than 6 millimeters.

The samples were prepared and analyzed within the method-prescribed time period from the date of collection, with the exceptions and any necessary qualifications noted in Table 3.

INSTRUMENT TUNING EVALUATION

All tuning criteria met method acceptance criteria.

INITIAL CALIBRATION

The initial calibrations met the minimum number of calibration standards, project required percent standard deviation (%RSD), relative correlation coefficient, and minimum relative response factor (RRF) limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 5.

INITIAL CALIBRATION VERIFICATION (ICV) AND CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION

The initial and continuing calibration verifications were within project-specified percent difference (%D) or percent recoveries (%R) and RRF limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 6.

Situations that required additional professional judgement are detailed below:

- SVOC analytes acetophenone, atrazine, benzaldehyde, biphenyl (diphenyl), caprolactam, N-nitrosodiphenylamine, and 1,2,4,5-tetrachlorobenzene were not reported in the ICV samples. These analytes were present in the initial calibrations and CCV samples and were within control limits. The detect and non-detected results in associated samples have been qualified J or UJ as applicable.

LABORATORY BLANK EVALUATION

The laboratory blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 7. The blank results indicate that contaminants may have been introduced to the samples during processing or analysis in the laboratory.

FIELD BLANK EVALUATION

The trip, filter, field, and equipment blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 8. Any field blank detections associated with laboratory blank contamination and qualified as non-detected (U) are not included in Table 8. The blank results indicate that contaminants may have been introduced to the samples during collection, shipment, handling, and storage.

BLANK AND MATRIX SPIKE EVALUATION

The laboratory control sample (LCS), laboratory control sample duplicate (LCSD) recoveries, and relative percent differences (RPDs) were within the laboratory's limits of acceptance, with the

exceptions and any necessary qualifications noted in Table 9. Data were not qualified if a high recovery was associated with a non-detected result.

The matrix spike (MS), matrix spike duplicate (MSD) recoveries, and RPDs were within the laboratory's limits of acceptance for target analytes for spiked project samples, with the exceptions and any necessary qualifications noted in Table 9. MS/MSDs performed on non-project samples were not reviewed. Data were not qualified if the analyte concentration in the parent sample was greater than four times the spike amount, if the spike amount was diluted out prior to analysis, or if a high recovery was associated with a non-detected result.

SERIAL DILUTION EVALUATION

The laboratory did not perform serial dilutions on any project samples. Serial dilutions performed on non-project samples were not reviewed.

SURROGATE SPIKE EVALUATION

The surrogate recoveries were within the laboratory limits of acceptance, with the exceptions and any necessary qualifications noted in Table 11. Semivolatile results were only qualified if two or more acid or base/neutral surrogates were outside of laboratory limits. Data were not qualified if the surrogate spike amount was diluted out prior to analysis or if a high recovery was associated with a non-detected result.

INTERNAL STANDARD EVALUATION

The internal standard responses for reported results were within acceptable limits. The acceptable internal standard responses indicate that the instrument sensitivity and response were stable during each analysis.

LABORATORY DUPLICATE EVALUATION

The laboratory prepared at least one project sample as a laboratory duplicate. Laboratory duplicates performed on non-project samples were not reviewed. The RPDs between the primary sample and the duplicate were within laboratory control limits, indicating acceptable laboratory precision.

FIELD DUPLICATE EVALUATION

No field duplicates were submitted to the laboratory.

COLUMN AGREEMENT EVALUATION

Column agreements met method criteria for dual column analysis.

CALIBRATION RANGE EVALUATION

All results were reported within each instrument's calibration range, with the exceptions and any necessary qualifications noted in Table 16.

Situations that required additional professional judgement are detailed below:

- The 1,4-dioxane result in sample I-73-WG-20201130 exceeded the instrument's calibration range. The laboratory could not perform re-extraction or re-analysis due to insufficient sample volume. The result has been qualified as estimated (J).

SENSITIVITY

The sample results were reported to the method detection limit. Results between the method detection limit and the reporting limit were flagged as estimated (J) by the laboratory. A number of sample analyses were performed at a dilution factor, resulting in non-detected results reported at elevated reporting limits due to the presence of high levels of non-target analytes or other matrix interference.

COMPLETENESS

The complete data package consisted of 949 reportable data points excluding field blank samples. 0 data points were rejected. The data completeness measure for this data package is calculated to be 100.0%. The project laboratory completeness goal of 95% was met.

OVERALL ASSESSMENT

None of the data required rejection. All of the data, including qualified data, can be used for decision-making purposes; however, the limitations indicated by the applied qualifiers should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

Table 3

Samples with Exceeded Holding Times

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Extraction Holding Time	Total Time	Analysis Holding Time	Total Time	Affected Analyte	ERM Qualifier
50274420	D-85-WG-20201130	SM4500-H-B	--	--	15 min.	1415 min.	pH	J
50274420	I-73-WG-20201130	SM4500-H-B	--	--	15 min.	1754 min.	pH	J
50274420	PZ-302-AS-WG-20201130	SM4500-H-B	--	--	15 min.	1556 min.	pH	J

Notes:

min. = minutes

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274420	8260 Instrument 50MV2A 11/17/2020	cis-1,2-Dichloroethene	37	--	20				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ
50274420									
50274420	8260 Instrument 50MV2A 11/17/2020	1,4-Dioxane	97	--	20				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ
50274420	8260 Instrument 50MV2A 11/17/2020	Iodomethane	38	--	20				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ
50274420	8260 Instrument 50MV2B 11/17/20	1,4-Dioxane	41	--	20				
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						TB-016-WQ-20201130	ND	ug/L	UJ

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274420	8260 Instrument 50MV2B 11/17/20	Iodomethane	46	--	20				
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						TB-016-WQ-20201130	ND	ug/L	UJ
50274420	8270 Instrument 50MSS6 10/07/2020	Famphur	34	--	20				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ
50274420	8270 Instrument 50MSS6 10/07/2020	Hexachlorophene	25	--	20				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ
50274420	8270 Instrument 50MSS6 10/07/2020	Kepone	26	--	20				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274420	8270 Instrument 50MSS6 10/07/2020	3,3'-Dimethylbenzidine	21	--	20				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ

Notes:

IC = Initial calibration

RSD = Relative standard deviation

RRF = Relative response factor

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274420	18159139ICV	Bromomethane	152 %R	--	70-130				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ
50274420	18159139ICV	Iodomethane	143 %R	--	75-125				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ
50274420	18159139ICV	Vinyl acetate	60 %R	--	75-125				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ
50274420	18159757ICV	Bromomethane	158 %R	--	70-130				
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						TB-016-WQ-20201130	ND	ug/L	UJ
50274420	18159757ICV	Iodomethane	170 %R	--	75-125				
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						TB-016-WQ-20201130	ND	ug/L	UJ
50274420	18159757ICV	Allyl chloride	190 %R	--	75-125				
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						TB-016-WQ-20201130	ND	ug/L	UJ
50274420	18159757ICV	Vinyl acetate	62 %R	--	75-125				
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						TB-016-WQ-20201130	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274420	17873843ICV	p-Phenylenediamine	139 %R	--	75-125				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ
50274420	17873843ICV	1,3,5-Trinitrobenzene	128 %R	--	75-125				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ
50274420	17873843ICV	P-Dimethylaminoazobenzene	128 %R	--	75-125				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ
50274420	17873843ICV	3,3'-Dimethylbenzidine	135 %R	--	75-125				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274420	17873843ICV	Famphur	161 %R	--	75-125				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ
50274420	Not present in ICV	Acetophenone	--	--	--				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ
50274420	Not present in ICV	Atrazine	--	--	--				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ
50274420	Not present in ICV	Benzaldehyde	--	--	--				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ
50274420	Not present in ICV	Biphenyl (Diphenyl)	--	--	--				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274420	Not present in ICV	Caprolactam	--	--	--				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	298	ug/L	J
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ
50274420	Not present in ICV	N-Nitrosodiphenylamine	--	--	--				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ
50274420	Not present in ICV	1,2,4,5-Tetrachlorobenzene	--	--	--				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ
50274420	18255727CCV	trans-1,4-Dichloro-2-butene	-30 %D	--	± 25				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ
50274420	18255727CCV	1,4-Dioxane	-48 %D	--	± 25				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274420	18255727CCV	Iodomethane	-58 %D	--	± 25				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ
50274420	18255727CCV	Isobutanol	-27 %D	--	± 25				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420						PZ-302-AS-WG-20201130	ND	ug/L	UJ
50274420	18255738CCV	Isobutanol	-54 %D	--	± 25				
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						TB-016-WQ-20201130	ND	ug/L	UJ
50274420	18255738CCV	Trichlorofluoromethane	31 %D	--	± 25				
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						TB-016-WQ-20201130	ND	ug/L	UJ
50274420	18301207CCV	1,4-Dioxane	-56 %D	--	± 25				
50274420						TB-016-WQ-20201130	ND	ug/L	UJ
50274420	18271642CCV	Dinoseb	26 %D	--	± 20				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420	18271642CCV	2,4,5-T	30 %D	--	± 20				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274420	18271642CCV	2,4,5-TP	33 %D	--	± 20				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420	18271645CCV	2,4-D	20 %D	--	± 20				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420	18271645CCV	2,4,5-T	32 %D	--	± 20				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ
50274420	18271645CCV	2,4,5-TP	35 %D	--	± 20				
50274420						D-85-WG-20201130	ND	ug/L	UJ
50274420						FB-003-WQ-20201130	ND	ug/L	UJ
50274420						I-73-WG-20201130	ND	ug/L	UJ

Notes:

CCV = Continuing calibration verification

%D = Percent difference

ICV = Initial calibration verification

RRF = Relative response factor

%R = Percent recovery

Table 7

Laboratory Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274420	2748367BLANK-50274420	Boron, Total	13.4 J	100	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274420	2750738BLANK-50274420	Indeno(1,2,3-cd)pyrene	0.060 J	0.10	None for qualification, analyte not detected in associated sample	--	--	ug/L	--
50274420	2755960BLANK-50274420	Sodium, Dissolved	55.5 J	1000	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274420	2121083BLANK-50274420	Methane	3.8 J	5.0				ug/L	
50274420		Methane			FB-003-WQ-20201130	9.5	5.0	ug/L	J+

Notes:

RL = Reporting Limit

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274420	FILTB-003-WQ-20201103	Calcium, Dissolved	413 J	500	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274420	FILTB-003-WQ-20201103	Copper, Dissolved	0.32 J	1.0				ug/L	
50274420		Copper, Dissolved			D-85-WG-20201130	0.68 J	1.0	ug/L	1.0 U
50274420		Copper, Dissolved			I-73-WG-20201130	1.2	1.0	ug/L	J+
50274420		Copper, Dissolved			PZ-302-AS-WG-20201130	0.34 J	1.0	ug/L	1.0 U
50274420	FILTB-003-WQ-20201103	Iron, Dissolved	26.2 J	50.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274420	FILTB-003-WQ-20201103	Magnesium, Dissolved	172 J	500	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274420	FILTB-003-WQ-20201103	Titanium, Dissolved	0.78 J	10.0				ug/L	
50274420		Titanium, Dissolved			I-73-WG-20201130	8.1 J	10.0	ug/L	10.0 U
50274420	FB-003-WQ-20201130	Carbon dioxide	746 J	900	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274420	FB-003-WQ-20201130	Chromium, Total	0.25 J	2.0		--	--	ug/L	--
50274420		Chromium, Total			D-85-WG-20201130	0.79	2.0	ug/L	2.0 U
50274420	FB-003-WQ-20201130	Copper, Total	0.24 J	1.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274420	FB-003-WQ-20201130	Lead, Total	0.35 J	1.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274420	FB-003-WQ-20201130	Methane	9.5	5.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274420	FB-003-WQ-20201130	Potassium, Total	108 J	1000	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274420	FB-003-WQ-20201130	Silicon, Total	51.2 J	200	None for qualification, sample results > 5x blank	--	--	ug/L	--

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274420	FB-003-WQ-20201130	Sodium, Total	137 J	1000	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274420	EB-004-WQ-20201120	Carbon disulfide	0.24 J	5.0	None for qualification, analyte not detected in associated sample	--	--	ug/L	--
50274420	EB-004-WQ-20201120	Chloroform	0.40 J	1.0	None for qualification, analyte not detected in associated sample	--	--	ug/L	--
50274420	EB-004-WQ-20201120	Copper, Total	0.21 J	1.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274420	EB-004-WQ-20201120	Lithium, Total	3.7 J	20.0				ug/L	
50274420		Lithium, Total			PZ-302-AS-WG-20201130	13.4 J	20.0	ug/L	20.0 U
50274420	EB-004-WQ-20201120	Methane	13	5.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274420	EB-004-WQ-20201120	Potassium, Total	280 J	1000	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274420	EB-004-WQ-20201120	Silicon, Total	26.4 J	200	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274420	EB-004-WQ-20201120	Sodium, Total	276 J	1000	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274420	EB-004-WQ-20201123	Phosphorus	0.034	0.050	None for qualification, sample results > 5x blank	--	--	mg/L	--

Notes:

RL = Reporting Limit

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
LCS/LCSD										
50274420	2747932LCS-50274420/		Pyrene	128/	71-127					
50274420	2749131LCS-50274420/		Chloroprene	61/	70-130					
50274420		D-85-WG-20201130	Chloroprene					<100	ug/L	UJ
50274420		I-73-WG-20201130	Chloroprene					<100	ug/L	UJ
50274420		PZ-302-AS-WG-20201130	Chloroprene					<100	ug/L	UJ
50274420	2750040LCS-50274420/		Acrolein	126/	56-120					
50274420	2750040LCS-50274420/		Allyl chloride	182/	70-130					
50274420	2750040LCS-50274420/		Chloroprene	66/	70-130					
50274420		FB-003-WQ-20201130	Chloroprene					<100	ug/L	UJ
50274420		TB-016-WQ-20201130	Chloroprene					<100	ug/L	UJ
MS/MSD										
50274420	D-85-WG-20201130MS/		1,4-Dioxane	48/	50-150					
50274420		D-85-WG-20201130	1,4-Dioxane					<100	ug/L	UJ
50274420	D-85-WG-20201130MS/		Chloroprene	64/	70-130					
50274420		D-85-WG-20201130	Chloroprene					<100	ug/L	UJ
50274420	D-85-WG-20201130MS/ D-85-WG-20201130MSD		Chloride	121/122	80-120	Pass	15			
50274420		D-85-WG-20201130	Chloride					499	mg/L	J+

Notes:

LCS/LCSD = Laboratory control sample/laboratory control sample duplicate

MS/MSD - Matrix spike/matrix spike duplicate

RPD = Relative percent difference

Table 11

Surrogate Recovery Results out of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Surrogate	Recovery (%)	Limit (%)	Affected Analyte	Dilution Factor	ERM Qualifier
50274420	I-73-WG-20201130	SW8270C	Nitrobenzene-d5	167	37-125	No qualification for one base surrogate outlier	5	--
50274420	I-73-WG-20201130	SW8270C-SIM	p-Terphenyl-d14	48	68-138	all PAHs	1	J-/UJ

Notes:

PAHs = Polycyclic Aromatic Hydrocarbons

Table 16

Calibration Range Exceedances

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Analyte	Reported Concentration	Units	ERM Qualifier
50274420	I-73-WG-20201130	1,4-Dioxane	2230	ug/L	J

ERM

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Memorandum

To	Alice Sandzen
From	Jack James
Date	2021-06-21
Reference	0579381
Subject	Revised Data Review of West Lake OU-3 RI/FS Routine Groundwater Samples Collected 12/01/2020: Pace Data Package 50274549.

This memorandum was revised to address changes to the initial calibration verification data for Gas Chromatography/Mass Spectrometry methods issued by the laboratory after the initial validation was complete. Table 6 has been revised as needed.

The data quality was assessed and any necessary qualifiers were applied following the Quality Assurance Project Plan (QAPP) for West Lake OU-3 Remediation Investigation/Feasibility Study, Revision 3, December 2020, USEPA Contract Laboratory Program (CLP) NFGs for Organic Superfund Methods Data Review, document number EPA-540-R-2017-002, January 2017, USEPA CLP NFGs for Inorganic Superfund Methods Data Review, document number EPA-540-R-2017-001, January 2017, and USEPA Region 1—New England Environmental Data Review Supplement for Region 1 Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement1, June 2018., the protocols and quality control (QC) requirements of the analytical methods, and the reviewer's professional judgement.

A Stage 2B data validation was performed on 100% of the laboratory data.

The following items were reviewed as part of the data validation:

- **Chain of Custody:** The chains of custody were reviewed for proper completion and that the laboratory performed the requested methods and reported the requested target analytes for each sample.
- **Dilutions and Reanalysis:** Dilutions, calibration ranges, and reanalyses were reviewed as applicable. The best result was chosen when more than one result was reported as final.
- **Sample Preservation:** The appropriate temperature and chemical preservation requirements were reviewed. Headspace for volatile sample analysis was reviewed.
- **Holding Times:** The period of time between collection of the sample and preparation/analysis of the sample was evaluated.
- **Instrument Tuning:** Instrument tuning and performance check frequency and results were reviewed.
- **Calibration:** The initial calibration type, fit, number of standards, and minimum response factors were evaluated. Additionally, the frequency and percent recoveries for initial and continuing calibration verification standards and blanks were evaluated.
- **Laboratory Blank Samples:** The preparation and analysis of reagent (contaminant-free) water was evaluated, along with the required frequency.

- **Field Blank Samples:** The collection and analysis of field blanks was evaluated. The reviewed data package(s) included the following associated field blanks: trip, filter, and equipment
- **Spike Samples:** Laboratory control, matrix spike, and post digestion spike sample preparation frequency and recoveries were reviewed as applicable.
- **Serial Dilutions:** Serial dilution sample preparation frequency and recoveries were reviewed as applicable.
- **Surrogate Spikes:** The addition of appropriate surrogates and their recoveries were evaluated.
- **Internal standards:** The presence and recoveries of internal standards and their appropriate association to target analytes were reviewed.
- **Laboratory Duplicate Samples:** Laboratory duplicate frequencies and recoveries were reviewed as applicable.
- **Field Duplicate Samples:** Field duplicate recoveries and absolute differences were reviewed as applicable.
- **Column Agreement:** Column agreements were reviewed for relevant methods.

Findings of the data validation are summarized in the sections below. As necessary, the following data quality flags were applied during validation.

J = estimated concentration
J+ = the result is an estimated concentration, but may be biased high
J- = the result is an estimated concentration, but may be biased low
UJ = estimated reporting limit
U = evaluated to be non-detected at the reporting limit
R = rejected, data not usable
NJ = tentative identification and estimated concentration

Validation outliers and any necessary data qualifications are summarized in outlier tables at the end of this memo. The table below indicates the included validation tables with findings. Tables without findings have been omitted.

Table Number	Table Name	Included
Table 1	Samples with Non-Preferred Results	No
Table 2	Samples with Exceeded Preservation Requirements	No
Table 3	**Samples with Exceeded Holding Times**	**Yes**
Table 4	Instrument Tuning Outside of Acceptable Limits	No
Table 5	**Initial Calibration Outside of Acceptable Limits**	**Yes**
Table 6	**Calibration Verification Outside of Acceptable Limits**	**Yes**
Table 7	**Laboratory Blank and Associated Suspect Sample Detections**	**Yes**
Table 8	**Field Blank and Associated Suspect Sample Detections**	**Yes**
Table 9	**Spike Recoveries Outside of Acceptable Limits**	**Yes**
Table 10	Serial Dilution Recoveries Outside of Acceptable Limits	No
Table 11	**Surrogate Recovery Results out of Acceptable Limits**	**Yes**
Table 12	Internal Standard Recovery Results out of Acceptable Limits	No

Table Number	Table Name	Included
Table 13	Laboratory Duplicate Result Outliers	No
Table 14	Field Duplicate Result Outliers	No
Table 15	Column Agreement Outliers	No
Table 16	Calibration Range Exceedances	No
Table 17	Professional Judgement Qualifiers	No

Findings of the data validation are summarized in the sections below.

CASE NARRATIVE NOTES AND CHAIN-OF-CUSTODY DISCREPANCIES

The laboratory indicated that it does not hold NELAC/TNI accreditation for the methods and parameters in non-potable water listed below. No qualifiers were applied based on accreditation status. Supporting calibrations and quality control data was provided for these analytes and reviewed as part of the data validation.

Method	Analyte without NELAC/TNI Accreditation	
	CAS	Analyte Name
EPA SW 6020	7440-29-1	Thorium
	7440-61-1	Uranium
EPA SW 6010	7440-21-3	Silicon
EPA SW 8082	1336-36-3	Total PCBs
EPA SW 8270	92-52-4	Biphenyl
	99-35-4	1,3,5-Trinitrobenzene
	1912-24-9	Atrazine
	106-50-3	p-Phenylenediamine
	105-60-2	Caprolactam
	95-53-4	o-Toluidine
	100-52-7	Benzaldehyde
EPA SW 8260	110-82-7	Cyclohexane
	108-87-2	Methylcyclohexane
	78-83-1	Isobutyl alcohol
	79-20-9	Methyl acetate
	126-99-8	beta-Chloroprene
EPA SW 9056	20461-54-5	Iodide

No discrepancies between the chains-of-custody and the sample containers received were noted by the laboratory, with the following exceptions:

- Data Package 50274549: Sample PZ-100-SS-WG-20201201 was not listed on COC. The laboratory recorded the sample and was directed to analyze the sample for the required methods. Data quality was not impacted.

PRESERVATION AND HOLDING TIME EVALUATION

The laboratory received the sample shipments within the method-prescribed temperature preservation requirements of less than 6 degrees Celsius, with acceptable sample pH values, and all vials for volatile analysis were received in good condition with headspace of less than 6 millimeters.

The samples were prepared and analyzed within the method-prescribed time period from the date of collection, with the exceptions and any necessary qualifications noted in Table 3.

INSTRUMENT TUNING EVALUATION

All tuning criteria met method acceptance criteria.

INITIAL CALIBRATION

The initial calibrations met the minimum number of calibration standards, project required percent standard deviation (%RSD), relative correlation coefficient, and minimum relative response factor (RRF) limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 5.

INITIAL CALIBRATION VERIFICATION (ICV) AND CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION

The initial and continuing calibration verifications were within project-specified percent difference (%D) or percent recoveries (%R) and RRF limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 6.

Situations that required additional professional judgement are detailed below:

- SVOC analytes acetophenone, atrazine, benzaldehyde, biphenyl (diphenyl), caprolactam, N-nitrosodiphenylamine, and 1,2,4,5-tetrachlorobenzene were not reported in the ICV samples. These analytes were present in the initial calibrations and CCV samples and were within control limits. The non-detected results in associated samples have been qualified UJ.

LABORATORY BLANK EVALUATION

The laboratory blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 7. The blank results indicate that contaminants may have been introduced to the samples during processing or analysis in the laboratory.

FIELD BLANK EVALUATION

The trip, filter, and equipment blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 8. Any field blank detections associated with laboratory blank contamination and qualified as non-detected (U) are not included in Table 8. The blank results indicate that contaminants may have been introduced to the samples during collection, shipment, handling, and storage.

BLANK AND MATRIX SPIKE EVALUATION

The laboratory control sample (LCS), laboratory control sample duplicate (LCSD) recoveries, and relative percent differences (RPDs) were within the laboratory's limits of acceptance, with the exceptions and any necessary qualifications noted in Table 9. Data were not qualified if a high recovery was associated with a non-detected result.

The matrix spike (MS), matrix spike duplicate (MSD) recoveries, and RPDs were within the laboratory's limits of acceptance for target analytes for spiked project samples, with the exceptions and any necessary qualifications noted in Table 9. MS/MSDs performed on non-project samples were not reviewed. Data were not qualified if the analyte concentration in the parent sample was greater than four times the spike amount, if the spike amount was diluted out prior to analysis, or if a high recovery was associated with a non-detected result.

SERIAL DILUTION EVALUATION

Where performed on project samples, the metals serial dilution percent differences were within laboratory limits of acceptance. Serial dilutions performed on non-project samples were not reviewed.

SURROGATE SPIKE EVALUATION

The surrogate recoveries were within the laboratory limits of acceptance, with the exceptions and any necessary qualifications noted in Table 11. Semivolatile results were only qualified if two or more acid or base/neutral surrogates were outside of laboratory limits. Data were not qualified if the surrogate spike amount was diluted out prior to analysis or if a high recovery was associated with a non-detected result.

INTERNAL STANDARD EVALUATION

The internal standard responses for reported results were within acceptable limits. The acceptable internal standard responses indicate that the instrument sensitivity and response were stable during each analysis.

LABORATORY DUPLICATE EVALUATION

The laboratory prepared at least one project sample as a laboratory duplicate. Laboratory duplicates performed on non-project samples were not reviewed. The RPDs between the primary sample and the duplicate were within laboratory control limits, indicating acceptable laboratory precision.

FIELD DUPLICATE EVALUATION

No field duplicates were submitted to the laboratory.

COLUMN AGREEMENT EVALUATION

Column agreements met method criteria for dual column analysis.

CALIBRATION RANGE EVALUATION

All results were reported within each instrument's calibration range.

SENSITIVITY

The sample results were reported to the method detection limit. Results between the method detection limit and the reporting limit were flagged as estimated (J) by the laboratory. A number of sample analyses were performed at a dilution factor, resulting in non-detected results reported at elevated reporting limits due to the presence of high levels of non-target analytes or other matrix interference.

COMPLETENESS

The complete data package consisted of 1277 reportable data points excluding field blank samples. 0 data points were rejected. The data completeness measure for this data package is calculated to be 100.0%. The project laboratory completeness goal of 95% was met.

OVERALL ASSESSMENT

None of the data required rejection. All of the data, including qualified data, can be used for decision-making purposes; however, the limitations indicated by the applied qualifiers should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

Table 3

Samples with Exceeded Holding Times

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Extraction Holding Time	Total Time	Analysis Holding Time	Total Time	Affected Analyte	ERM Qualifier
50274549	PZ-100-SD-WG-20201201	SM4500-H-B	--	--	15 min.	1441 min.	pH	J
50274549	PZ-100-SS-WG-20201201	SM4500-H-B	--	--	15 min.	1669 min.	pH	J
50274549	PZ-207-AS-WG-20201201	SM4500-H-B	--	--	15 min.	1603 min.	pH	J
50274549	PZ-302-AI-WG-20201201	SM4500-H-B	--	--	15 min.	1709 min.	pH	J

Notes:

min. = minutes

Table 5
Initial Calibration Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274549	8260 Instrument 50MV2A 11/17/2020	cis-1,2-Dichloroethene	37	--	20				
50274549						TB-017-WQ-20201201	ND	ug/L	UJ
50274549	8260 Instrument 50MV2A 11/17/2020	1,4-Dioxane	97	--	20				
50274549						TB-017-WQ-20201201	ND	ug/L	UJ
50274549	8260 Instrument 50MV2A 11/17/2020	Iodomethane	38	--	20				
50274549						TB-017-WQ-20201201	ND	ug/L	UJ
50274549	8260 Instrument 50MV2B 11/17/20	1,4-Dioxane	41	--	20				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549	8260 Instrument 50MV2B 11/17/20	Iodomethane	46	--	20				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549	8270 Instrument 50MSS6 10/07/2020	Famphur	34	--	20				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ

Table 5
Initial Calibration Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274549	8270 Instrument 50MSS6 10/07/2020	Hexachlorophene	25	--	20				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549	8270 Instrument 50MSS6 10/07/2020	Kepone	26	--	20				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549	8270 Instrument 50MSS6 10/07/2020	3,3'-Dimethylbenzidine	21	--	20				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ

Notes:
IC = Initial calibration
RSD = Relative standard deviation
RRF = Relative response factor

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274549	18159139ICV	Bromomethane	152 %R	--	70-130				
50274549						TB-017-WQ-20201201	ND	ug/L	UJ
50274549	18159139ICV	Iodomethane	143 %R	--	75-125				
50274549						TB-017-WQ-20201201	ND	ug/L	UJ
50274549	18159139ICV	Vinyl acetate	60 %R	--	75-125				
50274549						TB-017-WQ-20201201	ND	ug/L	UJ
50274549	18159757ICV	Bromomethane	158 %R	--	70-130				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549	18159757ICV	Iodomethane	170 %R	--	75-125				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549	18159757ICV	Allyl chloride	190 %R	--	75-125				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274549	18159757ICV	Vinyl acetate	62 %R	--	75-125				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549	17873843ICV	p-Phenylenediamine	139 %R	--	75-125				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549	17873843ICV	1,3,5-Trinitrobenzene	128 %R	--	75-125				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549	17873843ICV	P-Dimethylaminoazobenzene	128 %R	--	75-125				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274549	17873843ICV	3,3'-Dimethylbenzidine	135 %R	--	75-125				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549	17873843ICV	Famphur	161 %R	--	75-125				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549	Not present in ICV	Acetophenone	--	--	--				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549	Not present in ICV	Atrazine	--	--	--				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274549	Not present in ICV	Benzaldehyde	--	--	--				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549	Not present in ICV	Biphenyl (Diphenyl)	--	--	--				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549	Not present in ICV	Caprolactam	--	--	--				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549	Not present in ICV	N-Nitrosodiphenylamine	--	--	--				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274549	Not present in ICV	1,2,4,5-Tetrachlorobenzene	--	--	--				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549	18255731CCV	1,4-Dioxane	-48 %D	--	± 25				
50274549						TB-017-WQ-20201201	ND	ug/L	UJ
50274549	18255731CCV	Iodomethane	-46 %D	--	± 25				
50274549						TB-017-WQ-20201201	ND	ug/L	UJ
50274549	18255738CCV	Isobutanol	-55 %D	--	± 25				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549	18255738CCV	Trichlorofluoromethane	31 %D	--	± 25				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549	18271642CCV	Dinoseb	26 %D	--	± 20				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274549	18271642CCV	2,4,5-T	30 %D	--	± 20				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549	18271642CCV	2,4,5-TP	33 %D	--	± 20				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549	18271645CCV	2,4,5-T	32 %D	--	± 20				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AS-WG-20201201_1500	ND	ug/L	UJ
50274549	18271645CCV	2,4,5-TP	35 %D	--	± 20				
50274549						PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AS-WG-20201201_1500	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274549	18271647CCV	2,4,5-T	24 %D	--	± 20				
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AS-WG-20201201_1500	ND	ug/L	UJ
50274549	18271647CCV	2,4,5-TP	29 %D	--	± 20				
50274549						PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AS-WG-20201201	ND	ug/L	UJ
50274549						PZ-302-AS-WG-20201201_1500	ND	ug/L	UJ
50274549	Method1006CCV	TPH C6-C35 ALIPHATICS	42 %D	--	± 25				
50274549		All aliphatic ranges for method				PZ-100-SD-WG-20201201	ND	ug/L	UJ
50274549		All aliphatic ranges for method				PZ-100-SS-WG-20201201	ND	ug/L	UJ
50274549		All aliphatic ranges for method				PZ-207-AS-WG-20201201	ND	ug/L	UJ
50274549		All aliphatic ranges for method				PZ-302-AI-WG-20201201	ND	ug/L	UJ
50274549		All aliphatic ranges for method				TB-017-WQ-20201201	ND	ug/L	UJ

Notes:
ICV = Initial calibration verification
%D = Percent difference
CCV = Continuing calibration verification
RRF = relative response factor
%R = Percent recovery

Table 7

Laboratory Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274549	2752789BLANK-50274549	Barium, Dissolved	4.1 J	10.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274549	2752789BLANK-50274549	Boron, Dissolved	21.8 J	100				ug/L	
50274549		Boron, Dissolved			PZ-100-SD-WG-20201201	36.2	100	ug/L	100 U
50274549	2752789BLANK-50274549	Iron, Dissolved	36.0 J	50.0				ug/L	
50274549		Iron, Dissolved			PZ-100-SD-WG-20201201	99.3	50.0	ug/L	J+
50274549	2752789BLANK-50274549	Manganese, Dissolved	2.0 J	5.0				ug/L	
50274549	2754852BLANK-50274549	Sodium, Total	176 J	1000				ug/L	
50274549	2755565BLANK-50274549	Mercury, Dissolved	0.093 J	0.20				ug/L	
50274549		Mercury, Dissolved			PZ-302-AI-WG-20201201	0.12	0.20	ug/L	0.20 U
50274549	2121083BLANK-50274549	Methane	3.8 J	5.0				ug/L	
50274549		Methane			PZ-100-SS-WG-20201201	12	5.0	ug/L	J+

Notes:

RL = Reporting Limit

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274549	FILTB-003-WQ-20201103	Calcium, Dissolved	413 J	500	None for qualification, sample results are > 5x blank	--	--	ug/L	--
50274549	FILTB-003-WQ-20201103	Copper, Dissolved	0.32 J	1.0				ug/L	
50274549		Copper, Dissolved			PZ-207-AS-WG-20201201	0.56	1.0	ug/L	1.0 U
50274549		Copper, Dissolved			PZ-302-AI-WG-20201201	0.58	1.0	ug/L	1.0 U
50274549	FILTB-003-WQ-20201103	Iron, Dissolved	26.2 J	50.0				ug/L	
50274549	FILTB-003-WQ-20201103	Magnesium, Dissolved	172 J	500				ug/L	
50274549	FILTB-003-WQ-20201103	Titanium, Dissolved	0.78 J	10.0				ug/L	
50274549		Titanium, Dissolved			PZ-207-AS-WG-20201201	1.5	10.0	ug/L	10.0 U
50274549	FILTB-004-WQ-20201103	Barium, Dissolved	0.58 J	10.0	None for qualification, sample results are > 5x blank	--	--	ug/L	--
50274549	FILTB-004-WQ-20201103	Calcium, Dissolved	232 J	500	None for qualification, sample results are > 5x blank	--	--	ug/L	--
50274549	FILTB-004-WQ-20201103	Chromium, Dissolved	0.12 J	2.0				ug/L	
50274549		Chromium, Dissolved			PZ-100-SD-WG-20201201	0.12	2.0	ug/L	2.0 U
50274549		Chromium, Dissolved			PZ-100-SS-WG-20201201	0.22	2.0	ug/L	2.0 U
50274549	FILTB-004-WQ-20201103	Copper, Dissolved	0.22 J	1.0				ug/L	
50274549		Copper, Dissolved			PZ-100-SD-WG-20201201	0.37	1.0	ug/L	1.0 U
50274549	FILTB-004-WQ-20201103	Dissolved Organic Carbon	0.80 J	1.0				mg/L	
50274549		Dissolved Organic Carbon			PZ-100-SD-WG-20201201	1.2	1.0	mg/L	J+
50274549		Dissolved Organic Carbon			PZ-100-SS-WG-20201201	0.82	1.0	mg/L	1.0 U

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274549	FILTB-004-WQ-20201103	Magnesium, Dissolved	57.9 J	500	None for qualification, sample results are > 5x blank	--	--	ug/L	--
50274549	EB-003-WQ-20201113	Chloride	0.064 J	0.25	None for qualification, sample results are > 5x blank	--	--	mg/L	--
50274549	EB-003-WQ-20201113	Chromium, Total	0.22 J	2.0				ug/L	
50274549		Chromium, Total			PZ-100-SD-WG-20201201	0.72	2.0	ug/L	2.0 U
50274549		Chromium, Total			PZ-100-SS-WG-20201201	0.27	2.0	ug/L	2.0 U
50274549	EB-003-WQ-20201113	Copper, Total	0.27 J	1.0				ug/L	
50274549		Copper, Total			PZ-100-SD-WG-20201201	0.46	1.0	ug/L	1.0 U
50274549	EB-003-WQ-20201113	Thorium, Total	0.10 J	1.0				ug/L	
50274549		Thorium, Total			PZ-100-SD-WG-20201201	0.11	1.0	ug/L	1.0 U
50274549	EB-003-WQ-20201113	Uranium, Total	0.010 J	1.0				ug/L	
50274549	EB-003-WQ-20201113	Chromium, Hexavalent	0.0447	0.100				ug/L	
50274549		Chromium, Hexavalent			PZ-100-SS-WG-20201201	0.0913	0.100	ug/L	0.100 U
50274549	EB-004-WQ-20201120	Carbon disulfide	0.24 J	5.0	None for qualification, analyte not detected in associated sample	--	--	ug/L	--
50274549	EB-004-WQ-20201120	Chloroform	0.40 J	1.0	None for qualification, analyte not detected in associated sample	--	--	ug/L	--
50274549	EB-004-WQ-20201120	Copper, Total	0.21 J	1.0				ug/L	
50274549		Copper, Total			PZ-207-AS-WG-20201201	0.48	1.0	ug/L	1.0 U
50274549		Copper, Total			PZ-302-AI-WG-20201201	0.58	1.0	ug/L	1.0 U

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274549	EB-004-WQ-20201120	Lithium, Total	3.7 J	20.0	None for qualification, sample results are > 5x blank	--	--	ug/L	--
50274549	EB-004-WQ-20201120	Methane	13	5.0	None for qualification, sample results are > 5x blank	--	--	ug/L	--
50274549	EB-004-WQ-20201120	Potassium, Total	280 J	1000	None for qualification, sample results are > 5x blank	--	--	ug/L	--
50274549	EB-004-WQ-20201120	Silicon, Total	26.4 J	200	None for qualification, sample results are > 5x blank	--	--	ug/L	--
50274549	EB-004-WQ-20201120	Sodium, Total	276 J	1000	None for qualification, sample results are > 5x blank	--	--	ug/L	--
50274549	EB-004-WQ-20201123	Phosphorus	0.034	0.050				mg/L	
50274549		Phosphorus			PZ-302-AI-WG-20201201	0.084	0.050	mg/L	J+

Notes:

RL = Reporting Limit

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
			LCS/LCSD							
50274549	2750016LCS-50274549/		1,4-Dioxane	40/	50-150					
50274549		TB-017-WQ-20201201	1,4-Dioxane					<100	ug/L	UJ
50274549	2750016LCS-50274549/		Chloroprene	64/	70-130					
50274549		TB-017-WQ-20201201	Chloroprene					<100	ug/L	UJ
50274549	2750016LCS-50274549/		Dichlorodifluoromethane (Freon 12)	186/	36-145					
50274549	2750040LCS-50274549/		Acrolein	126/	56-120					
50274549	2750040LCS-50274549/		Allyl chloride	182/	70-130					
50274549	2750040LCS-50274549/		Chloroprene	66/	70-130					
50274549		PZ-100-SD-WG-20201201	Chloroprene					<100	ug/L	UJ
50274549		PZ-100-SS-WG-20201201	Chloroprene					<100	ug/L	UJ
50274549		PZ-207-AS-WG-20201201	Chloroprene					<100	ug/L	UJ
50274549		PZ-302-AI-WG-20201201	Chloroprene					<100	ug/L	UJ
50274549	R3602004-5LCS/R3602004-6LCSD		C6-C35-Total	Pass/Pass	60.0-140	20.3	20			
50274549		PZ-100-SD-WG-20201201	All analytes for method TX1006					ND	ug/L	UJ
50274549		PZ-100-SS-WG-20201201	All analytes for method TX1006					ND	ug/L	UJ
50274549		PZ-207-AS-WG-20201201	All analytes for method TX1006					ND	ug/L	UJ
50274549		PZ-302-AI-WG-20201201	All analytes for method TX1006					ND	ug/L	UJ
50274549		TB-017-WQ-20201201	All analytes for method TX1006					ND	ug/L	UJ

Table 9
Spike Recoveries Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
MS/MSD										
50274549	PZ-207-AS-WG-20201201MS/ PZ-207-AS-WG-20201201MSD		1-Methylnaphthalene	Pass/Pass	32-147	22	20			
50274549		PZ-207-AS-WG-20201201	1-Methylnaphthalene					1.2	ug/L	J
50274549	PZ-207-AS-WG-20201201MS/ PZ-207-AS-WG-20201201MSD		1,4-Dioxane	Pass/40	50-150	41	20			
50274549		PZ-207-AS-WG-20201201	1,4-Dioxane					<100	ug/L	UJ
50274549	PZ-207-AS-WG-20201201MS/ PZ-207-AS-WG-20201201MSD	None for qualification, sample result ND	2,4-Dichlorophenoxyacetic acid	Pass/Pass	22-128	24	20	--	--	--
50274549	PZ-207-AS-WG-20201201MS/ PZ-207-AS-WG-20201201MSD	None for qualification, sample result ND	2,4,5-TP (Silvex)	Pass/Pass	27-137	26	20	--	--	--
50274549	PZ-207-AS-WG-20201201MS/ PZ-207-AS-WG-20201201MSD	None for qualification, sample result is ND	Allyl chloride	183/183	70-130	Pass	20	--	--	--
50274549	PZ-207-AS-WG-20201201MS/ PZ-207-AS-WG-20201201MSD		Chloroprene	68/67	70-130	Pass	20			
50274549		PZ-207-AS-WG-20201201	Chloroprene					<100	ug/L	UJ
50274549	PZ-207-AS-WG-20201201MS/ PZ-207-AS-WG-20201201MSD	None for qualification, sample result > 4x spike concentration	Carbon dioxide	-57/Pass	38.0-147	Pass	40	--	--	--

Table 9
Spike Recoveries Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
50274549	PZ-207-AS-WG-20201201MS/ PZ-207-AS-WG-20201201MSD		Chemical Oxygen Demand	118/128	90-110	Pass	20			
50274549		PZ-207-AS-WG-20201201	Chemical Oxygen Demand					120	mg/L	J+
50274549	PZ-207-AS-WG-20201201MS/ PZ-207-AS-WG-20201201MSD	None for qualification, sample result > 4x spike concentration	Methane	592/143	70.0-130	Pass	30	--	--	--
50274549	PZ-207-AS-WG-20201201MS/ PZ-207-AS-WG-20201201MSD	None for qualification, sample result ND	Methyl iodide	Pass/Pass	10-186	43	20	--	--	--
50274549	PZ-207-AS-WG-20201201MS/ PZ-207-AS-WG-20201201MSD		Nitrite + Nitrate as N	47/41	90-110	Pass	20			
50274549		PZ-207-AS-WG-20201201	Nitrite + Nitrate as N					0.014	mg/L	J-
50274549	PZ-207-AS-WG-20201201MS/ PZ-207-AS-WG-20201201MSD		Sulfide	42/42	90-110	Pass	20			
50274549		PZ-207-AS-WG-20201201	Sulfide					<1.0	mg/L	UJ
50274549	PZ-207-AS-WG-20201201MS/ PZ-207-AS-WG-20201201MSD	None for qualification, sample result is ND	Trichlorophenoxyacetic Acid, 2,4,5-	Pass/Pass	28-129	24	20	--	--	--
50274549	PZ-207-AS-WG-20201201MS/ PZ-207-AS-WG-20201201MSD	None for qualification, sample result is ND	2-Nitroaniline	Pass/120	27-117	Pass	20	--	--	--

Table 9
Spike Recoveries Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
50274549	PZ-207-AS-WG-20201201MS/ PZ-207-AS-WG-20201201MSD	None for qualification, sample result > 4x spike concentration	Calcium, Total	Pass/136	75-125	Pass	20	--	--	--
50274549	PZ-207-AS-WG-20201201MS/ PZ-207-AS-WG-20201201MSD	None for qualification, sample result is ND	Cyanide CN-	Pass/89	90-110	Pass	20	--	--	--
50274549	PZ-207-AS-WG-20201201MS/ PZ-207-AS-WG-20201201MSD	None for qualification, sample result > 4x spike concentration	Sodium, Total	Pass/218	75-125	Pass	20	--	--	--

Notes:
LCS/LCSD = Laboratory control sample/laboratory control sample duplicate
MS/MSD - Matrix spike/matrix spike duplicate
RPD = Relative percent difference

Table 11

Surrogate Recovery Results out of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Surrogate	Recovery (%)	Limit (%)	Affected Analyte	Dilution Factor	ERM Qualifier
50274549	PZ-302-AI-WG-20201201	TCEQ-TX-1005	o-Terphenyl	151	70.0-130	None for qualification, analytes not detected in the sample	1.03	--

ERM

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Memorandum

To	Alice Sandzen
From	Jack James
Date	2021-06-21
Reference	0579381
Subject	Revised Data Review of West Lake OU-3 RI/FS Routine Groundwater Samples Collected 12/02/2020: Pace Data Package 50274657.

This memorandum was revised to address changes to the initial calibration verification data for Gas Chromatography/Mass Spectrometry methods issued by the laboratory after the initial validation was complete. Table 6 has been revised as needed.

The data quality was assessed and any necessary qualifiers were applied following the Quality Assurance Project Plan (QAPP) for West Lake OU-3 Remediation Investigation/Feasibility Study, Revision 3, December 2020, USEPA Contract Laboratory Program (CLP) NFGs for Organic Superfund Methods Data Review, document number EPA-540-R-2017-002, January 2017, USEPA CLP NFGs for Inorganic Superfund Methods Data Review, document number EPA-540-R-2017-001, January 2017, and USEPA Region 1—New England Environmental Data Review Supplement for Region 1 Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement1, June 2018., the protocols and quality control (QC) requirements of the analytical methods, and the reviewer's professional judgement.

A Stage 2B data validation was performed on 100% of the laboratory data.

The following items were reviewed as part of the data validation:

- **Chain of Custody:** The chains of custody were reviewed for proper completion and that the laboratory performed the requested methods and reported the requested target analytes for each sample.
- **Dilutions and Reanalysis:** Dilutions, calibration ranges, and reanalyses were reviewed as applicable. The best result was chosen when more than one result was reported as final.
- **Sample Preservation:** The appropriate temperature and chemical preservation requirements were reviewed. Headspace for volatile sample analysis was reviewed.
- **Holding Times:** The period of time between collection of the sample and preparation/analysis of the sample was evaluated.
- **Instrument Tuning:** Instrument tuning and performance check frequency and results were reviewed.
- **Calibration:** The initial calibration type, fit, number of standards, and minimum response factors were evaluated. Additionally, the frequency and percent recoveries for initial and continuing calibration verification standards and blanks were evaluated.
- **Laboratory Blank Samples:** The preparation and analysis of reagent (contaminant-free) water was evaluated, along with the required frequency.

- **Field Blank Samples:** The collection and analysis of field blanks was evaluated. The reviewed data package(s) included the following associated field blanks: trip, filter, and equipment
- **Spike Samples:** Laboratory control, matrix spike, and post digestion spike sample preparation frequency and recoveries were reviewed as applicable.
- **Serial Dilutions:** Serial dilution sample preparation frequency and recoveries were reviewed as applicable.
- **Surrogate Spikes:** The addition of appropriate surrogates and their recoveries were evaluated.
- **Internal standards:** The presence and recoveries of internal standards and their appropriate association to target analytes were reviewed.
- **Laboratory Duplicate Samples:** Laboratory duplicate frequencies and recoveries were reviewed as applicable.
- **Field Duplicate Samples:** Field duplicate recoveries and absolute differences were reviewed as applicable.
- **Column Agreement:** Column agreements were reviewed for relevant methods.

Findings of the data validation are summarized in the sections below. As necessary, the following data quality flags were applied during validation.

J = estimated concentration
J+ = the result is an estimated concentration, but may be biased high
J- = the result is an estimated concentration, but may be biased low
UJ = estimated reporting limit
U = evaluated to be non-detected at the reporting limit
R = rejected, data not usable
NJ = tentative identification and estimated concentration

Validation outliers and any necessary data qualifications are summarized in outlier tables at the end of this memo. The table below indicates the included validation tables with findings. Tables without findings have been omitted.

Table Number	Table Name	Included
Table 1	Samples with Non-Preferred Results	No
Table 2	Samples with Exceeded Preservation Requirements	No
Table 3	**Samples with Exceeded Holding Times**	**Yes**
Table 4	Instrument Tuning Outside of Acceptable Limits	No
Table 5	**Initial Calibration Outside of Acceptable Limits**	**Yes**
Table 6	**Calibration Verification Outside of Acceptable Limits**	**Yes**
Table 7	**Laboratory Blank and Associated Suspect Sample Detections**	**Yes**
Table 8	**Field Blank and Associated Suspect Sample Detections**	**Yes**
Table 9	**Spike Recoveries Outside of Acceptable Limits**	**Yes**
Table 10	Serial Dilution Recoveries Outside of Acceptable Limits	No
Table 11	**Surrogate Recovery Results out of Acceptable Limits**	**Yes**
Table 12	Internal Standard Recovery Results out of Acceptable Limits	No

Table Number	Table Name	Included
Table 13	Laboratory Duplicate Result Outliers	No
Table 14	Field Duplicate Result Outliers	No
Table 15	Column Agreement Outliers	No
Table 16	Calibration Range Exceedances	No
Table 17	Professional Judgement Qualifiers	No

Findings of the data validation are summarized in the sections below.

CASE NARRATIVE NOTES AND CHAIN-OF-CUSTODY DISCREPANCIES

The laboratory indicated that it does not hold NELAC/TNI accreditation for the methods and parameters in non-potable water listed below. No qualifiers were applied based on accreditation status. Supporting calibrations and quality control data was provided for these analytes and reviewed as part of the data validation.

Method	Analyte without NELAC/TNI Accreditation	
	CAS	Analyte Name
EPA SW 6020	7440-29-1	Thorium
	7440-61-1	Uranium
EPA SW 6010	7440-21-3	Silicon
EPA SW 8082	1336-36-3	Total PCBs
EPA SW 8270	92-52-4	Biphenyl
	99-35-4	1,3,5-Trinitrobenzene
	1912-24-9	Atrazine
	106-50-3	p-Phenylenediamine
	105-60-2	Caprolactam
	95-53-4	o-Toluidine
	100-52-7	Benzaldehyde
EPA SW 8260	110-82-7	Cyclohexane
	108-87-2	Methylcyclohexane
	78-83-1	Isobutyl alcohol
	79-20-9	Methyl acetate
	126-99-8	beta-Chloroprene
EPA SW 9056	20461-54-5	Iodide

No discrepancies between the chains-of-custody and the sample containers received were noted by the laboratory.

PRESERVATION AND HOLDING TIME EVALUATION

The laboratory received the sample shipments within the method-prescribed temperature preservation requirements of less than 6 degrees Celsius, with acceptable sample pH values, and

all vials for volatile analysis were received in good condition with headspace of less than 6 millimeters.

The samples were prepared and analyzed within the method-prescribed time period from the date of collection, with the exceptions and any necessary qualifications noted in Table 3.

INSTRUMENT TUNING EVALUATION

All tuning criteria met method acceptance criteria.

INITIAL CALIBRATION

The initial calibrations met the minimum number of calibration standards, project required percent standard deviation (%RSD), relative correlation coefficient, and minimum relative response factor (RRF) limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 5.

INITIAL CALIBRATION VERIFICATION (ICV) AND CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION

The initial and continuing calibration verifications were within project-specified percent difference (%D) or percent recoveries (%R) and RRF limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 6.

Situations that required additional professional judgement are detailed below:

- SVOC analytes acetophenone, atrazine, benzaldehyde, biphenyl (diphenyl), caprolactam, N-nitrosodiphenylamine, and 1,2,4,5-tetrachlorobenzene were not reported in the ICV samples. These analytes were present in the initial calibrations and CCV samples and were within control limits. The deteced and non-detected results in associated samples have been qualified J or UJ as applicable.

LABORATORY BLANK EVALUATION

The laboratory blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 7. The blank results indicate that contaminants may have been introduced to the samples during processing or analysis in the laboratory.

Situations that required additional professional judgement are detailed below:

- Field blank sample results above the reporting limit that were associated with method blank contamination were qualified U at the sample result.

FIELD BLANK EVALUATION

The trip, filter, field, and equipment blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 8. Any field blank detections associated with laboratory blank contamination and qualified as non-detected (U) are not included in Table 8. The blank results indicate that contaminants may have been introduced to the samples during collection, shipment, handling, and storage.

BLANK AND MATRIX SPIKE EVALUATION

The laboratory control sample (LCS), laboratory control sample duplicate (LCSD) recoveries, and relative percent differences (RPDs) were within the laboratory's limits of acceptance, with the exceptions and any necessary qualifications noted in Table 9. Data were not qualified if a high recovery was associated with a non-detected result.

The matrix spike (MS), matrix spike duplicate (MSD) recoveries, and RPDs were within the laboratory's limits of acceptance for target analytes for spiked project samples, with the exceptions and any necessary qualifications noted in Table 9. MS/MSDs performed on non-project samples were not reviewed. Data were not qualified if the analyte concentration in the parent sample was greater than four times the spike amount, if the spike amount was diluted out prior to analysis, or if a high recovery was associated with a non-detected result.

SERIAL DILUTION EVALUATION

The laboratory did not perform serial dilutions on any project samples. Serial dilutions performed on non-project samples were not reviewed.

SURROGATE SPIKE EVALUATION

The surrogate recoveries were within the laboratory limits of acceptance, with the exceptions and any necessary qualifications noted in Table 11. Semivolatile results were only qualified if two or more acid or base/neutral surrogates were outside of laboratory limits. Data were not qualified if the surrogate spike amount was diluted out prior to analysis or if a high recovery was associated with a non-detected result.

INTERNAL STANDARD EVALUATION

The internal standard responses for reported results were within acceptable limits. The acceptable internal standard responses indicate that the instrument sensitivity and response were stable during each analysis.

LABORATORY DUPLICATE EVALUATION

The laboratory prepared at least one project sample as a laboratory duplicate. Laboratory duplicates performed on non-project samples were not reviewed. The RPDs between the primary sample and the duplicate were within laboratory control limits, indicating acceptable laboratory precision.

FIELD DUPLICATE EVALUATION

No field duplicates were submitted to the laboratory.

COLUMN AGREEMENT EVALUATION

Column agreements met method criteria for dual column analysis.

CALIBRATION RANGE EVALUATION

All results were reported within each instrument's calibration range.

SENSITIVITY

The sample results were reported to the method detection limit. Results between the method detection limit and the reporting limit were flagged as estimated (J) by the laboratory. A number of sample analyses were performed at a dilution factor, resulting in non-detected results reported at elevated reporting limits due to the presence of high levels of non-target analytes or other matrix interference.

COMPLETENESS

The complete data package consisted of 1590 reportable data points excluding field blank samples. 0 data points were rejected. The data completeness measure for this data package is calculated to be 100.0%. The project laboratory completeness goal of 95% was met.

OVERALL ASSESSMENT

None of the data required rejection. All of the data, including qualified data, can be used for decision-making purposes; however, the limitations indicated by the applied qualifiers should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

Table 3

Samples with Exceeded Holding Times

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Extraction Holding Time	Total Time	Analysis Holding Time	Total Time	Affected Analyte	ERM Qualifier
50274657	PZ-100-KS-WG-20201202	SM4500-H-B	--	--	15 min.	1673 min.	pH	J
50274657	PZ-200-SS-WG-20201202	SM4500-H-B	--	--	15 min.	1480 min.	pH	J
50274657	PZ-202-SS-WG-20201202	SM4500-H-B	--	--	15 min.	1482 min.	pH	J
50274657	PZ-304-AI-WG-20201202	SM4500-H-B	--	--	15 min.	1696 min.	pH	J
50274657	PZ-304-AS-WG-20201202	SM4500-H-B	--	--	15 min.	1777 min.	pH	J

Notes:

min. = minutes

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274657	8260 Instrument 50MV2A 11/17/2020	cis-1,2-Dichloroethene	37	--	20				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	0.16	ug/L	J
50274657						TB-018-WQ-20201202	ND	ug/L	UJ
50274657	8260 Instrument 50MV2A 11/17/2020	1,4-Dioxane	97	--	20				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
50274657						TB-018-WQ-20201202	ND	ug/L	UJ
50274657	8260 Instrument 50MV2A 11/17/2020	Iodomethane	38	--	20				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
50274657						TB-018-WQ-20201202	ND	ug/L	UJ

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274657	8260 Instrument 50MW2A 12/10/20	1,4-Dioxane	36	--	20				
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657	8260 Instrument 50MW2A 12/10/20	Iodomethane	37	--	20				
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657	8270 Instrument 50MSS6 10/7/20	Famphur	34	--	20				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
50274657	8270 Instrument 50MSS6 10/7/20	Hexachlorophene	25	--	20				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274657	8270 Instrument 50MSS6 10/7/20	Kepone	26	--	20				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
50274657	8270 Instrument 50MSS6 10/7/20	3,3'-Dimethylbenzidine	21	--	20				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ

Notes:

IC = Initial calibration

RSD = Relative standard deviation

RRF = Relative response factor

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274657	18159139ICV	Bromomethane	152 %R	--	70-130				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
50274657						TB-018-WQ-20201202	ND	ug/L	UJ
50274657	18159139ICV	Iodomethane	143 %R	--	75-125				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
50274657						TB-018-WQ-20201202	ND	ug/L	UJ
50274657	18159139ICV	Vinyl acetate	60 %R	--	75-125				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
50274657						TB-018-WQ-20201202	ND	ug/L	UJ
50274657	18290110ICV	Bromomethane	146 %R	--	70-130				
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657	18290110ICV	Acrolein	127 %R	--	75-125				
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274657	18290110ICV	Iodomethane	131 %R	--	75-125				
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657	18290110ICV	1,4-Dioxane	153 %R	--	75-125				
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657	17873843ICV	p-Phenylenediamine	139 %R	--	75-125				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
50274657	17873843ICV	1,3,5-Trinitrobenzene	128 %R	--	75-125				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
50274657	17873843ICV	P-Dimethylaminoazobenzene	128 %R	--	75-125				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274657	17873843ICV	3,3'-Dimethylbenzidine	135 %R	--	75-125				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
50274657	17873843ICV	Famphur	161 %R	--	75-125				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
50274657	Not present in ICV	Acetophenone	--	--	--				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274657	Not present in ICV	Atrazine	--	--	--				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
50274657	Not present in ICV	Benzaldehyde	--	--	--				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
50274657	Not present in ICV	Biphenyl (Diphenyl)	--	--	--				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274657	Not present in ICV	Caprolactam	--	--	--				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	538	ug/L	J
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
50274657	Not present in ICV	N-Nitrosodiphenylamine	--	--	--				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274657	Not present in ICV	1,2,4,5-Tetrachlorobenzene	--	--	--				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
50274657	18378309CCV	Acetonitrile	-28 %D	--	± 25				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
						TB-018-WQ-20201202	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274657	18378309CCV	Allyl chloride	-26 %D	--	± 25				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
						TB-018-WQ-20201202	ND	ug/L	UJ
50274657	18378309CCV	trans-1,4-Dichloro-2-butene	-26 %D	--	± 25				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
						TB-018-WQ-20201202	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274657	18378309CCV	cis-1,2-Dichloroethene	-24 %D	--	± 20				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	0.16	ug/L	J
						TB-018-WQ-20201202	ND	ug/L	UJ
50274657	18378309CCV	1,4-Dioxane	-65 %D	--	± 25				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
						TB-018-WQ-20201202	ND	ug/L	UJ
50274657	18378309CCV	Iodomethane	-60 %D	--	± 25				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
						TB-018-WQ-20201202	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274657	18378309CCV	Isobutanol	-53 %D	--	± 25				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
						TB-018-WQ-20201202	ND	ug/L	UJ
50274657	18378309CCV	Propionitrile	-26 %D	--	± 25				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
						TB-018-WQ-20201202	ND	ug/L	UJ
50274657	18373266CCV	Caprolactam	37 %D	--	± 30				
50274657						PZ-202-SS-WG-20201202	538	ug/L	J

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274657	18271642CCV	2,4,5-TP	33 %D	--	± 30				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
50274657	18267783CCV	1,2-Dibromo-3-chloropropane	-33 %D	--	± 30				
50274657						FB-004-WQ-20201202	ND	ug/L	UJ
50274657						PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657						PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657						PZ-304-AS-WG-20201202	ND	ug/L	UJ
50274657						TB-018-WQ-20201202	ND	ug/L	UJ

Table 6
Calibration Verification Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274657	Method1006CCV	TPH C6-C35 ALIPHATICS	42 %D	--	± 25				
50274657		All aliphatic ranges for method				FB-004-WQ-20201202	ND	ug/L	UJ
50274657		All aliphatic ranges for method				PZ-100-KS-WG-20201202	ND	ug/L	UJ
50274657		All aliphatic ranges for method				PZ-200-SS-WG-20201202	ND	ug/L	UJ
50274657		All aliphatic ranges for method				PZ-202-SS-WG-20201202	ND	ug/L	UJ
50274657		All aliphatic ranges for method				PZ-304-AI-WG-20201202	ND	ug/L	UJ
50274657		All aliphatic ranges for method				PZ-304-AS-WG-20201202	ND	ug/L	UJ
50274657		All aliphatic ranges for method				TB-018-WQ-20201202	ND	ug/L	UJ

Notes:
CCV = Continuing calibration verification
%D = Percent difference
ICV = Initial calibration verification
RRF = Relative response factor
%R = Percent recovery

Table 7

Laboratory Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274657	2750738BLANK-50274657	Indeno(1,2,3-cd)pyrene	0.060 J	0.10	None for qualification, analyte ND in associated sample	--	--	ug/L	--
50274657	2752789BLANK-50274657	Barium, Dissolved	4.1 J	10.0				ug/L	
50274657		Barium, Dissolved			PZ-100-KS-WG-20201202	6.9	10.0	ug/L	10.0 U
50274657	2752789BLANK-50274657	Boron, Dissolved	21.8 J	100				ug/L	
50274657		Boron, Dissolved			PZ-200-SS-WG-20201202	50.4	100	ug/L	100 U
50274657	2752789BLANK-50274657	Iron, Dissolved	36.0 J	50.0				ug/L	
50274657		Iron, Dissolved			PZ-100-KS-WG-20201202	132	50.0	ug/L	J+
50274657	2752789BLANK-50274657	Manganese, Dissolved	2.0 J	5.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274657	2754852BLANK-50274657	Sodium, Total	176 J	1000	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274657	2755565BLANK-50274657	Mercury, Dissolved	0.093 J	0.20	None for qualification, analyte not detected in associated sample	--	--	ug/L	--
50274657	2121083BLANK-50274657	Methane	3.8 J	5.0				ug/L	
50274657		Methane			FB-004-WQ-20201202	7.7	5.0	ug/L	J+
50274657	2124370BLANK-50274657	Methane	3.1 J	5.0				ug/L	
50274657	18311178CCB	Ammoniacal Nitrogen NH3N	0.064	0.10	None for qualification, sample results > 5x blank or ND	--	--	mg/L	--
50274657	18311182CCB	Ammoniacal Nitrogen NH3N	0.04	0.10	None for qualification, sample results > 5x blank	--	--	mg/L	--

Notes:

RL = Reporting Limit

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274657	FILTB-003-WQ-20201103	Calcium, Dissolved	413 J	500	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274657	FILTB-003-WQ-20201103	Copper, Dissolved	0.32 J	1.0				ug/L	
50274657		Copper, Dissolved			PZ-202-SS-WG-20201202	1.3	1.0	ug/L	J+
50274657		Copper, Dissolved			PZ-304-AI-WG-20201202	0.67 J	1.0	ug/L	1.0 U
50274657		Copper, Dissolved			PZ-304-AS-WG-20201202	0.72 J	1.0	ug/L	1.0 U
50274657	FILTB-003-WQ-20201103	Iron, Dissolved	26.2 J	50.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274657	FILTB-003-WQ-20201103	Magnesium, Dissolved	172 J	500	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274657	FILTB-003-WQ-20201103	Titanium, Dissolved	0.78 J	10.0	None for qualification, sample results > 5x blank or ND	--	--	ug/L	--
50274657	FILTB-004-WQ-20201103	Barium, Dissolved	0.58 J	10.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274657	FILTB-004-WQ-20201103	Calcium, Dissolved	232 J	500	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274657	FILTB-004-WQ-20201103	Chromium, Dissolved	0.12 J	2.0				ug/L	
50274657		Chromium, Dissolved			PZ-100-KS-WG-20201202	0.14 J	2.0	ug/L	2.0 U
50274657		Chromium, Dissolved			PZ-200-SS-WG-20201202	0.14 J	2.0	ug/L	2.0 U
50274657	FILTB-004-WQ-20201103	Copper, Dissolved	0.22 J	1.0				ug/L	
50274657		Copper, Dissolved			PZ-100-KS-WG-20201202	0.30 J	1.0	ug/L	1.0 U
50274657		Copper, Dissolved			PZ-200-SS-WG-20201202	0.70 J	1.0	ug/L	1.0 U

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274657	FILTB-004-WQ-20201103	Dissolved Organic Carbon	0.80 J	1.0				ug/L	
50274657		Dissolved Organic Carbon			PZ-100-KS-WG-20201202	0.73 J	1.0	ug/L	1.0 U
50274657		Dissolved Organic Carbon			PZ-200-SS-WG-20201202	1.6	1.0	ug/L	J+
50274657	FILTB-004-WQ-20201103	Magnesium, Dissolved	57.9 J	500	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274657	FB-004-WQ-20201202	Carbon dioxide	303 J	900	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274657	FB-004-WQ-20201202	Chloroform	0.13 J	1.0	None for qualification, analyte ND in associated samples	--	--	ug/L	--
50274657	FB-004-WQ-20201202	Lead, Total	0.081 J	1.0	None for qualification, analyte ND in associated samples	--	--	ug/L	--
50274657	FB-004-WQ-20201202	Methane	7.7	5.0				ug/L	
50274657		Methane			PZ-100-KS-WG-20201202	36	5.0	ug/L	J+
50274657	FB-004-WQ-20201202	Sodium, Total	195 J	1000	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274657	EB-004-WQ-20201120	Carbon disulfide	0.24 J	5.0	None for qualification, analyte ND in associated samples	--	--	ug/L	--
50274657	EB-004-WQ-20201120	Chloroform	0.40 J	1.0	None for qualification, analyte ND in associated samples	--	--	ug/L	--
50274657	EB-004-WQ-20201120	Copper, Total	0.21 J	1.0				ug/L	
50274657		Copper, Total			PZ-304-AI-WG-20201202	0.61 J	1.0	ug/L	1.0 U
50274657		Copper, Total			PZ-304-AS-WG-20201202	0.94 J	1.0	ug/L	1.0 U

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274657	EB-004-WQ-20201120	Lithium, Total	3.7 J	20.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274657	EB-004-WQ-20201120	Methane	13	5.0	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274657	EB-004-WQ-20201120	Potassium, Total	280 J	1000	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274657	EB-004-WQ-20201120	Silicon, Total	26.4 J	200	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274657	EB-004-WQ-20201120	Sodium, Total	276 J	1000	None for qualification, sample results > 5x blank	--	--	ug/L	--
50274657	EB-004-WQ-20201123	Phosphorus	0.034	0.050	None for qualification, sample results > 5x blank	--	--	mg/L	--

Notes:

RL = Reporting Limit

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
LCS/LCSD										
50274657	2751542LCS-50274657/		1,4-Dioxane	43/	50-150					
50274657		FB-004-WQ-20201202	1,4-Dioxane					<100	ug/L	UJ
50274657		PZ-304-AI-WG-20201202	1,4-Dioxane					<100	ug/L	UJ
50274657		PZ-304-AS-WG-20201202	1,4-Dioxane					<100	ug/L	UJ
50274657		TB-018-WQ-20201202	1,4-Dioxane					<100	ug/L	UJ
50274657	2757104LCS-50274657/	None for qualification, sample result is ND	Mercury, Total	123/	80-120	--	--	--	--	--
50274657	2757355LCS-50274657/	None for qualification, sample result is ND	Acrolein	132/	56-120	--	--	--	--	--
50274657	2757355LCS-50274657/	None for qualification, sample result is ND	tert-Butylbenzene	109/	58-106	--	--	--	--	--
50274657	R3602004-5LCS/R3602004-6LCSD		C6-C35-Total	Pass/Pass	60-140	20.3	20			
50274657		PZ-304-AS-WG-20201202	All analytes for method TX1006					ND	ug/L	UJ
50274657		PZ-304-AI-WG-20201202	All analytes for method TX1006					ND	ug/L	UJ
50274657		PZ-100-KS-WG-20201202	All analytes for method TX1006					ND	ug/L	UJ
50274657		FB-004-WQ-20201202	All analytes for method TX1006					ND	ug/L	UJ
50274657		PZ-202-SS-WG-20201202	All analytes for method TX1006					ND	ug/L	UJ
50274657		PZ-200-SS-WG-20201202	All analytes for method TX1006					ND	ug/L	UJ
50274657		TB-018-WQ-20201202	All analytes for method TX1006					ND	ug/L	UJ

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
MS/MSD										
50274657	PZ-304-AS-WG-20201202MS/ PZ-304-AS-WG-20201202MSD		Chloride	-94/-95	80-120	Pass	15			
50274657		PZ-304-AS-WG-20201202	Chloride					241	mg/L	J-
50274657	PZ-100-KS-WG-20201202MS/ PZ-100-KS-WG-20201202MSD		1,2-Dibromo-3-chloropropane	Pass/59	60-140	26	20			
50274657		PZ-100-KS-WG-20201202	1,2-Dibromo-3-chloropropane					ND	mg/L	UJ

Notes:

LCS/LCSD = Laboratory control sample/laboratory control sample duplicate

MS/MSD - Matrix spike/matrix spike duplicate

RPD = Relative percent difference

Table 11

Surrogate Recovery Results out of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Surrogate	Recovery (%)	Limit (%)	Affected Analyte	Dilution Factor	ERM Qualifier
50274657	PZ-100-KS-WG-20201202	SW8151A	2,4-Dichlorophenylacetic acid	22	30-140	All	1	UJ
50274657	PZ-202-SS-WG-20201202	SW8151A	2,4-Dichlorophenylacetic acid	188	30-140	None for qualification, sample results are non-detect.	1	--

ERM

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Memorandum

To	Alice Sandzen
From	Rachel James
Date	2021-06-21
Reference	0579381
Subject	Revised Data Review of West Lake OU-3 RI/FS Routine Groundwater Samples Collected 12/03/2020: Pace Data Package 50274820.

This memorandum was revised to address changes to the initial calibration verification data for Gas Chromatography/Mass Spectrometry methods issued by the laboratory after the initial validation was complete. Table 6 has been revised as needed.

The data quality was assessed and any necessary qualifiers were applied following the Quality Assurance Project Plan (QAPP) for West Lake OU-3 Remediation Investigation/Feasibility Study, Revision 3, December 2020, USEPA Contract Laboratory Program (CLP) NFGs for Organic Superfund Methods Data Review, document number EPA-540-R-2017-002, January 2017, USEPA CLP NFGs for Inorganic Superfund Methods Data Review, document number EPA-540-R-2017-001, January 2017, and USEPA Region 1—New England Environmental Data Review Supplement for Region 1 Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement1, June 2018, the protocols and quality control (QC) requirements of the analytical methods, and the reviewer's professional judgement.

A Stage 2B data validation was performed on 100% of the laboratory data.

The following items were reviewed as part of the data validation:

- **Chain of Custody:** The chains of custody were reviewed for proper completion and that the laboratory performed the requested methods and reported the requested target analytes for each sample.
- **Dilutions and Reanalysis:** Dilutions, calibration ranges, and reanalyses were reviewed as applicable. The best result was chosen when more than one result was reported as final.
- **Sample Preservation:** The appropriate temperature and chemical preservation requirements were reviewed. Headspace for volatile sample analysis was reviewed.
- **Holding Times:** The period of time between collection of the sample and preparation/analysis of the sample was evaluated.
- **Instrument Tuning:** Instrument tuning and performance check frequency and results were reviewed.
- **Calibration:** The initial calibration type, fit, number of standards, and minimum response factors were evaluated. Additionally, the frequency and percent recoveries for initial and continuing calibration verification standards and blanks were evaluated.
- **Laboratory Blank Samples:** The preparation and analysis of reagent (contaminant-free) water was evaluated, along with the required frequency.

- **Field Blank Samples:** The collection and analysis of field blanks was evaluated. The reviewed data package(s) included the following associated field blanks: trip, filter, and equipment
- **Spike Samples:** Laboratory control, matrix spike, and post digestion spike sample preparation frequency and recoveries were reviewed as applicable.
- **Serial Dilutions:** Serial dilution sample preparation frequency and recoveries were reviewed as applicable.
- **Surrogate Spikes:** The addition of appropriate surrogates and their recoveries were evaluated.
- **Internal standards:** The presence and recoveries of internal standards and their appropriate association to target analytes were reviewed.
- **Laboratory Duplicate Samples:** Laboratory duplicate frequencies and recoveries were reviewed as applicable.
- **Field Duplicate Samples:** Field duplicate recoveries and absolute differences were reviewed as applicable.
- **Column Agreement:** Column agreements were reviewed for relevant methods.

Findings of the data validation are summarized in the sections below. As necessary, the following data quality flags were applied during validation.

J = estimated concentration
J+ = the result is an estimated concentration, but may be biased high
J- = the result is an estimated concentration, but may be biased low
UJ = estimated reporting limit
U = evaluated to be non-detected at the reporting limit
R = rejected, data not usable
NJ = tentative identification and estimated concentration

Validation outliers and any necessary data qualifications are summarized in outlier tables at the end of this memo. The table below indicates the included validation tables with findings. Tables without findings have been omitted.

Table Number	Table Name	Included
Table 1	Samples with Non-Preferred Results	No
Table 2	Samples with Exceeded Preservation Requirements	No
Table 3	**Samples with Exceeded Holding Times**	**Yes**
Table 4	Instrument Tuning Outside of Acceptable Limits	No
Table 5	**Initial Calibration Outside of Acceptable Limits**	**Yes**
Table 6	**Calibration Verification Outside of Acceptable Limits**	**Yes**
Table 7	**Laboratory Blank and Associated Suspect Sample Detections**	**Yes**
Table 8	**Field Blank and Associated Suspect Sample Detections**	**Yes**
Table 9	**Spike Recoveries Outside of Acceptable Limits**	**Yes**
Table 10	**Serial Dilution Recoveries Outside of Acceptable Limits**	**Yes**
Table 11	**Surrogate Recovery Results out of Acceptable Limits**	**Yes**
Table 12	Internal Standard Recovery Results out of Acceptable Limits	No

Table Number	Table Name	Included
Table 13	Laboratory Duplicate Result Outliers	No
Table 14	Field Duplicate Result Outliers	No
Table 15	Column Agreement Outliers	No
Table 16	Calibration Range Exceedances	No
Table 17	Professional Judgement Qualifiers	No

Findings of the data validation are summarized in the sections below.

CASE NARRATIVE NOTES AND CHAIN-OF-CUSTODY DISCREPANCIES

The laboratory indicated that it does not hold NELAC/TNI accreditation for the methods and parameters in non-potable water listed below. No qualifiers were applied based on accreditation status. Supporting calibrations and quality control data was provided for these analytes and reviewed as part of the data validation.

Method	Analyte without NELAC/TNI Accreditation	
	CAS	Analyte Name
EPA SW 6020	7440-29-1	Thorium
	7440-61-1	Uranium
EPA SW 6010	7440-21-3	Silicon
EPA SW 8082	1336-36-3	Total PCBs
EPA SW 8270	92-52-4	Biphenyl
	99-35-4	1,3,5-Trinitrobenzene
	1912-24-9	Atrazine
	106-50-3	p-Phenylenediamine
	105-60-2	Caprolactam
	95-53-4	o-Toluidine
	100-52-7	Benzaldehyde
EPA SW 8260	110-82-7	Cyclohexane
	108-87-2	Methylcyclohexane
	78-83-1	Isobutyl alcohol
	79-20-9	Methyl acetate
	126-99-8	beta-Chloroprene
EPA SW 9056	20461-54-5	Iodide

No discrepancies between the chains-of-custody and the sample containers received were noted by the laboratory.

PRESERVATION AND HOLDING TIME EVALUATION

The laboratory received the sample shipments within the method-prescribed temperature preservation requirements of less than 6 degrees Celsius, with acceptable sample pH values, and

all vials for volatile analysis were received in good condition with headspace of less than 6 millimeters.

The samples were prepared and analyzed within the method-prescribed time period from the date of collection, with the exceptions and any necessary qualifications noted in Table 3.

INSTRUMENT TUNING EVALUATION

All tuning criteria met method acceptance criteria.

INITIAL CALIBRATION

The initial calibrations met the minimum number of calibration standards, project required percent standard deviation (%RSD), relative correlation coefficient, and minimum relative response factor (RRF) limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 5.

INITIAL CALIBRATION VERIFICATION (ICV) AND CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION

The initial and continuing calibration verifications were within project-specified percent difference (%D) or percent recoveries (%R) and RRF limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 6.

Situations that required additional professional judgement are detailed below:

- SVOC analytes acetophenone, atrazine, benzaldehyde, biphenyl (diphenyl), caprolactam, N-nitrosodiphenylamine, and 1,2,4,5-tetrachlorobenzene were not reported in the ICV samples. These analytes were present in the initial calibrations and CCV samples and were within control limits. The detect and non-detected results in associated samples have been qualified J or UJ as applicable.

LABORATORY BLANK EVALUATION

The laboratory blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 7. The blank results indicate that contaminants may have been introduced to the samples during processing or analysis in the laboratory.

FIELD BLANK EVALUATION

The trip, filter, and equipment blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 8. Any field blank detections associated with laboratory blank contamination and qualified as non-detected (U) are not included in Table 8. The blank results indicate that contaminants may have been introduced to the samples during collection, shipment, handling, and storage.

BLANK AND MATRIX SPIKE EVALUATION

The laboratory control sample (LCS), laboratory control sample duplicate (LCSD) recoveries, and relative percent differences (RPDs) were within the laboratory's limits of acceptance, with the

exceptions and any necessary qualifications noted in Table 9. Data were not qualified if a high recovery was associated with a non-detected result.

The matrix spike (MS), matrix spike duplicate (MSD) recoveries, and RPDs were within the laboratory's limits of acceptance for target analytes for spiked project samples, with the exceptions and any necessary qualifications noted in Table 9. MS/MSDs performed on non-project samples were not reviewed. Data were not qualified if the analyte concentration in the parent sample was greater than four times the spike amount, if the spike amount was diluted out prior to analysis, or if a high recovery was associated with a non-detected result.

SERIAL DILUTION EVALUATION

The metals serial dilution sample percent differences were within laboratory limits of acceptance, with the exceptions and any necessary qualifications noted in Table 10. Results were not qualified if the analyte concentration in the original sample was less than 50 times the detection limit. Serial dilutions performed on non-project samples were not reviewed.

SURROGATE SPIKE EVALUATION

The surrogate recoveries were within the laboratory limits of acceptance, with the exceptions and any necessary qualifications noted in Table 11. Semivolatile results were only qualified if two or more acid or base/neutral surrogates were outside of laboratory limits. Data were not qualified if the surrogate spike amount was diluted out prior to analysis or if a high recovery was associated with a non-detected result.

INTERNAL STANDARD EVALUATION

The internal standard responses for reported results were within acceptable limits. The acceptable internal standard responses indicate that the instrument sensitivity and response were stable during each analysis.

LABORATORY DUPLICATE EVALUATION

The laboratory prepared at least one project sample as a laboratory duplicate. Laboratory duplicates performed on non-project samples were not reviewed. The RPDs between the primary sample and the duplicate were within laboratory control limits, indicating acceptable laboratory precision.

FIELD DUPLICATE EVALUATION

One field sample was submitted to the laboratory as a blind duplicate. RPDs and absolute differences were calculated as appropriate and compared to the limits established in the QAPP. The QAPP states that the RPDs must be less than or equal to 30 percent for aqueous samples when analytes are detected in both samples and these results are greater than or equal to five times the reporting limit. If one or both results are less than five times the reporting limit, or one result is detected and one is non-detected, the absolute difference between the results must be less than two times the reporting limit (if the reporting limits are not the same between the parent and field duplicate samples, the lower of the two was used for the control limit determination). The reporting limit was used for non-detected analytes when calculating absolute difference.

All RPDs and/or absolute differences were within QAPP criteria.

COLUMN AGREEMENT EVALUATION

Column agreements met method criteria for dual column analysis.

CALIBRATION RANGE EVALUATION

All results were reported within each instrument's calibration range.

SENSITIVITY

The sample results were reported to the method detection limit. Results between the method detection limit and the reporting limit were flagged as estimated (J) by the laboratory. A number of sample analyses were performed at a dilution factor, resulting in non-detected results reported at elevated reporting limits due to the presence of high levels of non-target analytes or other matrix interference.

COMPLETENESS

The complete data package consisted of 1908 reportable data points excluding field blank samples. 1 data points were rejected. The data completeness measure for this data package is calculated to be 99.9%. The project laboratory completeness goal of 95% was met.

OVERALL ASSESSMENT

All qualified data, excluding rejected data, can be used for decision-making purposes; however, the limitation identified by the applied qualifier should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

Table 3

Samples with Exceeded Holding Times

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Extraction Holding Time	Total Time	Analysis Holding Time	Total Time	Affected Analyte	ERM Qualifier
50274820	D-89-WG-20201203	SM4500-H-B	--	--	15 min.	1551 min.	pH	J
50274820	DUP-007-WG-20201203	SM4500-H-B	--	--	15 min.	2367 min.	pH	J
50274820	LR-100-WG-20201203	SM4500-H-B	--	--	15 min.	1510 min.	pH	J
50274820	PZ-103-SS-WG-20201203	SM4500-H-B	--	--	15 min.	1714 min.	pH	J
50274820	PZ-104-KS-WG-20201203	SM4500-H-B	--	--	15 min.	1721 min.	pH	J
50274820	PZ-107-SS-WG-20201203	SM4500-H-B	--	--	15 min.	1822 min.	pH	J

Notes:

min. = minutes

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274820	8260 Instrument 50MV2B 11/17/20	1,4-Dioxane	41	--	20				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						TB-019-WQ-20201203	ND	ug/L	UJ
50274820	8260 Instrument 50MV2B 11/17/20	Iodomethane	46	--	20				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ
50274820						TB-019-WQ-20201203	ND	ug/L	UJ
50274820	8260 Instrument 50MV2A 12/10/20	1,4-Dioxane	36	--	20				
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820	8260 Instrument 50MV2A 12/10/20	Iodomethane	37	--	20				
50274820						LR-100-WG-20201203	ND	ug/L	UJ

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274820	8270 Instrument 50MSS6 10/07/2020	Famphur	34	--	20				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ
50274820	8270 Instrument 50MSS6 10/07/2020	Hexachlorophene	25	--	20				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ
50274820	8270 Instrument 50MSS6 10/07/2020	Kepone	26	--	20				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274820	8270 Instrument 50MSS6 10/07/2020	3,3'-Dimethylbenzidine	21	--	20				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ

Notes:

IC = Initial calibration

RSD = Relative standard deviation

RRF = Relative response factor

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274820	18159757ICV	Bromomethane	158 %R	--	70-130				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ
50274820						TB-019-WQ-20201203	ND	ug/L	UJ
50274820	18159757ICV	Iodomethane	170 %R	--	75-125				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ
50274820						TB-019-WQ-20201203	ND	ug/L	UJ
50274820	18159757ICV	Allyl chloride	190 %R	--	75-125				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ
50274820						TB-019-WQ-20201203	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274820	18159757ICV	Vinyl acetate	62 %R	--	75-125				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ
50274820						TB-019-WQ-20201203	ND	ug/L	UJ
50274820	18290110ICV	Bromomethane	146 %R	--	70-130				
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820	18290110ICV	Acrolein	127 %R	--	75-125				
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820	18290110ICV	Iodomethane	131 %R	--	75-125				
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820	18290110ICV	1,4-Dioxane	153 %R	--	75-125				
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820	17873843ICV	p-Phenylenediamine	139 %R	--	75-125				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274820	17873843ICV	1,3,5-Trinitrobenzene	128 %R	--	75-125				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ
50274820	17873843ICV	P-Dimethylaminoazobenzene	128 %R	--	75-125				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ
50274820	17873843ICV	3,3'-Dimethylbenzidine	135 %R	--	75-125				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274820	17873843ICV	Famphur	161 %R	--	75-125				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ
50274820	Not present in ICV	Acetophenone	--	--	--				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ
50274820	Not present in ICV	Atrazine	--	--	--				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274820	Not present in ICV	Benzaldehyde	--	--	--				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ
50274820	Not present in ICV	Biphenyl (Diphenyl)	--	--	--				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ
50274820	Not present in ICV	Caprolactam	--	--	--				
50274820						PZ-107-SS-WG-20201203	5.0	ug/L	J
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	108	ug/L	J
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274820	Not present in ICV	N-Nitrosodiphenylamine	--	--	--				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ
50274820	Not present in ICV	1,2,4,5-Tetrachlorobenzene	--	--	--				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ
50274820	18301210CCV	Acrolein	-72 %D	--	± 25				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ
50274820						TB-019-WQ-20201203	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274820	18301210CCV	Chloromethane	-41 %D	--	± 30				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ
50274820						TB-019-WQ-20201203	ND	ug/L	UJ
50274820	18301210CCV	Chloroprene	-37 %D	--	± 25				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ
50274820						TB-019-WQ-20201203	ND	ug/L	UJ
50274820	18301210CCV	Vinyl acetate	-42 %D	--	± 25				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ
50274820						TB-019-WQ-20201203	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274820	18301210CCV	m,p-Xylene	111 %D	--	± 20				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	0.48	ug/L	J
50274820						D-89-WG-20201203	0.81	ug/L	J
50274820						DUP-007-WG-20201203	0.50	ug/L	J
50274820						TB-019-WQ-20201203	ND	ug/L	UJ
50274820	18328664CCV	Dinoseb	-26 %D	--	± 20				
50274820						PZ-107-SS-WG-20201203	ND	ug/L	UJ
50274820						PZ-104-KS-WG-20201203	ND	ug/L	UJ
50274820						PZ-103-SS-WG-20201203	ND	ug/L	UJ
50274820						D-89-WG-20201203	ND	ug/L	UJ
50274820						LR-100-WG-20201203	ND	ug/L	UJ
50274820						DUP-007-WG-20201203	ND	ug/L	UJ

Notes:

CCV = Continuing calibration verification

%D = Percent difference

ICV = Initial calibration verification

RRF = relative response factor

%R = Percent recovery

Table 7

Laboratory Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274820	2752789BLANK-50274820	Barium, Dissolved	4.1 J	10.0	None for qualification, samples > 5x blank	--	--	ug/L	--
50274820	2752789BLANK-50274820	Boron, Dissolved	21.8 J	100	None for qualification, samples > 5x blank	--	--	ug/L	--
50274820	2752789BLANK-50274820	Iron, Dissolved	36.0 J	50.0	None for qualification, samples > 5x blank	--	--	ug/L	--
50274820	2752789BLANK-50274820	Manganese, Dissolved	2.0 J	5.0	None for qualification, samples > 5x blank	--	--	ug/L	--
50274820	2755899BLANK-50274820	trans-1,3-Dichloropropene	0.23 J	1.0	None for qualification, sample ND	--	--	ug/L	--
50274820	2756761BLANK-50274820	Lithium, Total	3.5 J	20.0	None for qualification, samples > 5x blank	--	--	ug/L	--
50274820	2761403BLANK-50274820	Cyanide CN-	0.010	0.0050				mg/L	
50274820		Cyanide CN-			LR-100-WG-20201203	0.0018	0.0050	mg/L	0.0050 U
50274820	2123863BLANK-50274820	Methane	3.2 J	5.0	None for qualification, samples > 5x blank	--	--	ug/L	--
50274820	2124370BLANK-50274820	Methane	3.1 J	5.0	None for qualification, samples > 5x blank	--	--	ug/L	--

Notes:

RL = Reporting Limit

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274820	FILTB-003-WQ-20201103	Calcium, Dissolved	413 J	500	None for qualification, samples > 5x blank	--	--	ug/L	--
50274820	FILTB-003-WQ-20201103	Copper, Dissolved	0.32 J	1.0				ug/L	
50274820		Copper, Dissolved			PZ-107-SS-WG-20201203	0.65	1.0	ug/L	1.0 U
50274820		Copper, Dissolved			PZ-103-SS-WG-20201203	0.82	1.0	ug/L	1.0 U
50274820		Copper, Dissolved			LR-100-WG-20201203	0.58	1.0	ug/L	1.0 U
50274820		Copper, Dissolved			DUP-007-WG-20201203	1.1	1.0	ug/L	J+
50274820	FILTB-003-WQ-20201103	Iron, Dissolved	26.2 J	50.0	None for qualification, samples > 5x blank	--	--	ug/L	--
50274820	FILTB-003-WQ-20201103	Magnesium, Dissolved	172 J	500	None for qualification, samples > 5x blank	--	--	ug/L	--
50274820	FILTB-003-WQ-20201103	Titanium, Dissolved	0.78 J	10.0				ug/L	
50274820		Titanium, Dissolved			PZ-107-SS-WG-20201203	1.3	10.0	ug/L	10.0 U
50274820	FILTB-004-WQ-20201103	Barium, Dissolved	0.58 J	10.0	None for qualification, samples > 5x blank	--	--	ug/L	--
50274820	FILTB-004-WQ-20201103	Calcium, Dissolved	232 J	500	None for qualification, samples > 5x blank	--	--	ug/L	--
50274820	FILTB-004-WQ-20201103	Chromium, Dissolved	0.12 J	2.0	None for qualification, samples > 5x blank or ND	--	--	ug/L	--
50274820	FILTB-004-WQ-20201103	Copper, Dissolved	0.22 J	1.0				ug/L	
50274820		Copper, Dissolved			PZ-104-KS-WG-20201203	0.31	1.0	ug/L	1.0 U
50274820	FILTB-004-WQ-20201103	Dissolved Organic Carbon	0.80 J	1.0				ug/L	
50274820		Dissolved Organic Carbon			PZ-104-KS-WG-20201203	1.0	1.0	ug/L	1.0 U
50274820	FILTB-004-WQ-20201103	Magnesium, Dissolved	57.9 J	500	None for qualification, samples > 5x blank	--	--	ug/L	--

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274820	EB-003-WQ-20201113	Chloride	0.064	0.25	None for qualification, samples > 5x blank	--	--	mg/L	--
50274820	EB-003-WQ-20201113	Chromium, Total	0.22	2.0				ug/L	
50274820		Chromium, Total			PZ-104-KS-WG-20201203	0.43	2.0	ug/L	2.0 U
50274820	EB-003-WQ-20201113	Copper, Total	0.27	1.0				ug/L	
50274820		Copper, Total			PZ-104-KS-WG-20201203	0.55	1.0	ug/L	1.0 U
50274820		Copper, Total			D-89-WG-20201203	1.4	1.0	ug/L	J+
50274820	EB-003-WQ-20201113	Thorium, Total	0.10	1.0	None for qualification, samples ND	--	--	ug/L	--
50274820	EB-003-WQ-20201113	Uranium, Total	0.010	1.0				ug/L	
50274820		Uranium, Total			PZ-104-KS-WG-20201203	0.26	1.0	ug/L	1.0 U
50274820		Uranium, Total			D-89-WG-20201203	0.18	1.0	ug/L	1.0 U
50274820	EB-003-WQ-20201113	Chromium, Hexavalent	0.0447	0.100				ug/L	
50274820		Chromium, Hexavalent			D-89-WG-20201203	0.0774	0.100	ug/L	0.100 U
50274820	EB-004-WQ-20201120	Carbon disulfide	0.24 J	5.0	None for qualification, samples ND	--	--	ug/L	--
50274820	EB-004-WQ-20201120	Chloroform	0.40 J	1.0	None for qualification, samples ND	--	--	ug/L	--
50274820	EB-004-WQ-20201120	Copper, Total	0.21 J	1.0				ug/L	
50274820		Copper, Total			PZ-107-SS-WG-20201203	0.78	1.0	ug/L	1.0 U
50274820		Copper, Total			PZ-103-SS-WG-20201203	1.1	1.0	ug/L	J+
50274820		Copper, Total			DUP-007-WG-20201203	1.0	1.0	ug/L	1.0 U
50274820	EB-004-WQ-20201120	Lithium, Total	3.7 J	20.0	None for qualification, samples > 5x blank	--	--	ug/L	--
50274820	EB-004-WQ-20201120	Methane	13	5.0	None for qualification, samples > 5x blank	--	--	ug/L	--

Table 8
Field Blank and Associated Suspect Sample Detections
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274820	EB-004-WQ-20201120	Potassium, Total	280 J	1000	None for qualification, samples > 5x blank	--	--	ug/L	--
50274820	EB-004-WQ-20201120	Silicon, Total	26.4 J	200	None for qualification, samples > 5x blank	--	--	ug/L	--
50274820	EB-004-WQ-20201120	Sodium, Total	276 J	1000	None for qualification, samples > 5x blank	--	--	ug/L	--
50274820	EB-004-WQ-20201123	Phosphorus	0.034	0.050	None for qualification, samples > 5x blank	--	--	mg/L	--

Notes:
RL = Reporting Limit

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
LCS/LCSD										
50274820	2753628LCS-50274820/	None for qualification, samples ND	Allyl chloride	169/	70-130	--	--	--	--	--
50274820	2753628LCS-50274820/		Chloroprene	63/	70-130					
50274820		D-89-WG-20201203	Chloroprene					<100	ug/L	UJ
50274820		DUP-007-WG-20201203	Chloroprene					<100	ug/L	UJ
50274820		PZ-103-SS-WG-20201203	Chloroprene					<100	ug/L	UJ
50274820		PZ-104-KS-WG-20201203	Chloroprene					<100	ug/L	UJ
50274820		PZ-107-SS-WG-20201203	Chloroprene					<100	ug/L	UJ
50274820		TB-019-WQ-20201203	Chloroprene					<100	ug/L	UJ
50274820	2753628LCS-50274820/	None for qualification, samples ND	tert-Butylbenzene	110/	58-106	--	--	--	--	--
50274820	2755900LCS-50274820/		1,4-Dioxane	21/	50-150					
50274820		LR-100-WG-20201203	1,4-Dioxane					<100	ug/L	R
50274820	2755900LCS-50274820/	None for qualification, sample ND	Acrolein	127/	56-120	--	--	--	--	--
50274820	2755900LCS-50274820/	None for qualification, sample ND	Dichlorodifluoromethane (Freon 12)	159/	36-145	--	--	--	--	--
50274820	2755900LCS-50274820/	None for qualification, sample ND	tert-Butylbenzene	109/	58-106	--	--	--	--	--
MS/MSD										
50274820	PZ-107-SS-WG-20201203MS/		Ammoniacal Nitrogen NH3N	86/	90-110					
50274820		PZ-107-SS-WG-20201203	Ammoniacal Nitrogen NH3N					28.4	mg/L	J-
50274820	PZ-107-SS-WG-20201203MS/ PZ-107-SS-WG-20201203MSD		Chloride	132/Pass	80-120	Pass	15			
50274820		PZ-107-SS-WG-20201203	Chloride					472	mg/L	J+

Table 9
Spike Recoveries Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
50274820	PZ-107-SS-WG-20201203MS/ PZ-107-SS-WG-20201203MSD		Nitrite + Nitrate as N	70/69	90-110	Pass	20			
50274820		PZ-107-SS-WG-20201203	Nitrite + Nitrate as N					<1.0	mg/L	UJ
50274820	PZ-107-SS-WG-20201203MS/ PZ-107-SS-WG-20201203MSD		Selenium, Dissolved	55/56	75-125	Pass	20			
50274820		PZ-107-SS-WG-20201203	Selenium, Dissolved					<1.0	ug/L	UJ

Notes:
LCS/LCSD = Laboratory control sample/laboratory control sample duplicate
MS/MSD - Matrix spike/matrix spike duplicate
RPD = Relative percent difference

Table 10
Serial Dilution Recoveries Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Dilution		Concentration			Instrmt. DL	Result/ DL	%D	%D Limit	ERM Qualifier
	Sample ID	Analyte	Sample	Dilution	Units					
50274820	PZ-107-SS-WG-20201203	Chromium, Dissolved	7.3	8.1	ug/L	0.11	66	10.4	10	J

Notes:
%D = Percent Difference
DL = Detection Limit

Table 11

Surrogate Recovery Results out of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Surrogate	Recovery (%)	Limit (%)	Affected Analyte	Dilution Factor	ERM Qualifier
50274820	D-89-WG-20201203	SW8270C-SIM	p-Terphenyl-d14	23	68-138	All	1	Detects: J Non-detects: UJ
50274820	TB-019-WQ-20201203	SW8260C	Toluene-d8	112	83-111	None for qualification, results ND	1	--

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Memorandum

To	Alice Sandzen
From	Rachel James
Date	2021-06-21
Reference	0579381
Subject	Revised Data Review of West Lake OU-3 RI/FS Routine Groundwater Samples Collected 12/4/2020: Pace Data Package 50274973.

This memorandum was revised to address changes to the initial calibration verification data for Gas Chromatography/Mass Spectrometry methods issued by the laboratory after the initial validation was complete. Table 6 has been revised as needed.

The data quality was assessed and any necessary qualifiers were applied following the Quality Assurance Project Plan (QAPP) for West Lake OU-3 Remediation Investigation/Feasibility Study, Revision 3, December 2020, USEPA Contract Laboratory Program (CLP) NFGs for Organic Superfund Methods Data Review, document number EPA-540-R-2017-002, January 2017, USEPA CLP NFGs for Inorganic Superfund Methods Data Review, document number EPA-540-R-2017-001, January 2017, and USEPA Region 1—New England Environmental Data Review Supplement for Region 1 Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement1, June 2018., the protocols and quality control (QC) requirements of the analytical methods, and the reviewer's professional judgement.

A Stage 2B data validation was performed on 100% of the laboratory data.

The following items were reviewed as part of the data validation:

- **Chain of Custody:** The chains of custody were reviewed for proper completion and that the laboratory performed the requested methods and reported the requested target analytes for each sample.
- **Dilutions and Reanalysis:** Dilutions, calibration ranges, and reanalyses were reviewed as applicable. The best result was chosen when more than one result was reported as final.
- **Sample Preservation:** The appropriate temperature and chemical preservation requirements were reviewed. Headspace for volatile sample analysis was reviewed.
- **Holding Times:** The period of time between collection of the sample and preparation/analysis of the sample was evaluated.
- **Instrument Tuning:** Instrument tuning and performance check frequency and results were reviewed.
- **Calibration:** The initial calibration type, fit, number of standards, and minimum response factors were evaluated. Additionally, the frequency and percent recoveries for initial and continuing calibration verification standards and blanks were evaluated.
- **Laboratory Blank Samples:** The preparation and analysis of reagent (contaminant-free) water was evaluated, along with the required frequency.

- **Field Blank Samples:** The collection and analysis of field blanks was evaluated. The reviewed data package(s) included the following associated field blanks: trip, filter, and equipment
- **Spike Samples:** Laboratory control, matrix spike, and post digestion spike sample preparation frequency and recoveries were reviewed as applicable.
- **Serial Dilutions:** Serial dilution sample preparation frequency and recoveries were reviewed as applicable.
- **Surrogate Spikes:** The addition of appropriate surrogates and their recoveries were evaluated.
- **Internal standards:** The presence and recoveries of internal standards and their appropriate association to target analytes were reviewed.
- **Laboratory Duplicate Samples:** Laboratory duplicate frequencies and recoveries were reviewed as applicable.
- **Field Duplicate Samples:** Field duplicate recoveries and absolute differences were reviewed as applicable.
- **Column Agreement:** Column agreements were reviewed for relevant methods.

Findings of the data validation are summarized in the sections below. As necessary, the following data quality flags were applied during validation.

J = estimated concentration
J+ = the result is an estimated concentration, but may be biased high
J- = the result is an estimated concentration, but may be biased low
UJ = estimated reporting limit
U = evaluated to be non-detected at the reporting limit
R = rejected, data not usable
NJ = tentative identification and estimated concentration

Validation outliers and any necessary data qualifications are summarized in outlier tables at the end of this memo. The table below indicates the included validation tables with findings. Tables without findings have been omitted.

Table Number	Table Name	Included
Table 1	Samples with Non-Preferred Results	No
Table 2	Samples with Exceeded Preservation Requirements	No
Table 3	**Samples with Exceeded Holding Times**	**Yes**
Table 4	Instrument Tuning Outside of Acceptable Limits	No
Table 5	**Initial Calibration Outside of Acceptable Limits**	**Yes**
Table 6	**Calibration Verification Outside of Acceptable Limits**	**Yes**
Table 7	**Laboratory Blank and Associated Suspect Sample Detections**	**Yes**
Table 8	**Field Blank and Associated Suspect Sample Detections**	**Yes**
Table 9	**Spike Recoveries Outside of Acceptable Limits**	**Yes**
Table 10	Serial Dilution Recoveries Outside of Acceptable Limits	No
Table 11	**Surrogate Recovery Results out of Acceptable Limits**	**Yes**
Table 12	Internal Standard Recovery Results out of Acceptable Limits	No

Table Number	Table Name	Included
Table 13	Laboratory Duplicate Result Outliers	No
Table 14	Field Duplicate Result Outliers	No
Table 15	Column Agreement Outliers	No
Table 16	Calibration Range Exceedances	No
Table 17	Professional Judgement Qualifiers	No

Findings of the data validation are summarized in the sections below.

CASE NARRATIVE NOTES AND CHAIN-OF-CUSTODY DISCREPANCIES

The laboratory indicated that it does not hold NELAC/TNI accreditation for the methods and parameters in non-potable water listed below. No qualifiers were applied based on accreditation status. Supporting calibrations and quality control data was provided for these analytes and reviewed as part of the data validation.

Method	Analyte without NELAC/TNI Accreditation	
	CAS	Analyte Name
EPA SW 6020	7440-29-1	Thorium
	7440-61-1	Uranium
EPA SW 6010	7440-21-3	Silicon
EPA SW 8082	1336-36-3	Total PCBs
EPA SW 8270	92-52-4	Biphenyl
	99-35-4	1,3,5-Trinitrobenzene
	1912-24-9	Atrazine
	106-50-3	p-Phenylenediamine
	105-60-2	Caprolactam
	95-53-4	o-Toluidine
	100-52-7	Benzaldehyde
EPA SW 8260	110-82-7	Cyclohexane
	108-87-2	Methylcyclohexane
	78-83-1	Isobutyl alcohol
	79-20-9	Methyl acetate
	126-99-8	beta-Chloroprene
EPA SW 9056	20461-54-5	Iodide

No discrepancies between the chains-of-custody and the sample containers received were noted by the laboratory.

PRESERVATION AND HOLDING TIME EVALUATION

The laboratory received the sample shipments within the method-prescribed temperature preservation requirements of less than 6 degrees Celsius, with acceptable sample pH values, and

all vials for volatile analysis were received in good condition with headspace of less than 6 millimeters.

The samples were prepared and analyzed within the method-prescribed time period from the date of collection, with the exceptions and any necessary qualifications noted in Table 3.

INSTRUMENT TUNING EVALUATION

All tuning criteria met method acceptance criteria.

INITIAL CALIBRATION

The initial calibrations met the minimum number of calibration standards, project required percent standard deviation (%RSD), relative correlation coefficient, and minimum relative response factor (RRF) limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 5.

INITIAL CALIBRATION VERIFICATION (ICV) AND CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION

The initial and continuing calibration verifications were within project-specified percent difference (%D) or percent recoveries (%R) and RRF limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 6.

Situations that required additional professional judgement are detailed below:

- SVOC analytes acetophenone, atrazine, benzaldehyde, biphenyl (diphenyl), caprolactam, N-nitrosodiphenylamine, and 1,2,4,5-tetrachlorobenzene were not reported in the ICV samples. These analytes were present in the initial calibrations and CCV samples and were within control limits. The detect and non-detected results in associated samples have been qualified J or UJ as applicable.

LABORATORY BLANK EVALUATION

The laboratory blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 7. The blank results indicate that contaminants may have been introduced to the samples during processing or analysis in the laboratory.

FIELD BLANK EVALUATION

The trip, filter, and equipment blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 8. Any field blank detections associated with laboratory blank contamination and qualified as non-detected (U) are not included in Table 8. The blank results indicate that contaminants may have been introduced to the samples during collection, shipment, handling, and storage.

BLANK AND MATRIX SPIKE EVALUATION

The laboratory control sample (LCS), laboratory control sample duplicate (LCSD) recoveries, and relative percent differences (RPDs) were within the laboratory's limits of acceptance, with the

exceptions and any necessary qualifications noted in Table 9. Data were not qualified if a high recovery was associated with a non-detected result.

The matrix spike (MS), matrix spike duplicate (MSD) recoveries, and RPDs were within the laboratory's limits of acceptance for target analytes for spiked project samples, with the exceptions and any necessary qualifications noted in Table 9. MS/MSDs performed on non-project samples were not reviewed. Data were not qualified if the analyte concentration in the parent sample was greater than four times the spike amount, if the spike amount was diluted out prior to analysis, or if a high recovery was associated with a non-detected result.

SERIAL DILUTION EVALUATION

The laboratory did not perform serial dilutions on any project samples. Serial dilutions performed on non-project samples were not reviewed.

SURROGATE SPIKE EVALUATION

The surrogate recoveries were within the laboratory limits of acceptance, with the exceptions and any necessary qualifications noted in Table 11. Semivolatile results were only qualified if two or more acid or base/neutral surrogates were outside of laboratory limits. Data were not qualified if the surrogate spike amount was diluted out prior to analysis or if a high recovery was associated with a non-detected result.

INTERNAL STANDARD EVALUATION

The internal standard responses for reported results were within acceptable limits. The acceptable internal standard responses indicate that the instrument sensitivity and response were stable during each analysis.

LABORATORY DUPLICATE EVALUATION

The laboratory prepared at least one project sample as a laboratory duplicate. Laboratory duplicates performed on non-project samples were not reviewed. The RPDs between the primary sample and the duplicate were within laboratory control limits, indicating acceptable laboratory precision.

FIELD DUPLICATE EVALUATION

No field duplicates were submitted to the laboratory.

COLUMN AGREEMENT EVALUATION

Column agreements met method criteria for dual column analysis.

CALIBRATION RANGE EVALUATION

All results were reported within each instrument's calibration range.

SENSITIVITY

The sample results were reported to the method detection limit. Results between the method detection limit and the reporting limit were flagged as estimated (J) by the laboratory. A number of

sample analyses were performed at a dilution factor, resuting in non-detected results reported at elevated reporting limits due to the presence of high levels of non-target analytes or other matrix interference.

COMPLETENESS

The complete data package consisted of 1908 reportable data points excluding field blank samples. 2 data points were rejected. The data completeness measure for this data package is calculated to be 99.9%. The project laboratory completeness goal of 95% was met.

OVERALL ASSESSMENT

All qualified data, excluding rejected data, can be used for decision-making purposes; however, the limitation identified by the applied qualifier should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

Table 3

Samples with Exceeded Holding Times

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Extraction Holding Time	Total Time	Analysis Holding Time	Total Time	Affected Analyte	ERM Qualifier
50274973	EB-005-WQ-20201204	SM4500-H-B	--	--	15 min.	5722 min.	pH	J
50274973	EB-006-WQ-20201204	SM4500-H-B	--	--	15 min.	5863 min.	pH	J
50274973	PZ-116-SS-WG-20201204	SM4500-H-B	--	--	15 min.	6057 min.	pH	J
50274973	PZ-201A-SS-WG-20201204	SM4500-H-B	--	--	15 min.	6142 min.	pH	J
50274973	PZ-204A-SS-WG-20201204	SM4500-H-B	--	--	15 min.	6047 min.	pH	J
50274973	PZ-204-SS-WG-20201204	SM4500-H-B	--	--	15 min.	5959 min.	pH	J
50274973	PZ-211-SS-WG-20201204	SM4500-H-B	--	--	15 min.	5892 min.	pH	J
50274973	PZ-303-AS-WG-20201204	SM4500-H-B	--	--	15 min.	5782 min.	pH	J

Notes:

min. = minutes

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274973	8260 Instrument 50MV2A 11/17/2020	cis-1,2-Dichloroethene	37	--	20				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						TB-020-WQ-20201204	ND	ug/L	UJ
50274973	8260 Instrument 50MV2A 11/17/2020	1,4-Dioxane	97	--	20				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						TB-020-WQ-20201204	ND	ug/L	UJ
50274973	8260 Instrument 50MV2A 11/17/2020	Iodomethane	38	--	20				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						TB-020-WQ-20201204	ND	ug/L	UJ
50274973	8260 Instrument 50MV2B 12/10/20	Iodomethane	39	--	20				
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274973	8270 Instrument 50MSS2 10/07/2020	Hexachlorophene	40	--	20				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ

Notes:

IC = Initial calibration

RSD = Relative standard deviation

RRF = Relative response factor

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274973	18159139ICV	Bromomethane	152 %R	--	70-130				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						TB-020-WQ-20201204	ND	ug/L	UJ
50274973	18159139ICV	Iodomethane	143 %R	--	75-125				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						TB-020-WQ-20201204	ND	ug/L	UJ
50274973	18159139ICV	Vinyl acetate	60 %R	--	75-125				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						TB-020-WQ-20201204	ND	ug/L	UJ
50274973	18290130ICV	Bromomethane	156 %R	--	70-130				
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274973	18290130ICV	Acrolein	132 %R	--	75-125				
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ
50274973	18290130ICV	Iodomethane	140 %R	--	75-125				
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ
50274973	18290130ICV	Allyl chloride	243 %R	--	75-125				
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274973	18290130ICV	Carbon tetrachloride	126 %R	--	75-125				
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ
50274973	17876511ICV	3,3'-Dimethylbenzidine	138 %R	--	75-125				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ
50274973	17876511ICV	Kepone	132 %R	--	75-125				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274973	17876511ICV	Famphur	132 %R	--	75-125				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ
50274973	Not present in ICV	Acetophenone	--	--	--				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274973	Not present in ICV	Atrazine	--	--	--				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ
50274973	Not present in ICV	Benzaldehyde	--	--	--				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274973	Not present in ICV	Biphenyl (Diphenyl)	--	--	--				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ
50274973	Not present in ICV	Caprolactam	--	--	--				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204A-SS-WG-20201204	22.7	ug/L	J
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274973	Not present in ICV	N-Nitrosodiphenylamine	--	--	--				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ
50274973	Not present in ICV	1,2,4,5-Tetrachlorobenzene	--	--	--				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274973	18301204CCV	Acrolein	-80 %D	--	± 25				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						TB-020-WQ-20201204	ND	ug/L	UJ
50274973	18301204CCV	Chloroethane	27 %D	--	± 25				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						TB-020-WQ-20201204	ND	ug/L	UJ
50274973	18301204CCV	Chloroprene	-37 %D	--	± 25				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						TB-020-WQ-20201204	ND	ug/L	UJ
50274973	18301204CCV	trans-1,4-Dichloro-2-butene	-57 %D	--	± 25				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						TB-020-WQ-20201204	ND	ug/L	UJ
50274973	18301204CCV	1,4-Dioxane	-64 %D	--	± 25				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						TB-020-WQ-20201204	ND	ug/L	UJ
50274973	18301204CCV	Isobutanol	-39 %D	--	± 25				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						TB-020-WQ-20201204	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274973	18301204CCV	Vinyl acetate	-43 %D	--	± 25				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						TB-020-WQ-20201204	ND	ug/L	UJ
50274973	18301204CCV	m&p-Xylene	111 %D	--	± 20				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						TB-020-WQ-20201204	ND	ug/L	UJ
50274973	18373266CCV	Butylbenzylphthalate	36 %D	--	± 25				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ

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Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274973	18373266CCV	Caprolactam	37 %D	--	± 30				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204A-SS-WG-20201204	22.7	ug/L	J
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ
50274973	18373266CCV	Carbazole	26 %D	--	± 20				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ

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Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274973	18373266CCV	Di-n-butylphthalate	21 %D	--	± 20				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	6.9	ug/L	J
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ
50274973	18373266CCV	bis(2-Ethylhexyl)phthalate	27 %D	--	± 25				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274973	18268198CCV	Chlorobenzilate	29 %D	--	± 25				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ
50274973	18268198CCV	Hexachlorophene	-49 %D	--	± 25				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50274973	18328664CCV	Dinoseb	-26 %D	--	± 20				
50274973	18328666CCV	Dinoseb	-28 %D	--	± 20				
50274973						PZ-201A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-116-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204A-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-204-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-211-SS-WG-20201204	ND	ug/L	UJ
50274973						PZ-303-AS-WG-20201204	ND	ug/L	UJ
50274973						EB-006-WQ-20201204	ND	ug/L	UJ
50274973						EB-005-WQ-20201204	ND	ug/L	UJ

Notes:

CCV = Continuing calibration verification

%D = Percent difference

ICV = Initial calibration verification

RRF = relative response factor

%R = Percent recovery

Table 7

Laboratory Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274973	2755903BLANK-50274973	Methyl iodide	0.65 J	5.0	None for qualification, samples ND	--	--	ug/L	--
50274973	2756761BLANK-50274973	Lithium, Total	3.5 J	20.0				ug/L	
50274973		Lithium, Total			PZ-201A-SS-WG-20201204	15.7	20.0	ug/L	20.0 U
50274973		Lithium, Total			EB-005-WQ-20201204	3.2	20.0	ug/L	20.0 U
50274973	2123863BLANK-50274973	Methane	3.2 J	5.0				ug/L	
50274973		Methane			PZ-204-SS-WG-20201204	8.6	5.0	ug/L	J+
50274973		Methane			PZ-211-SS-WG-20201204	6.4	5.0	ug/L	J+
50274973		Methane			EB-005-WQ-20201204	5.4	5.0	ug/L	J+
50274973		Methane			EB-006-WQ-20201204	11	5.0	ug/L	J+
50274973	2124370BLANK-50274973	Methane	3.1 J	5.0	None for qualification, sample > 5x blank	--	--	ug/L	--

Notes:

RL = Reporting Limit

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274973	FILTB-003-WQ-20201103	Calcium, Dissolved	413 J	500	None for qualification, samples > 5x blank	--	--	ug/L	--
50274973	FILTB-003-WQ-20201103	Copper, Dissolved	0.32 J	1.0				ug/L	
50274973		Copper, Dissolved			PZ-116-SS-WG-20201204	0.68	1.0	ug/L	1.0 U
50274973		Copper, Dissolved			PZ-204A-SS-WG-20201204	1.0	1.0	ug/L	1.0 U
50274973		Copper, Dissolved			PZ-303-AS-WG-20201204	0.58	1.0	ug/L	1.0 U
50274973	FILTB-003-WQ-20201103	Iron, Dissolved	26.2 J	50.0				ug/L	
50274973		Iron, Dissolved			PZ-116-SS-WG-20201204	76.9	50.0	ug/L	J+
50274973		Iron, Dissolved			PZ-204-SS-WG-20201204	42.6	50.0	ug/L	50.0 U
50274973	FILTB-003-WQ-20201103	Magnesium, Dissolved	172 J	500	None for qualification, samples > 5x blank	--	--	ug/L	--
50274973	FILTB-003-WQ-20201103	Titanium, Dissolved	0.78 J	10.0				ug/L	
50274973		Titanium, Dissolved			PZ-204A-SS-WG-20201204	1.3	10.0	ug/L	10.0 U
50274973	FILTB-004-WQ-20201103	Barium, Dissolved	0.58 J	10.0	None for qualification, samples > 5x blank	--	--	ug/L	--
50274973	FILTB-004-WQ-20201103	Calcium, Dissolved	232 J	500	None for qualification, samples > 5x blank	--	--	ug/L	--

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274973	FILTB-004-WQ-20201103	Chromium, Dissolved	0.12 J	2.0				ug/L	
50274973		Chromium, Dissolved			PZ-201A-SS-WG-20201204	0.27	2.0	ug/L	2.0 U
50274973		Chromium, Dissolved			PZ-211-SS-WG-20201204	0.12	2.0	ug/L	2.0 U
50274973	FILTB-004-WQ-20201103	Copper, Dissolved	0.22 J	1.0				ug/L	
50274973		Copper, Dissolved			PZ-211-SS-WG-20201204	0.48	1.0	ug/L	1.0 U
50274973	FILTB-004-WQ-20201103	Dissolved Organic Carbon	0.80 J	1.0				ug/L	
50274973		Dissolved Organic Carbon			PZ-201A-SS-WG-20201204	0.82	1.0	ug/L	1.0 U
50274973		Dissolved Organic Carbon			PZ-211-SS-WG-20201204	0.72	1.0	ug/L	1.0 U
50274973	FILTB-004-WQ-20201103	Magnesium, Dissolved	57.9 J	500	None for qualification, samples > 5x blank	--	--	ug/L	--
50274973	EB-005-WQ-20201204	Chemical Oxygen Demand	6.2 J	10.0				mg/L	
50274973		Chemical Oxygen Demand			PZ-201A-SS-WG-20201204	4.0	10.0	mg/L	10.0 U
50274973		Chemical Oxygen Demand			PZ-211-SS-WG-20201204	6.0	10.0	mg/L	10.0 U
50274973	EB-005-WQ-20201204	Copper, Total	0.29 J	1.0				ug/L	
50274973		Copper, Total			PZ-211-SS-WG-20201204	0.43	1.0	ug/L	1.0 U

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274973	EB-005-WQ-20201204	Methane	5.4	5.0				ug/L	
50274973		Methane			PZ-211-SS-WG-20201204	6.4	5.0	ug/L	J+
50274973	EB-005-WQ-20201204	Nitrite + Nitrate as N	0.022 J	0.10	None for qualification, samples > 5x blank or ND	--	--	mg/L	--
50274973	EB-005-WQ-20201204	Phosphorus	0.028 J	0.050				mg/L	
50274973		Phosphorus			PZ-201A-SS-WG-20201204	0.11	0.050	mg/L	J+
50274973	EB-005-WQ-20201204	Silicon, Total	40.6 J	200	None for qualification, samples > 5x blank	--	--	ug/L	--
50274973	EB-005-WQ-20201204	Silver, Total	0.025 J	0.50	None for qualification, samples ND	--	--	ug/L	--
50274973	EB-006-WQ-20201204	Chemical Oxygen Demand	29.8	10.0				mg/L	
50274973		Chemical Oxygen Demand			PZ-204-SS-WG-20201204	3.9	10.0	mg/L	10.0 U
50274973	EB-006-WQ-20201204	Chromium, Total	0.12 J	2.0				ug/L	
50274973		Chromium, Total			PZ-116-SS-WG-20201204	0.50	2.0	ug/L	2.0 U
50274973		Chromium, Total			PZ-204-SS-WG-20201204	0.20	2.0	ug/L	2.0 U
50274973		Chromium, Total			PZ-303-AS-WG-20201204	0.34	2.0	ug/L	2.0 U
50274973	EB-006-WQ-20201204	Methane	11	5.0				ug/L	
50274973		Methane			PZ-116-SS-WG-20201204	21	5.0	ug/L	J+
50274973		Methane			PZ-204-SS-WG-20201204	8.6	5.0	ug/L	J+

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50274973	EB-006-WQ-20201204	Nitrite + Nitrate as N	0.048 J	0.10				mg/L	
50274973		Nitrite + Nitrate as N			PZ-116-SS-WG-20201204	0.024	0.10	mg/L	0.10 U
50274973		Nitrite + Nitrate as N			PZ-204-SS-WG-20201204	0.19	0.10	mg/L	J+
50274973	EB-006-WQ-20201204	Silicon, Total	42.3 J	200	None for qualification, samples > 5x blank	--	--	ug/L	--
50274973	EB-006-WQ-20201204	Sodium, Total	68.5 J	1000	None for qualification, samples > 5x blank	--	--	ug/L	--

Notes:

RL = Reporting Limit

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
LCS/LCSD										
50274973	2753623LCS-50274973/		1,4-Dioxane	36/	50-150					
50274973		PZ-116-SS-WG-20201204	1,4-Dioxane					<100	ug/L	UJ
50274973		PZ-201A-SS-WG-20201204	1,4-Dioxane					<100	ug/L	UJ
50274973		TB-020-WQ-20201204	1,4-Dioxane					<100	ug/L	UJ
50274973	2753623LCS-50274973/		Chloroprene	63/	70-130					
50274973		PZ-116-SS-WG-20201204	Chloroprene					<100	ug/L	UJ
50274973		PZ-201A-SS-WG-20201204	Chloroprene					<100	ug/L	UJ
50274973		TB-020-WQ-20201204	Chloroprene					<100	ug/L	UJ
50274973	2753623LCS-50274973/	None for qualification, samples ND	tert-Butylbenzene	108/	58-106	--	--	--	--	--
50274973	2754008LCS-50274973/	None for qualification, samples ND	Carbazole	128/	66-127	--	--	--	--	--
50274973	2755904LCS-50274973/	None for qualification, samples ND	1,1-Dichloropropene	121/	78-120	--	--	--	--	--
50274973	2755904LCS-50274973/	None for qualification, samples ND	Acrolein	132/	56-120	--	--	--	--	--
50274973	2755904LCS-50274973/	None for qualification, samples ND	Allyl chloride	243/	70-130	--	--	--	--	--
50274973	2755904LCS-50274973/	None for qualification, samples ND	Carbon tetrachloride	126/	73-125	--	--	--	--	--
50274973	2755904LCS-50274973/	None for qualification, samples ND	sec-Butylbenzene	121/	79-119	--	--	--	--	--
50274973	2755904LCS-50274973/	None for qualification, samples ND	tert-Butylbenzene	114/	58-106	--	--	--	--	--

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
50274973	2755919LCS-50274973/	None for qualification, samples ND	Acrolein	133/	56-120	--	--	--	--	--
50274973	2755919LCS-50274973/	None for qualification, samples ND	Allyl chloride	203/	70-130	--	--	--	--	--
50274973	2755919LCS-50274973/	None for qualification, samples ND	tert-Butylbenzene	110/	58-106	--	--	--	--	--
MS/MSD										
50274973	PZ-201A-SS-WG-20201204MS/		1,4-Dioxane	15/	50-150					
50274973		PZ-201A-SS-WG-20201204	1,4-Dioxane					<100	ug/L	R
50274973	PZ-201A-SS-WG-20201204MS/		Chloroprene	60/	70-130					
50274973		PZ-201A-SS-WG-20201204	Chloroprene					<100	ug/L	UJ
50274973	PZ-201A-SS-WG-20201204MS/		Chemical Oxygen Demand	112/	90-110					
50274973		PZ-201A-SS-WG-20201204	Chemical Oxygen Demand					4.0	mg/L	J+
50274973	PZ-201A-SS-WG-20201204MS/		Isobutyl alcohol	11/	50-150					
50274973		PZ-201A-SS-WG-20201204	Isobutyl alcohol					<100	ug/L	R

Notes:

LCS/LCSD = Laboratory control sample/laboratory control sample duplicate

MS/MSD - Matrix spike/matrix spike duplicate

RPD = Relative percent difference

Table 11

Surrogate Recovery Results out of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Surrogate	Recovery (%)	Limit (%)	Affected Analyte	Dilution Factor	ERM Qualifier
50274973	PZ-116-SS-WG-20201204	SW8260C	Toluene-d8	113	83-111	None for qualification, all analytes ND	1	--

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Memorandum

To	Alice Sandzen
From	Rachel James
Date	2021-06-21
Reference	0579381
Subject	Revised Data Review of West Lake OU-3 RI/FS Routine Groundwater Samples Collected 12/08/2020: Pace Data Package 50275199.

This memorandum was revised to address changes to the initial calibration verification data for Gas Chromatography/Mass Spectrometry methods issued by the laboratory after the initial validation was complete. Table 6 has been revised as needed.

The data quality was assessed and any necessary qualifiers were applied following the Quality Assurance Project Plan (QAPP) for West Lake OU-3 Remediation Investigation/Feasibility Study, Revision 3, December 2020, USEPA Contract Laboratory Program (CLP) NFGs for Organic Superfund Methods Data Review, document number EPA-540-R-2017-002, January 2017, USEPA CLP NFGs for Inorganic Superfund Methods Data Review, document number EPA-540-R-2017-001, January 2017, and USEPA Region 1—New England Environmental Data Review Supplement for Region 1 Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement1, June 2018, the protocols and quality control (QC) requirements of the analytical methods, and the reviewer's professional judgement.

A Stage 2B data validation was performed on 100% of the laboratory data.

The following items were reviewed as part of the data validation:

- **Chain of Custody:** The chains of custody were reviewed for proper completion and that the laboratory performed the requested methods and reported the requested target analytes for each sample.
- **Dilutions and Reanalysis:** Dilutions, calibration ranges, and reanalyses were reviewed as applicable. The best result was chosen when more than one result was reported as final.
- **Sample Preservation:** The appropriate temperature and chemical preservation requirements were reviewed. Headspace for volatile sample analysis was reviewed.
- **Holding Times:** The period of time between collection of the sample and preparation/analysis of the sample was evaluated.
- **Instrument Tuning:** Instrument tuning and performance check frequency and results were reviewed.
- **Calibration:** The initial calibration type, fit, number of standards, and minimum response factors were evaluated. Additionally, the frequency and percent recoveries for initial and continuing calibration verification standards and blanks were evaluated.
- **Laboratory Blank Samples:** The preparation and analysis of reagent (contaminant-free) water was evaluated, along with the required frequency.

- **Field Blank Samples:** The collection and analysis of field blanks was evaluated. The reviewed data package(s) included the following associated field blanks: trip, filter, and equipment
- **Spike Samples:** Laboratory control, matrix spike, and post digestion spike sample preparation frequency and recoveries were reviewed as applicable.
- **Serial Dilutions:** Serial dilution sample preparation frequency and recoveries were reviewed as applicable.
- **Surrogate Spikes:** The addition of appropriate surrogates and their recoveries were evaluated.
- **Internal standards:** The presence and recoveries of internal standards and their appropriate association to target analytes were reviewed.
- **Laboratory Duplicate Samples:** Laboratory duplicate frequencies and recoveries were reviewed as applicable.
- **Field Duplicate Samples:** Field duplicate recoveries and absolute differences were reviewed as applicable.
- **Column Agreement:** Column agreements were reviewed for relevant methods.

Findings of the data validation are summarized in the sections below. As necessary, the following data quality flags were applied during validation.

J = estimated concentration
J+ = the result is an estimated concentration, but may be biased high
J- = the result is an estimated concentration, but may be biased low
UJ = estimated reporting limit
U = evaluated to be non-detected at the reporting limit
R = rejected, data not usable
NJ = tentative identification and estimated concentration

Validation outliers and any necessary data qualifications are summarized in outlier tables at the end of this memo. The table below indicates the included validation tables with findings. Tables without findings have been omitted.

Table Number	Table Name	Included
Table 1	Samples with Non-Preferred Results	No
Table 2	**Samples with Exceeded Preservation Requirements**	**Yes**
Table 3	**Samples with Exceeded Holding Times**	**Yes**
Table 4	Instrument Tuning Outside of Acceptable Limits	No
Table 5	**Initial Calibration Outside of Acceptable Limits**	**Yes**
Table 6	**Calibration Verification Outside of Acceptable Limits**	**Yes**
Table 7	**Laboratory Blank and Associated Suspect Sample Detections**	**Yes**
Table 8	**Field Blank and Associated Suspect Sample Detections**	**Yes**
Table 9	**Spike Recoveries Outside of Acceptable Limits**	**Yes**
Table 10	**Serial Dilution Recoveries Outside of Acceptable Limits**	**Yes**
Table 11	**Surrogate Recovery Results out of Acceptable Limits**	**Yes**
Table 12	Internal Standard Recovery Results out of Acceptable Limits	No

Table Number	Table Name	Included
Table 13	Laboratory Duplicate Result Outliers	No
Table 14	**Field Duplicate Result Outliers**	**Yes**
Table 15	Column Agreement Outliers	No
Table 16	Calibration Range Exceedances	No
Table 17	Professional Judgement Qualifiers	No

Findings of the data validation are summarized in the sections below.

CASE NARRATIVE NOTES AND CHAIN-OF-CUSTODY DISCREPANCIES

The laboratory indicated that it does not hold NELAC/TNI accreditation for the methods and parameters in non-potable water listed below. No qualifiers were applied based on accreditation status. Supporting calibrations and quality control data was provided for these analytes and reviewed as part of the data validation.

Method	Analyte without NELAC/TNI Accreditation	
	CAS	Analyte Name
EPA SW 6020	7440-29-1	Thorium
	7440-61-1	Uranium
EPA SW 6010	7440-21-3	Silicon
EPA SW 8082	1336-36-3	Total PCBs
EPA SW 8270	92-52-4	Biphenyl
	99-35-4	1,3,5-Trinitrobenzene
	1912-24-9	Atrazine
	106-50-3	p-Phenylenediamine
	105-60-2	Caprolactam
	95-53-4	o-Toluidine
	100-52-7	Benzaldehyde
EPA SW 8260	110-82-7	Cyclohexane
	108-87-2	Methylcyclohexane
	78-83-1	Isobutyl alcohol
	79-20-9	Methyl acetate
	126-99-8	beta-Chloroprene
EPA SW 9056	20461-54-5	Iodide

No discrepancies between the chains-of-custody and the sample containers received were noted by the laboratory.

PRESERVATION AND HOLDING TIME EVALUATION

The sample shipments were received at the laboratory within the method-prescribed temperature preservation requirements of less than 6°C, with acceptable pH values, and all vials for volatile

analysis were received in good condition with headspace of less than 6mm, with the exceptions and any necessary qualifications noted in Table 2.

The samples were prepared and analyzed within the method-prescribed time period from the date of collection, with the exceptions and any necessary qualifications noted in Table 3.

INSTRUMENT TUNING EVALUATION

All tuning criteria met method acceptance criteria.

INITIAL CALIBRATION

The initial calibrations met the minimum number of calibration standards, project required percent standard deviation (%RSD), relative correlation coefficient, and minimum relative response factor (RRF) limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 5.

INITIAL CALIBRATION VERIFICATION (ICV) AND CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION

The initial and continuing calibration verifications were within project-specified percent difference (%D) or percent recoveries (%R) and RRF limits (as applicable to the methods) for target analytes, with the exceptions and any necessary qualifications noted in Table 6.

Situations that required additional professional judgement are detailed below:

- SVOC analytes acetophenone, atrazine, benzaldehyde, biphenyl (diphenyl), caprolactam, N-nitrosodiphenylamine, and 1,2,4,5-tetrachlorobenzene were not reported in the ICV samples. These analytes were present in the initial calibrations and CCV samples and were within control limits. The non-detected results in associated samples have been qualified UJ.

LABORATORY BLANK EVALUATION

The laboratory blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 7. The blank results indicate that contaminants may have been introduced to the samples during processing or analysis in the laboratory.

FIELD BLANK EVALUATION

The trip, filter, field, and equipment blank sample results were non-detected for each of the target analytes, with the exceptions and any necessary qualifications noted in Table 8. Any field blank detections associated with laboratory blank contamination and qualified as non-detected (U) are not included in Table 8. The blank results indicate that contaminants may have been introduced to the samples during collection, shipment, handling, and storage.

BLANK AND MATRIX SPIKE EVALUATION

The laboratory control sample (LCS), laboratory control sample duplicate (LCSD) recoveries, and relative percent differences (RPDs) were within the laboratory's limits of acceptance, with the

exceptions and any necessary qualifications noted in Table 9. Data were not qualified if a high recovery was associated with a non-detected result.

The matrix spike (MS), matrix spike duplicate (MSD) recoveries, and RPDs were within the laboratory's limits of acceptance for target analytes for spiked project samples, with the exceptions and any necessary qualifications noted in Table 9. MS/MSDs performed on non-project samples were not reviewed. Data were not qualified if the analyte concentration in the parent sample was greater than four times the spike amount, if the spike amount was diluted out prior to analysis, or if a high recovery was associated with a non-detected result.

SERIAL DILUTION EVALUATION

The metals serial dilution sample percent differences were within laboratory limits of acceptance, with the exceptions and any necessary qualifications noted in Table 10. Results were not qualified if the analyte concentration in the original sample was less than 50 times the detection limit. Serial dilutions performed on non-project samples were not reviewed.

SURROGATE SPIKE EVALUATION

The surrogate recoveries were within the laboratory limits of acceptance, with the exceptions and any necessary qualifications noted in Table 11. Semivolatile results were only qualified if two or more acid or base/neutral surrogates were outside of laboratory limits. Data were not qualified if the surrogate spike amount was diluted out prior to analysis or if a high recovery was associated with a non-detected result.

INTERNAL STANDARD EVALUATION

The internal standard responses for reported results were within acceptable limits. The acceptable internal standard responses indicate that the instrument sensitivity and response were stable during each analysis.

LABORATORY DUPLICATE EVALUATION

The laboratory prepared at least one project sample as a laboratory duplicate. Laboratory duplicates performed on non-project samples were not reviewed. The RPDs between the primary sample and the duplicate were within laboratory control limits, indicating acceptable laboratory precision.

FIELD DUPLICATE EVALUATION

One field sample was submitted to the laboratory as a blind duplicate. RPDs and absolute differences were calculated as appropriate and compared to the limits established in the QAPP. The QAPP states that the RPDs must be less than or equal to 30 percent for aqueous samples when analytes are detected in both samples and these results are greater than or equal to five times the reporting limit. If one or both results are less than five times the reporting limit, or one result is detected and one is non-detected, the absolute difference between the results must be less than two times the reporting limit (if the reporting limits are not the same between the parent and field duplicate samples, the lower of the two was used for the control limit determination). The reporting limit was used for non-detected analytes when calculating absolute difference.

The RPDs and/or absolute differences were within QAPP criteria, with the exceptions and any necessary qualifications noted in Table 14.

COLUMN AGREEMENT EVALUATION

Column agreements met method criteria for dual column analysis.

CALIBRATION RANGE EVALUATION

All results were reported within each instrument's calibration range.

SENSITIVITY

The sample results were reported to the method detection limit. Results between the method detection limit and the reporting limit were flagged as estimated (J) by the laboratory. A number of sample analyses were performed at a dilution factor, resulting in non-detected results reported at elevated reporting limits due to the presence of high levels of non-target analytes or other matrix interference.

COMPLETENESS

The complete data package consisted of 954 reportable data points excluding field blank samples. 1 data points were rejected. The data completeness measure for this data package is calculated to be 99.9%. The project laboratory completeness goal of 95% was met.

OVERALL ASSESSMENT

All qualified data, excluding rejected data, can be used for decision-making purposes; however, the limitation identified by the applied qualifier should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

Table 2
Samples with Exceeded Preservation Requirements
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Analysis Method	Sample Condition	Preservation Requirement	ERM Qualifier
50275199	LCS-5A-WL-20201208	SM 4500-S2-D	pH < 9	pH > 9	UJ
50275199	LCS-3D-WL-20201208	SM 4500-S2-D	pH < 9	pH > 9	UJ
50275199	DUP-008-WL-20201208	SM 4500-S2-D	pH < 9	pH > 9	J
50275199	LCS-3D-WL-20201208	EPA 410.4	pH > 2	pH < 2	J
50275199	DUP-008-WL-20201208	EPA 410.4	pH > 2	pH < 2	J
50275199	LCS-3D-WL-20201208	EPA 353.2	pH > 2	pH < 2	UJ
50275199	DUP-008-WL-20201208	EPA 353.2	pH > 2	pH < 2	UJ
50275199	LCS-3D-WL-20201208	EPA 365.1	pH > 2	pH < 2	J
50275199	DUP-008-WL-20201208	EPA 365.1	pH > 2	pH < 2	J
50275199	LCS-3D-WL-20201208	SM 4500-NH3 G	pH > 2	pH < 2	J
50275199	DUP-008-WL-20201208	SM 4500-NH3 G	pH > 2	pH < 2	J
50275199	LCS-3D-WL-20201208	SM 5310C	pH > 2	pH < 2	J
50275199	DUP-008-WL-20201208	SM 5310C	pH > 2	pH < 2	J
50275199	LCS-3D-WL-20201208	EPA 9012	pH < 10	pH > 10	J
50275199	DUP-008-WL-20201208	EPA 9012	pH < 10	pH > 10	J
50275199	LCS-3D-WL-20201208	SW 6010 Total metals	pH > 2	pH < 2	J
50275199	LCS-3D-WL-20201208	SW 6010 Dissolved metals	pH > 2	pH < 2	J
50275199	DUP-008-WL-20201208	SW 6010 Dissolved metals	pH > 2	pH < 2	J
50275199	LCS-3D-WL-20201208	SW 6020 Total metals	pH > 2	pH < 2	Detects: J Non-detects: UJ
50275199	LCS-3D-WL-20201208	SW 6020 Dissolved metals	pH > 2	pH < 2	Detects: J Non-detects: UJ
50275199	DUP-008-WL-20201208	SW 6020 Dissolved metals	pH > 2	pH < 2	Detects: J Non-detects: UJ

Table 2
Samples with Exceeded Preservation Requirements
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Analysis Method	Sample Condition	Preservation Requirement	ERM Qualifier
50275199	LCS-3D-WL-20201208	SW 7470 Total mercury	pH > 2	pH < 2	J
50275199	LCS-3D-WL-20201208	SW 7470 Dissolved mercury	pH > 2	pH < 2	J
50275199	DUP-008-WL-20201208	SW 7470 Dissolved mercury	pH > 2	pH < 2	J
50275199	LCS-3D-WL-20201208	TCEQ-TX-1005	pH > 2	pH < 2	Detects: J Non-detects: UJ
50275199	DUP-008-WL-20201208	TCEQ-TX-1005	pH > 2	pH < 2	Detects: J Non-detects: UJ
50275199	TB-020-WQ-20201208	TCEQ-TX-1005	pH > 2	pH < 2	UJ
50275199	LCS-3D-WL-20201208	TCEQ-TX-1006	pH > 2	pH < 2	UJ
50275199	DUP-008-WL-20201208	TCEQ-TX-1006	pH > 2	pH < 2	UJ
50275199	TB-020-WQ-20201208	TCEQ-TX-1006	pH > 2	pH < 2	UJ

Table 3

Samples with Exceeded Holding Times

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Extraction Holding Time	Total Time	Analysis Holding Time	Total Time	Affected Analyte	ERM Qualifier
50275199	DUP-008-WL-20201208	SM4500-H-B	--	--	15 min.	2268 min.	pH	J
50275199	LCS-3D-WL-20201208	SM4500-H-B	--	--	15 min.	1405 min.	pH	J
50275199	LCS-5A-WL-20201208	SM4500-H-B	--	--	15 min.	1677 min.	pH	J

Notes:

min. = minutes

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50275199	8260 Instrument 50MV2A 12/10/20	1,4-Dioxane	36	--	20				
50275199						TB-020-WQ-20201208	ND	ug/L	UJ
50275199	8260 Instrument 50MV2A 12/10/20	Iodomethane	37	--	20				
50275199						TB-020-WQ-20201208	ND	ug/L	UJ
50275199	8260 Instrument 50MV2B 12/10/20	Iodomethane	39	--	20				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	8270 Instrument 50MSS2 10/07/2020	Hexachlorophene	40	--	20	None for qualification, analyte not reported from instrument	--	--	--
50275199	8270 Instrument 50MSS6 10/07/2020	Famphur	34	--	20				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	8270 Instrument 50MSS6 10/07/2020	Hexachlorophene	25	--	20				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ

Table 5

Initial Calibration Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	IC Sample ID	Analyte	IC RSD (%)	IC RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50275199	8270 Instrument 50MSS6 10/07/2020	Kepone	26	--	20				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	8270 Instrument 50MSS6 10/07/2020	3,3'-Dimethylbenzidine	21	--	20				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ

Notes:

IC = Initial calibration

RSD = Relative standard deviation

RRF = Relative response factor

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50275199	18290110ICV	Bromomethane	146 %R	--	70-130				
50275199						TB-020-WQ-20201208	ND	ug/L	UJ
50275199	18290110ICV	Acrolein	127 %R	--	75-125				
50275199						TB-020-WQ-20201208	ND	ug/L	UJ
50275199	18290110ICV	Iodomethane	131 %R	--	75-125				
50275199						TB-020-WQ-20201208	ND	ug/L	UJ
50275199	18290110ICV	1,4-Dioxane	153 %R	--	75-125				
50275199						TB-020-WQ-20201208	ND	ug/L	UJ
50275199	18290130ICV	Bromomethane	156 %R	--	70-130				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	18290130ICV	Acrolein	132 %R	--	75-125				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50275199	18290130ICV	Iodomethane	140 %R	--	75-125				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	18290130ICV	Allyl chloride	243 %R	--	75-125				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	18290130ICV	Carbon tetrachloride	126 %R	--	75-125				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	17873843ICV	p-Phenylenediamine	139 %R	--	75-125				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50275199	17873843ICV	1,3,5-Trinitrobenzene	128 %R	--	75-125				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	17873843ICV	P-Dimethylaminoazobenzene	128 %R	--	75-125				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	17873843ICV	3,3'-Dimethylbenzidine	135 %R	--	75-125				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	17873843ICV	Famphur	161 %R	--	75-125				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50275199	Not present in ICV	Acetophenone	--	--	--				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	Not present in ICV	Atrazine	--	--	--				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	Not present in ICV	Benzaldehyde	--	--	--				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	Not present in ICV	Biphenyl (Diphenyl)	--	--	--				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50275199	Not present in ICV	Caprolactam	--	--	--				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	Not present in ICV	N-Nitrosodiphenylamine	--	--	--				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	Not present in ICV	1,2,4,5-Tetrachlorobenzene	--	--	--				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	18301227CCV	Bromomethane	31 %D	--	± 30				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199	18301227CCV	Isobutanol	-61 %D	--	± 25				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50275199	18301226CCV	1,4-Dioxane	26 %D	--	± 25	None for qualification, analyte not reported from sequence	--	--	--
50275199	18301229CCV	1,4-Dioxane	-31 %D	--	± 25		--	--	--
50275199						LCS-3D-WL-20201208	48100	ug/L	J
50275199						DUP-008-WL-20201208	19200	ug/L	J
50275199	18301229CCV	Isobutanol	-28 %D	--	± 25	None for qualification, analyte not reported from sequence	--	--	--
50275199	18325717CCV	Acetonitrile	29 %D	--	± 25	None for qualification, analyte not reported from sequence	--	--	--
50275199	18325717CCV	Acrolein	-67 %D	--	± 25	None for qualification, analyte not reported from sequence	--	--	--
50275199	18325717CCV	Carbon tetrachloride	39 %D	--	± 25	None for qualification, analyte not reported from sequence	--	--	--
50275199	18325717CCV	2,2-Dichloropropane	28 %D	--	± 25	None for qualification, analyte not reported from sequence	--	--	--
50275199	18325717CCV	Isobutanol	-28 %D	--	± 25	None for qualification, analyte not reported from sequence	--	--	--
50275199	18325717CCV	m&p-Xylene	109 %D	--	± 20	None for qualification, analyte not reported from sequence	--	--	--
50275199	18311345CCV	Butylbenzylphthalate	32 %D	--	± 25				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50275199	18311345CCV	Carbazole	26 %D	--	± 20				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	18311345CCV	Di-n-butylphthalate	21 %D	--	± 20				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	18311345CCV	2-Nitrophenol	21 %D	--	± 20				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	18302468CCV	Chlorobenzilate	28 %D	--	± 25				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50275199	18302468CCV	Hexachlorophene	-74 %D	--	± 25				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	18328667CCV	2,4-D	41 %D	--	± 20				
50275199	18328671CCV	2,4-D	71 %D	--	± 20				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199	18328667CCV	Dinoseb	89 %D	--	± 20				
50275199	18328671CCV	Dinoseb	181 %D	--	± 20				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199	18328667CCV	2,4,5-T	85 %D	--	± 20				
50275199	18328671CCV	2,4,5-T	130 %D	--	± 20				
50275199						FB-005-WQ-20201208	ND	ug/L	UJ
50275199						LCS-5A-WL-20201208	ND	ug/L	UJ
50275199	18328667CCV	2,4,5-TP	41 %D	--	± 20	None for qualification, analyte not reported from sequence	--	--	--
50275199	18328671CCV	2,4,5-TP	73 %D	--	± 20	None for qualification, analyte not reported from sequence	--	--	--

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50275199	18328671CCV	2,4-D	71 %D	--	± 20				
50275199	18328673CCV	2,4-D	89 %D	--	± 20				
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	18328671CCV	Dinoseb	181 %D	--	± 20				
50275199	18328673CCV	Dinoseb	151 %D	--	± 20				
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	18328671CCV	2,4,5-T	130 %D	--	± 20				
50275199	18328673CCV	2,4,5-T	121 %D	--	± 20				
50275199						LCS-3D-WL-20201208	ND	ug/L	UJ
50275199						DUP-008-WL-20201208	ND	ug/L	UJ
50275199	18328671CCV	2,4,5-TP	73 %D	--	± 20	None for qualification, analyte not reported from sequence	--	--	--
50275199	18328673CCV	2,4,5-TP	72 %D	--	± 20	None for qualification, analyte not reported from sequence	--	--	--
50275199	18328666CCV	Dinoseb	-28 %D	--	± 20	None for qualification, analyte not reported from sequence	--	--	--
50275199	18328669CCV	Dinoseb	-26 %D	--	± 20	None for qualification, analyte not reported from sequence	--	--	--

Table 6

Calibration Verification Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	ICV/CCV Sample ID	Analyte	ICV/CCV (%)	ICV/CCV RRF	Limits	Associated Sample	Result	Units	ERM Qualifier
50275199	18328669CCV	2,4,5-T	-25 %D	--	± 20	None for qualification, analyte not reported from sequence	--	--	--

Notes:

CCV = Continuing calibration verification

%D = Percent difference

ICV = Initial calibration verification

RRF = Relative response factor

%R = Percent recovery

Table 7

Laboratory Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50275199	2756761BLANK-50275199	Lithium, Total	3.5 J	20.0	None for qualification, samples > 5x blank	--	--	ug/L	--
50275199	2757361BLANK-50275199	Iodomethane	0.51 J	5.0	None for qualification, samples ND	--	--	ug/L	--
50275199	2124937BLANK-50275199	Methane	3.1 J	5.0				ug/L	
50275199		Methane			FB-005-WQ-20201208	5.2	5.0	ug/L	J+

Notes:

RL = Reporting Limit

Table 8

Field Blank and Associated Suspect Sample Detections

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Blank ID	Detected Analyte	Reported Blank Conc.	Blank Report Limit	Associated Sample	Assoc. Sample Result	Assoc. Sample RL	Units	ERM Qualifier
50275199	FB-005-WQ-20201208	Carbon dioxide	992	900	None for qualification, sample > 5x blank	--	--	ug/L	--
50275199	FB-005-WQ-20201208	Chromium, Total	0.18	2.0	None for qualification, sample > 5x blank	--	--	ug/L	--
50275199	FB-005-WQ-20201208	Silicon, Total	21.3	200	None for qualification, sample > 5x blank	--	--	ug/L	--
50275199	FB-005-WQ-20201208	Sodium, Total	58.6	1000	None for qualification, sample > 5x blank	--	--	ug/L	--
50275199	FB-005-WQ-20201208	Methane	5.2	5.0	None for qualification, sample > 5x blank	--	--	ug/L	--
50275199	FILTB-005-WQ-20201208	Chromium, Dissolved	0.82 J	2.0	None for qualification, samples > 5x blank	--	--	ug/L	--
50275199	FILTB-005-WQ-20201208	Copper, Dissolved	0.18 J	1.0				ug/L	
50275199		Copper, Dissolved			LCS-5A-WL-20201208	0.59	1.0	ug/L	1.0 U
50275199	FILTB-005-WQ-20201208	Silicon, Dissolved	26.7 J	200	None for qualification, samples > 5x blank	--	--	ug/L	--

Notes:

RL = Reporting Limit

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
LCS/LCSD										
50275199	2757355LCS-50275199/	None for qualification, sample ND	Acrolein	132/	56-120	--	--	--	--	--
50275199	2757355LCS-50275199/	None for qualification, sample ND	tert-Butylbenzene	109/	58-106	--	--	--	--	--
50275199	2757362LCS-50275199/	None for qualification, sample ND	Acrolein	139/	56-120	--	--	--	--	--
50275199	2757362LCS-50275199/	None for qualification, sample ND	Allyl chloride	235/	70-130	--	--	--	--	--
50275199	2757362LCS-50275199/	None for qualification, sample ND	Carbon tetrachloride	127/	73-125	--	--	--	--	--
50275199	2757362LCS-50275199/	None for qualification, sample ND	sec-Butylbenzene	120/	79-119	--	--	--	--	--
50275199	2757362LCS-50275199/	None for qualification, sample ND	tert-Butylbenzene	113/	58-106	--	--	--	--	--
50275199	2757370LCS-50275199/	None for qualification, sample ND	Acrolein	131/	56-120	--	--	--	--	--
50275199	2757370LCS-50275199/	None for qualification, sample ND	Allyl chloride	232/	70-130	--	--	--	--	--
50275199	2757370LCS-50275199/	None for qualification, sample ND	Carbon tetrachloride	127/	73-125	--	--	--	--	--
50275199	2757370LCS-50275199/	None for qualification, sample ND	tert-Butylbenzene	111/	58-106	--	--	--	--	--

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
			MS/MSD							
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD		3,3'-Dichlorobenzidine	0/0	12-148	NC	20			
50275199		LCS-5A-WL-20201208	3,3'-Dichlorobenzidine					<95.2	ug/L	R
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample ND	Acrolein	Pass/125	28-122	25	20	--	--	--
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample ND	Allyl chloride	240/261	70-130	Pass	20	--	--	--
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample > 4x spike	Ammoniacal Nitrogen NH3N	-88/-37	90-110	Pass	20	--	--	--
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample ND	Aroclor 1016	Pass/Pass	10-165	24	20	--	--	--
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample > 4x spike	Boron, Dissolved	129/Pass	75-125	Pass	20	--	--	--
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD		Boron, Total	142/146	75-125	Pass	20			
50275199		LCS-5A-WL-20201208	Boron, Total					3980	ug/L	J+
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample ND	Bromomethane	Pass/Pass	10-191	26	20	--	--	--
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample > 4x spike	Calcium, Dissolved	184/130	75-125	Pass	20	--	--	--
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample > 4x spike	Calcium, Total	186/218	75-125	Pass	20	--	--	--
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample > 4x spike	Carbon dioxide	-57/264	38.0-147	Pass	40	--	--	--

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD		Chemical Oxygen Demand	79/79	90-110	Pass	20			
50275199		LCS-5A-WL-20201208	Chemical Oxygen Demand					757	mg/L	J-
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD		Cyanide CN-	72/72	90-110	Pass	20			
50275199		LCS-5A-WL-20201208	Cyanide CN-					0.0022	mg/L	J-
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample ND	Dinoseb	158/147	10-140	Pass	20	--	--	--
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD		Dissolved Organic Carbon	74/75	80-120	Pass	20			
50275199		LCS-5A-WL-20201208	Dissolved Organic Carbon					225	mg/L	J-
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample > 4x spike	Hardness as CaCO3, Total	170/192	75-125	Pass	20	--	--	--
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample > 4x spike	Magnesium, Dissolved	142/Pass	75-125	Pass	20	--	--	--
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample > 4x spike	Magnesium, Total	161/176	75-125	Pass	20	--	--	--
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD		Mercury, Dissolved	55/52	75-125	Pass	20			
50275199		LCS-5A-WL-20201208	Mercury, Dissolved					<0.20	ug/L	UJ
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample > 4x spike	Methane	16.0/-192	70.0-130	Pass	30	--	--	--
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample ND	Methyl iodide	Pass/Pass	10-186	23	20	--	--	--

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD		Nitrite + Nitrate as N	84/84	90-110	Pass	20			
50275199		LCS-5A-WL-20201208	Nitrite + Nitrate as N					<0.40	mg/L	UJ
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD		Phosphorus	135/141	90-110	Pass	20			
50275199		LCS-5A-WL-20201208	Phosphorus					0.96	mg/L	J+
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample > 4x spike	Potassium, Dissolved	145/Pass	75-125	Pass	20	--	--	--
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample > 4x spike	Sodium, Dissolved	395/270	75-125	Pass	20	--	--	--
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample > 4x spike	Sodium, Total	135/275	75-125	Pass	20	--	--	--
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD		Sulfide	44/45	90-110	Pass	20			
50275199		LCS-5A-WL-20201208	Sulfide					<5.0	mg/L	UJ
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample ND	Trichlorophenoxyacetic Acid, 2,4,5-	174/151	28-129	Pass	20	--	--	--
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample ND	Acrolein	Pass/125	28-122	25	20	--	--	--
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample ND	Carbon tetrachloride	Pass/141	55-134	Pass	20	--	--	--
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample ND	Chloromethane	Pass/130	17-129	Pass	20	--	--	--
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample ND	Dichlorodifluoromethane (Freon 12)	Pass/168	21-154	Pass	20	--	--	--

Table 9

Spike Recoveries Outside of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Spike Sample ID	Associated Sample	Analyte	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample > 4x spike	Potassium, Total	Pass/142	75-125	Pass	20	--	--	--
50275199	LCS-5A-WL-20201208MS/ LCS-5A-WL-20201208MSD	None for qualification, sample > 4x spike	Silicon, Dissolved	Pass/72	75-125	Pass	20	--	--	--

Notes:

LCS/LCSD = Laboratory control sample/laboratory control sample duplicate

MS/MSD - Matrix spike/matrix spike duplicate

NC = Not Calculated. The laboratory does not calculate RPDs when one or both results are below the reporting limit.

RPD = Relative percent difference

Table 10
Serial Dilution Recoveries Outside of Acceptable Limits
West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Dilution		Concentration			Instrmt. DL	Result/ DL	%D	%D Limit	ERM Qualifier
	Sample ID	Analyte	Sample	Dilution	Units					
50275199	LCS-5A-WL-20201208	Arsenic, Total	20.1	23.0	ug/L	0.20	101	14	10	J
50275199	LCS-5A-WL-20201208	Chromium, Total	18.1	20.6	ug/L	0.11	165	27	10	J

Notes:
%D = Percent Difference
DL = Detection Limit

Table 11

Surrogate Recovery Results out of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Surrogate	Recovery (%)	Limit (%)	Affected Analyte	Dilution Factor	ERM Qualifier
50275199	DUP-008-WL-20201208	SW8151A Column 1	2,4-Dichlorophenylacetic acid	0	30-140	None for qualification, dilution factor > 10	50	--
50275199	DUP-008-WL-20201208	SW8151A Column 2	2,4-Dichlorophenylacetic acid	0	30-140	None for qualification, dilution factor > 10	50	--
50275199	DUP-008-WL-20201208	SW8270C	2-Fluorobiphenyl	0	40-107	None for qualification, dilution factor > 10	50	--
50275199	DUP-008-WL-20201208	SW8270C	2-Fluorophenol	0	13-81	None for qualification, dilution factor > 10	50	--
50275199	DUP-008-WL-20201208	SW8270C	2,4,6-Tribromophenol	0	43-135	None for qualification, dilution factor > 10	50	--
50275199	DUP-008-WL-20201208	SW8270C	Nitrobenzene-d5	1140	37-125	None for qualification, dilution factor > 10	50	--
50275199	DUP-008-WL-20201208	SW8270C	p-Terphenyl-d14	0	30-158	None for qualification, dilution factor > 10	50	--
50275199	DUP-008-WL-20201208	SW8270C	Phenol-d5	611	10-65	None for qualification, dilution factor > 10	50	--
50275199	LCS-3D-WL-20201208	SW8151A Column 1	2,4-Dichlorophenylacetic acid	0	30-140	None for qualification, dilution factor > 10	50	--
50275199	LCS-3D-WL-20201208	SW8151A Column 2	2,4-Dichlorophenylacetic acid	0	30-140	None for qualification, dilution factor > 10	50	--
50275199	LCS-3D-WL-20201208	SW8270C	2-Fluorobiphenyl	0	40-107	None for qualification, dilution factor > 10	50	--
50275199	LCS-3D-WL-20201208	SW8270C	2-Fluorophenol	0	13-81	None for qualification, dilution factor > 10	50	--

Table 11

Surrogate Recovery Results out of Acceptable Limits

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Sample ID	Method	Surrogate	Recovery (%)	Limit (%)	Affected Analyte	Dilution Factor	ERM Qualifier
50275199	LCS-3D-WL-20201208	SW8270C	2,4,6-Tribromophenol	0	43-135	None for qualification, dilution factor > 10	50	--
50275199	LCS-3D-WL-20201208	SW8270C	Nitrobenzene-d5	1050	37-125	None for qualification, dilution factor > 10	50	--
50275199	LCS-3D-WL-20201208	SW8270C	p-Terphenyl-d14	0	30-158	None for qualification, dilution factor > 10	50	--
50275199	LCS-3D-WL-20201208	SW8270C	Phenol-d5	637	10-65	None for qualification, dilution factor > 10	50	--

Table 14

Field Duplicate Result Outliers

West Lake OU-3 RI/FS Routine Groundwater

Lab Package	Primary/Duplicate Sample ID	Analyte	Concentration		Report Limit		Units	AbD	RPD	Limit	ERM Qualifier
			Sample	Duplicate	Sample	Duplicate					
50275199	DUP-008-WL-20201208/LCS-3D-WL-20201208	1,4-Dioxane	48100	19200	10000	10000	ug/L	28900	--	20000	J

Notes:

AbD = Absolute Difference

RPD = Relative percent difference

APPENDIX G Q4 2020 STATISTICAL SUMMARY TABLES AND BOX PLOTS

Table G-1: Descriptive Statistics by Analyte and Data Type for Total Parameters
OU-3 2020 Revised Annual Report

Chemical name	Unit	Number of Samples	Number of Field Duplicates	Number Exceeding RSL	Number Exceeding MCL	Number with Detectible Concentration	Percentage with Detectable Concentration	Minimum Concentration	Median Concentration	Mean Concentration	Maximum Concentration
1,2,4-Trichlorobenzene	ug/L	74	7	1	NE	1	1.49	1	1	1.26	10
1,2,4-Trimethylbenzene	ug/L	74	7	2	NE	5	7.46	0.31	5	7.2	139
1,2-Dichlorobenzene	ug/L	74	7	0	NE	1	1.49	1	1	1.21	10
1,3,5-Trimethylbenzene	ug/L	74	7	1	NE	3	4.48	0.097	5	6.64	59.4
1,3-Dichlorobenzene	ug/L	74	7	NE	NE	2	2.99	0.18	1	1.21	10
1,4-Dichlorobenzene	ug/L	74	7	10	NE	12	17.91	0.42	1	1.94	24.2
1,4-Dioxane	ug/L	67	6	5	NE	5	8.2	100	100	164	2230
1-Methylnaphthalene	ug/L	74	7	4	NE	6	8.96	0.11	1	1.31	22.8
2,4-Dichlorophenoxyacetic acid	ug/L	74	7	0	NE	1	1.49	0.89	1	0.992	1.1
2,4-Dimethylphenol	ug/L	74	7	1	NE	2	2.99	6.7	9.5	12.5	135
2-Methylnaphthalene	ug/L	74	7	1	NE	8	11.94	0.18	1	1.36	25.6
4-Isopropyltoluene	ug/L	74	7	NE	NE	1	1.49	1	1	1.25	10
Acenaphthene	ug/L	74	7	0	NE	6	8.96	0.089	1	0.932	1.1
Acenaphthylene	ug/L	74	7	NE	NE	6	8.96	0.081	1	0.937	1
Acetone	ug/L	74	7	0	NE	1	1.49	8.7	20	23.7	200
Alkalinity, Total as CaCO3	ug/L	74	7	NE	NE	67	100	266000	499000	636000	2100000
Aluminum	ug/L	74	7	0	NE	21	31.34	43.6	200	206	960
Ammoniacal Nitrogen NH3N	ug/L	74	7	NE	NE	56	83.58	38	780	24300	477000
Antimony	ug/L	74	7	0	0	32	47.76	0.077	1	0.627	1
Aroclor 1248	ug/L	74	7	1	NE	1	1.49	0.091	0.095	0.115	1.4
Aroclor 1254	ug/L	74	7	1	NE	1	1.49	0.091	0.095	0.103	0.57
Aroclor 1260	ug/L	74	7	1	NE	1	1.49	0.091	0.095	0.0997	0.34
Arsenic	ug/L	74	7	64	20	64	95.52	0.24	2.2	26.9	395
Barium	ug/L	74	7	38	7	66	98.51	7.3	487	880	8250
Benzene	ug/L	74	7	20	NE	20	29.85	0.71	1	25.8	676
Benzo(k)fluoranthene	ug/L	74	7	0	NE	1	1.49	0.1	0.1	0.101	0.15
Beryllium	ug/L	74	7	0	0	14	20.9	0.023	0.2	0.179	0.68
Bicarbonate Alkalinity as CaCO3	ug/L	74	7	NE	NE	67	100	266000	499000	633000	2100000
Boron	ug/L	74	7	32	NE	66	98.51	31.4	370	656	3680
Bromide	ug/L	74	7	NE	NE	59	88.06	32	380	1810	16100
C12-C16-Aromatics	ug/L	74	7	NE	NE	1	1.49	1000	1000	1010	1230
C12-C28-Total	ug/L	74	7	NE	NE	4	5.97	770	900	1090	12000
C28-C35-Total	ug/L	74	7	NE	NE	1	1.49	900	900	911	1150
C6-C12-Total	ug/L	74	7	NE	NE	5	7.46	703	900	1200	9660
C6-C35-Total	ug/L	74	7	NE	NE	6	8.96	703	900	1450	16700

Notes:
RSL=USEPA Regional Screening Level for Tapwater
MCL= USEPA Maximum Contaminant Limit
NE=RSL and/or MCL not established
ug/L=micrograms per liter
pCi/L=picocuries per liter

Table G-1: Descriptive Statistics by Analyte and Data Type for Total Parameters
OU-3 2020 Revised Annual Report

Chemical name	Unit	Number of Samples	Number of Field Duplicates	Number Exceeding RSL	Number Exceeding MCL	Number with Detectible Concentration	Percentage with Detectable Concentration	Minimum Concentration	Median Concentration	Mean Concentration	Maximum Concentration
Cadmium	ug/L	74	7	0	0	11	16.42	0.025	0.2	0.204	0.92
Calcium	ug/L	74	7	NE	NE	67	100	8010	137000	171000	928000
Caprolactam	ug/L	74	7	0	NE	7	10.45	5	9.5	32.7	607
Carbon dioxide	ug/L	74	7	NE	NE	67	100	3460	75000	116000	635000
Carbonate Alkalinity as CaCO3	ug/L	74	7	NE	NE	10	14.93	1200	2000	4190	25400
Chemical Oxygen Demand	ug/L	74	7	NE	NE	56	83.58	3800	30900	109000	1200000
Chloride	ug/L	74	7	NE	NE	67	100	2100	140000	263000	2780000
Chlorobenzene	ug/L	74	7	8	NE	22	32.84	0.68	1	7.26	179
Chloroethane	ug/L	74	7	0	NE	2	2.99	2	2	2.59	20
Chromium	ug/L	74	7	NE	0	39	58.21	0.11	2	2.11	19.1
Chromium (III)	ug/L	74	7	0	NE	5	7.46	6.2	10	9.96	17
Chromium (VI)	ug/L	74	7	18	NE	18	26.87	0.0403	0.1	0.163	2.29
cis-1,2-Dichloroethene	ug/L	74	7	0	NE	7	10.45	0.16	1	1.17	10
Cobalt	ug/L	74	7	44	NE	44	65.67	0.65	5	4.9	28.5
Copper	ug/L	74	7	0	NE	49	73.13	0.25	1	1.44	17
Cyanide CN-	ug/L	71	7	5	NE	5	7.81	2	5	4.81	5
Cyclohexane	ug/L	74	7	0	NE	3	4.48	0.44	20	23.2	200
Dibenzo(a,h)anthracene	ug/L	74	7	1	NE	1	1.49	0.061	0.1	0.0996	0.11
Dibutyl phthalate	ug/L	74	7	0	NE	1	1.49	6.9	9.5	10.6	47.6
Dichlorodifluoromethane (Freon 12)	ug/L	74	7	1	NE	3	4.48	0.63	2	2.8	29.9
Ethyl ether	ug/L	74	7	0	NE	39	58.21	0.2	20	16.8	123
Ethylbenzene	ug/L	74	7	2	NE	7	10.45	0.13	1	1.36	17.3
Fluoranthene	ug/L	74	7	0	NE	1	1.49	0.076	1	0.988	1.1
Fluorene	ug/L	74	7	0	NE	3	4.48	0.15	1	0.969	1.1
Fluoride	ug/L	74	7	64	5	66	98.51	59	460	1470	14900
Hardness as CaCO3	ug/L	74	7	NE	NE	67	100	42100	559000	698000	3410000
Iodide	ug/L	74	7	NE	NE	37	55.22	84	500	686	6900
Iron	ug/L	74	7	45	NE	67	100	58.2	4310	17800	160000
Isopropylbenzene (Cumene)	ug/L	74	7	0	NE	9	13.43	1	1	1.54	19.2
Lead	ug/L	74	7	1	NE	33	49.25	0.038	1	0.916	15.4
Lithium	ug/L	74	7	64	NE	64	95.52	10.3	32	39.9	199
m,p-Xylenes	ug/L	74	7	NE	NE	7	10.45	0.39	2	4.76	154
Magnesium	ug/L	74	7	NE	NE	67	100	5370	51900	65800	265000
Manganese	ug/L	74	7	48	NE	64	95.52	5	227	792	8350
Methane	ug/L	74	7	NE	NE	63	94.03	5	650	5350	30000

Notes:
RSL=USEPA Regional Screening Level for Tapwater
MCL= USEPA Maximum Contaminant Limit
NE=RSL and/or MCL not established
ug/L=micrograms per liter
pCi/L=picocuries per liter

Table G-1: Descriptive Statistics by Analyte and Data Type for Total Parameters
OU-3 2020 Revised Annual Report

Chemical name	Unit	Number of Samples	Number of Field Duplicates	Number Exceeding RSL	Number Exceeding MCL	Number with Detectible Concentration	Percentage with Detectable Concentration	Minimum Concentration	Median Concentration	Mean Concentration	Maximum Concentration
Methyl tert-butyl ether	ug/L	74	7	0	NE	27	40.3	0.11	4	3.21	10.8
Methylcyclohexane	ug/L	74	7	NE	NE	1	1.49	4.1	20	23.6	200
Molybdenum	ug/L	74	7	5	NE	54	80.6	0.61	3	5.68	54.1
Naphthalene	ug/L	74	7	12	NE	12	17.91	0.14	1	1.46	17.7
n-Butylbenzene	ug/L	74	7	0	NE	1	1.49	0.8	1	1.19	10
n-Hexane	ug/L	74	7	0	NE	1	1.49	1.1	5	5.91	50
Nickel	ug/L	74	7	8	NE	55	82.09	1.3	10	21.5	419
Nitrate as N	ug/L	74	7	NE	NE	16	23.88	15	50	90.1	1700
Nitrite + Nitrate as N	ug/L	74	7	NE	NE	19	28.36	14	100	219	1700
Nitrite as N	ug/L	74	7	NE	NE	2	2.99	17	50	204	500
n-Propylbenzene	ug/L	74	7	0	NE	4	5.97	0.26	1	1.31	10
o-Chlorotoluene (2-chlorotoluene)	ug/L	74	7	0	NE	1	1.49	0.45	1	1.19	10
Organic Carbon, Total	ug/L	74	7	NE	NE	66	98.51	340	7300	30000	366000
o-Xylene	ug/L	74	7	1	NE	7	10.45	0.36	1	2.05	51.7
PCBs, Total	ug/L	74	7	2	NE	2	2.99	0.091	0.095	0.13	2.3
pH, Lab	pH units	74	7	NE	NE	67	100	6.4	7	7.03	8.1
Phenanthrene	ug/L	74	7	NE	NE	7	10.45	0.19	1	1.09	9.1
Phenol	ug/L	74	7	0	NE	1	1.49	9	9.5	10.6	47.6
Phosphorus	ug/L	74	7	NE	NE	54	80.6	27	150	482	3600
Potassium	ug/L	74	7	NE	NE	67	100	1550	6700	19100	235000
Radium-226	pCi/L	74	7	NE	NE	67	100	0.0507	0.972	2.44	36.5
Radium-226/228	pCi/L	74	7	NE	15	67	100	0.0507	2.23	4.01	39.7
Radium-228	pCi/L	74	7	NE	NE	67	100	-0.137	1.1	1.57	5.95
sec-Butylbenzene	ug/L	74	7	0	NE	3	4.48	1	1	1.21	10
Selenium	ug/L	74	7	0	0	15	22.39	0.31	1	0.91	1.7
Silicon	ug/L	74	7	NE	NE	67	100	3840	12000	13100	27600
Silver	ug/L	74	7	0	NE	1	1.49	0.026	0.5	0.493	0.5
Sodium	ug/L	74	7	NE	NE	67	100	7080	84500	130000	673000
Strontium	ug/L	74	7	25	NE	67	100	376	1010	1540	7420
Sulfate	ug/L	74	7	NE	NE	63	94.03	130	22600	45800	862000
Sulfide	ug/L	74	7	NE	NE	7	10.45	32	1000	913	1000
Thallium	ug/L	74	7	1	0	1	1.49	0.048	1	0.986	1
Thorium	ug/L	74	7	NE	NE	19	28.36	0.066	1	0.77	1
Thorium-228	pCi/L	74	7	NE	NE	67	100	-0.08	0.066	0.0699	0.294
Thorium-230	pCi/L	74	7	NE	NE	67	100	-0.015	0.243	0.211	0.526

Notes:
RSL=USEPA Regional Screening Level for Tapwater
MCL= USEPA Maximum Contaminant Limit
NE=RSL and/or MCL not established
ug/L=micrograms per liter
pCi/L=picocuries per liter

Table G-1: Descriptive Statistics by Analyte and Data Type for Total Parameters
OU-3 2020 Revised Annual Report

Chemical name	Unit	Number of Samples	Number of Field Duplicates	Number Exceeding RSL	Number Exceeding MCL	Number with Detectible Concentration	Percentage with Detectable Concentration	Minimum Concentration	Median Concentration	Mean Concentration	Maximum Concentration
Thorium-232	pCi/L	74	7	NE	NE	67	100	-0.013	0.027	0.033	0.152
Tin	ug/L	74	7	0	NE	16	23.88	1.8	10	9.45	68.9
Titanium	ug/L	74	7	NE	NE	26	38.81	0.9	10	7.77	15.6
Toluene	ug/L	74	7	0	NE	15	22.39	0.15	1	1.46	17.5
Total suspended solids	ug/L	74	7	NE	NE	49	73.13	2000	10000	33300	246000
trans-1,2-Dichloroethene	ug/L	74	7	0	NE	1	1.49	0.51	1	1.19	10
Trichloroethene	ug/L	74	7	1	NE	1	1.49	0.34	1	1.18	10
Tritium	pCi/L	74	7	NE	NE	67	100	-286	64.5	2010	48360
Uranium	ug/L	74	7	32	NE	59	88.06	0.01	0.83	1.36	10.7
Uranium-234	pCi/L	74	7	NE	NE	67	100	0.116	0.525	0.959	6.22
Uranium-235	pCi/L	74	7	NE	NE	67	100	-0.009	0.138	0.152	0.441
Uranium-238	pCi/L	74	7	NE	NE	67	100	0.041	0.267	0.482	2.93
Vanadium	ug/L	74	7	3	NE	48	71.64	0.15	1	1.82	16.3
Vinyl chloride	ug/L	74	7	2	NE	2	2.99	1	1	1.22	10
Xylene, Total	ug/L	74	7	2	NE	9	13.43	0.16	3	6.62	206
Zinc	ug/L	74	7	0	NE	28	41.79	7.4	20	32.5	397

Notes:

RSL=USEPA Regional Screening Level for Tapwater

MCL= USEPA Maximum Contaminant Limit

NE=RSL and/or MCL not established

ug/L=micrograms per liter

pCi/L=picocuries per liter

Table G-2: Descriptive Statistics by Analyte and Data Type for Dissolved Parameters
OU-3 2020 Revised Annual Report

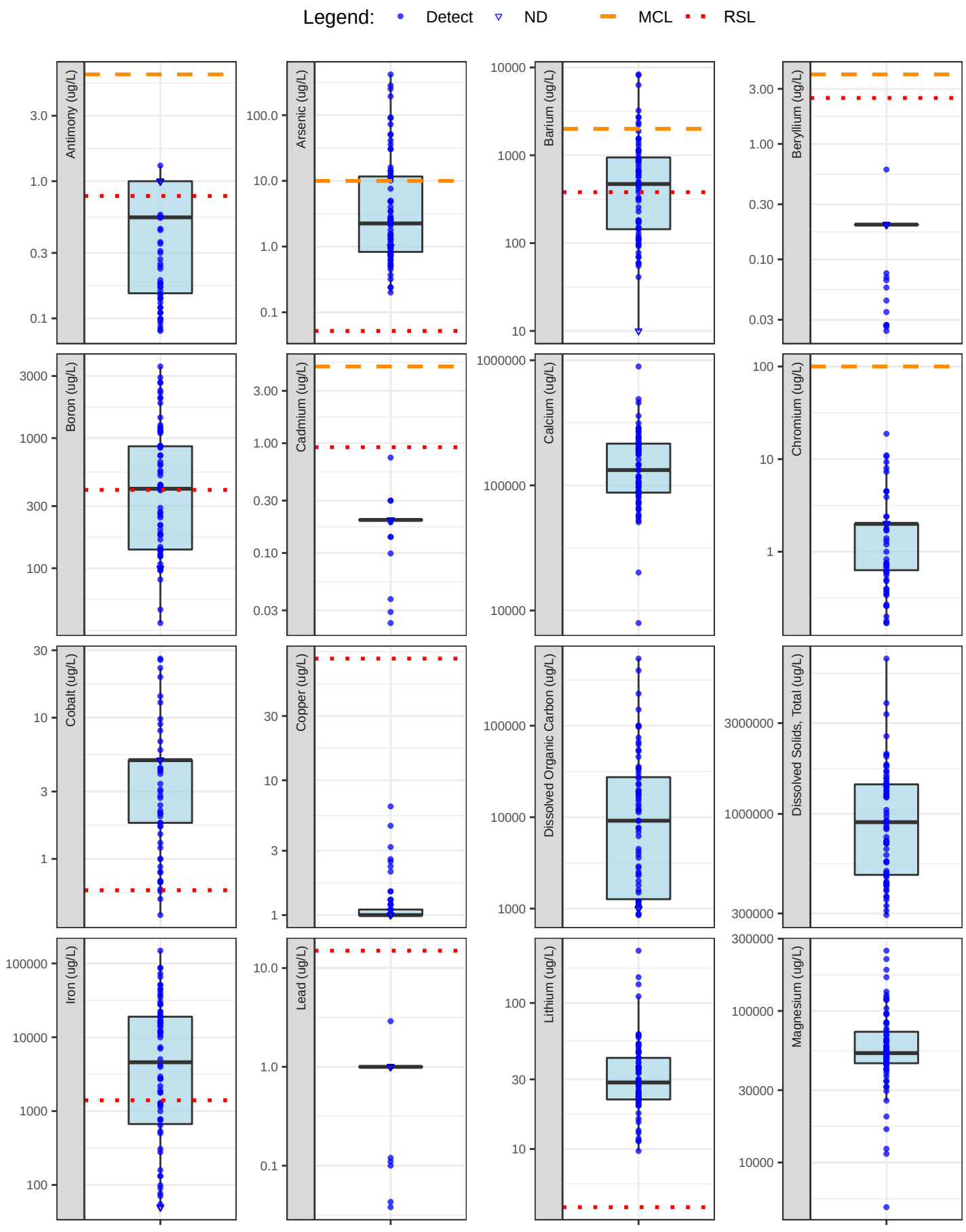
Chemical Name	Unit	Number of Samples	Number of Field Duplicates	Number Exceeding Screening Level	Number Exceeding MCL	Number with Detectible Concentration	Percentage with Detectable Concentration	Minimum Concentration	Median Concentration	Mean Concentration	Maximum Concentration
Aluminum	ug/L	74	7	0	NE	3	4.48	66.1	200	206	812
Antimony	ug/L	74	7	1	0	35	52.24	0.081	0.57	0.603	1.3
Arsenic	ug/L	74	7	65	21	65	97.01	0.2	2.1	27.1	417
Barium	ug/L	74	7	37	7	65	97.01	10	463	872	8330
Beryllium	ug/L	74	7	0	0	11	16.42	0.024	0.2	0.184	0.6
Boron	ug/L	74	7	33	NE	63	94.03	37.9	397	653	3550
Cadmium	ug/L	74	7	0	0	8	11.94	0.023	0.2	0.199	0.74
Calcium	ug/L	74	7	NE	NE	67	100	7940	132000	166000	891000
Chromium	ug/L	74	7	NE	0	40	59.7	0.17	2	2.17	18.8
Cobalt	ug/L	74	7	38	NE	41	61.19	0.4	5	4.8	26.2
Copper	ug/L	74	7	0	NE	18	26.87	1	1	1.29	6.4
Dissolved Organic Carbon	ug/L	74	7	NE	NE	58	86.57	850	7700	34800	542000
Dissolved Solids, Total	ug/L	74	7	NE	NE	67	100	294000	864000	1100000	6550000
Iron	ug/L	74	7	42	NE	61	91.04	50	4170	16900	149000
Lead	ug/L	74	7	0	NE	5	7.46	0.038	1	0.973	2.9
Lithium	ug/L	74	7	67	NE	67	100	9.7	28.6	38	228
Magnesium	ug/L	74	7	NE	NE	67	100	5070	51700	64900	250000
Manganese	ug/L	74	7	47	NE	62	92.54	5	188	749	7640
Molybdenum	ug/L	74	7	7	NE	34	50.75	0.5	10	8.12	53.6
Nickel	ug/L	74	7	4	NE	59	88.06	1.4	10	20.9	446
Potassium	ug/L	74	7	NE	NE	67	100	1580	6980	18800	229000
Radium-226	pCi/L	74	7	NE	NE	67	100	-0.13	0.996	2.66	39.4
Radium-226/228	pCi/L	74	7	NE	16	67	100	0.14	2.04	4.23	42.6
Radium-228	pCi/L	74	7	NE	NE	67	100	-0.159	1.03	1.56	5.65
Selenium	ug/L	74	7	0	0	15	22.39	0.28	1	0.904	1.3
Silicon	ug/L	74	7	NE	NE	67	100	3890	12000	12900	27700
Sodium	ug/L	74	7	NE	NE	67	100	6760	80200	128000	686000
Strontium	ug/L	74	7	25	NE	67	100	335	1010	1550	8000
Thallium	ug/L	74	7	1	0	1	1.49	0.045	1	0.986	1
Thorium	ug/L	74	7	NE	NE	14	20.9	0.052	1	0.824	1
Thorium-228	pCi/L	74	7	NE	NE	67	100	-0.084	0.049	0.0605	0.356
Thorium-230	pCi/L	74	7	NE	NE	67	100	-0.027	0.201	0.18	0.455
Thorium-232	pCi/L	74	7	NE	NE	67	100	-0.026	0.017	0.0279	0.173
Tin	ug/L	74	7	0	NE	5	7.46	1.9	10	9.8	14.2
Titanium	ug/L	74	7	NE	NE	3	4.48	1.2	10	9.66	10
Uranium	ug/L	74	7	32	NE	63	94.03	0.01	0.58	1.33	10.8

Table G-2: Descriptive Statistics by Analyte and Data Type for Dissolved Parameters
OU-3 2020 Revised Annual Report

Chemical Name	Unit	Number of Samples	Number of Field Duplicates	Number Exceeding Screening Level	Number Exceeding MCL	Number with Detectible Concentration	Percentage with Detectable Concentration	Minimum Concentration	Median Concentration	Mean Concentration	Maximum Concentration
Uranium-234	pCi/L	74	7	NE	NE	67	100	0.081	0.602	0.996	6.07
Uranium-235	pCi/L	74	7	NE	NE	67	100	0.003	0.152	0.167	0.583
Uranium-238	pCi/L	74	7	NE	NE	67	100	0.012	0.248	0.486	3.47
Vanadium	ug/L	74	7	2	NE	44	65.67	0.16	1	1.77	16.7
Zinc	ug/L	74	7	0	NE	16	23.88	5.9	20	33	181

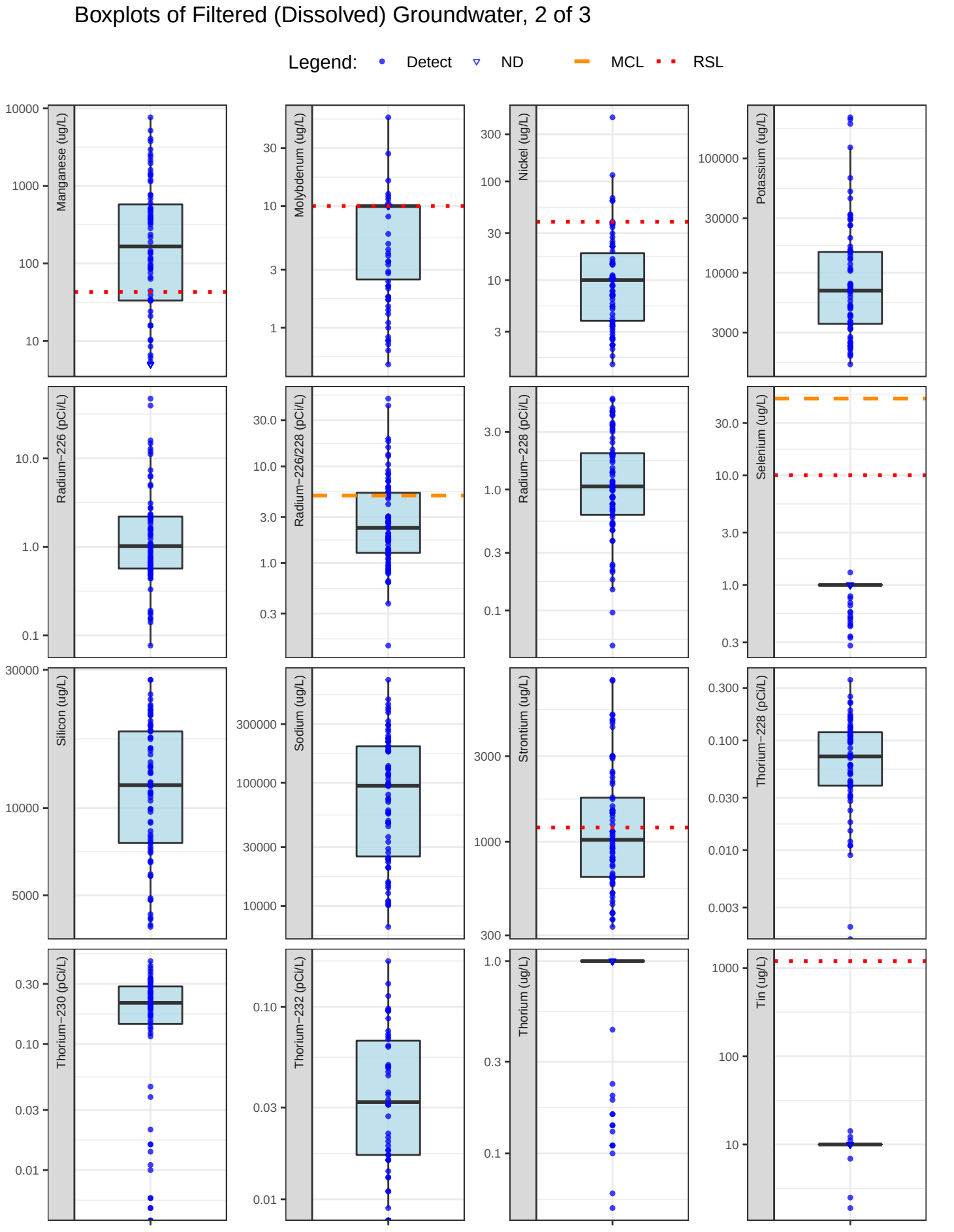
NE=Screening level and/or MCL not established

Figure G-1: Filtered (Dissolved) Groundwater, Samples 1 of 3



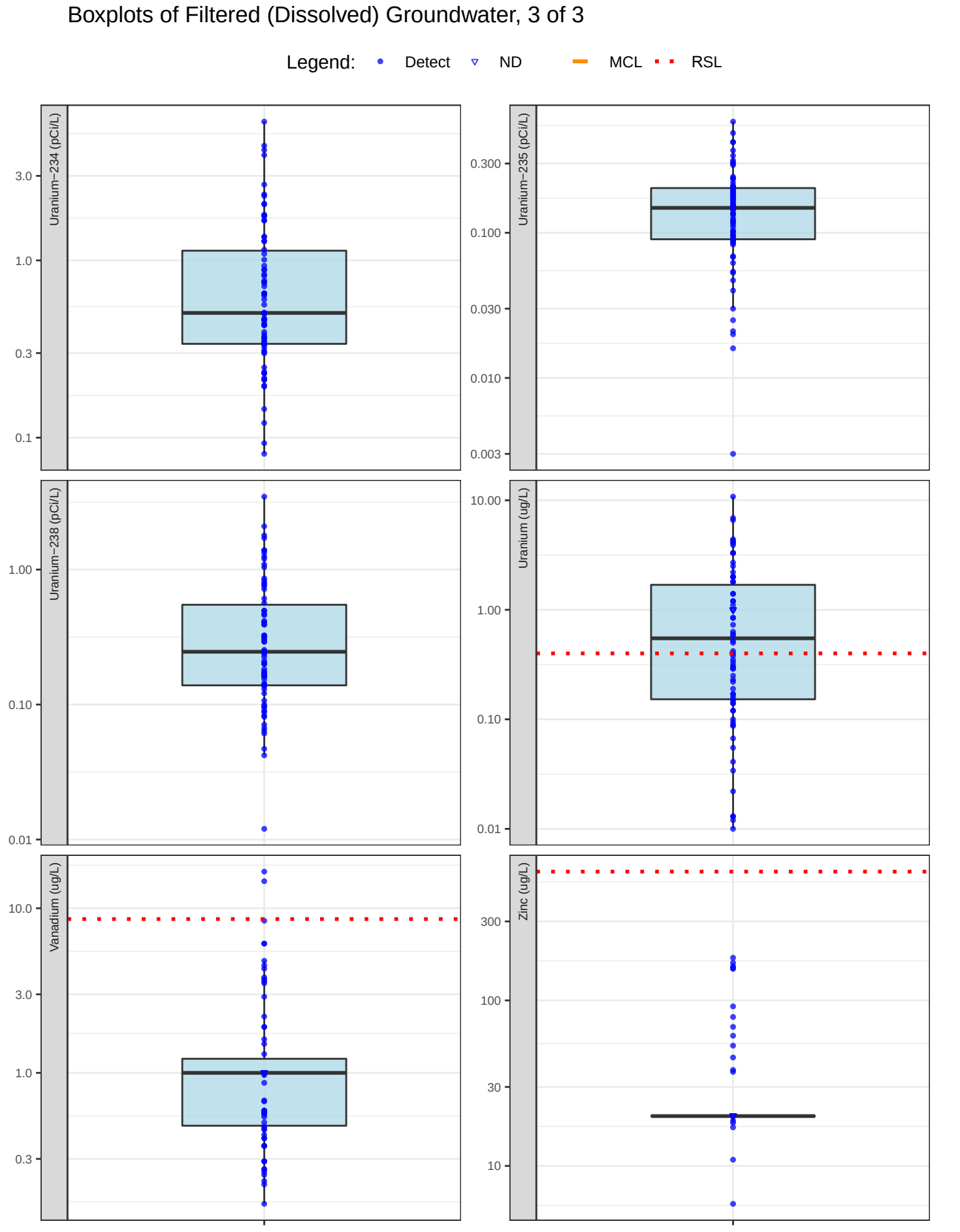
Notes: ND = Not Detected; MCL=USEPA Maximum Contaminant Limit; RSL=USEPA Regional Screening Level for Tapwater

Figure G-2: Filtered (Dissolved) Groundwater, Samples 2 of 3



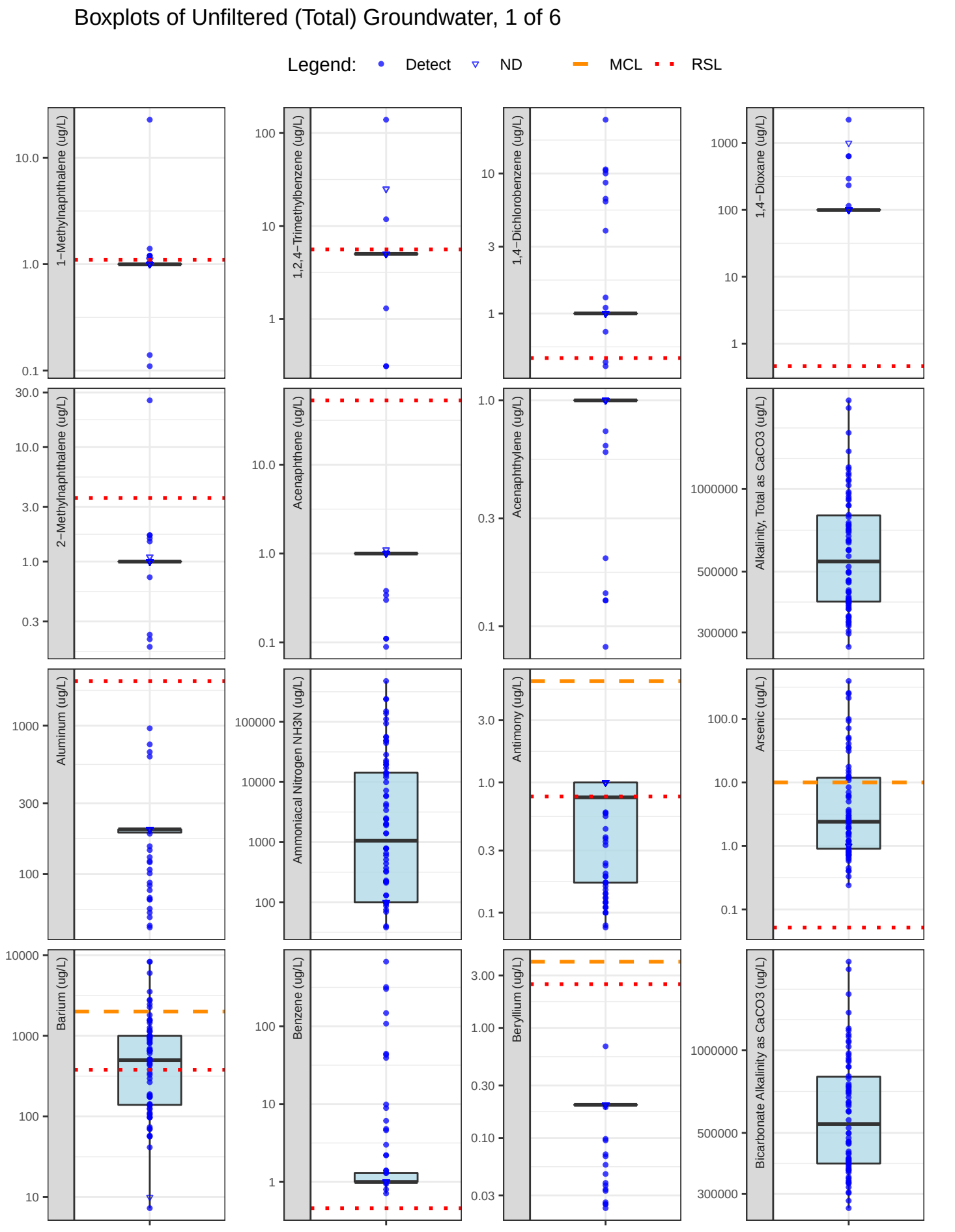
Notes: ND = Not Detected; MCL=USEPA Maximum Contaminant Limit; RSL=USEPA Regional Screening Level for Tapwater

Figure G-3: Filtered (Dissolved) Groundwater, Samples 3 of 3



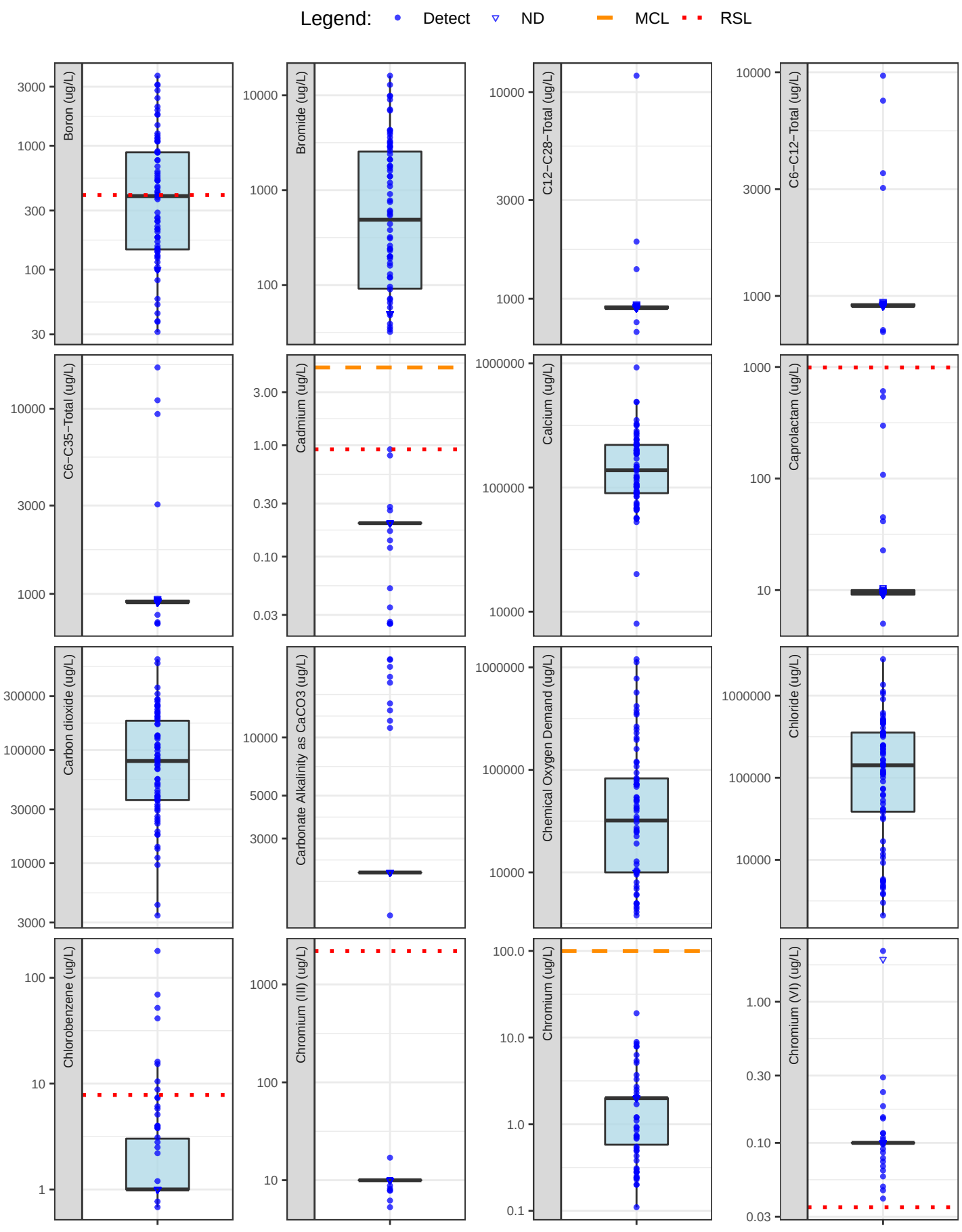
Notes: ND = Not Detected; MCL=USEPA Maximum Contaminant Limit; RSL=USEPA Regional Screening Level for Tapwater

Figure G-4: Unfiltered (Total) Groundwater, Samples 1 of 6



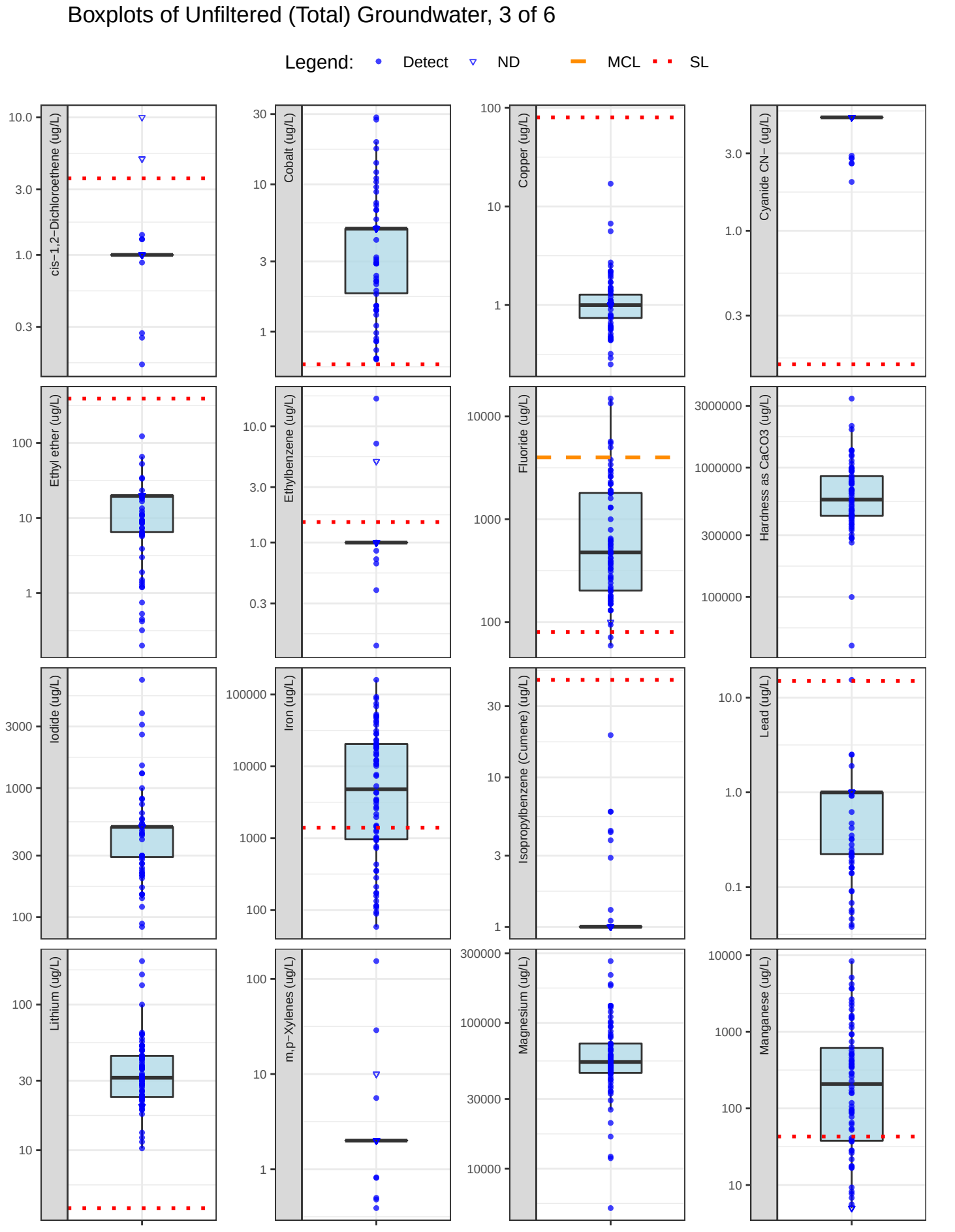
Notes: ND = Not Detected; MCL=USEPA Maximum Contaminant Limit; RSL=USEPA Regional Screening Level for Tapwater

Figure G-5: Unfiltered (Total) Groundwater, Samples 2 of 6



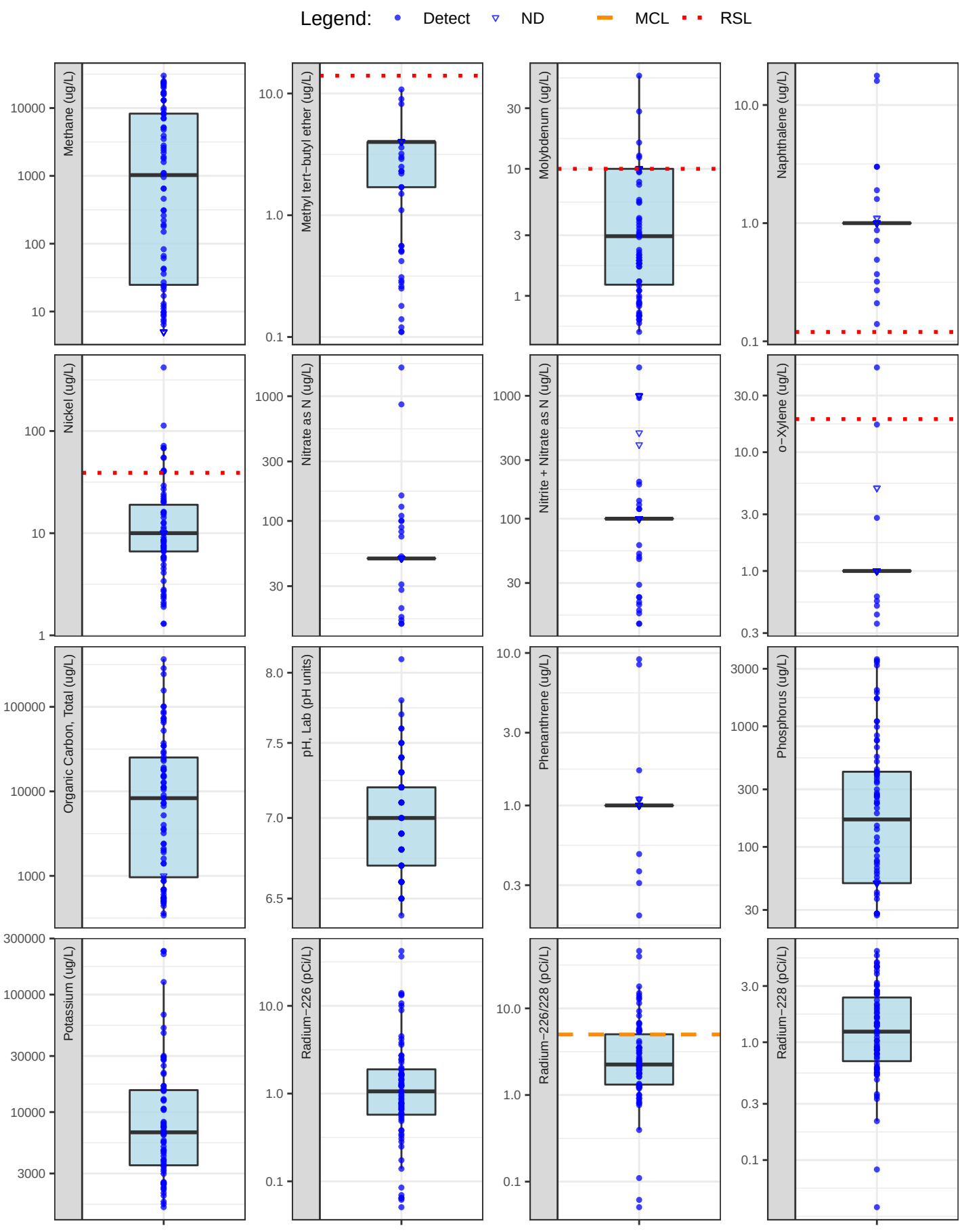
Notes: ND = Not Detected; MCL=USEPA Maximum Contaminant Limit; RSL=USEPA Regional Screening Level for Tapwater

Figure G-6: Unfiltered (Total) Groundwater, Samples 3 of 6



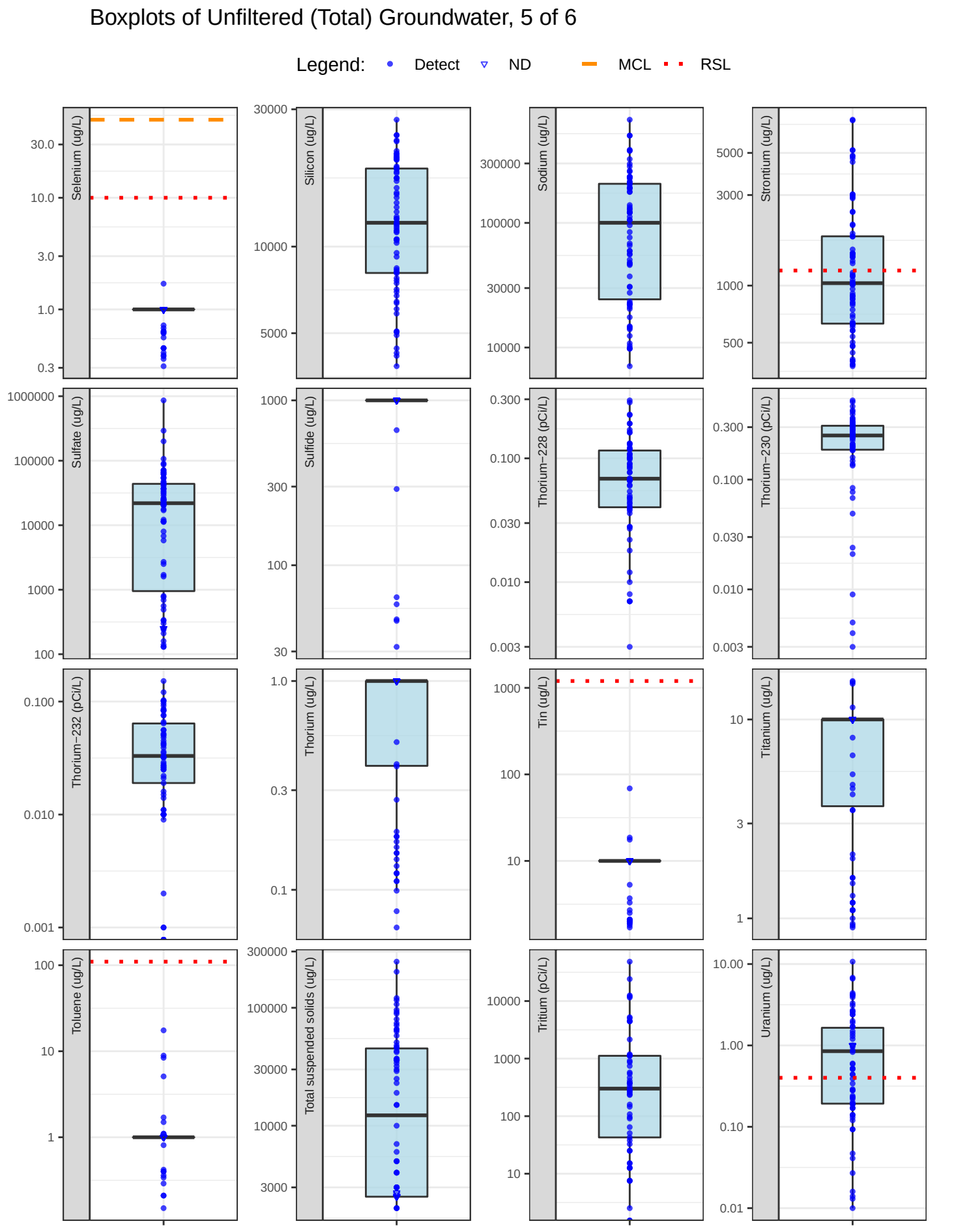
Notes: ND = Not Detected; MCL=USEPA Maximum Contaminant Limit; RSL=USEPA Regional Screening Level for Tapwater

Figure G-7: Unfiltered (Total) Groundwater, Samples 4 of 6



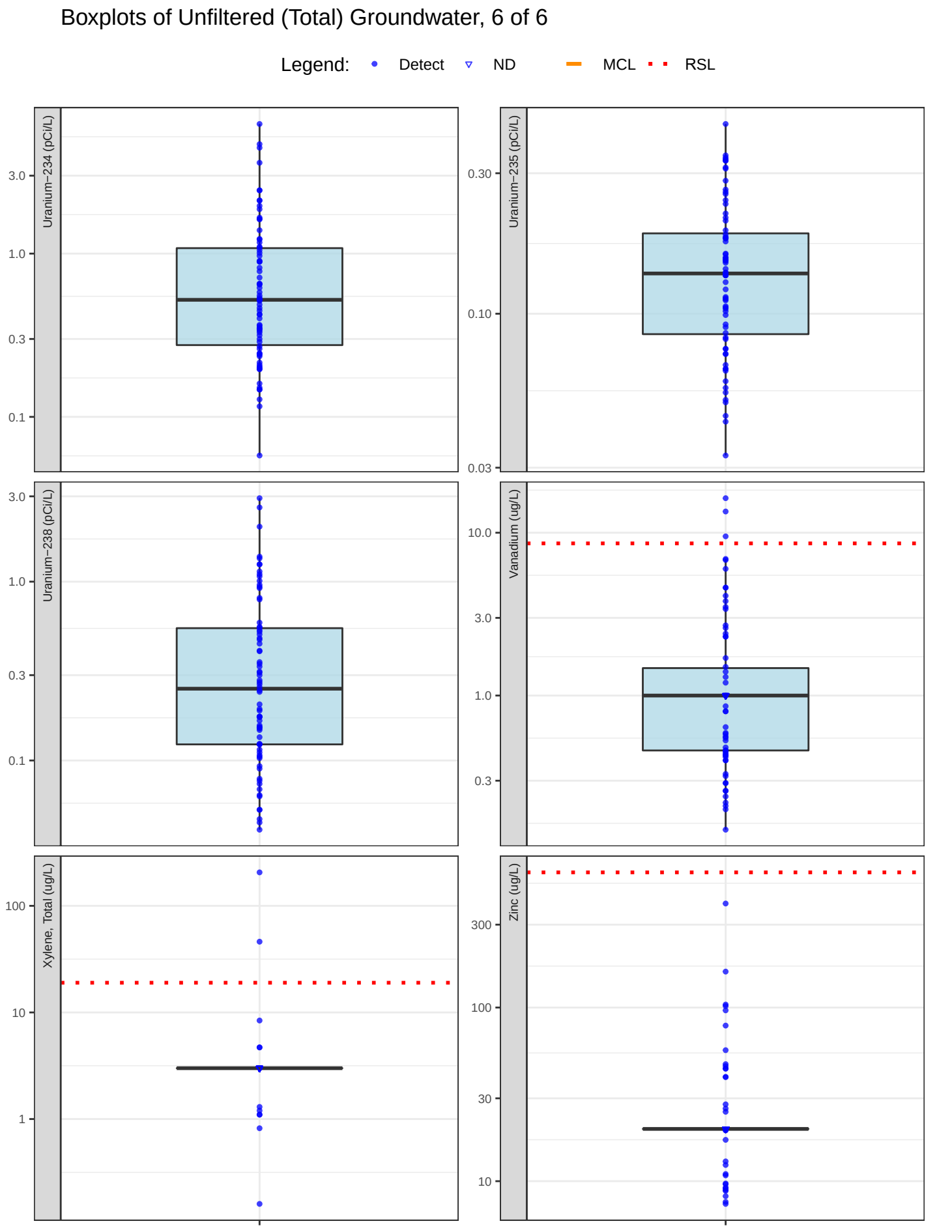
Notes: ND = Not Detected; MCL=USEPA Maximum Contaminant Limit; RSL=USEPA Regional Screening Level for Tapwater

Figure G-8: Unfiltered (Total) Groundwater, Samples 5 of 6



Notes: ND = Not Detected; MCL=USEPA Maximum Contaminant Limit; RSL=USEPA Regional Screening Level for Tapwater

Figure G-9: Unfiltered (Total) Groundwater, Samples 6 of 6



Notes: ND = Not Detected; MCL=USEPA Maximum Contaminant Limit; RSL=USEPA Regional Screening Level for Tapwater

APPENDIX H VAPOR INTRUSION BUILDING INSPECTION REPORT

West Lake Landfill
Vapor Intrusion Investigation
Summary of the Building Survey/Inventory
Completed on 10 December 2020

			Building Construction					
Building No.	**Name**	**Approximate Square Footage of Building (SF)**	**Foundation**	**Above Grade**	**Odor/Methane Mitigation Systems Present (if any)**	**Occupation**	**Building Use Notes**	**Rationale for Proposed Sampling**
1	Engineering Building	5700	Concrete slab on grade. Perimeter footers unknown.	Wood/Steel Frame Construction/Dry-Wall/Drop Ceilings/Steel Siding	Two vent fans located in the bathroom	Occupied	Landfill Admin/Engineering Staff & Support Operations. Continuously occupied by 4 to 5 staff, 5 days/week, 0600 to 1900 hours. Sometimes on weekends.	Keep proposed sampling number, methods, and schedule.
2	Scale House	275	Raised concrete slab with concrete walls.	Wood/Steel Frame Construction/Dry-Wall/Drop Ceilings/Steel Siding	One bathroom vent fan. Raised foundation venting system (radon type fan/fresh air intake).	Occupied	Incoming load scale. One staff person at all times except between 1300 on Saturday until 0200 on Monday mornings.	Keep proposed sampling number, methods, and schedule.
3	Transfer Station	22000	Concrete slab on grade. Perimeter footers unknown.	Steel/Concrete Structure	None	Occupied	One side of building is completely made up of overhead doors that are open all the time. Trucks drop off trash for consolidation and reloading for transfer to another landfill. Staff hours are generally same as the Scale House. Staff includes 2 to 4 equipment operators for loading and truck drivers.	No sampling proposed in this building as bay doors are never closed (except for 12 hours on Sunday when no one is working there).
4	MBI Building	3300	Concrete slab on grade. Perimeter footers unknown.	Wood/Steel Frame Construction/Dry-Wall/Steel Siding	None	Not currently occupied	Building used for material storage by MBI (on-site contractor). May have a small occupiable space (this has not been verified), but it is not currently occupied.	No sampling proposed at this time. Results from sampling at other site buildings will be used to inform the need for sampling at this location.
5	Pump House	675	Concrete slab on grade. Perimeter footers unknown.	Wood/Steel Frame Construction/Dry-Wall/Steel Siding	None	Occupied (as needed)	Currently used as needed as a support building for on-site contractors to fix or repair pumps, etc.	Keep proposed sampling number, methods, and schedule.
6	Contractor Building	725	Concrete slab on grade. Perimeter footers unknown.	Wood/Steel Frame Construction/Dry-Wall/Steel Siding	None	Not currently occupied	Support building for on-site contractors (currently empty). Plans for building to be torn down.	No sampling proposed at this time. Results from sampling at other site buildings will be used to inform the need for sampling at this location.
7	Pretreatment Building (Office Area)	22000 total (600 SF Office Area add on)	Concrete slab on grade. Perimeter footers unknown.	Concrete Tilt-Up Building	There is a sub-slab methane venting system under most of building except approximately 600 SF office area add-on.	Occupied	Staffed 24/7. Four staff from 0600 to 1800 daily and 2 staff from 1800 to 0600 daily. Leachate Pretreatment Building.	Sampling has been updated to include 1 soil gas, 1 ambient, and 1 indoor air sample to this building (VOCs, long term and short term radon). Indoor air sample to be collected within the office area add-on. No plans to sample within the area covered by the sub-slab methane venting system.
8	Asphalt Plant Building[1]					Occupied		
9	Flare Compressor Station	600	Concrete slab on grade. Perimeter footers unknown.	Wood/Steel Frame Construction/Steel Siding	None	Not occupied	Compressor station for landfill gas recovery system. Only entry would be infrequent maintenance if needed or turning off/on equipment.	No sampling proposed at this time. Results from sampling at other site buildings will be used to inform the need for sampling at this location.
10	Multiple Conex boxes (Contractor Use)	Various length containers - 10 ft = 75 SF, 20 ft = 150 SF, 40 ft = 300 SF	No foundation except steel bottom of container.	Steel container	None	Occupied (as needed)	Temporary structures. Currently used as needed as support buildings for on-site contractors to fix or repair pumps, etc.	No sampling proposed at this time. Results from sampling at other site buildings will be used to inform the need for sampling at these locations.
11	Multiple Conex boxes (Storage)	Various length containers - 10 ft = 75 SF, 20 ft = 150 SF, 40 ft = 300 SF	No permanent foundation. Steel bottom of container.	Steel container	None	Not occupied	Used for material storage only.	No sampling proposed at this time. Results from sampling at other site buildings will be used to inform the need for sampling at these locations.
12	Contractor Field Trailers	Various	No permanent foundations. Elevated work trailers.	Steel/wood frame, steel sheet sided mobile trailers	None	Occupied (as needed)	Temporary structures. Currently used as needed as support buildings for on-site contractors	No sampling proposed at this time. Results from sampling at other site buildings will be used to inform the need for sampling at these locations.

Notes:

[1] Initial building inspection is pending access.

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