CITY WATER, LIGHT AND POWER
CITY OF SPRINGFIELD, ILLINOIS
MISTY BUSCHER, MAYOR
DOUG BROWN, CHIEF UTILITY ENGINEER

VIA E-MAIL: dierich.andrea@epa.gov

June 13, 2025

Andrea Dierich
EPA Project Officer
US EPA, Region 5
77 W Jackson Blvd
Chicago, IL 60604

RE: Surface Impoundments
Nature and Extent Report

Dear Ms. Dierich:

Provided herein is the Surface Impoundments Nature and Extent Report in accordance with paragraph 270 of the Consent Agreement and Final Order (CAFO) effective January 14, 2025.

CWLP agreed to provide to EPA a Nature and Extent Report for the Appendix IV constituents exhibiting Statistically Significant Levels identified in the February 13, 2025 Groundwater Protection Standards Report.

Should you have any questions or require additional information, please contact me at 217-757-8610 ext. 1110.

Sincerely,

PJ Becker
Environmental Health and Safety Manager

Certification of City Water, Light and Power

City of Springfield, Office of Public Utilities, d/b/a City Water, Light and Power provides the following certification as required by paragraph 300 of the Consent Agreement and Final Order effective January 14, 2025.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: PJB
Name: PJ Becker
Title: Environmental Health and Safety Manager
Date: 6/13/2025

ANDREWS ENGINEERING

3300 Ginger Creek Drive | 217.787.2334
Springfield, IL 62711

June 11, 2025

Mr. P.J. Becker
Environmental Health and Safety
City Water, Light and Power
3100 Stevenson Drive
Springfield, Illinois 62712

Re: City Water, Light and Power – CCR Surface Impoundments
Nature and Extent Report

Dear Mr. Becker:

Provided herein is a Nature and Extent Report pursuant to paragraphs 268 and 270 of the Consent Agreement and Final Order (CAFO), effective January 14, 2025. This report has been prepared for the Appendix IV constituents exhibiting Statistically Significant Levels (SSLs) identified in the February 13, 2025 Groundwater Protection Standards Report (GWPS Report) for the parameters arsenic at wells RW-3, AP-7, AP-8, and AW-1 and cobalt at wells AP-2 and AP-3.

If you have any questions, please feel free to contact me at (217) 787-2334. Thank you.

Sincerely,

Mahlon Hewitt

Mahlon Hewitt, L.P.G.
Project Director

MTH:sjb:jdt

Enclosure

cc: Brad Hunsberger – Andrews Engineering

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Applications

City Water, Light and Power Springfield,
Sangamon County, Illinois

CCR Surface Impoundments – Nature and Extent Report (CAFO, Paragraphs 268 and 270)

June 2025

Prepared for:
City Water, Light and Power
3100 Stevenson Drive
Springfield, Illinois 62712

Prepared by:
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ILLINOIS | MISSOURI | INDIANA

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1. INTRODUCTION

This Nature and Extent Report has been prepared on behalf of City Water, Light and Power (CWLP) pursuant to Paragraphs 268 and 270 of the Consent Agreement and Final Order (CAFO), effective January 14, 2025 and the requirements of 40 CFR 257.95(g). This report addresses the Appendix IV constituents exhibiting Statistically Significant Levels (SSLs) identified in the February 13, 2025 Groundwater Protection Standards Report (GWPS Report) for the parameters arsenic (total) at wells RW-3, AP-7, AP-8, and AW-1 and cobalt (total) at wells AP-2 and AP-3.

2. BACKGROUND

CWLP owns and operates two existing coal combustion residuals (CCR) surface impoundments, identified as Lakeside Ash Pond and Dallman Ash Pond. The CWLP CCR surface impoundments are located north and east of the former Lakeside Power Generating Station and Dallman Power Generating Station in the Eastern ½ of Section 12, Township 15 North, Range 5 West, in Springfield, Illinois (see Figure 1). The subject of this submittal, the CCR surface impoundments, are identified as the Lakeside Ash Pond and the Dallman Ash Pond and will be closed.

The former Lakeside Power Generating Station and Dallman Power Generating Station are situated on the northwestern bank of Lake Springfield in Springfield, Illinois. The Lakeside Ash Pond is immediately north of Spaulding Dam at the northern end of Lake Springfield (see Figure 2). The Dallman Ash Pond is immediately northwest of the Lakeside Ash Pond. Placed into service prior to 1958, the Lakeside Ash Pond is primarily a diked embankment with an in situ soil liner. The Lakeside Ash Pond consists of four separate ponds (i.e., three lime softening ponds and a settling pond) totaling approximately 35.0 acres. The Lakeside Ash Pond ceased receiving ash in 2009. The Dallman Ash Pond was placed into service in approximately 1976 and is also a diked embankment with an in situ soil liner. The Dallman Ash Pond is approximately 34.5 acres in area and ceased receiving CCR materials in 2023.

The Lakeside Ash Pond historically received lime sludge from the CWLP Drinking Water Purification Plant and scrubber wastewater treatment plant clarifier blowdown. The Dallman Ash Pond historically received fly ash and bottom ash, which were sluiced with raw lake water from the power generating structures, and industrial facility wastewater treatment plant clarifier blowdown. Settled water from both the Lakeside Ash Pond and Dallman Ash Pond flows into opposite sides of a Clarification Pond for final treatment before being discharged to Sugar Creek at NPDES permitted Outfall 004.

Groundwater adjacent to the impoundments has been monitored under the direction of the Illinois EPA Bureau of Water beginning in 2011 and the US EPA (2016) pursuant to 40 CFR §257.91 – §257.97. A Groundwater Monitoring Program (GMP) and statistical method appropriate for evaluating groundwater quality changes was prepared, placed into the facility operating record

and certifications posted to the facility website October 12, 2017. The GMP was updated April 2018 (certification posted June 7, 2018) when well AW-3 was replaced. The GMP and statistical method were again updated March 2024 (certifications posted March 11, 2024) when wells AP-14, AW-1, and G120 were added to the program. The groundwater protection standards were recalculated, and the sampling procedures document was revised based upon USEPA comments. Most recently, the GMP and statistical method were updated in February 2025 (certifications posted February 21, 2025). Groundwater monitoring performed in accordance with the GMP identified Appendix III parameters at specific wells that exceeded the background concentrations. The exceedances were evaluated pursuant to 40 CFR §257.95. Assessment monitoring results over the period of first quarter 2022 (February 16, 2022) through fourth quarter 2024 (November 11, 2024) identified Appendix IV parameter arsenic exceeding the groundwater protection standard (0.0239 mg/L) at wells RW-3, AP-7, AP-8, and AW1 and Appendix IV parameter cobalt exceeding the groundwater protection standard (0.006 mg/L) at wells AP-2 and AP-3.

A detailed description of groundwater monitoring history for the impoundments is presented in Section 3 below.

3. GROUNDWATER MONITORING PROGRAM

Currently, the surface impoundments are regulated by the USEPA (40 CFR Part 257) and the Illinois EPA (35 Ill. Adm. Code 845). There are two separate groundwater monitoring programs. Data from both regulatory programs have been used in this report and will be differentiated where applicable.

Pursuant to 35 Ill. Adm. Code 845 and 40 CFR §257.91, a GMP was prepared for the CWLP CCR surface impoundments to characterize the groundwater monitoring network of wells, the sampling and analysis methods and procedures, and the Groundwater Protection Standards (GWPS). The GMP also characterizes the activities associated with the assessment of corrective measures, corrective action plan, and implementation of the corrective action plan.

3.1 Historical Groundwater Monitoring Activities

The GMP was initially operated pursuant to §257.94 and consisted of wells AP-1R, AP-2A, AP-3, AP-4, AP-5, and RW-3/AW-3. Under §257.94, constituents listed in Appendix III to 40 CFR Part 257 were monitored on a routine basis. In accordance with §257.95(b), an Assessment Monitoring Program was implemented in February 2018 in response to the statistically significant increase (SSI) over background concentrations for one or more parameters listed in Part 257, Appendix III. In May 2019, as part of the §257.94(e)(2) alternate source investigation, wells AP-6 and AP-7 were installed. Subsequent investigation of the Statistically Significant Increases (SSIs) completed pursuant to §257.95(g)(3)(ii) demonstrated compliance with the GWPS as no

Appendix IV constituent concentration exceeded the GWPS. Therefore, assessment monitoring continued pursuant to §257.95(f).

In response to exceedances of GWPS values pursuant to 35 IAC 845.600, seven more wells were installed as part of the Illinois EPA CCR program to augment the monitoring well network and allow the evaluation of exceedances. In February 2021, wells AP-10 and AP-14 were installed along the west side of the impoundments, AP-8 installed along the north side of the CCR ash impoundments and wells AP-9, AP-11, AP-12, and AP-13 were installed west of the creek as facility boundary wells.

In March 2024, six existing wells from the 35 IAC 845 program were added to the 40 CFR 257 groundwater monitoring network pursuant to correspondence with the USEPA. These wells included AP-6, AP-7, AP-8, AP-14, AW-1, and G120.

In May 2024, five additional monitoring wells were advanced in locations across Sugar Creek opposite of the CCR ash impoundments. The subject temporary assessment wells (i.e., T-1, T-2, T-4, T-5, and T-6) were installed at these locations for purposes of an alternate source demonstration and/or determination of the nature and extent of elevated concentrations per 40 CFR 257.95(g)(1)(i) and (iii). The screen intervals were set at the bedrock interface, consistent with the existing downgradient wells. The current monitor well network is shown in Figure 2.

3.2 Monitoring System

In accordance with §257.91 the groundwater monitoring system consists of a sufficient number of wells, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer that: (1) accurately represent the quality of background groundwater that has not been affected by the CCR surface impoundment, and (2) accurately represent the quality of groundwater passing the impoundment boundary of the CCR surface impoundment to monitor potential geochemical changes in the uppermost aquifer.

Pursuant to §257.91(b) the number, spacing, and depths of the groundwater monitoring wells have been determined based upon site-specific technical information to meet the rule's performance standard, including the subsurface conditions observed at the site. This includes a characterization of the uppermost aquifer and the confining bedrock layer immediately below the uppermost aquifer.

The groundwater monitoring system consists of wells screening the silt, sand, and gravel at the bedrock interface. Based on the direction of groundwater movement, the northern and western boundaries of the impoundments will be downgradient, and the southern boundaries will be upgradient for both impoundments with the eastern boundaries being upgradient to the Lakeside Ash Pond.

As shown in Figure 2, the current monitor well network includes AP-1R, AP-2A, AP-3, AP-4, AP-5, AP-6, AP-7, AP-8, AP-10, AP-14, RW-3, AW-1, and G120. Two (2) groundwater monitoring wells are representative of background (ambient) groundwater quality conditions of the uppermost aquifer. These wells are identified as AP-4 and AP-5. Background concentrations are chemical concentrations or parameter values that represent naturally-occurring groundwater that has not been affected by the surface impoundment or other facility activities.

Monitoring well AP-4 is located in the southwest corner of the CCR surface impoundments and along the eastern bank of Sugar Creek, immediately north of the Spaulding Dam. Well AP-4 is screened at the surface of the Pennsylvanian shale and basal sand deposits. This well is not upgradient of the subject CCR surface impoundments, but it is located on available CWLP property where it provides representative background groundwater quality pursuant to §257.91(a).

Monitoring well AP-5 is located in a hydraulically upgradient location, southeast of the Lakeside Ash Pond and in a slightly higher topographic location. The well is screened in wet sand and silt seams a few feet above the shale as the borehole samples at the bedrock interface were tight with no indications of formation water. This well monitors the upgradient groundwater quality of the uppermost aquifer at this location.

Eleven groundwater wells allow monitoring of the downgradient groundwater quality conditions in the uppermost aquifer (See Figure 2). The wells are identified as AW-1, RW-3, AP-1R, AP-2A, AP-3, AP-6, AP-7, AP-9, AP-10, AP-14, and G120. The locations and depths of these wells accurately represent the quality of groundwater passing the impoundment boundaries of the CCR units and reasonably make possible the detection of geochemical changes in the uppermost aquifer. Figure 3 identifies the facility boundary wells T-1, T-2, T-4, T-5, T-6, AP-7, AP-9, AP-11, AP-12, and AP-13 installed pursuant to 35 IAC 845.650(d)(1) and/or 40 CFR 257.95(g)(1) to delineate the GWPS exceedances. Temporary assessment wells AP-6 and AP-7 were installed during a July 2019 nature and extent investigation. Temporary assessment wells (i.e., T-1, T-2, T-4, T-5, and T-6) were installed west and north of Sugar Creek as part of the October 28, 2024 ASD to determine the nature and extent of elevated parameter concentrations. The screen intervals of these wells were set at the bedrock interface, consistent with the existing downgradient wells.

Groundwater sampling and analysis over the review period (i.e., first quarter 2022 through fourth quarter 2024) has demonstrated that the CCR surface impoundments have resulted in exceedances of the Appendix IV GWPS for arsenic at wells, AP-8, AW-1, and RW-3 and Appendix IV GWPS exceedances of cobalt at wells AP-2A and AP-3. The vertical and horizontal extent of has been delineated pursuant to §257.95(g)(1).

The detections of arsenic at monitoring well AP-7 are attributed to an alternate source and are not related to the CCR surface impoundments. AP-7 is located north of Sugar Creek, in an area hydrologically separated from the Dallman Ash Pond and other CCR units by a convergent groundwater flow system that directs groundwater from the north and south toward the creek.

Potentiometric surface elevations confirm that groundwater north of Sugar Creek flows southward toward the creek, while groundwater south of the creek, including beneath the Dallman Ash Pond, flows northward. This bidirectional flow pattern establishes Sugar Creek as a discharge zone and a natural hydraulic divide. The absence of hydraulic connectivity between the CCR impoundments and well AP-7 effectively rules out the CCR units as a source of arsenic at this location.

Furthermore, temporary assessment wells T-5 and T-6, located north of AP-7, exhibit potentiometric elevations greater than AP-7, indicating that groundwater and any associated constituents flows from those locations toward AP-7, not from the CCR units located south of the creek. These findings are corroborated by analytical results showing no consistent pattern of arsenic exceedances in wells situated between the Dallman Ash Pond and AP-7.

The spatial distribution of arsenic, combined with groundwater flow direction and the absence of a geochemical plume connecting the impoundments to AP-7, strongly supports the conclusion that the arsenic detected in AP-7 originates from natural geologic variability or other anthropogenic sources unrelated to the CCR surface impoundments. Therefore, no further action under CCR regulatory provisions is warranted at AP-7 based on current data.

3.3 Sampling and Analysis

The GMP includes consistent sampling and analysis procedures to provide accurate representation of groundwater quality (§257.93(a)). The activities include sample collection, preservation and shipment, analytical procedures, chain of custody, and quality assurance and quality control.

Groundwater is sampled for the constituents listed in Appendix III and Appendix IV to Part 257. For groundwater monitoring, these constituents include:

Appendix III to Part 257 Constituents for Detection Monitoring

- Boron
- Calcium
- Chloride
- Fluoride
- pH
- Sulfate
- Total Dissolved Solids

Appendix IV to Part 257 Constituents for Assessment Monitoring

- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium
- Cobalt
- Fluoride
- Lead
- Lithium
- Mercury
- Molybdenum
- Selenium
- Thallium
- Radium 226 and 228 combined

In accordance with §257.93(i), all constituents are analyzed as total recoverable metals where samples are not field filtered. All groundwater samples collected pursuant to §257 Subpart D are analyzed by a certified laboratory using Test Methods for Evaluating Solid Waste, Physical/ Chemical Methods, SW-846 (§257.93(b)). Pursuant to §257.93(c), groundwater levels are measured in each groundwater monitoring well immediately prior to purging, and each time groundwater is sampled.

All monitoring wells were sampled in accordance with 40 CFR 257.95(g)(1)(iv) for the characterization of the nature and extent.

4. SITE HYDROGEOLOGY

The uppermost aquifer and underlying confining unit control groundwater movement and the potential for CCR impacted groundwater migration.

4.1 Uppermost Aquifer

The uppermost aquifer is characterized as the basal sand overlying the shale bedrock. In some locations, the creek fill materials, ranging from silty clays and organic silty clays to silty sands and clayey sands, were found to be in direct hydraulic communication with the basal sand that directly overlies the bedrock surface. Due to the highly variable hydraulic characteristics and random placement of the creek fill materials, further characterization is difficult.

As indicated above, the hydraulic conductivity of the basal sand ranges from 5.6 x 10^{-4} to 3.6 x 10^{-2} cm/sec. The groundwater in the basal sand appears to be under confined, semi-confined, or unconfined conditions dependent upon location. The upper limit of the uppermost aquifer is dependent upon the seasonally fluctuating groundwater table. The potentiometric surface of the basal sand varies from 565 feet MSL at upgradient locations, south of the Lakeside Ash Pond, to 525 feet MSL at downgradient locations near Sugar Creek, north of the Dallman Ash Pond. As a result, the saturated thickness is variably dependent upon the location and the seasonal variation in the groundwater table.

Groundwater movement within the uppermost aquifer is controlled by recharge along topographic highs and discharge along topographic lows via gravity. The pre-surface impoundment flow direction in the uppermost aquifer was dominantly horizontal from the adjacent banks toward the natural convergence along Sugar Creek, which formerly drained the site. This was overall from east to west and south to north, perpendicular to Sugar Creek with local deviations. This dominant flow pattern persists under present day conditions but with localized variation introduced by the hydrologic discontinuity created upon construction of the CCR surface impoundments.

Groundwater elevations are collected on a quarterly basis from the CCR surface impoundment groundwater monitoring wells, and surface water elevations collected from the Lakeside Ash Pond, the Dallman Ash Pond, the Clarification Pond, Sugar Creek and Lake Springfield. The groundwater and surface water elevations were used to construct potentiometric surface maps (see Appendix A).

Groundwater monitoring well AW-1 exhibited exceedances of the Appendix IV parameter arsenic during the review period (first quarter 2022 through fourth quarter 2024). Well AW-1 is located along the southeast corner of the Dallman Ash Pond. Groundwater monitoring wells/piezometer R111, G120 and P06D are located east, north and northeast of AW-1, respectively. Well R111 is part of the 40 CFR 257.94 groundwater monitoring program for the CCR landfill. Both well R111 and piezometer P06D are part of the Illinois EPA groundwater monitoring program for the FGDS Development landfill established pursuant to 35 IAC 811.319.

The potentiometric surface elevations at wells AW-1, R111, G120 and P06D are shown in the following table.

Well	2/16/22	6/2/22	8/25/22	11/9/22	1/26/23	4/11/23	7/5/23	10/25/23	2/22/24	5/13/24	8/12/24	11/12/24
AW-1	541.50	541.55	539.31	540.70	544.02	541.05	539.73	537.04	542.55	541.79	538.85	539.88
R111	529.90	529.40	528.20	528.85	526.74	527.74	526.87	525.53	528.06	528.18	526.11	527.16
G120	537.20	536.92	535.11	537.06	536.49	536.81	534.21	533.13	537.11	536.95	534.09	535.02
P06D	524.70	524.70	524.70	528.29	519.78	519.78	518.17	517.41	523.96	523.96	523.96	NM

NM – Not Measured

Potential constituent concentrations are expected to travel via advective flow. Groundwater, movement is west to east/northeast along the east side of the Dallman Ash Pond. The impacts reported for well AW-1 are attributed to the Dallman Ash Pond. These impacts are delineated by the downgradient wells R111, G120 and P06D. As discussed in Section 5.1 below, arsenic concentrations detected in AW-1 have been delineated.

The temporary assessment well AP-7 was installed to determine the extent of elevated concentrations of specific constituents observed at well RW-3. Sampling of AP-7 indicated exceedance of the Groundwater Protection Standard for arsenic. Additional temporary assessment wells T-5 and T-6 were installed to delineate concentrations of arsenic in the vicinity of AP-7. Temporary assessment well T-4 was installed north of Sugar Creek to delineate concentrations of arsenic detected at well AP-8.

The potentiometric surface elevations at wells RW-3, AP-6, AP-7 and AP-8 and temporary assessment wells T-4, T-5 and T-6 are shown in the following table. The surface water elevations for Sugar Creek (USGS Gage 05576250) are also included in the following table.

Well	2/16/22	6/2/22	8/25/22	11/9/22	1/26/23	4/11/23	7/5/23	10/25/23	2/22/24	5/13/24	8/12/24	11/12/24
RW-3	529.64	530.30	529.72	528.71	528.52	529.68	527.43	526.63	529.32	530.55	527.11	526.97
AP-6	530.04	530.06	528.6	NM	528.51	529.03	526.98	526.4	528.61	529.89	526.71	526.65
AP-8	530.79	531.74	529.90	NM	535.10	535.95	533.56	532.23	535.82	536.56	533.33	532.98
Sugar Creek	524.48	525.34	520.3	521.42	523.29	520.25	521.86	520.35	520.18	522.06	520.28	521.34
T-4	NI	NI	NI	NI	NI	NI	NI	NI	NI	536.22	530.28	529.32
AP-7	528.13	528.98	527.81	NM	524.41	527.43	526.57	525.44	526.81	528.02	525.87	525.45
T-6	NI	NI	NI	NI	NI	NI	NI	NI	NI	529.87	528.44	527.30
T-5	NI	NI	NI	NI	NI	NI	NI	NI	NI	535.36	529.96	529.20

Note:
NM – not measured
NI – not installed

The groundwater elevations at well RW-3 are greater than those observed at AP-6, a well located between Sugar Creek and RW-3. The creek elevation is consistently lower than the groundwater elevations adjacent (both sides) to the creek. This indicates groundwater movement is from RW-3 to the north. Potentiometric surfaces in wells T-5 and T-6 are greater than well AP-7, all located north of Sugar Creek. Groundwater movement is from north to south towards the creek. The creek is a convergence point (low point) between wells screened north and south of the creek. Potential constituent concentrations will travel via advective flow. As groundwater, movement is north to south, north of the creek, no influence from the impoundments will be detected north of the creek.

Similarly, to the north end of the Dallman Ash Pond, groundwater east and west of the Dallman Ash pond converges on Sugar Creek. Groundwater monitoring wells AP-2A and AP-3 are located immediately east of Sugar Creek, at the toe of the Dallman Ash Pond embankment. Groundwater monitoring wells AP-11 and AP-12 were installed west of Sugar Creek to delineate concentrations of cobalt. These wells were installed as assessment wells to determine the extent of the impacts observed at wells AP-2A and AP-3. Groundwater monitoring well T-2 was installed further west of AP-11 and AP-12 to allow determination of groundwater flow west of Sugar Creek.

The potentiometric surface elevations at wells AP-2A, AP-3, AP-11 and AP-12 and temporary assessment well T-2 are shown in the following table. The surface water elevations for Sugar Creek (USGS Gage 05576250) are also included in the following table.

Well	2/16/22	6/2/22	8/25/22	11/9/22	1/26/23	4/11/23	7/5/23	10/25/23	2/22/24	5/13/24	8/12/24	11/12/24
AP-2A	529.89	528.17	527.23	NM	529.2	528.86	527.53	527.40	528.88	529.05	527.61	529.56
AP-3	526.98	525.54	524.39	NM	525.93	525.77	524.69	525.31	528.14	526.14	525.30	525.70
Sugar Creek	524.48	525.34	520.3	521.42	523.29	520.25	521.86	520.35	520.18	522.06	520.28	521.34
AP-11	526.89	525.16	522.68	NM	NM	523.90	523.39	522.14	523.68	528.35	522.28	522.67
AP-12	526.52	526.09	523.41	NM	NM	525.74	524.07	522.26	523.35	528.46	522.66	522.78
T-2	NI	NI	NI	NI	NI	NI	NI	NI	NI	530.37	523.87	534.39

Note:
NM – not measured
NI – not installed

Potential constituent concentrations are expected to travel via advective flow. Groundwater, movement is east to west along the east side of Sugar Creek and west to east along the west side of Sugar Creek. No influence from the impoundments will be detected west of the creek. As discussed in Section 5.1 below, arsenic concentrations detected in AP-7 are not the result of influences from the impoundments.

4.2 Lower Confining Unit

The uppermost bedrock at the project site is primarily Pennsylvanian age shale with isolated thin coal layers. The Pennsylvanian shale functions as a lower confining unit due to its low permeability and effective porosity. The lower confining unit represents a natural hydrogeologic barrier (i.e., aquitard) to the vertical movement of groundwater.

In situ hydraulic conductivity test (slug tests) indicate that the hydraulic conductivity for the upper portions of the bedrock range from 1.8×10^{-7} to 1.3×10^{-6} cm/sec. There appears to be good correlation between the rock lithology and the measured values of hydraulic conductivity. The bedrock over most of the site will act as an aquitard and prevent the downward movement of groundwater.

4.3 Surface Water

The nearest surface water bodies are Lake Springfield, located upgradient to the CCR surface impoundments and Sugar Creek located adjacent to the western and northern perimeter of the CCR surface impoundments:

- Lake Springfield
- Sugar Creek

4.3.1 Surface Water Intakes

There are two surface water intakes located near the CCR surface impoundments facility. These intakes are identified as:

- Intake No. 52140 - Lake Springfield 1 Intake
- Intake No. 52141 - South Fork Horse Creek Intake

Both of these intakes are located along Lake Springfield and supply water to the Springfield public water supply (IL1671200). These intakes are upgradient of the CCR surface impoundments and completely disassociated with the impoundments.

4.4 Community Water Supply Wells

A potable water well survey was completed in the vicinity of the Dallman and Lakeside Ash Ponds. The survey was conducted using the Illinois EPA's web-based Geographic Information System (GIS) database[1] in the Source Water Assessment Program (SWAP) for potable water wells downgradient of the CCR impoundments.

The Illinois EPA's SWAP GIS database system identifies community water supply wells and other potable wells (private, semi-private and non-community water supply wells) include data from the following sources:

- Illinois EPA, Division of Public Water Supplies;
- Illinois State Geological Survey (ISGS);
- Illinois State Water Survey; and
- Illinois Department of Public Health

Based on groundwater elevation data from numerous monitoring wells and piezometers located between and adjacent to the CWLP CCR impoundments, groundwater movement in the vicinity of the CCR impoundments is generally from the south-southeast to the north, approximately paralleling the Sugar Creek basin. The search extended to the first water well encountered

[1] (http://illinois-epa.maps.arcgis.com/apps/webappviewer/index.html?id=4d37a05f5ba441f1b30dab54ccb81fc8)

hydraulically downgradient of the impoundments, located near Illinois Route 29 at a distance of approximately 3,400 feet.

There is no reason to believe that potable wells exist within 2,500-feet of the CCR impoundments that were not identified as part of this potable water well survey.

5. GROUNDWATER ANALYTICAL RESULTS

Quarterly groundwater sampling and analyses have occurred at CCR Impoundment wells for the parameters identified in Appendix III and Appendix IV to Part 257. The results of first quarter 2022 through fourth quarter 2024 sampling events indicate an exceedance of the GWPSs for the Appendix IV to Part 257 constituent arsenic at wells AW-1, RW-3, AP-7, and AP-8 and cobalt at wells AP-2A and AP-3. A summary table of the exceedances is provided as Table 1. Analytical summary tables are provided in Appendix B. Exceedance parameter trend graphs are provided in Appendix C. Geologic cross-sections are included as Appendix D. Laboratory analytical reports are provided in Appendix E.

5.1 Arsenic, Total

The groundwater protection standard for arsenic (0.0239 mg/L) exhibited confirmed exceedances at groundwater monitoring wells AW-1, RW-3, AP-7, and AP-8 during the review period (i.e., first quarter 2022 through fourth quarter 2024). Arsenic exceedances at downgradient wells RW-3 and AP-7 have been previously addressed in an October 28, 2024 ASD and are discussed in detail below. Graphs depicting arsenic concentrations at the CCR Impoundment groundwater monitoring well network are provided in Appendix C.

Arsenic occurs naturally in rock, soil, air, and plants. A report entitled, arsenic in Illinois Groundwater[2], was published in January 2002 in cooperation with the Illinois Department of Natural Resources, Illinois Department of Public Health, and Illinois Environmental Protection Agency. The report states that higher concentrations of arsenic are expected to be observed in private groundwater sources of drinking water as opposed to public water supply sources, as it is not filtered to remove natural sedimentation. A subsequent study conducted by the Illinois State Water Survey (Wilson, et al., 2004[3]) stated “arsenic is a minor constituent of some common minerals, and dissolved arsenic concentrations greater than 1 ppb are common in groundwater. In some aquifers and under certain conditions, much greater arsenic concentrations can be found, and concentrations above 10 ppb are not uncommon.

[2] *Website:https://www.isws.illinois.edu/groundwater-science/gs-archive/arsenic-information/arsenic-in-illinois-groundwater.*

[3] *Wilson, S. D., Dunneback, B., Askren, K., and Kaiser, B., 2004, Arsenic in Illinois Groundwater: Implications for non-community public water supplies, MTAC TR04-0, Illinois State Water Survey, 40 p.*

As discussed above, arsenic occurs naturally in rock, soil, air, and plants. The report, arsenic in Illinois Groundwater, states that higher concentrations of arsenic are expected to be observed in private groundwater sources. The elevated arsenic concentrations are attributed to the impact of the shallow outwash/bedrock aquifer. The uppermost bedrock is comprised of Pennsylvanian aged shale of the Spoon Formation. As noted in Panno et al. (1994)[4], redox-conditions and bedrock mineralogy control arsenic concentrations. Panno et al. (1994) identifies the reduction of adsorbed arsenate to arsenite as a possible source of the remobilization of adsorbed arsenic. Based upon the geological information collected to date, there appears to be a bedrock high oriented roughly northwest to southeast, between the northern limb located between T-4 and T-5 and extending southeast toward RW-3. The bedrock along this ridge appears to be the source of the higher total arsenic concentrations. Geologic cross-sections are provided in Appendix D. The ridge can be seen on two east-west cross sections, one immediately north of the impoundments (A-A') and one immediately north of Sugar Creek (M-M'). Cross Section K-K' is a north-south section crossing the creek between well T-5 and a previous assessment well TW3W. The change in bedrock elevation is very apparent, decreasing from approximately 527 feet MSL at previous assessment well GP3 to approximately 513 feet MSL at TW3W.

5.1.1 Well AW-1

Well AW-1 is located along the southeast corner of the Dallman Ash Pond. Nearby downgradient wells include R111 and G120. The concentrations of arsenic at well AW-1 during the review period ranged from 0.129 to 0.208 mg/L, exceeding the groundwater protection standard nine out of the twelve sampling events. The groundwater protection standard for arsenic was not exceeded at wells R111 or G120 during the review period.

Geologic cross-sections I-I' and L-L' depict the geologic conditions in the vicinity of AW-1, G-120, and R111 (see Appendix D). As depicted in these geologic cross-sections the groundwater monitoring wells are consistently screened across the basal sand and unconsolidated/bedrock interface. The potentiometric surface depicted on cross-sections I-I' and L-L' shows groundwater elevations at wells AW-1, G-120, and R111. As depicted on the cross-section groundwater movement is from AW-1 towards G-120 and towards R111. As indicated above, the groundwater protection standard for arsenic was not exceeded at wells P06D, R111 or G120 during the review period. These wells help define the downgradient extent of the arsenic detections at well AW-1.

5.1.2 Well RW-3

Well RW-3 is located at the northeast corner of the Dallman Ash Pond situated immediately north of the Dallman Ash Pond embankment and south of Sugar Creek. The concentrations of arsenic at well RW-3 during the review period ranged from 0.0831 to 0.74 mg/L, exceeding the groundwater protection standard all twelve sampling events.

[4] *Panno, S.V., et al. "Hydrochemistry of the Mahomet Bedrock Valley Aquifer, East-Central Illinois: indicators of recharge and ground-water flow." Ground Water, vol. 32, no. 4, July-Aug. 1994, pp. 591.*

The nature and extent of the arsenic exceedances at well RW-3 is defined by assessment wells AP-6, T-5, and T-6. These wells are located north of and downgradient of well RW-3.

The groundwater protection standard for arsenic was not exceeded at wells AP-6, T-4, T-5, or T-6 during the review period. The exceedances of arsenic at well AP-7 are discussed below.

Geologic cross-section N-N' depicts the geologic conditions along the north and south side of Sugar Creek, from RW-3 through AP-6, and across Sugar Creek to AP-7 (see Appendix D). As depicted in the geologic cross-sections the groundwater monitoring wells are consistently screened across the basal sand and unconsolidated/bedrock interface. The potentiometric surface depicted on cross-section N-N' shows groundwater elevations at these wells and Sugar Creek. As depicted on the cross-section groundwater movement both north and south of Sugar Creek appears to be toward the creek, as expected with a gaining stream.

5.1.3 Well AP-7

Well AP7 was installed to determine the nature and extent of the arsenic detected in well RW-3. The concentrations at well AP-7 ranged from non-detect (<0.025 mg/L) to 0.0947 mg/L during the review period, exceeding the groundwater protection standard nine out of the twelve sampling events.

Temporary assessment wells located north of AP-7 include T-5 and T-6. Only three sampling events have occurred thus far for these temporary assessment wells. Arsenic concentrations at wells T-5 and T-6 ranged from less than the detection limit (0.001 mg/L) to 0.0158 mg/L for the second and third quarters of 2024 and at 0.0016 mg/L for the fourth quarter 2024.

The creek has historically been a point of convergence for the local groundwater system. As depicted in geologic cross-section N-N', groundwater movement at well AP-7 appears to be towards the creek, which is toward the impoundments (see Appendix D). The groundwater quality at well AP-7 is believed representative of conditions north of and unrelated to the CCR site.

5.1.4 Well AP-8

Well AP-8, was installed along the north side of the Dallman Ash Pond to characterize CCR constituent concentrations. The concentrations of arsenic at well AP-8 during the review period ranged from 0.0319 to 0.0513 mg/L, exceeding the groundwater protection standard for seven out of the twelve sampling events. The nature and extent of the arsenic exceedance at well AP-8 is defined by temporary assessment well T-4. Well T-4 was installed north of well AP-8, along the northern bank of Sugar Creek. Only three sampling events have occurred thus far for temporary assessment well T-4. The concentrations of arsenic at well T-4 during the review period ranged from 0.0013 to 0.0055 mg/L.

Geologic cross-section O-O' depicts the geologic conditions along the north and south side of Sugar Creek, near AP-8 and T-4 (see Appendix D). As depicted in the geologic cross-sections the groundwater monitoring wells are consistently screened across the basal sand and unconsolidated/bedrock interface. The potentiometric surface depicted on cross-section O-O' shows groundwater elevations at wells AP-8 and T-4 and Sugar Creek. As depicted on the cross-section groundwater movement, both north and south of Sugar Creek appears to be toward the creek.

5.2 Cobalt, Total

The groundwater protection standard for cobalt (0.006 mg/L) exhibit confirmed exceedances at groundwater monitoring wells AP-2A and AP-3 during the review period (i.e., first quarter 2022 through fourth quarter 2024).

Cobalt in Illinois groundwater is not extensively documented; however, its presence is inferred from geological and anthropogenic sources. According to Hem (1985)[5] naturally occurring concentrations of cobalt are low (<0.1 mg/L) in natural groundwater, likely derived from weathering of Cobalt-rich minerals. Elevated concentrations (>0.05 mg/L) typically indicate anthropogenic inputs. Electric Power Research Institute (EPRI) (2019)[6] states the occurrence of cobalt in CCR leachate ranges from less than the analytical detection limit to 3.1 mg/L with the median concentrations for porewater from different types of CCR at concentrations typically less than 0.004 mg/L.

Graphs depicting cobalt concentrations at the CCR impoundment groundwater monitoring well network are provided in Appendix C.

5.2.1 AP-2A

The concentrations of cobalt at well AP-2A during the review period ranged from 0.0068 to 0.0115 mg/L, exceeding the groundwater protection standard (0.006 mg/L) for all twelve sampling events. At well AP-11, located west of the creek from AP-2A, the cobalt concentrations ranged from non-detect (<0.005 mg/L) to 0.0061 mg/L, exceeding the groundwater protection standard in two of the twelve sampling events.

Well AP-2A is located along the west side of the CCR impoundments and immediately east of Sugar Creek. As part of the evaluation of the extent of cobalt concentration in excess of the GWPS, temporary assessment wells AP-11 and T-2 were installed along the west side of Sugar Creek. Only three sampling events have occurred thus far for temporary assessment well T-2. The groundwater protection standard exceedances for cobalt at well AP-11 occurred during 2022

[5] *Hem, J. D. - Study and interpretation of the chemical characteristics of natural water. 3.ed: U.S. Geological Survey Water- Supply Paper 2254. 1985. p. 272.*

[6] *Chemical Constituents in Coal Combustion Products: cobalt. EPRI, Palo Alto, CA: 2019. 3002016497.*

and 2023. The maximum concentrations detected at AP-11 during this period were approximately twice the cobalt concentrations detected at well AP-2A, located adjacent to the CCR impoundments. The groundwater protection standard for cobalt was exceeded at temporary assessment well T-2 during the second quarter 2024 with subsequent results being below the detection limit (<0.005 mg/L).

The creek has historically been a point of convergence for the local groundwater system. Geologic cross-sections B-B' and C-C' depict the geologic conditions along the west side and east side of Sugar Creek, respectively (see Appendix D). As depicted in the geologic cross-sections, the groundwater monitoring wells are consistently screened across the basal sand and unconsolidated/bedrock interface. The potentiometric surface depicted on cross-section P-P' shows groundwater elevations at wells AP-2A and AP-11 and Sugar Creek. As depicted on the cross-section, groundwater movement both east and west of Sugar Creek appears to be toward the creek. The groundwater quality at wells AP-11 and T-2 is representative of conditions west of the CCR site.

5.2.2 AP-3

The concentrations of cobalt at well AP-3 during the review period ranged from non-detect (0.005 mg/L) to 0.0071 mg/L, exceeding the groundwater protection standard in only two of the twelve sampling events. Well AP-12 is located directly west and across the creek from AP-3. Concentrations ranged from non-detect (<0.005 mg/L) to 0.0236 mg/L, exceeding the groundwater protection standard in five of the twelve sampling events. Therefore, well T-2 was installed west of AP-12 to further evaluate the cobalt concentrations. Of the three sampling events conducted to date at T-2, the concentrations ranged from non-detect (<0.005 mg/L) to 0.0075 mg/L, exceeding the groundwater protection standard in one of the three sampling events.

Well AP-3 is located along the west side of the CCR impoundments and immediately east of Sugar Creek. Temporary assessment wells AP-12 and T-2 are installed along the west side of Sugar Creek, opposite well AP-3. Wells AP-12 and T-2 were installed to evaluate the cobalt concentrations at AP-3. Only three sampling events have occurred thus far for temporary assessment well T-2. The groundwater protection standard exceedances for cobalt at well AP-12 occurred during 2022 and 2023. The maximum concentrations detected at AP-12 during this period were approximately twice the cobalt concentrations detected at well AP-3, located adjacent to the CCR impoundments. The groundwater protection standard exceedance for cobalt at temporary assessment well T-2 was for the second quarter 2024 with subsequent results being below the detection limit (<0.005 mg/L).

The creek has historically been a point of convergence for the local groundwater system. Geologic cross-sections B-B', C-C', and F-F' depict the geologic conditions in the vicinity of AP-3, AP-12, and T-2 (see Appendix C). As depicted in these geologic cross-sections the

groundwater monitoring wells are consistently screened across the basal sand and unconsolidated/bedrock interface. The potentiometric surface depicted on cross-section F-F' shows groundwater elevations at wells AP-3, AP-12, T-2, and Sugar Creek. As depicted on the cross-section groundwater movement both east and west of the creek appears to be toward the creek. The groundwater quality at wells AP-12 and T-2 is believed to be representative of conditions west of the CCR site.

5.3 Indicator Parameters

Detecting groundwater impacts from fly ash and bottom ash requires monitoring specific indicator parameters that reflect the leaching of CCRs and their interaction with groundwater. The best indicators are those that are mobile, persistent, and uniquely associated with CCRs, while also being detectable at low concentrations.

Based on a significant amount of data obtained from the numerous wells located on the periphery of the impoundments, boron has shown to be the best indicator parameter of the CCR constituents for the CWLP CCR ash impoundments. A graph illustrating the boron concentrations for the wells located immediately adjacent and downgradient to the impoundments (AP-1R, AP-3, AP-4, AP-6, AP-8, AP-10, AP-14, and RW-3) is provided in Appendix C. As shown, wells AP-1R and AP-14 consistently exhibit the highest boron concentrations of the wells. Well AP-3 exhibits the next highest boron concentrations. The northern wells (AP-6 and RW-3) exhibit boron concentrations less than 0.5 mg/L. This indicates that the uppermost aquifer is not significantly influenced by the CCR impoundments on the northern periphery of the impoundments.

6. NATURE AND ESTIMATED QUANTITY OF MATERIAL RELEASED

40 CFR 257.95(g)(1)(ii) requires data on the nature and estimated quantity of material released, including specific information on the constituents listed in Appendix IV and the levels at which they are present in the material released to be collected.

No material has been released from the Dallman or Lakeside Ash Pond.

Information on the constituents listed in Appendix IV and the levels at which they are present in the in-place materials within Lakeside and Dallman Ash Ponds has been collected. In May 2024, four borings were advanced within Lakeside Ash Pond (L1, L3, L4 and L5) and four borings were advanced within Dallman Ash Pond (D1, D2, D3 and D4) for the purpose of obtaining representative samples of in-place solids materials and porewater. Each boring was advanced with hollow stem augers and solids samples were collected via split barrel samplers. Solids samples were submitted for total and TCLP/SPLP analysis of the Appendix IV constituents. Once final depth was reached, a PVC monitoring well was installed in the boring using 10-foot prepacked screens placed immediately above the clay bottom of the impoundments. After

development, porewater samples were collected from each monitoring well and submitted for total and dissolved phase analysis of the Appendix IV constituents. This information along with the volume, porosity and bulk density estimates were used to approximate the quantity of material.

The Dallman Ash Pond has approximately 1,523,073 cubic yards (1,164,000 m^3) and Lakeside Ash Pond has approximately 841,200 cubic yards (643,144 m^3) of in place CCR, a mixture of fly ash and bottom ash. The sluicing process homogenizes particle distribution and the post-settlement stratification, and consolidation decreases the CCR mixture porosity and increases the bulk density.

Studies of sluiced CCR in surface impoundments, which represent mixtures of fly ash and bottom ash, indicate that these materials exhibit porosities generally between 0.47 and 0.65 and dry unit weights ranging from 10.8 to 17.0 kN/m³. Converting these dry unit weights to bulk densities yields values between approximately 1,100 kg/m³ and 1,730 kg/m³. Field data obtained by Tan et al. (2022)[7] from twelve undisturbed impoundment samples show individual sample porosities (θ) from 0.44 to 0.65 and corresponding dry unit weights (γ_n) of 10.8–17.0 kN/m³, reflecting normally consolidated, sandy-silt-like behavior in situ.

These values are supported by laboratory-simulated impoundment tests (EPRI 2012)[8] reporting bulk densities near 1,000–1,200 kg/m³. For context, individual ash properties reported by IEA Clean Coal Centre (2008)[9] show porosity ranges of 0.40–0.50 for fly ash and 0.25–0.40 for bottom ash, but mixed, sluiced CCR exhibits somewhat higher porosities due to fines content and natural consolidation.

Based on regression analyses presented by Tan et al. (2022), “typical” impoundment-scale hydraulic properties correspond to:

- Typical Porosity: $\theta \approx 0.50$ (50 %), and
- Typical Dry Unit Weight: $\gamma_n \approx 12$ kN/m³ (≈ 1,224 kg/m³).

These values are most representative of impoundment CCRs for when site-specific data are unavailable. In the calculations below, the dry unit weight is assumed to represent the bulk density.

[7] Tan, Y., Basantis, A., Benson, C. H., & Chen, J. N. (2022). “Hydraulic Properties of Sluiced Coal Combustion Products Disposed in Impoundments.” Geo-Congress 2022, 335, 505–517.

[8] Electric Power Research Institute (EPRI). (2012). “Laboratory-Simulated Coal Combustion Product (CCP) Impoundment Tests.”

[9] IEA Clean Coal Centre. (2008). Management of Coal Combustion Wastes (CCC/231).

6.1 Antimony

The mass of antimony leachable from fly ash and bottom ash in a CCR surface impoundment was estimated from the SPLP and porewater analytical results.

Dallman Ash Pond - SPLP/TCLP Results – Antimony

Method	Units	D1 19.5-21.5	D1 36.5-38.5	D2 19.5-21.5	D2 33.5-35.5	D3 4.5-6.5	D3 14.5-29.5	D4 19.5-21.5	D4 29.5-31.5	Min	Max	Avg
SPLP	mg/L	0.0035	0.0078	0.0141	0.0273	0.0029	0.007	0.0034	0.024	0.0029	0.0273	0.0113
TCLP	mg/L	0.017	0.0237	0.0163	0.0125	0.0178	0.0197	0.0395	0.0376	0.0125	0.0395	0.0230

The porewater volume of the surface impoundment is:

$V_{porewater}$ = Total Impoundment Volume x θ

= 1,164,000 m^3 x 0.50 = 582,000 m^3 = 582,000,000 L

Using an average concentration (0.0113 mg/L) the total mass of antimony is:

Mass of Antimony = Average Antimony Concentration x $V_{porewater}$

= 0.0113 mg/L x 582,000,000 L = 6.58 kg

Conservative estimate using the maximum concentration (0.0273 mg/L) is:

= 0.0273 mg/L x 582,000,000 L = 15.9 kg

Using bulk density ($\rho_b = \frac{mass\ of\ ash}{total\ volume}$) the total ash mass in the surface impoundment is:

M_{ash} = $V_{surface\ impoundment}$ x ρ_b

= 1,164,000 m^3 x 1,224 kg/m^3 = 1,424,736,000 kg = 1.42 million metric tons

The average and maximum antimony leaching rate per metric ton of ash is:

Antimony Leached = Total Antimony Mass / Total Ash Mass

= 6.58 kg / 1,424,736 metric tons = 0.00462 g Antimony/metric ton ash

= 15.9 kg / 1,424,736 metric tons = 0.0112 g Antimony/metric ton ash

Dallman Ash Pond - Porewater Results – Antimony, total and dissolved

Method	Units	Date	D1	D2	D3	D4	Min	Max	Avg
Total	mg/L	4/29/24	J 0.061	J 0.024	0.23	0.0812	0.024	0.23	0.09905
Dissolved	mg/L	7/19/24	0.0025	0.0044	0.0034	0.0021	0.0021	0.0044	0.0031
Total	mg/L	7/19/24	0.0026	0.0058	0.0047	0.0059	0.0026	0.0059	0.00475

Note:
J - Analyte detected below quantitation limits

Using average porewater data for antimony, dissolved, the total mass is:

Mass of Antimony = Average Antimony Concentration x $V_{porewater}$

= 0.0031 mg/L x 582,000,000 L = 1.8 kg

Conservative estimate using the maximum concentration (0.0059 mg/L) is:

= 0.0044 mg/L x 582,000,000 L = 2.56 kg

The average and maximum antimony leaching rate per metric ton of ash is:

= 1.8 kg / 1,424,736 metric tons = 0.00127 g Antimony/metric ton ash

= 2.56 kg / 1,424,736 metric tons = 0.00180 g Antimony/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Dallman Ash Pond - Results Comparison – Antimony

Parameter	SPLP	Porewater
Average Antimony Concentration	0.0113 mg/L	0.0031 mg/L
Total Antimony Mass	6.58 kg	1.80 kg

The concentrations of antimony, dissolved, in the porewater sample are approximately 73% lower compared to SPLP results (0.0031mg/L vs. 0.0113 mg/L). The total antimony mass in porewater is 1.8-2.56 kg, significantly lower than SPLP-derived estimates (6.58-15.9 kg).

The significant difference between SPLP-derived antimony estimates (6.58-15.9 kg) and actual porewater measurements (1.8-2.56 kg) stems from fundamental contrasts between laboratory leaching tests and in-situ geochemical conditions. The SPLP test's acidic environment (pH 4.2) aggressively mobilizes antimony by dissolving weakly bound fractions and oxidizing Sb(III) to highly soluble Sb(V) (antimonate). This creates a "worst-case" leaching scenario that overestimates field conditions.

In contrast, the alkaline, reducing environment within the ash pond (pH ~8-12) promotes antimony retention through two key mechanisms: First, reducing conditions stabilize antimony as Sb(III) (antimonite), which strongly adsorbs to abundant iron oxide surfaces in the ash. Second, the high pH enhances Sb(III) adsorption onto mineral phases while simultaneously limiting mineral dissolution. These processes collectively suppress antimony solubility in the actual porewater, resulting in 73% lower dissolved concentrations than SPLP predictions.

Regarding mobility, antimony's behavior under current pond conditions is relatively constrained. The dominant Sb(III) species exhibits low mobility due to its affinity for iron oxides and the advection-dominated flow regime. However, this could change if environmental conditions shift: Oxidation during pond decommissioning could convert Sb(III) to mobile Sb(V), while acidic groundwater intrusion could dissolve sorbed fractions. The primary transport risk remains advective movement of Sb(V) rather than diffusion, given the low concentration gradients observed. Monitoring redox transitions and maintaining alkaline conditions are thus critical for long-term management.

Lakeside Ash Pond - SPLP/TCLP Results – Antimony

Method	Units	L1 14.5-21.5	L1 24.5-31.5	L3 19.5-21.5	L3 29.5-32.7	L4 10-15.3	L5 19.5-21.5	L5 32.5-35.2	Min	Max	Avg
SPLP	mg/L	0.0114	0.0012	0.0054	0.0037	J 0.0009	0.0067	0.0025	0.0009	0.0114	0.0045
TCLP	mg/L	0.0019	0.0064	0.0066	0.0024	0.0012	0.0072	0.0017	0.0012	0.0072	0.0039

The porewater volume of the surface impoundment is:

$$= 643{,}144\ m^3 \times 0.50 = 351{,}572\ m^3 = 351{,}572{,}000\ L$$

Using an average concentration (0.0045 mg/L) the total mass of antimony is:

$$= 0.0045\ mg/L \times 351{,}572{,}000\ L = 1.58\ kg$$

Conservative estimate using the maximum concentration (0.0114 mg/L) is:

$$= 0.0114\ mg/L \times 351{,}572{,}000\ L = 4.01\ kg$$

Using bulk density, the total ash mass in the surface impoundment is:

$$= 351{,}572\ m^3 \times 1{,}224\ kg/m^3 = 430{,}324{,}128\ kg = 0.430\ million\ metric\ tons$$

The average and maximum antimony leaching rate per metric ton of ash is:

= 1.58 kg / 430,324 metric tons = 0.00367 g Antimony/metric ton ash

= 4.01 kg / 430,324 metric tons = 0.00932 g Antimony/metric ton ash

Lakeside Ash Pond - Porewater Results – Antimony, total and dissolved

Method	Units	Date	L1	L3	L4	L5	Min	Max	Avg
Total	mg/L	4/29/24	BJ 0.027	B 0.0655	0.002	<B 0.1	0.002	0.1	0.0486
Dissolved	mg/L	7/19/24	< 0.001	J 0.001	0.0025	0.0014	0.001	0.0025	0.00148
Total	mg/L	7/19/24	0.0011	J 0.0008	0.0051	J 0.0009	0.0008	0.0051	0.00198

Note:
B - Analyte detected in associated Method Blank
J - Analyte detected below quantitation limits

Using average porewater data for antimony, dissolved, the total mass is:

= 0.00148 mg/L x 351,572,000 L = 0.520 kg

Conservative estimate using the maximum concentration (0.0025 mg/L) is:

= 0.0025 mg/L x 351,572,000 L = 0.879 kg

The average and maximum antimony leaching rate per metric ton of ash is:

= 0.520 kg / 430,324 metric tons = 0.00121 g Antimony/metric ton ash

= 0.879 kg / 430,324 metric tons = 0.00204 g Antimony/metric ton ash

Comparison of the average porewater result with the average SPLP estimate:

Lakeside Ash Pond - Results Comparison – Antimony

Parameter	SPLP	Porewater
Average Antimony Concentration	0.0045 mg/L	0.00148 mg/L
Total Antimony Mass	1.58 kg	0.520 kg

The concentrations of antimony, dissolved, in the porewater sample are approximately 67% lower compared to SPLP results (0.00148 mg/L vs. 0.0045 mg/L). The total antimony mass in porewater is 0.52-0.879 kg, significantly lower than SPLP-derived estimates (1.58-4.01 kg).

Similar to the Dallman Ash Pond, the significant differences between SPLP-derived and porewater antimony concentrations in Lakeside Ash Pond reflect fundamental distinctions

between leaching potential (SPLP) and in-situ equilibrium (porewater), controlled by site-specific geochemistry. See discussion above.

6.2 Arsenic

The mass of arsenic leachable from fly ash and bottom ash in a CCR surface impoundment was estimated from the SPLP and porewater analytical results.

Dallman Ash Pond - SPLP/TCLP Results – Arsenic

Method	Units	D1 19.5-21.5	D1 36.5-38.5	D2 19.5-21.5	D2 33.5-35.5	D3 4.5-6.5	D3 14.5-29.5	D4 19.5-21.5	D4 29.5-31.5	Min	Max	Avg
SPLP	mg/L	< 0.01	0.0471	< 0.01	0.039	< 0.01	0.0173	< 0.01	0.0114	0.01	0.0471	0.0194
TCLP	mg/L	< 0.01	0.0528	0.0505	0.345	< 0.01	0.0155	< 0.01	0.0242	0.01	0.345	0.0648

The porewater volume of the surface impoundment is 582,000,000 L. Using an average concentration (0.0194 mg/L) the total mass of arsenic is:

= 0.0194 mg/L x 582,000,000 L = 11.3 kg

Conservative estimate using the maximum concentration (0.0471 mg/L) is:

= 0.0471 mg/L x 582,000,000 L = 27.4 kg

Based upon a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum arsenic leaching rate per metric ton of ash is:

= 11.3 kg / 1,424,736 metric tons = 0.00793 g Arsenic/metric ton ash

= 27.4 kg / 1,424,736 metric tons = 0.0192 g Arsenic/metric ton ash

Dallman Ash Pond - Porewater Results – Arsenic, total and dissolved

Method	Units	Date	D1	D2	D3	D4	Min	Max	Avg
Total	mg/L	4/29/24	1.17	0.279	2.33	0.378	0.279	2.33	1.04
Dissolved	mg/L	7/19/24	0.0829	0.111	0.0797	0.0231	0.0231	0.111	0.0742
Total	mg/L	7/19/24	0.171	0.16	0.104	0.0629	0.0629	0.171	0.124

Using average porewater data for arsenic, dissolved, the total mass is:

= 0.124 mg/L x 582,000,000 L = 43.2 kg

Conservative estimate using the maximum concentrations (0.171 mg/L) is:

= 0.171 mg/L x 582,000,000 L = 64.6 kg

Using a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum arsenic leaching rate per metric ton of ash is:

= 43.2 kg / 1,424,736 metric tons = 0.0303 g Arsenic/metric ton ash

= 64.6 kg / 1,424,736 metric tons = 0.0453 g Arsenic/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Dallman Ash Pond - Results Comparison – Arsenic

Parameter	SPLP	Porewater
Average Arsenic Concentration	0.0194 mg/L	0.0742 mg/L
Total Arsenic Mass	11.3 kg	43.2 kg

The concentrations of arsenic in the SPLP sample are approximately 74% lower compared to porewater results (0.0194 mg/L vs. 0.0742mg/L). The total arsenic mass in porewater is 43.2-64.6 kg, significantly higher than SPLP-derived estimates (11.3-27.4 kg). This reversal of the typical pattern (where SPLP often over predicts leaching) occurs due to arsenic's unique geochemical behavior under alkaline, reducing conditions within the ash pond.

Arsenic may be more mobile under oxidizing and alkaline conditions (common in porewater) but less mobile under acidic SPLP conditions. The higher arsenic concentrations in porewater suggest site conditions (i.e., high pH or reducing conditions) favor arsenic mobility, which SPLP does not characterize well.

Under alkaline oxidizing conditions typical of CCR porewater, arsenic is present primarily as arsenate (AsO_4^{3-}), a negatively charged oxyanion. Arsenate is poorly sorbed under high pH conditions, especially when competing anions (e.g., phosphate, sulfate) are present, allowing it to remain dissolved and mobile.

The observed difference in arsenic concentrations between porewater and SPLP leachate can be attributed to key differences in geochemical conditions, test methodology, and material interaction timeframes.

Field conditions in saturated ash impoundments often become anaerobic (reducing conditions) over time. Under reducing conditions, arsenic associated with iron oxides released into solution as ferric iron (Fe^{3+}) is reduced to ferrous iron (Fe^{2+}), dissolving iron hydroxide minerals and

mobilizing arsenic, particularly arsenite (As^{3+}). SPLP, in contrast, is an aerobic laboratory procedure and does not simulate this reductive dissolution process.

Porewater in CCR surface impoundments commonly exhibits elevated pH (>8) (i.e., alkaline conditions), due to the presence of alkaline ash components. At higher pH, arsenate (As^{5+}) sorption to mineral surfaces (e.g., iron oxides or aluminosilicates) is reduced, increasing arsenic mobility. SPLP extraction fluid is mildly acidic (pH 4.2–4.8), favoring stronger sorption of arsenic and thus lower leachate concentrations.

Porewater represents long-term equilibrium conditions that allow for extended interaction between the ash and pore fluids. Over time, arsenic may desorb from solid phases or be released from the dissolution of arsenic-bearing minerals. SPLP is a short-duration test (18 hours) that does not fully capture these long-term processes.

The SPLP procedure uses a 20:1 liquid-to-solid ratio, which dilutes the leachate and may underestimate field concentrations. In contrast, porewater samples are collected under in-situ moisture conditions, often resulting in higher solute concentrations.

Porewater may contain competing anions such as phosphate, bicarbonate, or silicate, which can displace arsenic from mineral sorption sites. These constituents are typically absent or at low concentrations in SPLP extraction fluid, further limiting their ability to replicate in-situ arsenic mobility.

The higher arsenic concentration observed in porewater relative to SPLP leachate is consistent with the expected influence of site-specific geochemical conditions, including reducing redox states, alkaline pH, extended interaction time, and the presence of competing ions. These factors enhance arsenic mobility under field conditions and are not fully replicated by the SPLP test method.

Regarding mobility, arsenic's behavior is highly sensitive to two site conditions. The mobility peaks in alkaline environments (current pond conditions) and reducing conditions maintain mobile As-III. These factors currently promote arsenic mobility within the impoundment. However, advection remains the dominant transport mechanism given the low concentration gradients.

Lakeside Ash Pond - SPLP/TCLP Results – Arsenic

Method	Units	L1 14.5-21.5	L1 24.5-31.5	L3 19.5-21.5	L3 29.5-32.7	L4 10-15.3	L5 19.5-21.5	L5 32.5-35.2	Min	Max	Avg
SPLP	mg/L	0.0276	< 0.01	0.0195	< 0.01	< 0.01	0.0331	< 0.01	0.01	0.0331	0.0172
TCLP	mg/L	< 0.01	< 0.01	0.0279	0.0337	< 0.01	0.0276	< 0.01	0.01	0.0337	0.0185

The porewater volume of the surface impoundment is 351,572,000 L. Using an average concentration (0.0172 mg/L) the total mass of arsenic is:

= 0.0172 mg/L x 351,572,000 L = 6.05 kg

Conservative estimate using the maximum concentration (0.0331 mg/L) is:

= 0.0331 mg/L x 351,572,000 L = 11.6 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the average and maximum arsenic leaching rate per metric ton of ash is:

= 6.05 kg / 430,324 metric tons = 0.0141 g Arsenic/ metric ton ash

= 11.6 kg / 430,324 metric tons = 0.0270 g Arsenic/metric ton ash

Lakeside Ash Pond - Porewater Results – Arsenic, total and dissolved

Method	Units	Date	L1	L3	L4	L5	Min	Max	Avg
Total	mg/L	4/29/24	0.717	2.43	0.0512	2.58	0.0512	2.58	1.44
Dissolved	mg/L	7/19/24	0.0076	0.0142	0.185	0.0217	0.0076	0.185	0.0571
Total	mg/L	7/19/24	0.0139	0.0328	0.453	0.0473	0.0139	0.453	0.137

Using average porewater data for arsenic, dissolved, the total mass is:

= 0.0571 mg/L x 351,572,000 L = 20.1 kg

Conservative estimate using the maximum concentration (0.185 mg/L) is:

= 0.185 mg/L x 351,572,000 L = 65.0 kg

Based upon the total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the average and maximum arsenic leaching rate per metric ton of ash is:

= 20.1 kg / 430,324 metric tons = 0.0467 g Arsenic/metric ton ash

= 65.0 kg / 430,324 metric tons = 0.151 g Arsenic/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Lakeside Ash Pond - Results Comparison – Arsenic

Parameter	SPLP	Porewater
Average Arsenic Concentration	0.0172 mg/L	0.0571 mg/L
Total Arsenic Mass	6.05 kg	20.1 kg

The concentrations of arsenic in the SPLP sample are approximately 70% lower compared to porewater results (0.0172 mg/L vs. 0.0571 mg/L). The total arsenic mass in porewater is 20.1-65.0 kg, significantly higher than SPLP-derived estimates (6.05-11.6 kg). These results are similar to the Dallman Ash Pond SPLP and porewater analytical results. See discussion above.

6.3 Barium

The mass of barium leachable from fly ash and bottom ash in a CCR surface impoundment was estimated from the SPLP and porewater analytical results.

Dallman Ash Pond - SPLP/TCLP Results – Barium

Method	Units	D1 19.5-21.5	D1 36.5-38.5	D2 19.5-21.5	D2 33.5-35.5	D3 4.5-6.5	D3 14.5-29.5	D4 19.5-21.5	D4 29.5-31.5	Min	Max	Avg
SPLP	mg/L	< 0.045	< 0.045	J 0.021	< 0.045	< 0.045	< 0.045	< 0.045	< 0.045	0.021	0.045	0.042
TCLP	mg/L	0.358	0.514	0.556	0.352	0.492	0.373	0.238	0.287	0.238	0.556	0.396

Note:
J - Analyte detected below quantitation limits

The porewater volume of the surface impoundment is 582,000,000 L. Using an average concentration (0.042 mg/L) the total mass of barium is:

= 0.042 mg/L x 582,000,000 L = 24.4 kg

Conservative estimate using the maximum concentration (0.045 mg/L) is:

= 0.045 mg/L x 582,000,000 L = 26.2 kg

Based upon a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum barium leaching rate per metric ton of ash is:

= 24.4 kg / 1,424,736 metric tons = 0.0171 g Barium/metric ton ash

= 26.2 kg / 1,424,736 metric tons = 0.0184 g Barium/metric ton ash

Dallman Ash Pond - Porewater Results – Barium, total and dissolved

Method	Units	Date	D1	D2	D3	D4	Min	Max	Avg
Total	mg/L	4/29/24	2.48	1.13	3.51	0.975	0.975	3.51	2.02
Dissolved	mg/L	7/19/24	0.0541	0.0376	0.0676	0.0843	0.0376	0.0843	0.0609
Total	mg/L	7/19/24	0.118	0.0997	0.0823	0.186	0.0823	0.186	0.122

Using average porewater data for barium, dissolved, the total mass is:

= 0.0609 mg/L x 582,000,000 L = 35.4 kg

Conservative estimate using the maximum concentrations (0.0843mg/L) is:

= 0.0843 mg/L x 582,000,000 L = 49.1 kg

Using a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum barium leaching rate per metric ton of ash is:

= 35.4 kg / 1,424,736 metric tons = 0.0249 g Barium/metric ton ash

= 49.1 kg / 1,424,736 metric tons = 0.0344 g Barium/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Dallman Ash Pond - Results Comparison – Barium

Parameter	SPLP	Porewater
Average Barium Concentration	0.042 mg/L	0.0609 mg/L
Total Barium Mass	24.4 kg	35.4 kg

The concentrations of barium in the SPLP sample are approximately 31% lower compared to porewater results (0.042 mg/L vs. 0.0609 mg/L). The total barium mass in porewater is 35.4-49.1 kg, significantly higher than SPLP-derived estimates (24.4-26.2 kg).

The higher barium concentrations in Dallman Ash Pond's porewater compared to SPLP results arise from geochemical interactions specific to alkaline CCR environments and methodological limitations of leaching tests. Three factors drive this discrepancy.

The SPLP's acidic leachant (pH 4.2 ± 0.5) contains elevated sulfate (SO_4^{2-}) from simulated rainwater. This promotes barite ($BaSO_4$) precipitation, sequestering dissolved barium during testing—a process absent in the sulfate-limited, alkaline porewater (pH 8–12).

Natural bicarbonate (HCO_3^-) in the pond porewater complexes Ba^{2+}, increasing solubility. In contrast, SPLP's low-pH environment lacks sufficient alkalinity to offset barite formation.

High calcium (Ca^{2+}) and magnesium (Mg^{2+}) in CCR porewater compete with Ba^{2+} for sorption sites, further elevating dissolved concentrations unaccounted for in SPLP's simplified chemistry.

Barium mobility is primarily controlled by sulfate availability and pH. In the ash pond's low-sulfate, alkaline setting, barium remains relatively mobile as dissolved Ba^{2+} or bicarbonate complexes. However, its migration downgradient may self-limit if sulfate-rich groundwater is encountered, triggering barite precipitation. Advection governs transport given the pond's sandy-silt hydrology, but the risk of barium spreading is constrained by its strong affinity for sulfate unlike more mobile CCR constituents (e.g., boron).

The porewater's 35.4–49.1 kg Ba mass (vs. SPLP's 24.4–26.2 kg) confirms SPLP under predicts barium solubility in alkaline impoundments. Site-specific porewater data better reflects actual leaching risk, though long-term stability depends on preventing sulfate influx or acidic shifts that could immobilize or remobilize barium, respectively.

Lakeside Ash Pond - SPLP/TCLP Results – Barium

Method	Units	L1 14.5-21.5	L1 24.5-31.5	L3 19.5-21.5	L3 29.5-32.7	L4 10-15.3	L5 19.5-21.5	L5 32.5-35.2	Min	Max	Avg
SPLP	mg/L	< 0.045	J 0.026	J 0.028	J 0.0076	0.185 0.0571	0.0596	J 0.023	**0.0076**	**0.0596**	**0.0352**
TCLP	mg/L	0.345	0.172	0.635	0.0139	0.453 0.137	0.574	1.24	0.0139	1.24	0.445

Note:
J - Analyte detected below quantitation limits

The porewater volume of the surface impoundment is 351,572,000 L. Using an average concentration (0.0352 mg/L) the total mass of barium is:

= 0.0352 mg/L x 351,572,000 L = 12.4 kg

Conservative estimate using the maximum concentration (0.0331 mg/L) is:

= 0.0596 mg/L x 351,572,000 L = 21.0 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the average and maximum barium leaching rate per metric ton of ash is:

= 12.4 kg / 430,324 metric tons = 0.0288 g Barium/metric ton ash

= 21.0 kg / 430,324 metric tons = 0.0488 g Barium/metric ton ash

Lakeside Ash Pond - Porewater Results – Barium, total and dissolved

Method	Units	Date	L1	L3	L4	L5	Min	Max	Avg
Total	mg/L	4/29/24	3.48	1.49	0.308	1.6	0.308	3.48	1.72
Dissolved	mg/L	7/19/24	0.13	0.0912	0.101	0.0523	0.0523	0.13	0.0936
Total	mg/L	7/19/24	0.161	0.128	0.497	0.0877	0.0877	0.497	0.218

Using average porewater data for barium, dissolved, the total mass is:

= 0.0936 mg/L x 351,572,000 L = 32.9 kg

Conservative estimate using the maximum concentration (0.13 mg/L) is:

= 0.13 mg/L x 351,572,000 L = 45.7 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the average and maximum barium leaching rate per metric ton of ash is:

= 32.9 kg / 430,324 metric tons = 0.0765 g Barium/metric ton ash

= 45.7 kg / 430,324 metric tons = 0.106 g Barium/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Lakeside Ash Pond - Results Comparison – Barium

Parameter	SPLP	Porewater
Average Barium Concentration	0.0352 mg/L	0.0936 mg/L
Total Barium Mass	12.4 kg	32.9 kg

The concentrations of barium in the SPLP sample are approximately 62% lower compared to porewater results (0.0352 mg/L vs. 0.0936 mg/L). The total barium mass in porewater is 32.9-45.7 kg, significantly higher than SPLP-derived estimates (12.4-21 kg). These results are similar to the Dallman Ash Pond SPLP and porewater analytical results. See discussion above.

6.4 Beryllium

The mass of beryllium leachable from fly ash and bottom ash in a CCR surface impoundment was estimated from the SPLP and porewater analytical results.

Dallman Ash Pond - SPLP/TCLP Results – Beryllium

Method	Units	D1 19.5-21.5	D1 36.5-38.5	D2 19.5-21.5	D2 33.5-35.5	D3 4.5-6.5	D3 14.5-29.5	D4 19.5-21.5	D4 29.5-31.5	Min	Max	Avg
SPLP	mg/L	< 0.001	J 0.0002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0002	0.001	0.0009
TCLP	mg/L	0.0145	0.0085	0.0231	J 0.0002	0.0114	0.0113	0.0056	0.0012	0.0002	0.0231	0.00948

Note:
J - Analyte detected below quantitation limits

The porewater volume of the surface impoundment is 582,000,000 L. Using an average concentration (0.0009 mg/L) the total mass of beryllium is:

= 0.0009 mg/L x 582,000,000 L = 0.524 kg

Conservative estimate using the maximum concentration (0.001 mg/L) is:

= 0.001 mg/L x 582,000,000 L = 0.582 kg

Based upon a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum beryllium leaching rate per metric ton of ash is:

= 0.524 kg / 1,424,736 metric tons = 0.000368 g Beryllium/metric ton ash

= 0.582 kg / 1,424,736 metric tons = 0.000409 g Beryllium/metric ton ash

Dallman Ash Pond - Porewater Results – Beryllium, total and dissolved

Method	Units	Date	D1	D2	D3	D4	Min	Max	Avg
Total	mg/L	4/29/24	0.254	0.064	0.439	0.0674	0.064	0.439	0.206
Dissolved	mg/L	7/19/24	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0005	0.0005	0.0005
Total	mg/L	7/19/24	0.002	0.0035	0.001	0.0056	0.001	0.0056	0.00303

The dissolved boron concentrations were reported as non-detect (<0.0005 mg/L) for all sampling events. Using the dissolved beryllium non-detect value, the total mass is:

= 0.0005 mg/L x 582,000,000 L = 0.291 kg

Using a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum beryllium leaching rate per metric ton of ash is:

= 0.291 kg / 1,424,736 metric tons = 0.000204 g Beryllium/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Dallman Ash Pond - Results Comparison – Beryllium

Parameter	SPLP	Porewater
Average Beryllium Concentration	0.0009 mg/L	0.0005 mg/L
Total Beryllium Mass	0.524 kg	0.291 kg

The concentrations of beryllium in the porewater sample are approximately 44% lower compared to SPLP results (0.0005 mg/L vs 0.0009 mg/L). The total beryllium mass in SPLP-derived estimates (0.524-0.582 kg) is higher than determined for porewater (0.291 kg).

The slightly higher SPLP-derived mass (0.524 kg vs. 0.291 kg) stems from its aggressive extraction of weakly adsorbed Be fractions, but the absolute difference remains small (<0.3 kg total). Both methods confirm beryllium poses minimal groundwater risk due to its extreme attenuation, consistent with its rarity as a contaminant of concern at CCR sites.
The minimal beryllium (Be) concentrations in both Dallman Ash Pond porewater and SPLP leachate reflect its strong geochemical immobilization, though subtle differences arise from testing conditions. Three factors explain the near-identical mass estimates.

Beryllium exhibits lowest solubility near pH 6–8. The ash pond's alkaline porewater (pH 8–12) promotes hydrolysis to insoluble $Be(OH)_2$ or $Be(OH)_3^-$, while SPLP's acidic environment (pH 4.2) slightly enhances dissolution via Be^{2+} formation, though still limited by adsorption.

Be sorbs strongly to Al/Fe/Mn oxides, clay minerals, and organic matter in ash. At high pH, it forms stable surface complexes (e.g., ≡FeO–$BeOH^+$), reducing dissolved concentrations. SPLP's low pH partially disrupts this, explaining its marginally higher detection limit but still negligible release.

Be likely exists as refractory mineral phases (e.g., bertrandite) or substituted in silicate matrices, resisting dissolution in both natural and acidic conditions.

Beryllium is inherently immobile in CCR environments due to adsorption affinity (high K_d > 10^3 L/kg), low solubility in alkaline systems, and limited redox sensitivity. Its migration is restricted to short distances via advection, with precipitation or adsorption likely trapping it near source zones. No significant plume formation is expected.

Lakeside Ash Pond - SPLP/TCLP Results – Beryllium

Method	Units	L1 14.5-21.5	L1 24.5-31.5	L3 19.5-21.5	L3 29.5-32.7	L4 10-15.3	L5 19.5-21.5	L5 32.5-35.2	Min	Max	Avg
SPLP	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	0.001	0.001
TCLP	mg/L	J 0.0007	0.0015	< 0.001	0.0054	< 0.001	0.0049	< 0.001	0.0007	0.0054	0.00221

Note:
J - Analyte detected below quantitation limits

The porewater volume of the surface impoundment is 351,572,000 L. Beryllium concentrations were non-detect (<0.001 mg/L) for all SPLP samples. Using detection limit value (0.001 mg/L) the total mass of beryllium is:

= 0.001 mg/L x 351,572,000 L = 0.352 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the beryllium leaching rate per metric ton of ash is:

= 0.352 kg / 430,324 metric tons = 0.000818 g Beryllium/metric ton ash

Lakeside Ash Pond - Porewater Results – Beryllium, total and dissolved

Method	Units	Date	L1	L3	L4	L5	Min	Max	Avg
Total	mg/L	4/29/24	0.0542	0.102	0.0024	0.0911	0.0024	0.102	0.0624
Dissolved	mg/L	7/19/24	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0005	0.0005	0.0005
Total	mg/L	7/19/24	J 0.0003	J 0.0004	0.0045	0.0005	0.0003	0.0045	0.00143

Note:
J - Analyte detected below quantitation limits

The dissolved boron concentrations were reported as non-detect (<0.0005 mg/L) for all sampling events. Using the dissolved beryllium non-detect value, the total mass is:

= 0.0005 mg/L x 351,572,000 L = 0.176 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the average and maximum beryllium leaching rate per metric ton of ash is:

= 0.176 kg / 430,324 metric tons = 0.000408 g Beryllium/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Lakeside Ash Pond - Results Comparison – Beryllium

Parameter	SPLP	Porewater
Average Beryllium Concentration	0.001 mg/L	0.0005 mg/L
Total Beryllium Mass	0.352 kg	0.176 kg

The non-detect concentrations of beryllium in the porewater sample are approximately 50% lower compared to porewater results (0.0005 mg/L vs 0.001 mg/L). The total beryllium mass in SPLP samples (0.352 kg), is higher than porewater derived estimates (0.176 kg). These results are similar to the Dallman Ash Pond SPLP and porewater analytical results. See discussion above.

6.5 Cadmium

The mass of cadmium leachable from fly ash and bottom ash in a CCR surface impoundment was estimated from the SPLP and porewater analytical results.

Dallman Ash Pond - SPLP/TCLP Results – Cadmium

Method	Units	D1 19.5-21.5	D1 36.5-38.5	D2 19.5-21.5	D2 33.5-35.5	D3 4.5-6.5	D3 14.5-29.5	D4 19.5-21.5	D4 29.5-31.5	Min	Max	Avg
SPLP	mg/L	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.002	0.002	0.002
TCLP	mg/L	0.0293	0.0706	0.0638	< 0.002	0.0302	0.0475	0.0422	0.0063	0.002	0.0706	0.0365

The porewater volume of the surface impoundment is 582,000,000 L. Using an average concentration (0.002 mg/L) the total mass of cadmium is:

= 0.002 mg/L x 582,000,000 L = 1.16 kg

Based upon a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average cadmium leaching rate per metric ton of ash is:

= 1.16 kg / 1,424,736 metric tons = 0.000814 g Cadmium/metric ton ash

Dallman Ash Pond - Porewater Results – Cadmium, total and dissolved

Method	Units	Date	D1	D2	D3	D4	Min	Max	Avg
Total	**mg/L**	4/29/24	0.222	0.0541	0.492	J 0.068	0.0541	0.492	0.209
Dissolved	**mg/L**	7/19/24	< 0.002	< 0.002	< 0.002	< 0.002	0.002	0.002	0.002
Total	**mg/L**	7/19/24	J 0.0016	J 0.0014	< 0.002	0.0035	0.0014	0.0035	0.00213

Note:
J - Analyte detected below quantitation limits

Cadmium concentrations were non-detect (<0.002 mg/L) for all samples. Using detection limit value (0.002 mg/L) the total mass of cadmium is:

= 0.002 mg/L x 582,000,000 L = 1.16 kg

Using a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum cadmium leaching rate per metric ton of ash is:

= 1.16 kg / 1,424,736 metric tons = 0.000817 g Cadmium/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Dallman Ash Pond - Results Comparison – Cadmium

Parameter	SPLP	Porewater
Average Cadmium Concentration	0.002 mg/L	0.002 mg/L
Total Cadmium Mass	1.16 kg	1.16 kg

The concentrations of cadmium in the SPLP sample are in agreement with porewater results (0.002 mg/L vs. 0.002 mg/L). The total cadmium mass in porewater is 1.16 kg the same as the SPLP-derived estimate (1.16 kg).

The agreement between SPLP and porewater cadmium results in Dallman Ash Pond—both below detection (<0.002 mg/L) with identical mass estimates stems from cadmium's geochemical behavior in coal ash systems. Cadmium solubility is primarily controlled by pH-dependent adsorption and precipitation. In SPLP's acidic environment (pH 4.2), cadmium might be expected to mobilize as Cd^{2+}, but its strong affinity for iron oxides, clay minerals, and organic matter in ash promotes retention. Conversely, the alkaline porewater (pH 8–12) favors cadmium precipitation as insoluble carbonates (e.g., $CdCO_3$) or hydroxides, while also enhancing adsorption onto mineral surfaces. These opposing mechanisms, low-pH adsorption versus high-pH precipitation, converge to limit solubility across both environments.

Cadmium mobility is further suppressed by its tendency to form stable complexes with sulfides (e.g., CdS) under reducing conditions, which likely exist in submerged ash. The low concentrations indicate minimal dissolved cadmium, reflecting effective attenuation regardless of testing conditions. In groundwater, cadmium's mobility would be constrained by three key factors: (1) pH extremes that trigger precipitation/adsorption, (2) the presence of sorbents (Fe/Al oxides, carbonates), and (3) sulfide availability that immobilizes it as insoluble precipitates. This results in limited transport potential, confining cadmium plumes to narrow zones near sources unless acidic or low-sulfide conditions prevail. The consistency between SPLP and porewater data confirms cadmium's low leaching risk in this setting.

Lakeside Ash Pond - SPLP/TCLP Results – Cadmium

Method	Units	L1 14.5-21.5	L1 24.5-31.5	L3 19.5-21.5	L3 29.5-32.7	L4 10-15.3	L5 19.5-21.5	L5 32.5-35.2	Min	Max	Avg
SPLP	**mg/L**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.002	0.002	0.002
TCLP	**mg/L**	0.0045	0.0045	0.0154	0.0397	< 0.002	0.149	0.0022	0.002	0.149	0.0310

The porewater volume of the surface impoundment is 351,572,000 L. Using an average concentration (0.002 mg/L) the total mass of cadmium is:

= 0.002 mg/L x 351,572,000 L = 0.703 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the average cadmium leaching rate per metric ton of ash is:

= 0.703 kg / 430,324 metric tons = 0.00163 g Cadmium/metric ton ash

Lakeside Ash Pond - Porewater Results – Cadmium, total and dissolved

Method	Units	Date	L1	L3	L4	L5	Min	Max	Avg
Total	mg/L	4/29/24	0.0776	0.26	0.0019	0.296	0.0019	0.296	0.159
Dissolved	mg/L	7/19/24	< 0.002	< 0.002	< 0.002	< 0.002	0.002	0.002	0.002
Total	mg/L	7/19/24	< 0.002	< 0.002	0.0097	< 0.002	0.002	0.0097	0.00393

Cadmium concentrations were non-detect (<0.002 mg/L) for all samples. Using the detection limit value (0.002 mg/L) the total mass of cadmium is:

= 0.002 mg/L x 351,572,000 L = 0.703 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the average and maximum cadmium leaching rate per metric ton of ash is:

= 0.703 kg / 430,324 metric tons = 0.00163 g Cadmium/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Lakeside Ash Pond - Results Comparison – Cadmium

Parameter	SPLP	Porewater
Average Cadmium Concentration	0.002 mg/L	0.002 mg/L
Total Cadmium Mass	0.703 kg	0.703 kg

Similar to the Dallman Ash Pond results, the concentrations of cadmium in the SPLP sample are the same for porewater results (0.002 mg/L vs. 0.002 mg/L). The total cadmium mass in porewater is 0.703 kg, the same as the SPLP-derived estimate (0.703 kg). These results are similar to the Dallman Ash Pond SPLP and porewater analytical results. See discussion above.

6.6 Chromium

The mass of chromium leachable from fly ash and bottom ash in a CCR surface impoundment was estimated from the SPLP and porewater analytical results.

Dallman Ash Pond - SPLP/TCLP Results – Chromium

Method	Units	D1 19.5-21.5	D1 36.5-38.5	D2 19.5-21.5	D2 33.5-35.5	D3 4.5-6.5	D3 14.5-29.5	D4 19.5-21.5	D4 29.5-31.5	Min	Max	Avg
SPLP	mg/L	J 0.0049	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0049	0.01	0.00936
TCLP	mg/L	0.105	0.0707	0.116	< 0.01	0.0692	0.0438	0.0151	< 0.01	0.01	0.116	0.0550

Note:
J - Analyte detected below quantitation limits

The porewater volume of the surface impoundment is 582,000,000 L. Using an average concentration (0.00936 mg/L) the total mass of chromium is:

= 0.00936 mg/L x 582,000,000 L = 5.45 kg

Conservative estimate using the maximum concentration (0.01 mg/L) is:

= 0.01 mg/L x 582,000,000 L = 5.82 kg

Based upon a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum chromium leaching rate per metric ton of ash is:

= 5.45 kg / 1,424,736 metric tons = 0.00383 g Chromium/metric ton ash

= 5.82 kg / 1,424,736 metric tons = 0.00408 g Chromium/metric ton ash

Dallman Ash Pond - Porewater Results – Chromium, total and dissolved

Method	Units	Date	D1	D2	D3	D4	Min	Max	Avg
Total	mg/L	4/29/24	3.91	0.902	6.25	1.03	0.902	6.25	3.02
Dissolved	mg/L	7/19/24	< 0.005	< 0.005	< 0.005	< 0.005	0.005	0.005	0.005
Total	mg/L	7/19/24	0.0277	0.0426	0.0121	0.0645	0.0121	0.0645	0.0367

Chromium concentrations were non-detect (<0.005 mg/L) for all samples. Using detection limit value (0.005 mg/L) the total mass of chromium is:

= 0.005 mg/L x 582,000,000 L = 2.91 kg

Using a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum chromium leaching rate per metric ton of ash is:

= 2.91 kg / 1,424,736 metric tons = 0.00204 g Chromium/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Dallman Ash Pond - Results Comparison – Chromium

Parameter	SPLP	Porewater
Average Chromium Concentration	0.00936 mg/L	0.005 mg/L
Total Chromium Mass	5.45 kg	2.91 kg

The concentrations of chromium in the porewater sample are approximately 47% lower compared to SPLP results (0.005 mg/L vs. 00936 mg/L). The total chromium mass in SPLP-derived estimates (5.45-5.82 kg) is greater than the porewater-derived estimate (2.91 kg).
The lower chromium concentrations in Dallman Ash Pond's porewater compared to SPLP results reflect redox and pH-controlled geochemical processes unique to in situ conditions. SPLP's acidic, oxygenated environment (pH 4.2) promotes chromium mobilization as soluble Cr(VI) (chromate, $HCrO_4^-$), while the pond's alkaline and reducing conditions (pH 8–12; low Eh) reduce Cr(VI) to Cr(III). This reduction triggers precipitation as insoluble Cr(III) hydroxides [$Cr(OH)_3$] or coprecipitation with iron oxides, sharply limiting dissolved chromium in porewater. Adsorption of Cr(III) onto clay minerals and organic matter further suppresses mobility under alkaline conditions.

Chromium's mobility is governed by three interdependent factors. These are 1) Cr(VI) is highly mobile; Cr(III) is immobile; 2) alkaline conditions favor Cr(III) precipitation but can remobilize Cr(VI) as oxyanions; and 3) iron oxides and clays permanently sequester Cr(III).

In groundwater, chromium's nature and extent would depend on redox stability. If reducing conditions persist, migration would be minimal (< meters). However, oxidation during pond dewatering or acidic recharge could convert Cr(III) to mobile Cr(VI), potentially forming elongated plumes. The SPLP overestimates current risk (5.45–5.82 kg vs. porewater's 2.91 kg) because it ignores the pond's natural attenuation capacity. Long-term monitoring of Eh/pH is essential to detect shifts that could liberate Cr(VI).

Lakeside Ash Pond - SPLP/TCLP Results – Chromium

Method	Units	L1 14.5-21.5	L1 24.5-31.5	L3 19.5-21.5	L3 29.5-32.7	L4 10-15.3	L5 19.5-21.5	L5 32.5-35.2	Min	Max	Avg
SPLP	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	0.01	0.01
TCLP	mg/L	< 0.01	< 0.01	< 0.01	0.0185	< 0.01	J 0.0082	< 0.01	0.0082	0.0185	0.0110

Note:
J - Analyte detected below quantitation limits

The porewater volume of the surface impoundment is 351,572,000 L. Chromium concentrations were non-detect (<0.01 mg/L) for all SPLP samples. Using detection limit value (0.01 mg/L) the total mass of chromium is:

= 0.01 mg/L x 351,572,000 L = 3.52 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the chromium leaching rate per metric ton of ash is:

= 3.52 kg / 430,324 metric tons = 0.00818 g Chromium/metric ton ash

Lakeside Ash Pond - Porewater Results – Chromium, total and dissolved

Method	Units	Date	L1	L3	L4	L5	Min	Max	Avg
Total	mg/L	4/29/24	0.993	2.08	0.0632	1.81	0.0632	2.08	1.24
Dissolved	mg/L	7/19/24	< 0.005	< 0.005	< 0.005	< 0.005	0.005	0.005	0.005
Total	mg/L	7/19/24	0.0053	0.0068	0.0773	0.0078	0.0053	0.0773	0.0243

Chromium concentrations were non-detect (<0.005 mg/L) for all samples. Using detection limit value (0.005 mg/L) the total mass of chromium is:

= 0.005 mg/L x 351,572,000 L = 1.76 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the average and maximum chromium leaching rate per metric ton of ash is:

= 1.76 kg / 430,324 metric tons = 0.00409 g Chromium/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Lakeside Ash Pond - Results Comparison – Chromium

Parameter	SPLP	Porewater
Average Chromium Concentration	0.01 mg/L	0.005 mg/L
Total Chromium Mass	3.52 kg	1.76 kg

Similar to the Dallman Ash Pond results, the concentrations of chromium in the porewater sample are approximately 50% lower compared to SPLP results (0.005 mg/L vs 0.01 mg/L). The total chromium mass in the SPLP sample is 3.52 kg/L, greater than the porewater-derived estimate (1.76 kg). These results are similar to the Dallman Ash Pond SPLP and porewater analytical results. See discussion above.

6.7 Cobalt

The mass of cobalt leachable from fly ash and bottom ash in a CCR surface impoundment was estimated from the SPLP and porewater analytical results.

Dallman Ash Pond - SPLP/TCLP Results – Cobalt

Method	Units	D1 19.5-21.5	D1 36.5-38.5	D2 19.5-21.5	D2 33.5-35.5	D3 4.5-6.5	D3 14.5-29.5	D4 19.5-21.5	D4 29.5-31.5	Min	Max	Avg
SPLP	mg/L	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	0.006	0.006	0.006
TCLP	mg/L	0.0145	0.0116	0.0182	0.013	0.0118	J 0.0054	0.0107	0.0089	0.0054	0.0182	0.0118

Note:
J - Analyte detected below quantitation limits

The porewater volume of the surface impoundment is 582,000,000 L. Using an average concentration (0.006 mg/L) the total mass of cobalt is:

= 0.006 mg/L x 582,000,000 L = 3.49 kg

Based upon a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average cobalt leaching rate per metric ton of ash is:

= 3.49 kg / 1,424,736 metric tons = 0. 00245 g Cobalt/metric ton ash

Dallman Ash Pond - Porewater Results – Cobalt, total and dissolved

Method	Units	Date	D1	D2	D3	D4	Min	Max	Avg
Total	mg/L	4/29/24	0.241	0.0579	0.323	J 0.061	0.0579	0.323	0.170
Dissolved	mg/L	7/19/24	< 0.005	< 0.005	< 0.005	< 0.005	0.005	0.005	0.005
Total	mg/L	7/19/24	J 0.0029	J 0.0029	< 0.005	0.0062	0.0029	0.0062	0.00425

Note:
J - Analyte detected below quantitation limits

Cobalt concentrations were non-detect (<0.005 mg/L) for all samples. Using detection limit value (0.005 mg/L) the total mass of dissolved cobalt is:

= 0.005 mg/L x 582,000,000 L = 2.91 kg

Using a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum cobalt leaching rate per metric ton of ash is:

= 2.91 kg / 1,424,736 metric tons = 0.00204 g Cobalt/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Dallman Ash Pond - Results Comparison – Cobalt

Parameter	SPLP	Porewater
Average Cobalt Concentration	0.006 mg/L	0.005 mg/L
Total Cobalt Mass	3.49 kg	2.91 kg

The concentrations of cobalt, dissolved, in the porewater results are approximately 17% lower compared to SPLP samples (0.005 mg/L vs. 0.006 mg/L). The total cobalt mass in porewater is 2.91 kg, and the SPLP-derived estimate is 3.49 kg.

The close alignment between cobalt concentrations in Dallman Ash Pond's porewater and SPLP leachate reflects cobalt's consistent geochemical behavior across pH and redox gradients. Unlike redox-sensitive metals (e.g., Cr, As), cobalt solubility is primarily governed by pH-controlled precipitation and adsorption. In SPLP's acidic environment (pH 4.2), cobalt remains largely immobilized through adsorption onto Fe/Mn oxides and clay minerals. Conversely, in the pond's alkaline porewater (pH 8–12), cobalt precipitates as insoluble hydroxides ($Co(OH)_2$) or carbonates ($CoCO_3$), while also binding strongly to mineral surfaces. These parallel retention mechanisms, adsorption in acid, precipitation in alkali, converge to limit dissolved cobalt in both settings.

Cobalt mobility in groundwater is constrained by three key factors: 1) high K_d values (>500 L/kg) on Fe/Mn oxides, particularly in neutral-alkaline conditions; 2) precipitation as secondary minerals reduces dissolved concentrations; and 3) formation of immobile CoS in reducing zones.

These characteristics restrict cobalt plumes to short migration distances (<10–50 m typically), with sharp concentration declining downgradient. The minor mass difference likely stems from SPLP's partial dissolution of weakly adsorbed cobalt pools absent in porewater equilibrium. Overall, the agreement confirms cobalt's low leaching risk in CCR impoundments regardless of testing methodology, though slightly higher SPLP values appropriately represent a conservative leaching scenario for regulatory purposes.

Lakeside Ash Pond - SPLP/TCLP Results – Cobalt

Method	Units	L1 14.5-21.5	L1 24.5-31.5	L3 19.5-21.5	L3 29.5-32.7	L4 10-15.3	L5 19.5-21.5	L5 32.5-35.2	Min	Max	Avg
SPLP	mg/L	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	0.006	0.006	0.006
TCLP	mg/L	J 0.0054	J 0.0033	0.0065	0.0161	0.0077	0.0218	J 0.0043	0.0033	0.0218	0.0093

Note:
J - Analyte detected below quantitation limits

The porewater volume of the surface impoundment is 351,572,000 L. Cobalt concentrations were non-detect (<0.006 mg/L) for all SPLP samples. Using detection limit value (0.006 mg/L) the total mass of cobalt is:

= 0.006 mg/L x 351,572,000 L = 2.11 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the cobalt leaching rate per metric ton of ash is:

= 2.11 kg / 430,324 metric tons = 0.00490 g Cobalt/metric ton ash

Lakeside Ash Pond - Porewater Results – Cobalt, total and dissolved

Method	Units	Date	L1	L3	L4	L5	Min	Max	Avg
Total	mg/L	4/29/24	0.154	0.336	0.0213	0.296	0.0213	0.336	0.202
Dissolved	mg/L	7/19/24	< 0.005	< 0.005	< 0.005	< 0.005	0.005	0.005	0.005
Total	mg/L	7/19/24	< 0.005	< 0.005	0.0194	< 0.005	0.005	0.0194	0.0086

Dissolved cobalt concentrations were non-detect (<0.005 mg/L) for all samples. Using detection limit value (0.005 mg/L) the total mass of dissolved cobalt is:

= 0.005 mg/L x 351,572,000 L = 1.76 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the average and maximum barium leaching rate per metric ton of ash is:

= 1.76 kg / 430,324 metric tons = 0.00409 g Barium/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Lakeside Ash Pond - Results Comparison – Cobalt

Parameter	SPLP	Porewater
Average Cobalt Concentration	0.006 mg/L	0.005 mg/L
Total Cobalt Mass	2.11 kg	1.76 kg

The concentrations of cobalt in porewater are approximately 17% lower compared to SPLP derived results (0.005 mg/L vs. 0.006 mg/L). The total cobalt mass in SPLP-derived estimates is 2.11 kg, is slightly higher than porewater estimates (1.76 kg). These results are similar to the Dallman Ash Pond SPLP and porewater analytical results. See discussion above.

6.8 Fluoride

The mass of chromium leachable from fly ash and bottom ash in a CCR surface impoundment was estimated from the “Shake Extraction” and porewater analytical results.

The soil samples were analyzed for dissolved fluoride using ASTM D3987 (SW-846 Method 9036) "Shake Extraction". This method represents a water-based leaching scenario designed to simulate the dissolution of soluble constituents when solid materials come into contact with natural freshwater under mild agitation.

Dallman Ash Pond – Shake Extraction Results – Fluoride

Method	Units	D1 19.5-21.5	D1 36.5-38.5	D2 19.5-21.5	D2 33.5-35.5	D3 4.5-6.5	D3 14.5-29.5	D4 19.5-21.5	D4 29.5-31.5	Min	Max	Avg
Shake Extraction	mg/L	0.13	0.19	0.2	J 0.37	J 0.08	0.11	J 0.06	0.14	0.06	0.37	0.16

Note:
J - Analyte detected below quantitation limits

The porewater volume of the surface impoundment is 582,000,000 L. Using an average concentration (0.16 mg/L) the total mass of fluoride is:

= 0.16 mg/L x 582,000,000 L = 93.1kg

Conservative estimate using the maximum concentration (0.37 mg/L) is:

= 0.37 mg/L x 582,000,000 L = 215 kg

Based upon a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum fluoride leaching rate per metric ton of ash is:

= 93.1 kg / 1,424,736 metric tons = 0.0653 g Fluoride/metric ton ash

= 215 kg / 1,424,736 metric tons = 0.151 g Fluoride/metric ton ash

Dallman Ash Pond - Porewater Results – Fluoride, total and dissolved

Method	Units	Date	D1	D2	D3	D4	Min	Max	Avg
Total	mg/L	4/29/24	0.32	0.21	0.33	0.43	0.21	0.43	0.3225
Dissolved	mg/L	7/19/24	J 0.06	J 0.09	0.12	J 0.09	0.06	0.12	0.09
Total	mg/L	7/19/24	J 0.07	J 0.1	0.12	0.12	0.07	0.12	0.103

Note:
J - Analyte detected below quantitation limits

Using average porewater data for fluoride, dissolved, the total mass is:

= 0.09 mg/L x 582,000,000 L = 52.4 kg

Conservative estimate using the maximum concentrations (0.12 mg/L) is:

= 0.12 mg/L x 582,000,000 L = 69.8 kg

Using a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum fluoride leaching rate per metric ton of ash is:

= 52.4 kg / 1,424,736 metric tons = 0.0368 g Fluoride/metric ton ash

= 69.8 kg / 1,424,736 metric tons = 0.0490 g Fluoride/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Dallman Ash Pond - Results Comparison – Fluoride

Parameter	SPLP	Porewater
Average Fluoride Concentration	0.16 mg/L	0.09 mg/L
Total Fluoride Mass	93.1 kg	52.4 kg

The concentrations of fluoride, dissolved, in the porewater sample are approximately 44% lower compared to shake extraction samples (0.16 mg/L vs. 0.09 mg/L). The total fluoride mass in shake extraction results is 93.1-215 kg, significantly higher than porewater derived estimates (52.4-69.8 kg).

The lower fluoride concentrations in Dallman Ash Pond's porewater compared to shake extraction results (0.16 mg/L) arise from methodological and geochemical factors. Shake extraction's aggressive agitation and acidic pH (typically pH ~4–5) dissolve weakly bound fluoride from mineral phases like fluorapatite [$Ca_5(PO_4)_3F$] or adsorb onto aluminum/iron oxides, amplifying release. In contrast, the alkaline porewater (pH 8–12) enhances fluoride adsorption onto positively charged Fe/Al-oxide surfaces and promotes precipitation as CaF_2 (fluorite), suppressing dissolved concentrations.

Fluoride mobility in groundwater is governed by three key characteristics: 1) mobility peaks in acidic conditions (pH < 6) where OH^- competition is minimal; 2) higher Ca^{2+} promotes CaF_2 precipitation, immobilizing fluoride; and 3) fluorite controls long-term release, with dissolution favored by low Ca^{2+}/high CO_3^{2-}.

In this setting, alkaline porewater and abundant calcium in ash limit fluoride mobility, confining plumes near source zones. The shake extraction overestimates mass (93–215 kg vs. porewater's 53–70 kg) because it disrupts natural equilibrium, dissolving pools not readily available under field conditions. Actual groundwater impacts would depend on downgradient pH and calcium levels, with advection dominating transport but attenuation likely within short distances due to adsorption/precipitation.

Lakeside Ash Pond – Shake Extraction Results – Fluoride

Method	Units	L1 14.5-21.5	L1 24.5-31.5	L3 19.5-21.5	L3 29.5-32.7	L4 10-15.3	L5 19.5-21.5	L5 32.5-35.2	Min	Max	Avg
SPLP	mg/L	0.37	0.21	0.2	0.2	0.42	0.36	J 0.08	0.08	0.42	0.263

Note:
J - Analyte detected below quantitation limits

The porewater volume of the surface impoundment is 351,572,000 L. Fluoride concentrations ranged from a trace amount of 0.08 mg/L to 0.42 mg/L. Using an average concentration (0.263 mg/L) the total mass of fluoride is:

= 0.263 mg/L x 351,572,000 L = 92.5 kg

Conservative estimate using the maximum concentration (0.42 mg/L) is:

= 0.42 mg/L x 351,572,000 L = 148 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the fluoride leaching rate per metric ton of ash is:

= 92.5 kg / 430,324 metric tons = 0.215 g Fluoride/metric ton ash

= 148 kg / 430,324 metric tons = 0.344 g Fluoride/metric ton ash

Lakeside Ash Pond - Porewater Results – Fluoride, total and dissolved

Method	Units	Date	L1	L3	L4	L5	Min	Max	Avg
Total	mg/L	4/29/24	0.5	1.07	1.19	1.32	0.5	1.32	1.02
Dissolved	mg/L	7/19/24	0.1	0.35	0.62	0.37	0.1	0.62	0.36
Total	mg/L	7/19/24	0.11	0.36	0.64	0.38	0.11	0.64	0.373

Using average porewater data for fluoride, dissolved, the total mass is:

= 0.36 mg/L x 351,572,000 L = 127 kg

Conservative estimate using the maximum concentration (0.62 mg/L) is:

= 0.62 mg/L x 351,572,000 L = 218 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the average and maximum fluoride leaching rate per metric ton of ash is:

= 127 kg / 430,324 metric tons = 0.294 g Fluoride/metric ton ash

= 218 kg / 430,324 metric tons = 0.507 g Fluoride/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Lakeside Ash Pond - Results Comparison – Fluoride

Parameter	SPLP	Porewater
Average Fluoride Concentration	0.263 mg/L	0.36 mg/L
Total Fluoride Mass	92.5 kg	127 kg

The concentrations of fluoride in the shake extraction sample are approximately 27% lower compared to porewater results (0.263 mg/L vs. 0.36 mg/L). The total fluoride mass in porewater is 127-218 kg, higher than shake extraction derived estimates (92.5-148 kg).

The higher fluoride concentrations in Lakeside Ash Pond's porewater compared to shake extraction results reflect pH-driven geochemical processes that suppress fluoride release in acidic leaching tests but enhance solubility in alkaline field conditions. Shake extraction's low-pH environment (typically pH 4–5) promotes fluoride adsorption onto positively charged mineral surfaces (e.g., Al-/Fe-oxides) and may trigger precipitation as CaF_2 if calcium is abundant in the leachant. Conversely, the pond's alkaline porewater (pH 8–12) generates negatively charged mineral surfaces that repel fluoride anions, while high bicarbonate concentrations compete for adsorption sites, collectively increasing dissolved fluoride.

Fluoride mobility is primarily controlled by three factors: 1) pH, which reverses adsorption behavior (immobile in acid, mobile in alkali); 2) calcium availability, where high Ca^{2+} induces fluorite precipitation; and 3) competing anions (e.g., HCO_3^-, SO_4^{2-}) that displace adsorbed fluoride.

In groundwater, fluoride plumes may extend farther in alkaline, low-calcium settings but will attenuate rapidly if downgradient conditions favor adsorption (pH < 6) or precipitation (high Ca^{2+}). The shake extraction underestimates mass (92.5–148 kg vs. porewater's 127–218 kg) because its artificial chemistry immobilizes fluoride through mechanisms not representative of in-situ alkalinity. This highlights the importance of porewater data for predicting actual contaminant flux, particularly where pH deviates from neutral.

6.9 Lead

The mass of lead leachable from fly ash and bottom ash in a CCR surface impoundment was estimated from the SPLP and porewater analytical results.

Dallman Ash Pond - SPLP/TCLP Results – Lead

Method	Units	D1 19.5-21.5	D1 36.5-38.5	D2 19.5-21.5	D2 33.5-35.5	D3 4.5-6.5	D3 14.5-29.5	D4 19.5-21.5	D4 29.5-31.5	Min	Max	Avg
SPLP	mg/L	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	0.0075	0.0075	0.0075
TCLP	mg/L	< 0.0075	0.0102	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	0.0075	0.0102	0.00784

The porewater volume of the surface impoundment is 582,000,000 L. Using the non-detect value (0.0075 mg/L) the total mass of lead is:

= 0.0075 mg/L x 582,000,000 L = 4.37 kg

Based upon a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum lead leaching rate per metric ton of ash is:

= 4.37 kg / 1,424,736 metric tons = 0.000307 g Lead/metric ton ash

Dallman Ash Pond - Porewater Results – Lead, total and dissolved

Method	Units	Date	D1	D2	D3	D4	Min	Max	Avg
Total	mg/L	4/29/24	1.04	0.199	1.46	0.266	0.199	1.46	0.741
Dissolved	mg/L	7/19/24	< 0.0075	< 0.0075	< 0.0075	< 0.0075	0.0075	0.0075	0.0075
Total	mg/L	7/19/24	0.0415	0.0135	J 0.0046	0.0262	0.0046	0.0415	0.0215

Note:
J - Analyte detected below quantitation limits

Using average porewater data for lead, dissolved, (0.0075) the total mass is:

= 0.0075 mg/L x 582,000,000 L = 4.37 kg

Using a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum lead leaching rate per metric ton of ash is:

= 4.37 kg / 1,424,736 metric tons = 0.00306 g Lead/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Dallman Ash Pond - Results Comparison – Lead

Parameter	SPLP	Porewater
Average Lead Concentration	0.0075 mg/L	0.0075 mg/L
Total Lead Mass	4.37 kg	4.37 kg

The concentrations of lead in the SPLP sample are the same calculated to the porewater results (0.0075 mg/L vs. 0.0075 mg/L). The total lead mass in porewater is 4.37 kg, is the same for the SPLP-derived estimates (4.37 kg).

The identical lead concentrations (0.0075 mg/L) and total mass (4.37 kg) in both SPLP and porewater samples from Dallman Ash Pond result from lead's unique geochemical behavior, which minimizes solubility across a wide range of conditions. In SPLP's acidic environment (pH 4.2), lead precipitates as insoluble anglesite ($PbSO_4$) due to sulfate in the leachant, while in the pond's alkaline porewater (pH 8–12), it forms stable cerussite ($PbCO_3$) or hydroxides. Additionally, lead adsorbs strongly to iron/aluminum oxides and clay minerals in ash regardless of pH, with distribution coefficients (K_d) typically >10^4 L/kg. These parallel immobilization mechanisms—precipitation and adsorption—suppress dissolution equally in both test methods.

Lead's mobility in groundwater is inherently low due to three key characteristics: 1) sulfate or carbonate availability triggers near-instantaneous mineral formation; strong surface bonding persists across pH gradients; and lead lacks soluble oxidized species, unlike chromium or arsenic.

Consequently, lead plumes rarely extend beyond local zones (<50 m) unless exposed to unusually acidic, low-sulfate, or low-carbonate groundwater. The SPLP-porewater agreement confirms that standardized leaching tests reliably predict lead's low environmental mobility in coal ash impoundments. However, long-term stability depends on maintaining geochemical conditions that favor precipitation—particularly avoiding acidic groundwater intrusion that could dissolve mineral phases.

Lakeside Ash Pond - SPLP/TCLP Results – Lead

Method	Units	L1 14.5-21.5	L1 24.5-31.5	L3 19.5-21.5	L3 29.5-32.7	L4 10-15.3	L5 19.5-21.5	L5 32.5-35.2	Min	Max	Avg
SPLP	mg/L	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	0.0075	0.0075	0.0075
TCLP	mg/L	< 0.0075	< 0.0075	< 0.0075	0.0247	< 0.0075	< 0.0075	< 0.0075	0.0075	0.0247	0.00996

The porewater volume of the surface impoundment is 351,572,000 L. Lead concentrations were non-detect (<0.0075 mg/L) for all SPLP samples. Using detection limit value (0.0075 mg/L) the total mass of lead is:

= 0.0075 mg/L x 351,572,000 L = 2.64 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the lead leaching rate per metric ton of ash is:

= 2.64 kg / 430,324 metric tons = 0.00613 g Lead/metric ton ash

Lakeside Ash Pond - Porewater Results – Lead, total and dissolved

Method	Units	Date	L1	L3	L4	L5	Min	Max	Avg
Total	mg/L	4/29/24	B 0.655	B 3.4	0.0526	2.78	0.0526	3.4	1.72
Dissolved	mg/L	7/19/24	< 0.0075	< 0.0075	< 0.0075	< 0.0075	0.0075	0.0075	0.0075
Total	mg/L	7/19/24	< 0.0075	< 0.0075	0.16	J 0.0043	0.0043	0.16	0.0448

Note:
B - Analyte detected in associated Method Blank

The dissolved lead concentrations were reported as non-detect (<0.0075 mg/L) for all sampling events. Using the average porewater data for lead, dissolved (0.0075), the total mass is:

= 0.0075 mg/L x 351,572,000 L = 2.64 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the average and maximum lead leaching rate per metric ton of ash is:

= 2.64 kg / 430,324 metric tons = 0.00613 g Lead/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Lakeside Ash Pond - Results Comparison – Lead

Parameter	SPLP	Porewater
Average Lead Concentration	0.0075 mg/L	0.0075 mg/L
Total Lead Mass	2.64 kg	2.64 kg

Similar to the Dallman Ash Pond results, the concentrations of lead in the SPLP sample are similar to porewater results (0.0075 mg/L vs. 0.0075 mg/L). The total lead mass in porewater is 2.64 kg, the same as the SPLP-derived estimates (2.64 kg). See discussion above.

6.10 Lithium

The mass of lithium leachable from fly ash and bottom ash in a CCR surface impoundment was estimated from the SPLP and porewater analytical results.

Dallman Ash Pond - SPLP/TCLP Results – Lithium

Method	Units	D1 19.5-21.5	D1 36.5-38.5	D2 19.5-21.5	D2 33.5-35.5	D3 4.5-6.5	D3 14.5-29.5	D4 19.5-21.5	D4 29.5-31.5	Min	Max	Avg
SPLP	mg/L	0.0033	0.0112	0.0078	0.0065	0.0033	0.0034	0.0075	0.0059	0.0033	0.0112	0.00611
TCLP	mg/L	0.0112	0.0367	0.0228	0.0707	0.0131	0.01	0.0192	0.0374	0.01	0.0707	0.0276

The porewater volume of the surface impoundment is 582,000,000 L. Using an average concentration (0.00611 mg/L) the total mass of lithium is:

= 0.00611 mg/L x 582,000,000 L = 3.56 kg

Conservative estimate using the maximum concentration (0.0112 mg/L) is:

= 0.0112 mg/L x 582,000,000 L = 6.52 kg

Based upon a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum lithium leaching rate per metric ton of ash is:

= 3.56 kg / 1,424,736 metric tons = 0.00250 g Lithium/metric ton ash

= 6.52 kg / 1,424,736 metric tons = 0.00458 g Lithium/metric ton ash

Dallman Ash Pond - Porewater Results – Lithium, total and dissolved

Method	Units	Date	D1	D2	D3	D4	Min	Max	Avg
Total	mg/L	4/29/24	0.428	0.154	0.571	0.228	0.154	0.571	0.345
Dissolved	mg/L	7/19/24	0.207	0.0963	0.117	0.261	0.0963	0.261	0.170
Total	mg/L	7/19/24	0.273	0.11	0.11	0.298	0.11	0.298	0.198

Using average porewater data for lithium, dissolved, the total mass is:

= 0.17 mg/L x 582,000,000 L = 98.9 kg

Conservative estimate using the maximum concentrations (0.298 mg/L) is:

= 0.261 mg/L x 582,000,000 L = 152 kg

Using a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum lithium leaching rate per metric ton of ash is:

= 98.9 kg / 1,424,736 metric tons = 0.0694 g Lithium/metric ton ash

= 152 kg / 1,424,736 metric tons = 0.107 g Lithium/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Dallman Ash Pond - Results Comparison – Lithium

Parameter	SPLP	Porewater
Average Lithium Concentration	0.00611 mg/L	0.170 mg/L
Total Lithium Mass	3.56 kg	98.9 kg

The concentrations of lithium in the SPLP sample are approximately 96% lower compared to porewater results (0.00611 mg/L vs. 0.170 mg/L). The total lithium mass in porewater is 98.9-152 kg, significantly higher than SPLP-derived estimates (3.56-6.52 kg).

The substantial difference in lithium concentrations with porewater results stems from lithium's unique geochemistry in coal ash environments and methodological limitations of leaching tests. The key drivers of the discrepancy are pH-dependent mobilization, mineral dissolution and absence of precipitation controls.

SPLP's acidic leachant (pH 4.2) promotes ion exchange of Li^+ onto clay minerals and metal oxides in ash, temporarily sequestering it. Alkaline porewater (pH 8–12) enhances Li^+ solubility due to repulsive electrostatic forces on negatively charged mineral surfaces, and competition with Na^+/K^+ (abundant in ash porewater) for sorption sites.

Lithium is often hosted in soluble glassy phases of fly ash. Alkaline conditions gradually dissolve these phases, releasing Li^+ into porewater, a process not replicated in short-duration SPLP tests.

Unlike metals (e.g., Pb, Ba), lithium lacks insoluble precipitates, allowing it to accumulate in solution under favorable pH.

Lithium's mobility in groundwater is exceptionally high due to: 1) minimal adsorption (low K_d ~1–10 L/kg); 2) no redox sensitivity or hydrolysis; and 3) high solubility across all pH ranges.

Once released, lithium behaves conservatively (similar to chloride), migrating with advective flow and forming extensive plumes. Its actual extent depends solely on hydraulic residence time and dilution, not chemical attenuation.

SPLP's acidic, low-ionic-strength chemistry fails to replicate the alkaline, ion-rich porewater that liberates lithium. The test thus grossly underestimates in-situ leaching potential. Porewater data is essential to identify lithium as a high-mobility contaminant in CCR impoundments.

Lakeside Ash Pond - SPLP/TCLP Results – Lithium

Method	Units	L1 14.5-21.5	L1 24.5-31.5	L3 19.5-21.5	L3 29.5-32.7	L4 10-15.3	L5 19.5-21.5	L5 32.5-35.2	Min	Max	Avg
SPLP	mg/L	< 0.003	J 0.003	J 0.0015	J 0.003	< 0.003	J 0.0027	0.0033	0.0015	0.0033	0.00279
TCLP	mg/L	0.0036	0.0087	0.0053	0.0061	0.0034	0.0153	0.0183	0.0034	0.0183	0.00867

Note:
J - Analyte detected below quantitation limits

The porewater volume of the surface impoundment is 351,572,000 L. Using an average concentration (0.00279 mg/L) the total mass of lithium is:

= 0.00279 mg/L x 351,572,000 L = 0.981 kg

Conservative estimate using the maximum concentration (0.0033 mg/L) is:

= 0.0033 mg/L x 351,572,000 L = 1.16 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the average and maximum lithium leaching rate per metric ton of ash is:

= 0.981 kg / 430,324 metric tons = 0.00228 g Lithium/metric ton ash

= 1.16 kg / 430,324 metric tons = 0.00270 g Lithium/metric ton ash

Lakeside Ash Pond - Porewater Results – Lithium, total and dissolved

Method	Units	Date	L1	L3	L4	L5	Min	Max	Avg
Total	mg/L	4/29/24	0.172	0.621	0.0288	0.613	0.0288	0.621	0.359
Dissolved	mg/L	7/19/24	0.0408	0.0553	0.0071	0.144	0.0071	0.144	0.0618
Total	mg/L	7/19/24	0.0562	0.0899	0.0522	0.217	0.0522	0.217	0.104

Using average porewater data for lithium, dissolved, the total mass is:

= 0.0618 mg/L x 351,572,000 L = 21.7 kg

Conservative estimate using the maximum concentration (0.144 mg/L) is:

= 0.144 mg/L x 351,572,000 L = 50.6 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the average and maximum lithium leaching rate per metric ton of ash is:

= 21.7 kg / 430,324 metric tons = 0.0505 g Barium/metric ton ash

= 50.6 kg / 430,324 metric tons = 0.118 g Barium/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Lakeside Ash Pond - Results Comparison – Lithium

Parameter	SPLP	Porewater
Average Lithium Concentration	0.00279 mg/L	0.0618 mg/L
Total Lithium Mass	0.981 kg	21.7 kg

Similar to the Dallman Ash Pond results, the concentrations of lithium in the SPLP sample are approximately 88% lower compared to porewater results (0.00279 mg/L vs. 0.0618 mg/L). The total lithium mass in porewater is 21.7-50.6 kg, significantly higher than SPLP-derived estimates (0.981-1.16 kg). See discussion above.

6.11 Mercury

The mass of mercury leachable from fly ash and bottom ash in a CCR surface impoundment was estimated from the SPLP and porewater analytical results.

Dallman Ash Pond - SPLP/TCLP Results – Mercury

Method	Units	D1 19.5-21.5	D1 36.5-38.5	D2 19.5-21.5	D2 33.5-35.5	D3 4.5-6.5	D3 14.5-29.5	D4 19.5-21.5	D4 29.5-31.5	Min	Max	Avg
SPLP	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0002	0.0002	0.0002
TCLP	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.00029	< 0.0002	0.0002	0.00029	0.000211

The porewater volume of the surface impoundment is 582,000,000 L. Mercury concentrations were non-detect (<0.0002 mg/L) for all SPLP samples. Using detection limit value (0.0002 mg/L) the total mass of mercury is:

= 0.0002 mg/L x 582,000,000 L = 0.116 kg

Based upon a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the mercury leaching rate per metric ton of ash is:

= 0.116 kg / 1,424,736 metric tons = 0.0000814 g Mercury/metric ton ash

Dallman Ash Pond - Porewater Results – Mercury, total and dissolved

Method	Units	Date	D1	D2	D3	D4	Min	Max	Avg
Total	mg/L	4/29/24	0.00562	0.00046	H 0.00685	0.00717	0.00046	0.00717	0.005025
Dissolved	mg/L	7/19/24	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0002	0.0002	0.0002
Total	mg/L	7/19/24	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0002	0.0002	0.0002

Mercury concentrations were non-detect (<0.0002 mg/L) for all dissolved mercury porewater samples. Using the detection limit value (0.0002 mg/L) the total mass of mercury is:

= 0.0002 mg/L x 582,000,000 L = 0.116 kg

Using a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum mercury leaching rate per metric ton of ash is:

= 0.116 kg / 1,424,736 metric tons = 0.0000814 g Mercury/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Dallman Ash Pond - Results Comparison – Mercury

Parameter	SPLP	Porewater
Maximum Mercury Concentration	0.0002 mg/L	0.0002 mg/L
Total Mercury Mass	0.116 kg	0.116 kg

The concentrations of mercury for both the SPLP and porewater samples were non-detect (<0.0002 mg/L). The total mercury mass is estimated to be 0.116 kg.

The non-detect mercury results in both SPLP and porewater samples from Dallman Ash Pond reflect mercury's extreme immobility in coal ash environments. Three geochemical factors drive this behavior: 1) mercury readily volatilizes during coal combustion, leaving minimal soluble Hg^{2+} in ash; 2) residual mercury adsorbs irreversibly to carbon particles or sulfides in ash, forming insoluble complexes (e.g., HgS, Hg^0); and 3) submerged, reducing conditions in the pond favor precipitation as cinnabar (HgS) or amalgamation with other metals.

Mercury's mobility is inherently low due to high affinity for organic/sulfide phases (log K_d<5), volatility limiting aqueous residence, and reduction to insoluble Hg^0 under anoxia.

Consequently, mercury rarely migrates beyond ash deposits, posing negligible groundwater risk. The non-detects in both methods confirm that standardized leaching tests and porewater sampling align for mercury, unlike mobile constituents (e.g., Li, As), due to its near-total sequestration. Any long-term release would require oxidation or sulfide dissolution, which is unlikely in stable impoundments.

Lakeside Ash Pond - SPLP/TCLP Results – Mercury

Method	Units	L1 14.5-21.5	L1 24.5-31.5	L3 19.5-21.5	L3 29.5-32.7	L4 10-15.3	L5 19.5-21.5	L5 32.5-35.2	Min	Max	Avg
SPLP	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0002	0.0002	0.0002
TCLP	mg/L	< 0.0002	< 0.0002	0.00028	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0002	0.00028	0.000211

Note:
H - Holding times exceeded

The porewater volume of the surface impoundment is 351,572,000 L. Using an average concentration (0.0002 mg/L) the total mass of mercury is:

= 0.0002 mg/L x 351,572,000 L = 0.0703 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the average mercury leaching rate per metric ton of ash is:

= 0.0703 kg / 430,324 metric tons = 0.000163 g Mercury/metric ton ash

Lakeside Ash Pond - Porewater Results – Mercury, total and dissolved

Method	Units	Date	L1	L3	L4	L5	Min	Max	Avg
Total	mg/L	4/29/24	0.00198	0.00926	0.0005	0.00559	0.0005	0.00926	0.004333
Dissolved	mg/L	7/19/24	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0002	0.0002	0.0002
Total	mg/L	7/19/24	< 0.0002	< 0.0002	0.0003	< 0.0002	0.0002	0.0003	0.000225

Mercury concentrations were non-detect (<0.0002 mg/L) for all dissolved mercury porewater samples. Using the detection limit value (0.0002 mg/L) the total mass of mercury is:

= 0.0002 mg/L x 351,572,000 L = 0.0703 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the average and maximum mercury leaching rate per metric ton of ash is:

= 0.0703 kg / 430,324 metric tons = 0.000163 g Mercury/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Lakeside Ash Pond - Results Comparison – Mercury

Parameter	SPLP	Porewater
Average Mercury Concentration	0.0002 mg/L	0.0002 mg/L
Total Mercury Mass	0.0703 kg	0.0703 kg

The concentrations of mercury in the SPLP sample are the same as the porewater results (0.0002 mg/L vs. 0.0002 mg/L). The total mercury mass in porewater and SPLP samples is 0.0703 kg. These results are similar to the Dallman Ash Pond SPLP and porewater analytical results. See discussion above.

6.12 Molybdenum

The mass of molybdenum leachable from fly ash and bottom ash in a CCR surface impoundment was estimated from the SPLP and porewater analytical results.

Dallman Ash Pond - SPLP/TCLP Results – Molybdenum

Method	Units	D1 19.5-21.5	D1 36.5-38.5	D2 19.5-21.5	D2 33.5-35.5	D3 4.5-6.5	D3 14.5-29.5	D4 19.5-21.5	D4 29.5-31.5	Min	Max	Avg
SPLP	mg/L	0.216	0.144	0.155	5.21	0.0138	0.0355	0.0495	0.134	0.0138	5.21	0.745
TCLP	mg/L	0.0402	0.0554	0.0571	1.27	0.0375	0.0415	0.105	0.179	0.0375	1.27	0.223

The porewater volume of the surface impoundment is 582,000,000 L. Using an average concentration (0.745 mg/L) the total mass of molybdenum is:

= 0.745 mg/L x 582,000,000 L = 434 kg

Conservative estimate using the maximum concentration (5.21 mg/L) is:

= 5.21 mg/L x 582,000,000 L = 3,030 kg

Based upon a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum molybdenum leaching rate per metric ton of ash is:

= 434 kg / 1,424,736 metric tons = 0.305 g Molybdenum/metric ton ash

= 3,030 kg / 1,424,736 metric tons = 2.13 g Molybdenum/metric ton ash

Dallman Ash Pond - Porewater Results – Molybdenum, total and dissolved

Method	Units	Date	D1	D2	D3	D4	Min	Max	Avg
Total	mg/L	4/29/24	15.7	8.04	2.61	2.3	2.3	15.7	7.16
Dissolved	mg/L	7/19/24	10.4	6.58	2.78	3.61	2.78	10.4	5.84
Total	mg/L	7/19/24	11.7	7.04	2.89	3.77	2.89	11.7	6.35

Using average porewater data for molybdenum, dissolved, the total mass is:

= 5.84 mg/L x 582,000,000 L = 3,399 kg

Conservative estimate using the maximum concentrations (10.4 mg/L) is:

= 5.84 mg/L x 582,000,000 L = 6,053 kg

Using a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum molybdenum leaching rate per metric ton of ash is:

= 3,399 kg / 1,424,736 metric tons = 2.39 g Molybdenum/metric ton ash

= 6,053 kg / 1,424,736 metric tons = 4.25 g Molybdenum/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Dallman Ash Pond - Results Comparison – Molybdenum

Parameter	SPLP	Porewater
Average Molybdenum Concentration	0.745 mg/L	5.84 mg/L
Total Molybdenum Mass	434 kg	3,399 kg

The concentrations of molybdenum in the SPLP sample are approximately 87% lower compared to porewater results (0.745 mg/L vs. 5.84 mg/L). The total molybdenum mass in porewater is 3,399-6,053 kg, significantly higher than SPLP-derived estimates (434-3,030 kg).

The stark difference in molybdenum concentrations stems from molybdenum's unique pH-dependent geochemistry and the contrasting conditions of the tests.

SPLP's acidic environment (pH 4.2) triggers molybdenum adsorption onto iron/aluminum oxides and clay minerals, where it forms strong inner-sphere complexes (e.g., ≡Fe–MoO_4^+). This immobilizes dissolved molybdenum. Conversely, the alkaline porewater (pH 8–12) in the ash pond generates negatively charged mineral surfaces that repel molybdate anions (MoO_4^{2-}), while high pH also dissolves Mo-bearing phases (e.g., powellite, $CaMoO_4$), enhancing solubility.

Molybdenum's mobility is exceptionally high in alkaline settings due to: 1) as an oxyanion, it resists adsorption at high pH; 2) few insoluble phases form in typical groundwater; and 3) Mo(VI) dominates across most Eh conditions.
Once released, molybdenum migrates conservatively with groundwater flow, forming extensive plumes with minimal attenuation—unlike cationic metals (e.g., Pb, Cd) that adsorb or precipitate.

SPLP's low-pH chemistry artificially immobilizes molybdenum through adsorption mechanisms irrelevant to the actual alkaline impoundment. Porewater data thus reveals the true leaching potential, confirming molybdenum as a high-priority contaminant in CCR sites. Its long-term

mobility depends solely on pH stability; acidification could reduce flux, but alkaline plumes may migrate kilometers downgradient.

Lakeside Ash Pond - SPLP/TCLP Results – Molybdenum

Method	Units	L1 14.5-21.5	L1 24.5-31.5	L3 19.5-21.5	L3 29.5-32.7	L4 10-15.3	L5 19.5-21.5	L5 32.5-35.2	Min	Max	Avg
SPLP	mg/L	0.0145	< 0.01	0.0111	0.0169	< 0.01	J 0.0076	0.0904	0.0076	0.0904	0.0229
TCLP	mg/L	< 0.01	0.0118	0.0307	< 0.01	< 0.01	J 0.0081	0.0375	0.0081	0.0375	0.0169

Note:
J - Analyte detected below quantitation limits

The porewater volume of the surface impoundment is 351,572,000 L. Using an average concentration (0.0229 mg/L) the total mass of molybdenum is:

= 0.0229 mg/L x 351,572,000 L = 8.05 kg

Conservative estimate using the maximum concentration (0.0904 mg/L) is:

= 0.0904 mg/L x 351,572,000 L = 31.8 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the average and maximum molybdenum leaching rate per metric ton of ash is:

= 8.05 kg / 430,324 metric tons = 0.0187 g Molybdenum/metric ton ash

= 31.8 kg / 430,324 metric tons = 0.0739 g Molybdenum/metric ton ash

Lakeside Ash Pond - Porewater Results – Molybdenum, total and dissolved

Method	Units	Date	L1	L3	L4	L5	Min	Max	Avg
Total	mg/L	4/29/24	0.161	0.218	0.0218	0.282	0.0218	0.282	0.171
Dissolved	mg/L	7/19/24	0.0903	0.0571	< 0.01	0.366	0.01	0.366	0.131
Total	mg/L	7/19/24	0.0942	0.0611	0.01	0.378	0.01	0.378	0.136

Using average porewater data for molybdenum, dissolved, the total mass is:

= 0.131 mg/L x 351,572,000 L = 46.1 kg

Conservative estimate using the maximum concentration (0.378 mg/L) is:

= 0.366 mg/L x 351,572,000 L = 129 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the average and maximum molybdenum leaching rate per metric ton of ash is:

= 46.1 kg / 430,324 metric tons = 0.107 g Molybdenum/metric ton ash

= 129 kg / 430,324 metric tons = 0.299 g Molybdenum/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Lakeside Ash Pond - Results Comparison – Molybdenum

Parameter	SPLP	Porewater
Average Molybdenum Concentration	0.0229 mg/L	0.131 mg/L
Total Molybdenum Mass	8.05 kg	46.1 kg

Similar to the Dallman Ash Pond results, the concentrations of molybdenum in the SPLP sample are approximately 83% lower compared to porewater results (0.0229 mg/L vs. 0.131 mg/L). The total molybdenum mass in porewater is 46.1-129 kg, significantly higher than SPLP-derived estimates (8.05-31.8 kg). See discussion above.

6.13 Selenium

The mass of selenium leachable from fly ash and bottom ash in a CCR surface impoundment was estimated from the SPLP and porewater analytical results.

Dallman Ash Pond - SPLP/TCLP Results – Selenium

Method	Units	D1 19.5-21.5	D1 36.5-38.5	D2 19.5-21.5	D2 33.5-35.5	D3 4.5-6.5	D3 14.5-29.5	D4 19.5-21.5	D4 29.5-31.5	Min	Max	Avg
SPLP	mg/L	J 0.03	J 0.021	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	J 0.021	0.021	0.05	0.0403
TCLP	mg/L	J 0.017	J 0.037	J 0.017	< 0.05	< 0.05	J 0.03	< 0.05	J 0.022	0.017	0.05	0.0341

Note:
J - Analyte detected below quantitation limits

The porewater volume of the surface impoundment is 582,000,000 L. Using an average concentration (0.0403 mg/L) the total mass of selenium is:

= 0.0403 mg/L x 582,000,000 L = 23.5 kg

Conservative estimate using the maximum concentration (0.05 mg/L) is:

= 0.05 mg/L x 582,000,000 L = 29.1 kg

Based upon a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum selenium leaching rate per metric ton of ash is:

= 23.5 kg / 1,424,736 metric tons = 0.0165 g Selenium/metric ton ash

= 29.1 kg / 1,424,736 metric tons = 0.0204 g Selenium/metric ton ash

Dallman Ash Pond - Porewater Results – Selenium, total and dissolved

Method	Units	Date	D1	D2	D3	D4	Min	Max	Avg
Total	mg/L	4/29/24	J 0.1	< 0.05	J 0.13	J 0.09	0.05	0.13	0.0925
Dissolved	mg/L	7/19/24	J 0.032	J 0.036	< 0.04	0.143	0.032	0.143	0.0628
Total	mg/L	7/19/24	J 0.036	J 0.024	J 0.028	0.158	0.024	0.158	0.0615

Note:
J - Analyte detected below quantitation limits

Using average porewater data for selenium, dissolved, the total mass is:

= 0.0628 mg/L x 582,000,000 L = 36.5 kg

Conservative estimate using the maximum concentrations (0.143 mg/L) is:

= 0.143 mg/L x 582,000,000 L = 83.2 kg

Using a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum selenium leaching rate per metric ton of ash is:

= 36.5 kg / 1,424,736 metric tons = 0.0257 g Selenium/metric ton ash

= 83.2 kg / 1,424,736 metric tons = 0.0584 g Selenium/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Dallman Ash Pond - Results Comparison – Selenium

Parameter	SPLP	Porewater
Average Selenium Concentration	0.0403 mg/L	0.0628 mg/L
Total Selenium Mass	23.5 kg	36.5 kg

The concentrations of selenium in the SPLP sample are approximately 36% lower compared to porewater results (0.0403 mg/L vs. 0.0628 mg/L). The total selenium mass in porewater is 36.5-83.2 kg, significantly higher than SPLP-derived estimates (23.5-29.1 kg).

The higher selenium concentrations in Dallman Ash Pond's porewater compared to SPLP results with porewater mass estimates significantly exceeding SPLP-derived values result from selenium's redox-driven geochemistry and the contrasting conditions between field and lab environments. In SPLP's acidic (pH 4.2), oxygenated setting, selenium adsorbs strongly to iron oxides as immobile selenite [Se(IV)]. Conversely, the pond's alkaline (pH 8–12), reducing conditions stabilize mobile selenite [Se(IV)] while suppressing further reduction to insoluble elemental selenium [Se(0)]. This partial reduction traps selenium in its soluble Se(IV) form, enhancing porewater concentrations.

Selenium mobility hinges on three factors: 1) oxic conditions favor mobile selenate [Se(VI)]; reducing environments stabilize Se(IV) or Se(0); 2) alkaline conditions diminish adsorption of Se(IV) onto mineral surfaces; 3) sulfate and bicarbonate in porewater displace adsorbed selenium.

In groundwater, selenium's extent is determined by redox gradients. If reducing conditions persist, Se(IV) migrates moderately via advection but may attenuate where full reduction to Se(0) occurs. Oxidation during pond closure could convert Se(IV) to highly mobile Se(VI), forming extensive plumes. SPLP underestimates in-situ selenium because its acidic, oxic chemistry immobilizes selenium through adsorption irrelevant to the pond's actual reducing, alkaline environment. Porewater data thus better reflects current leaching risk, though long-term stability depends on maintaining reducing conditions to limit Se(VI) generation.

Lakeside Ash Pond - SPLP/TCLP Results – Selenium

Method	Units	L1 14.5-21.5	L1 24.5-31.5	L3 19.5-21.5	L3 29.5-32.7	L4 10-15.3	L5 19.5-21.5	L5 32.5-35.2	Min	Max	Avg
SPLP	mg/L	J 0.019	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.019	0.05	0.0456
TCLP	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	0.05	0.05

Note:
J - Analyte detected below quantitation limits

The porewater volume of the surface impoundment is 351,572,000 L. Using an average concentration (0.0456 mg/L) the total mass of selenium is:

= 0.0456 mg/L x 351,572,000 L = 16.0 kg

Conservative estimate using the maximum concentration (0.05 mg/L) is:

= 0.05 mg/L x 351,572,000 L = 17.6 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the average and maximum selenium leaching rate per metric ton of ash is:

= 16.0 kg / 430,324 metric tons = 0.0372 g Selenium/metric ton ash

= 17.6 kg / 430,324 metric tons = 0.0409 g Selenium/metric ton ash

Lakeside Ash Pond - Porewater Results – Selenium, total and dissolved

Method	Units	Date	L1	L3	L4	L5	Min	Max	Avg
Total	mg/L	4/29/24	0.0906	0.158	0.0066	0.205	0.0066	0.205	0.115
Dissolved	mg/L	7/19/24	< 0.04	J 0.022	0.0456	J 0.034	0.022	0.0456	0.0354
Total	mg/L	7/19/24	J 0.026	J 0.027	0.0428	J 0.028	0.026	0.0428	0.0310

Note:
J - Analyte detected below quantitation limits

Using average porewater data for selenium, dissolved, the total mass is:

= 0.0354 mg/L x 351,572,000 L = 12.4 kg

Conservative estimate using the maximum concentration (0.0456 mg/L) is:

= 0.0456 mg/L x 351,572,000 L = 16.0 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the average and maximum selenium leaching rate per metric ton of ash is:

= 12.4 kg / 430,324 metric tons = 0.0289 g Selenium/metric ton ash

= 16.0 kg / 430,324 metric tons = 0.0373 g Selenium/metric ton ash

Comparison of the conservative porewater results with the SPLP estimate:

Lakeside Ash Pond - Results Comparison – Selenium

Parameter	SPLP	Porewater
Average Selenium Concentration	0.0456 mg/L	0.0354 mg/L
Total Selenium Mass	16.0 kg	12.4 kg

The concentrations of selenium, dissolved, in the porewater sample are approximately 22% lower compared to SPLP results (0.0354 mg/L vs. 0.0456 mg/L). The total selenium mass in porewater is 12.4-16.0 kg, is slightly lower than SPLP-derived estimates (16.0-17.6 kg).

Selenium is a redox-sensitive anion-forming element commonly associated with coal combustion residues and is known for its potential environmental mobility and ecological effects.

The SPLP result for the Lakeside Ash Pond was unexpectedly higher than porewater, suggesting the acidic SPLP leachate (pH ~4.2–4.8) may promote desorption or dissolution of selenium from ash surfaces that are otherwise more stable under neutral pH porewater conditions. The SPLP test environment is more oxidizing, favoring formation and release of selenate, the more mobile selenium species. The SPLP test may extract selenium that is not readily soluble under in-situ conditions but becomes mobilized under artificial laboratory conditions.

The selenium SPLP mass estimates for the Lakeside Ash Pond are only modestly greater, suggesting that field porewater concentrations reflect a reasonably representative long-term leaching scenario. SPLP overestimates mobility for selenium under certain conditions by not accounting for redox-controlled sorption or retention processes present in the field.

Given that the total selenium mass estimates differ by less than a factor of two, both datasets may be considered complementary for characterizing selenium mobility, with field conditions providing the more environmentally relevant perspective.

6.14 Thallium

The mass of thallium leachable from fly ash and bottom ash in a CCR surface impoundment was estimated from the SPLP and porewater analytical results.

Dallman Ash Pond - SPLP/TCLP Results – Thallium

		D1	D1	D2	D2	D3	D3	D4	D4			
Method	Units	19.5-21.5	36.5-38.5	19.5-21.5	33.5-35.5	4.5-6.5	14.5-29.5	19.5-21.5	29.5-31.5	Min	Max	Avg
SPLP	mg/L	< 0.002	J 0.001	< 0.002	J 0.0015	< 0.002	J 0.0017	J 0.0017	J 0.0013	0.001	0.002	0.00165
TCLP	mg/L	0.0229	0.0268	0.0257	J 0.0018	0.0252	0.0185	0.0225	0.0243	0.0018	0.0268	0.0210

Note:
J - Analyte detected below quantitation limits

The porewater volume of the surface impoundment is 582,000,000 L. Using an average concentration (0.165 mg/L) the total mass of thallium is:

= 0.00165 mg/L x 582,000,000 L = 0.960 kg

Conservative estimate using the maximum concentration (0.002 mg/L) is:

= 0.002 mg/L x 582,000,000 L = 1.16 kg

Based upon a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum thallium leaching rate per metric ton of ash is:

= 0.960kg / 1,424,736 metric tons = 0.000674 g Thallium/metric ton ash

= 1.16 kg / 1,424,736 metric tons = 0.000814 g Thallium/metric ton ash

Dallman Ash Pond - Porewater Results – Thallium, total and dissolved

Method	Units	Date	D1	D2	D3	D4	Min	Max	Avg
Total	mg/L	4/29/24	J 0.13	J 0.049	0.274	J 0.066	0.049	0.274	0.130
Dissolved	mg/L	7/19/24	< 0.002	< 0.002	0.0021	J 0.0017	0.0017	0.0021	0.00195
Total	mg/L	7/19/24	0.0035	0.0044	0.003	0.0071	0.003	0.0071	0.0045

Note:
J - Analyte detected below quantitation limits

Using average porewater data for thallium, dissolved, the total mass is:

= 0.00195 mg/L x 582,000,000 L = 1.13 kg

Conservative estimate using the maximum concentrations (0.0021 mg/L) is:

= 0.0021 mg/L x 582,000,000 L = 1.22 kg

Using a total ash mass in the surface impoundment of 1,424,736,000 kg (1.42 million metric tons), the average and maximum thallium leaching rate per metric ton of ash is:

= 1.13 kg / 1,424,736 metric tons = 0.000797 g Thallium/metric ton ash

= 1.22 kg / 1,424,736 metric tons = 0.000858 g Thallium/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Dallman Ash Pond - Results Comparison – Thallium

Parameter	SPLP	Porewater
Average Thallium Concentration	0.00165 mg/L	0.00195 mg/L
Total Thallium Mass	0.960 kg	1.13 kg

The concentrations of thallium in the SPLP sample are approximately 15% lower compared to porewater results (0.00165 mg/L vs. 0.00195 mg/L). The total thallium mass in porewater is 1.13-1.22 kg, somewhat higher than SPLP-derived estimates (0.960-1.16 kg).

The modestly higher thallium concentrations in Dallman Ash Pond's porewater compared to SPLP results arise from thallium's unique cationic geochemistry and subtle pH-dependent interactions. In SPLP's acidic environment (pH 4.2), thallium (Tl^+) competes with abundant H^+ ions for sorption sites on clay minerals and metal oxides, partially suppressing dissolution. Conversely, the alkaline porewater (pH 8–12) contains high concentrations of Na^+ and K^+ (common in coal ash leachates), which displace weakly adsorbed Tl^+ from exchange sites via ion competition, enhancing its solubility. This ion exchange effect, absent in SPLP's low-ionic-strength leachant, drives the small but consistent increase in porewater concentrations.

Thallium mobility in groundwater is governed by three key characteristics: 1) Tl^+ adsorbs moderately to clay/oxide surfaces (K_d ~10–100 L/kg), but is readily displaced by K^+/Na^+; 2) unlike metals like lead, thallium lacks highly insoluble phases; and 3) Tl(I) dominates in most conditions, though oxidation to Tl(III) can occur in Mn-rich settings.

These traits allow thallium to migrate farther than strongly sorbed metals (e.g., lead) but not as conservatively as anions (e.g., molybdenum). Plumes typically extend 100–500 meters downgradient, attenuated gradually by adsorption. The SPLP slightly under predicts in-situ mobility because it fails to replicate the ion-rich porewater that liberates Tl^+ via competition. While the mass difference is small (~15%), porewater data better reflects actual flux, particularly in alkaline CCR impoundments where cation competition is pronounced. Long-term risks depend on downgradient potassium/sodium levels and pH stability.

Lakeside Ash Pond - SPLP/TCLP Results – Thallium

Method	Units	L1 14.5-21.5	L1 24.5-31.5	L3 19.5-21.5	L3 29.5-32.7	L4 10-15.3	L5 19.5-21.5	L5 32.5-35.2	Min	Max	Avg
SPLP	mg/L	< 0.002	< 0.002	< 0.002	< 0.002	J 0.0011	< 0.002	J 0.0019	0.0011	0.002	0.00186
TCLP	mg/L	0.0023	0.0041	0.0086	0.006	J 0.0015	0.0199	0.0021	0.0015	0.0199	0.00636

Note:
J - Analyte detected below quantitation limits

The porewater volume of the surface impoundment is 351,572,000 L. Using an average concentration (0.00186 mg/L) the total mass of thallium is:

= 0.00186 mg/L x 351,572,000 L = 0.654 kg

Conservative estimate using the maximum concentration (0.002 mg/L) is:

= 0.002 mg/L x 351,572,000 L = 0.703 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the average and maximum thallium leaching rate per metric ton of ash is:

= 0.654 kg / 430,324 metric tons = 0.00152 g Thallium/metric ton ash

= 0.703 kg / 430,324 metric tons = 0.00163 g Thallium/metric ton ash

Lakeside Ash Pond - Porewater Results – Thallium, total and dissolved

Method	Units	Date	L1	L3	L4	L5	Min	Max	Avg
Total	mg/L	4/29/24	< 0.04	0.0433	J 0.0012	< 0.1	0.0012	0.1	0.0461
Dissolved	mg/L	7/19/24	< 0.002	< 0.002	< 0.002	0.0023	0.002	0.0023	0.00208
Total	mg/L	7/19/24	J 0.001	< 0.002	0.0055	0.0036	0.001	0.0055	0.00303

Note:
J - Analyte detected below quantitation limits

Using average porewater data for thallium, dissolved, the total mass is:

= 0.00208 mg/L x 351,572,000 L = 0.731 kg

Conservative estimate using the maximum concentration (0.0023 mg/L) is:

= 0.0023 mg/L x 351,572,000 L = 0.809 kg

Based upon a total ash mass in the surface impoundment of 430,324,128 kg (0.430 million metric tons), the average and maximum thallium leaching rate per metric ton of ash is:

= 0.731 kg / 430,324 metric tons = 0.00170 g Thallium/metric ton ash

= 0.809 kg / 430,324 metric tons = 0.00188 g Thallium/metric ton ash

Comparison of the porewater results with the SPLP estimate:

Lakeside Ash Pond - Results Comparison – Thallium

Parameter	SPLP	Porewater
Average Thallium Concentration	0.00186 mg/L	0.00208 mg/L
Total Thallium Mass	0.654 kg	0.731 kg

Similar to the Dallman Ash Pond, the concentrations of thallium in the Lakeside Ash Pond SPLP sample are approximately 11% lower compared to porewater results (0.00186 mg/L vs. 0.00208 mg/L). The total thallium mass in porewater is 0.731-0.809 kg, higher than SPLP-derived estimates (0.654-0.703 kg). See discussion above.

6.15 Radium 226 and 228 combined

The mass of radium 226 and radium 228 combined leachable from fly ash and bottom ash in a CCR surface impoundment was estimated from the solids and porewater analytical results.

The radium 226 and radium 228 CCR solids samples were analyzed using SW-846 Method 9315 and SW-846 Method 9320. Method 9315 is used to determine the concentrations of radium-226 (Ra-226) and radium-228 (Ra-228) in solid and aqueous environmental samples (e.g., soil, sediment, sludge, ash, and groundwater). Method 9320 is used to measure the concentration of radium-226 (Ra-226) in water samples (specifically drinking water, groundwater, and surface water).

The radium 226 and radium 228 CCR porewater samples were analyzed using EPA 903.0 and EPA 904.0, respectively.

Dallman Ash Pond - Results – Radium 226 and 228 combined

Method	Units	D1 19.5-21.5	D1 36.5-38.5	D2 19.5-21.5	D2 33.5-35.5	D3 4.5-6.5	D3 14.5-29.5	D4 19.5-21.5	D4 29.5-31.5	Min	Max	Avg
9315/9320	pCi/g	< 2	< 2	< 2	< 2	< 2		< 2	< 2	2	2	2

The total mass of combined Radium-226 and Radium-228 in the surface impoundment is based on the given concentration in the ash solids. Given a radium-226 and radium-228 combined concentration of 2 pCi/g (in ash), and a total ash mass of 1,424,736,000 kg (1.42 million metric tons), the total radioactivity (pCi) is:

Total activity = Concentration x Mass of Ash

Total activity = 2000 pCi/kg x 1,424,736,000 kg = 2,849,472,000,000 pCi

Converting activity to mass (using Ra-226 specific activity = 1 Ci/g = 3.7 x 10^{10} pCi/g):

Mass = 2,849,472,000,000 / 3.7 x 10^{10} pCi/g = 0.0770 kg

The total combined mass of Radium-226 and Radium-228 in the ash is approximately 0.0770 kg. This assumes the entire 2 pCi/g is due to Ra-226 or an average radionuclide with similar specific activity. If Ra-228, with a much shorter half-life, were dominant, the mass would be even smaller.

Dallman Ash Pond - Porewater Results – Radium 226 and 228 combined

Method	Units	Date	D1	D2	D3	D4	Min	Max	Avg
9320	pci/L	4/29/24	< 1.43	6.81	< 2.5	< 3.34	1.43	6.81	3.52

The total mass of combined radium 226 and radium 228 in porewater is calculated using the total activity for the average combined concentration and the total activity:

Total activity = Concentration x Volume

Total activity = 3.52 pCi/L x 582,000,000 L = 2,048,640,000 pCi

For the maximum concentration (6.81 pCi/L) the total activity is:

Total activity = 6.81 pCi/L x 582,000,000 L = 3,963,420,000 pCi

Converting activity to mass (using Ra-226 equivalence):

Mass = 2,048,640,000 pCi / 3.7 x 10^{10} pCi/g = 0.0000554 kg

And for the maximum concentration:

Mass = 3,963,420,000 pCi / 3.7 x 10^{10} pCi/g = 0.000107 kg

The total combined mass of Radium-226 and Radium-228 in the ash is approximately 0.0000554 to 0.000107 kg. This assumes the specific activity of Ra-226; if Ra-228 dominates (which has a much higher specific activity due to its shorter half-life), the actual mass would be smaller.

Dallman Ash Pond - Results Comparison – Radium 226 and 228 combined

Parameter	SPLP	Porewater
Average Radium 226 and 228 combined Concentration	2 pCi/g	3.52 pCi/L
Total Radium 226 and 228 combined Mass	0.0770 kg	0.0000554 kg

The concentrations of radium 226 and 228 combined, in the SPLP and porewater samples are given in different units (pCi/kg and pCi/L, respectively). The total radium 226 and 228 combined mass in porewater is 0.0000554 kg, is significantly less than the SPLP-derived estimate (0.0770 kg).

The observed discrepancy in the total mass of radium-226 (Ra-226) and radium-228 (Ra-228) between the coal combustion residual (CCR) solids (fly ash and bottom ash) and the associated porewater reflects important geochemical and risk-based differences. These differences are influenced by the mobility of radium in CCR environments and have direct implications for human health risk assessments. Solids Analysis (SW-846 Methods 9315 & 9320) shows significantly higher total mass of Ra-226 and Ra-228. Porewater Analysis (EPA Methods 903.0 & 904.0)

shows much lower total radium mass. Based upon the evaluation, approximately 99% of total radium mass is retained in the solid phase.

The likely causes of the discrepancy include factors which limit radium mobility such as sorption and incorporation into solid matrix. Radium strongly adsorbs to iron and manganese oxides, aluminosilicates, and other mineral phases present in fly ash and bottom ash. In some cases, radium may be co-precipitated or structurally incorporated into solid phases (e.g., barium sulfate or carbonate minerals).

The geochemical conditions of CCR porewater that may contribute to this discrepancy include high pH typical of CCR porewater (>8.5–11). High pH promotes low radium solubility due to formation of insoluble hydroxides or competition with Ca^{2+}, Ba^{2+}, and Sr^{2+} for exchange sites. Also, the redox environment and the absence of strong complexing agents also reduce Ra mobility.

Low partitioning to aqueous phase may also contribute to the discrepancy. The distribution coefficient (Kd) for radium in CCR environments is often high, meaning only a small fraction partitions to water.

Therefore, despite high solid-phase concentrations, porewater concentrations may remain low unless geochemical conditions shift.

Porewater concentrations are more representative of risk. Human exposure risk from CCR sites (particularly for groundwater users) is generally driven by dissolved-phase transport of contaminants—what can leach and migrate into drinking water supplies.

The solid-phase inventory is useful for understanding the long-term potential for release (i.e., source strength), but does not represent an immediate risk unless radium becomes mobilized.

The large mass of Ra-226 and Ra-228 in CCR solids demonstrates a substantial source term, but the very low porewater concentrations indicate limited current mobility under site conditions. From a risk assessment perspective, porewater concentrations are the more relevant and protective measure of human health risk, particularly for groundwater contamination pathways.

Lakeside Ash Pond – Results – Radium 226 and 228 combined

Method	Units	L1 14.5-21.5	L1 24.5-31.5	L3 19.5-21.5	L3 29.5-32.7	L4 10-15.3	L5 19.5-21.5	L5 32.5-35.2	Min	Max	Avg
SPLP	pCi/g	< 2	< 2	< 2	< 2	< 2	< 3.31	< 3.55	2	3.55	2.41

Given a radium-226 and radium-228 combined average concentration of 2.41 pCi/g (in ash), and a total ash mass of 430,324,128 kg (0.430 million metric tons), the total radioactivity (pCi) is:

Total activity = 2,410 pCi/kg x 430,324,128 kg = 1,037,081,148,000 pCi

For the maximum combined radium 226 and radium 228 concentration (3.55 pCi/kg), the total activity is:

Total activity = 3,550 pCi/kg x 430,324,128 kg = 1,527,650,654,000 pCi

The mass calculation assumes an average effective specific activity for radium-226:

Mass = 1,037,081,148,000 pCi / 3.7 x 10^{10} pCi/g = 0.0280 kg

And for the maximum combined radium-226 and radium-228 concentration (3.55 pCi/kg), the mass is:

Mass = 1,527,650,654,000 pCi / 3.7 x 10^{10} pCi/g = 0.0413 kg

The total combined mass of Radium-226 and Radium-228 in the ash is approximately 0.0280 kg to 0.0413 kg. This assumes the entire combined mass of radium-226 and radium-228 is due to Ra-226 or an average radionuclide with similar specific activity. If Ra-228, with a much shorter half-life, were dominant, the mass would be even smaller.

Lakeside Ash Pond - Porewater Results – Radium 226 and 228 combined

Method	Units	Date	L1	L3	L4	L5	Min	Max	Avg
Porewater	pci/L	4/29/24	< 1.25	2.5	1.05	17.7	1.05	17.7	5.64

The total mass of combined radium 226 and radium 228 in porewater is calculated using the total activity for the average combined concentration and the total activity:

Total activity = 5.64 pCi/L x 351,572,000 L = 1,982,866,080 pCi

For the maximum combined radium 226 and radium 228 concentration (17.7 pCi/L), the total activity is:

Total activity = 17.7 pCi/L x 351,572,000 L = 6,222,824,400 pCi

Since the activity is combined, the combined mass is calculated assuming an average effective specific activity for radium-226:

$$\text{Mass} = 1{,}982{,}866{,}080 \text{ pCi} / 3.7 \times 10^{10} \text{ pCi/g} = 0.0000536 \text{ kg}$$

And for the maximum combined radium-226 and radium-228 concentration, the mass is:

$$\text{Mass} = 6{,}222{,}824{,}400 \text{ pCi} / 3.7 \times 10^{10} \text{ pCi/g} = 0.000168 \text{ kg}$$

The total combined mass of Radium-226 and Radium-228 in the ash is approximately 0.0000536 kg to 0.000168 kg. This assumes the specific activity of Ra-226; if Ra-228 dominates (which has a much higher specific activity due to its shorter half-life), the actual mass would be smaller.

Lakeside Ash Pond - Results Comparison – Radium 226 and 228 combined

Parameter	SPLP	Porewater
Average Radium 226 and 228 combined Concentration	2.41 pCi/kg	5.64 pCi/L
Total Radium 226 and 228 combined Mass	0.0280 kg	0.0000536 kg

The concentrations of radium 226 and 228 combined, in the solids and porewater analytical results are given in different units (pCi/kg and pCi/L, respectively) and cannot be directly compared. The total radium 226 and 228 combined mass in porewater is 0.0000536-0.000168 kg, and significantly less than that calculated for the solids derived estimate (0.0280-0.0413 kg). See discussion above.

7. CONCLUSIONS

Based upon an evaluation of the analytical data from the review period (first quarter 2022 through fourth quarter 2024) there were exceedances of the groundwater protection standards for arsenic at wells AW-1, RW-3, AP-7, and AP-8 and cobalt at wells AP-2A and AP-3. While the source of the arsenic and cobalt exceedances at wells adjacent to the CCR surface impoundments is likely due to leaching of the CCR, the spatial distribution of the impacts at wells north and west of Sugar Creek indicates the source is more likely attributed to other natural and/or anthropogenic sources.

The nature and extent of arsenic exceedances along the north side of the Dallman Ash Pond at wells AW-1, RW-3, AP-7, and AP-8 have been characterized. Advection appears to be the primary transport mechanism due to sustained groundwater flow, while diffusion is negligible because large, dilute plumes generate weak concentration gradients. At well AW-1, the limits of arsenic exceedances are delineated by the arsenic concentrations at G120, P06D, and R111. The arsenic exceedances at RW-3 are delineated by well AP-6. At well AP-7, the arsenic exceedances appear to be the result of natural spatial variability or influences from other sources

north of the impoundments. Bedrock contours and potentiometric surface data indicate groundwater converges on Sugar Creek with groundwater flow to the south, north of Sugar Creek and groundwater flow to the north, south of Sugar Creek. At well AP-8 the nature and extent of the arsenic exceedances are defined by well T-4. The wells (i.e., T-4, T-5, T-6, and AP-7) utilized in the evaluation of arsenic are all north of Sugar Creek, Wells AP-6 and RW-3 are located south of Sugar Creek.

Along the west side of the Dallman Ash Pond, the nature and extent of the cobalt exceedances at AP-2A and AP-3 are characterized by the cobalt concentrations at wells located west of Sugar Creek (i.e., AP-11, AP-12, and T-2). The cobalt exceedances at wells AP-2A and AP-3 may be related to the CCR surface impoundments; however, the concentrations of cobalt at wells AP-11, AP-12, and T-2 appears to be related to natural spatial variability or influences from other sources west of the impoundments. Bedrock contours and potentiometric surface data indicate groundwater converges on Sugar Creek with groundwater flow to the east, west of Sugar Creek and groundwater flow to the west, east of Sugar Creek.

Evaluation of porewater and synthetic precipitation leaching procedure (SPLP) analytical results provides important insight into the environmental mobility of arsenic and cobalt in the ash ponds. In the Dallman Ash Pond, the average arsenic concentration in porewater (0.124 mg/L) is approximately 84% higher than the SPLP concentration (0.0194 mg/L). Correspondingly, the estimated total arsenic mass in porewater (72.2–99.5 kg) is substantially greater than SPLP-derived estimates (11.3–27.4 kg). In the Lakeside Ash Pond, the average arsenic concentration in porewater (0.137 mg/L) is approximately 87% higher than in SPLP samples (0.0172 mg/L), and the estimated arsenic mass in porewater (48.2–159 kg) similarly exceeds SPLP-derived estimates (6.05–11.6 kg). These findings suggest that site-specific porewater conditions—characterized by elevated pH and potentially reducing environments—enhance arsenic solubility and mobility, conditions not replicated under SPLP's acidic leaching environment. As a result, SPLP may under predict the mass and leachability of arsenic from CCR under field-relevant conditions.

In the Dallman Ash Pond, the average porewater cobalt concentrations (0.00425 mg/L) are about 29% lower than SPLP results (0.006 mg/L), yielding comparable mass estimates (2.47–3.61 kg for porewater vs. 3.49 kg SPLP-derived). In the Lakeside Ash Pond, porewater cobalt concentrations (0.0086 mg/L) are approximately 30% higher than SPLP concentrations (0.006 mg/L), with estimated mass in porewater (3.02–6.82 kg) slightly exceeding SPLP-derived estimates (2.11 kg). The modest but notable differences between porewater and SPLP cobalt data highlight some influence of site geochemical conditions, though cobalt appears to be less sensitive to pH-driven mobilization than arsenic.

Taken together, the significantly higher arsenic concentrations and mass estimates in CCR porewater compared to SPLP data indicate that arsenic is mobilized under field conditions present within the ash ponds and that these conditions are not well captured by laboratory leaching tests.

This supports the conclusion that arsenic observed in groundwater at wells adjacent to the impoundments is likely at least partially attributable to leaching from CCR materials.

In contrast, cobalt exhibits smaller differences between porewater and SPLP results, suggesting that while leaching may occur, it may be less dependent on the site-specific geochemical conditions. Nonetheless, given the presence of statistically significant exceedances near the impoundments and measurable cobalt mass in porewater, CCR leaching remains a plausible source for observed cobalt concentrations in groundwater near the ash ponds.

Accordingly, the combined assessment of groundwater exceedances, hydrogeologic conditions, and constituent leaching behavior supports the conclusion that leachate originating from CCR units is a likely contributor to the observed arsenic and cobalt concentrations in certain downgradient wells. Continued assessment monitoring and corrective measures evaluation under 40 CFR § 257.95 are warranted to ensure protection of groundwater resources and inform closure strategy implementation.

The assessment of corrective measures per 40 CFR 257.95(g)(1) for the Appendix IV constituents identified as exhibiting Statistically Significant Levels (SSLs) identified in the February 13, 2025 Groundwater Protection Standards Report (GWPS Report) has been completed. The nature and extent of the Appendix IV exceedances are not expected to affect the proposed closure of the CCR surface impoundments (i.e., the selected remedy).

This report has provided a discussion of relevant site conditions necessary to characterize the nature and extent of the Appendix IV exceedances and any conditions that may affect the proposed closure of the CCR surface impoundments. Characterization of the release includes:

- A groundwater monitoring well network that adequately characterizes groundwater flow and the Appendix IV exceedances; and,
- A summary of analytical results for Appendix IV constituents and comparison to the established groundwater protection standards.

Assessment monitoring shall continue as specified in the GMP.

8. QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

I, Karl W. Finke, a qualified professional engineer in good standing in the State of Illinois, certify that the information in this report pursuant to 40 CFR 257.95(g)(3)(ii) is accurate as of the date of my signature below. The content of this report is not to be used for other than for its intended purpose and meaning, or for extrapolations beyond the interpretations contained herein.

Karl W. Finke
Professional Engineer
062-068571
Illinois
Andrews Engineering, Inc.
Date: June 11, 2025

License Expiration: November 30, 2025

TABLES

TABLE 1:
Groundwater Analytical Summary Data

City Water, Light and Power
Power Plant Ash Impoundment
2022 - 2024 Summary of Exceedances

Well	Parameter	Units	Background	40 CFR 257	MCL 40 CFR 141	GPS	2022-Q1	2022-Q2	2022-Q3	2022-Q4	2023-Q1	2023-Q2	2023-Q3	2023-Q4	2024-Q1	2024-Q2	2024-Q3	2024-Q4
Appendix III																		
AP-1	Boron, total	mg/L	0.14973			**0.14973**	22.3	23.1	22.1	21.4	23.2	21.2	22.5	21.7	23.5	22.7	22.9	23.6
AP-2	Boron, total	mg/L	0.14973			**0.14973**	4.68	4.25	4.32	4.08	3.94	3.7	3.73	3.23	3.38	3.43	3.1	3.52
AP-3	Boron, total	mg/L	0.14973			**0.14973**	15.8	14.7	14.8	14.6	14.5	14.3	14	15.2	14.8	14.5	14.6	14.9
AP-6	Boron, total	mg/L	0.14973			**0.14973**	0.247	0.275	0.0716	0.166	0.13	0.174	0.0753	0.214	0.171	0.238	0.25	0.248
AP-7	Boron, total	mg/L	0.14973			**0.14973**	0.381	0.339	0.204	0.26	0.18	0.391	0.141	0.331	0.173	0.0978	0.244	0.332
AP-10	Boron, total	mg/L	0.14973			**0.14973**		3.58	3.52	3.35	3.32	3.76	3.81	3.6	3.71	3.92	3.9	3.95
AP-11	Boron, total	mg/L	0.14973			**0.14973**	0.276	0.271	0.0533	0.261	0.282	0.241	0.24	0.256	0.232	0.0555	0.211	0.261
AP-13	Boron, total	mg/L	0.14973			**0.14973**	0.0403	0.0375	0.268	0.044	0.0485	0.0328	0.0235	0.0386	0.0356	0.0343	0.0357	< 0.02
AP-14	Boron, total	mg/L	0.14973			**0.14973**	23.1	23.3	21.8	21.3	21.3	23	22.6	22.1	21.6	22.3	20	21
AW-1	Boron, total	mg/L	0.14973			**0.14973**		8.24	7.78			8.39		8.66	8.24	9.44	9.19	8.91
G120	Boron, total	mg/L	0.14973			**0.14973**		6.19	5.85			6.92		7.15	7.12	7.43	7.71	7.5
RW-3	Boron, total	mg/L	0.14973			**0.14973**	0.179	0.196	0.177	0.192	0.175	0.186	0.0595	0.117	0.116	0.154	0.122	0.137
T-1	Boron, total	mg/L	0.14973			**0.14973**										0.227	0.141	0.15
T-2	Boron, total	mg/L	0.14973			**0.14973**										0.189	0.0718	0.0507
T-6	Boron, total	mg/L	0.14973			**0.14973**										0.201	0.214	0.21
R111	Boron, total	mg/L	0.14973			**0.14973**	4.19		0.104			4.64	3.89	0.102	< 0.02	0.901	3.5	4.19
AP-1	Calcium, total	mg/L	181.6			**181.6**	245	243	239	242	230	242	285	229	250	248	244	237
AP-2	Calcium, total	mg/L	181.6			**181.6**	265	236	241	248	217	210	244	204	210	194	206	222
AP-3	Calcium, total	mg/L	181.6			**181.6**	150	152	157	160	161	168	189	181	177	176	175	185
AP-11	Calcium, total	mg/L	181.6			**181.6**	127	149	102	141	169	145	118	134	150	217	126	124
AP-12	Calcium, total	mg/L	181.6			**181.6**	201	287	266	260	265	269	271	268	228	240	258	203
AP-14	Calcium, total	mg/L	181.6			**181.6**	225	215	217	236	209	233	235	278	263	245	237	253
AW-1	Calcium, total	mg/L	181.6			**181.6**		195				191		197	203	200	186	193
G120	Calcium, total	mg/L	181.6			**181.6**		263				274		257	265	259	240	263
T-1	Calcium, total	mg/L	181.6			**181.6**										105	183	172
T-2	Calcium, total	mg/L	181.6			**181.6**										150	218	211
AP-1	Chloride, total	mg/L	12.3			**12.3**	55	59	44	61	58	60	36	53	54	29	59	52.1
AP-2	Chloride, total	mg/L	12.3			**12.3**	36	35	34	34	36	37	54	40	39	36	39	35.1
AP-3	Chloride, total	mg/L	12.3			**12.3**	42	42	47	55	60	59	51	57	54	53	55.9	59.5
AP-4	Chloride, total	mg/L	12.3			**12.3**	12	16	13	14	14	14	13	14	13	13	15	12.3
AP-6	Chloride, total	mg/L	12.3			**12.3**	35	38	25	31	27	31	28	33	30	33	37	34.5
AP-7	Chloride, total	mg/L	12.3			**12.3**	64	66	36	58	45	70	39	60	42	43	50	62.1
AP-8	Chloride, total	mg/L	12.3			**12.3**	26	28	27	26	26	26	25	25	24	26	35	23.2
AP-9	Chloride, total	mg/L	12.3			**12.3**	24	64	30	27	36	60	28	26	25	39	29	23.6
AP-10	Chloride, total	mg/L	12.3			**12.3**		29	28	28	27	28	28	27	27	27	30	25.7
AP-11	Chloride, total	mg/L	12.3			**12.3**	83	119	29	105	140	123	79	90	122	429	90	91
AP-12	Chloride, total	mg/L	12.3			**12.3**	113	162	143	147	140	142	139	124	115	121	136	120
AP-13	Chloride, total	mg/L	12.3			**12.3**	35	27	103	26	29	26	26	27	27	26	27	25.8
AP-14	Chloride, total	mg/L	12.3			**12.3**	49	52	59	65	59	71	73	89	82	83	92	94
AW-1	Chloride, total	mg/L	12.3			**12.3**		40				41		40	40	40	41	37.3
G120	Chloride, total	mg/L	12.3			**12.3**		40				40		40	39	39	41	37.4
RW-3	Chloride, total	mg/L	12.3			**12.3**	29	31	31	30	29	32	28	31	27	28	29	25.1
T-1	Chloride, total	mg/L	12.3			**12.3**										49	259	233
T-2	Chloride, total	mg/L	12.3			**12.3**										173	447	509
T-6	Chloride, total	mg/L	12.3			**12.3**										21	24	19.4
R111	Chloride, total	mg/L	12.3			**12.3**	202		25			219		< 4	6	22	185	202

1. A shaded value indicates an exceedance of the Groundwater Protection Standard (GPS), which is higher of the MCL and the Background.

City Water, Light and Power
Power Plant Ash Impoundment
2022 - 2024 Summary of Exceedances

Well	Parameter	Units	Background	40 CFR 257	MCL 40 CFR 141	GPS	2022-Q1	2022-Q2	2022-Q3	2022-Q4	2023-Q1	2023-Q2	2023-Q3	2023-Q4	2024-Q1	2024-Q2	2024-Q3	2024-Q4
AP-1	pH	s.u.	6.7 - 7.87			**7.87**	6.57	6.58	6.65	6.68	6.6	6.52	6.51	6.71	6.51	6.31	6.7	6.54
AP-2	pH	s.u.	6.7 - 7.87			**7.87**	6.43	6.43	6.45	6.52	6.46	6.44	6.4	6.57	6.41	6.21	6.58	6.41
AP-3	pH	s.u.	6.7 - 7.87			**7.87**	6.6	6.58	6.6	6.65	6.58	6.64	6.53	6.69	6.55	6.36	6.2	6.48
AP-9	pH	s.u.	6.7 - 7.87			**7.87**	7.47	6.63	6.92	6.83	6.85	6.69	6.88	6.81	6.82	6.75	6.89	6.8
AP-10	pH	s.u.	6.7 - 7.87			**7.87**		6.69	6.7	6.76	6.58	6.68	6.57	6.82	6.65	6.54	6.53	6.73
AP-11	pH	s.u.	6.7 - 7.87			**7.87**	6.57	6.51	6.61	6.64	6.42	6.45	6.64	6.6	6.45	6.75	6.44	6.66
AP-12	pH	s.u.	6.7 - 7.87			**7.87**	6.53	6.44	6.56	6.6	6.47	6.43	6.57	6.62	6.53	6.52	6.43	6.59
AP-13	pH	s.u.	6.7 - 7.87			**7.87**	6.71	6.59	6.76	6.79	6.62	6.54	6.66	6.74	6.73	6.7	6.59	6.67
AP-14	pH	s.u.	6.7 - 7.87			**7.87**	6.93	6.95	6.94	7.05	6.69	6.97	6.93	7.06	6.93	6.95	6.76	6.93
AW-1	pH	s.u.	6.7 - 7.87			**7.87**	6.67	6.66	6.64	6.83	6.54	6.47	6.51	6.54	6.55	6.58	6.58	6.56
G120	pH	s.u.	6.7 - 7.87			**7.87**	6.77	6.73	6.7	6.7	6.62	6.54	6.79	6.78	6.47	6.65	6.81	6.55
RW-3	pH	s.u.	6.7 - 7.87			**7.87**	7.27	7.2	7.11	7.21	6.15	7.06	7.13	7.31	7.1	6.7	7.23	7.13
T-1	pH	s.u.	6.7 - 7.87			**7.87**										6.57	6.51	6.57
T-2	pH	s.u.	6.7 - 7.87			**7.87**										6.51	6.37	6.54
T-4	pH	s.u.	6.7 - 7.87			**7.87**										6.31	6.68	6.65
T-5	pH	s.u.	6.7 - 7.87			**7.87**										6.62	6.86	6.82
T-6	pH	s.u.	6.7 - 7.87			**7.87**										6.56	6.77	6.97
R111	pH	s.u.	6.7 - 7.87			**7.87**	5.96	6.86	6.92	6.81	7.69	6.97	6.91	6.42	6.14	6.01	6.84	5.96
AP-1	Sulfate, total	mg/L	55.5			**55.5**	732	791	753	777	56.8	768	443	740	790	805	836	849
AP-2	Sulfate, total	mg/L	55.5			**55.5**	583	532	545	643	485	462	795	380	393	411	417	440
AP-3	Sulfate, total	mg/L	55.5			**55.5**	410	408	384	444	461	483	467	495	512	493	554	558
AP-5	Sulfate, total	mg/L	55.5			**55.5**	57	35	66	36	37	44	43	45	50	43	63	59.2
AP-9	Sulfate, total	mg/L	55.5			**55.5**	23	57	27	28	38	64	24	23	23	22	25	17.7
AP-10	Sulfate, total	mg/L	55.5			**55.5**		86	87	96	96	100	100	91	96	100	108	89.4
AP-11	Sulfate, total	mg/L	55.5			**55.5**	67	88	120	89	105	89	65	81	89	134	77	63.4
AP-12	Sulfate, total	mg/L	55.5			**55.5**	402	678	607	691	641	659	632	563	460	499	612	457
AP-13	Sulfate, total	mg/L	55.5			**55.5**	134	135	64	142	133	146	139	151	118	140	135	121
AP-14	Sulfate, total	mg/L	55.5			**55.5**	670	681	639	736	699	707	714	806	679	740	821	909
AW-1	Sulfate, total	mg/L	55.5			**55.5**		344				399		384	369	401	406	388
G120	Sulfate, total	mg/L	55.5			**55.5**		464				500		555	503	535	534	565
T-1	Sulfate, total	mg/L	55.5			**55.5**										36	236	224
T-2	Sulfate, total	mg/L	55.5			**55.5**										135	181	142
T-4	Sulfate, total	mg/L	55.5			**55.5**										87	100	104
AP-1	Total Dissolved Solids	mg/L	609.21			**609.21**	1490	1550	1550	1540	7.4	1540	1190	1360	1400	1490	1530	1640
AP-2	Total Dissolved Solids	mg/L	609.21			**609.21**	1310	1270	1360	1310	1180	1100	1600	1020	1020	1040	1110	1160
AP-3	Total Dissolved Solids	mg/L	609.21			**609.21**	882	942	1030	920	1040	984	990	1080	935	1040	1170	1160
AP-9	Total Dissolved Solids	mg/L	609.21			**609.21**	224	618	565	595	586	638	515	524	530	535	558	740
AP-10	Total Dissolved Solids	mg/L	609.21			**609.21**		752	755	730	778	756	725	732	745	720	796	790
AP-11	Total Dissolved Solids	mg/L	609.21			**609.21**	606	778	550	625	820	726	670	640	665	1780	596	686
AP-12	Total Dissolved Solids	mg/L	609.21			**609.21**	998	1600	1540	1440	1440	1580	1640	1320	1290	1620	1670	1300
AP-13	Total Dissolved Solids	mg/L	609.21			**609.21**	486	530	690	525	495	538	530	465	500	910	560	655
AP-14	Total Dissolved Solids	mg/L	609.21			**609.21**	1240	1340	1390	1380	1280	1330	1480	1440	1510	1480	1610	1840
AW-1	Total Dissolved Solids	mg/L	609.21			**609.21**	1080	1060	1090	1100	1150			1220	1120	1010	1190	1100
G120	Total Dissolved Solids	mg/L	609.21			**609.21**	1360	1440	1420	1400	1450			1390	1320	1320	1450	1430
RW-3	Total Dissolved Solids	mg/L	609.21			**609.21**	1030	428	428	425	420		290	340	335	345	344	470
T-1	Total Dissolved Solids	mg/L	609.21			**609.21**										700	1020	1060
T-2	Total Dissolved Solids	mg/L	609.21			**609.21**										1060	1430	1580
T-4	Total Dissolved Solids	mg/L	609.21			**609.21**										255	382	695
R111	Total Dissolved Solids	mg/L	609.21			**609.21**	875	135	805	118	110			68	78	525	832	875

1. A shaded value indicates an exceedance of the Groundwater Protection Standard (GPS), which is higher of the MCL and the Background.

City Water, Light and Power
Power Plant Ash Impoundment
2022 - 2024 Summary of Exceedances

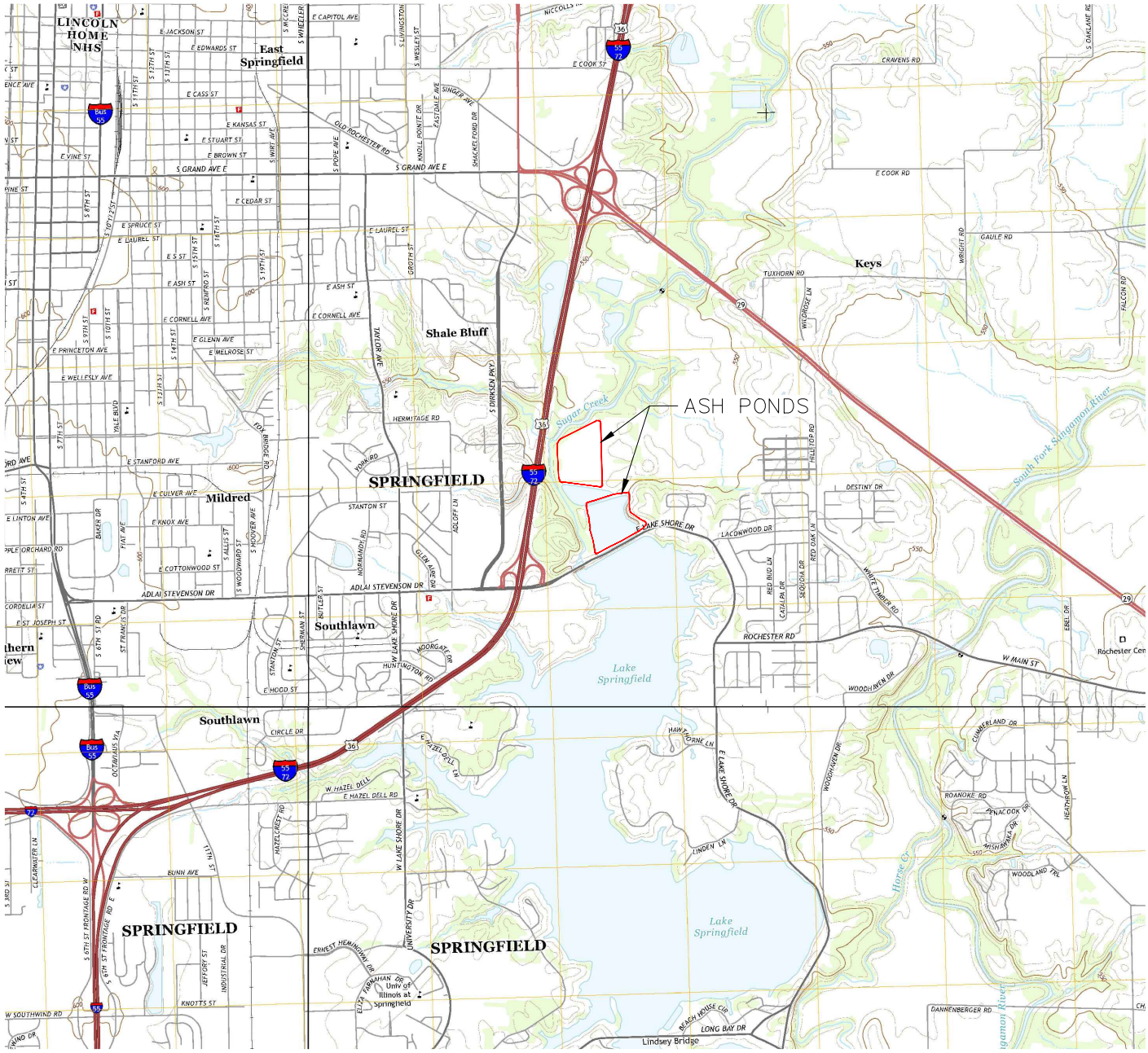
Well	Parameter	Units	Background	40 CFR 257	MCL 40 CFR 141	GPS	2022-Q1	2022-Q2	2022-Q3	2022-Q4	2023-Q1	2023-Q2	2023-Q3	2023-Q4	2024-Q1	2024-Q2	2024-Q3	2024-Q4
Appendix IV																		
AP-7	Arsenic, total	mg/L	0.0375	0.01		**0.0375**	< 0.025	0.0468	0.0376	< 0.025	< 0.025	0.0462	0.0412	0.075	0.0555	0.0395	0.0438	0.0947
AP-8	Arsenic, total	mg/L	0.0375	0.01		**0.0375**	0.0319	0.0352	0.0377	0.034	0.0336	0.0348	0.0513	0.0395	0.0426	0.0461	0.0414	0.0386
AW-1	Arsenic, total	mg/L	0.0375	0.01		**0.0375**		0.148	0.192			0.152		0.208	0.16	0.153	0.129	0.168
RW-3	Arsenic, total	mg/L	0.0375	0.01		**0.0375**	0.178	0.109	0.11	0.142	0.169	0.185	0.0831	0.74	0.306	0.188	0.107	0.214
AW-1	Barium, total	mg/L	0.51918	2		**2**		0.64				0.622		1.96	2.02	1.48	0.602	0.446
AP-2	Cobalt, total	mg/L	0.0052		0.006	**0.006**	0.0102	0.0089	0.0115	0.0111	0.0091	0.0102	0.0085	0.0091	0.0068	0.0102	0.0073	0.0085
AP-3	Cobalt, total	mg/L	0.0052		0.006	**0.006**	< 0.005	< 0.005	< 0.005	0.0054	< 0.005	0.0054	< 0.005	0.0051	< 0.005	0.0065	0.0071	< 0.005
AP-11	Cobalt, total	mg/L	0.0052		0.006	**0.006**	< 0.005	< 0.005	0.005	0.0061	0.011	< 0.005	0.0055	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AP-12	Cobalt, total	mg/L	0.0052		0.006	**0.006**	0.0143	0.0077	0.0219	0.007	< 0.005	< 0.005	< 0.005	0.0236	< 0.005	0.0054	< 0.005	< 0.005
AP-13	Cobalt, total	mg/L	0.0052		0.006	**0.006**	< 0.005	< 0.005	0.0215	0.021	< 0.005	< 0.005	< 0.005	0.0127	< 0.005	< 0.005	< 0.005	< 0.005
T-1	Cobalt, total	mg/L	0.0052		0.006	**0.006**										< 0.005	0.0063	< 0.005
T-2	Cobalt, total	mg/L	0.0052		0.006	**0.006**										0.0075	< 0.005	< 0.005
AP-09	Lead, total	mg/L	0.0075		0.015	**0.015**	< 0.015	0.0168	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.0075	< 0.0075
AP-12	Lead, total	mg/L	0.0075		0.015	**0.015**	0.0225	< 0.015	0.0228	< 0.015	< 0.015	< 0.015	< 0.015	0.0161	< 0.015	< 0.015	< 0.0075	< 0.0075
AP-13	Lead, total	mg/L	0.0075		0.015	**0.015**	< 0.015	< 0.015	0.0163	0.0177	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.0075	< 0.0075
AP-14	Lead, total	mg/L	0.0075		0.015	**0.015**	< 0.015	0.0189	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.0075	< 0.0075
AP-1	Lithium	mg/L	0.0124		0.04	**0.04**	0.0098	0.0096	0.0087	< 0.05	0.0566	< 0.005	0.0109	0.0085	0.0099	< 0.05	0.0103	0.0094
AP-2	Lithium	mg/L	0.0124		0.04	**0.04**	0.0057	0.0056	0.0055	< 0.05	0.0476	< 0.005	0.0063	0.0056	0.0059	< 0.05	0.0081	0.0068
AP-3	Lithium	mg/L	0.0124		0.04	**0.04**	0.0053	< 0.005	< 0.005	< 0.05	0.0501	< 0.005	0.0063	0.0051	0.0062	< 0.05	0.0064	0.0062
AP-14	Lithium	mg/L	0.0124		0.04	**0.04**	0.0074	0.0066	0.0063	< 0.05	0.0716	< 0.005	0.0076	< 0.005	0.0076	< 0.05	0.0078	0.0072
AW-1	Lithium	mg/L	0.0124		0.04	**0.04**								0.0739	0.0184	< 0.05	0.0145	0.0113
G120	Lithium	mg/L	0.0124		0.04	**0.04**								0.0486	0.008	< 0.05	0.0081	0.0086
AP-1	Thallium, total	mg/L	0.002	0.002		**0.002**	< 0.002	< 0.002	< 0.002	< 0.002	1.52	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-09	Thallium, total	mg/L	0.002	0.002		**0.002**	0.0032	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

1. A shaded value indicates an exceedance of the Groundwater Protection Standard (GPS), which is higher of the MCL and the Background.

FIGURES

FIGURE 1:
Site Location

C:\Civil 3D Projects\Springfield CWLP\DWG\2025\Site Map.dwg Tab: Layout1



NOTE:
BACKGROUND IMAGE COURTESY OF
UNITED STATES GEOLOGICAL SURVEY.

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APPROVED BY: KWF | DESIGNED BY: KWF | DRAWN BY: BCK

SITE LOCATION

PLANS PREPARED FOR
CITY, WATER, LIGHT & POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: JANUARY 2025
PROJECT ID: 240227/0006
SHEET NUMBER:
FIGURE 1

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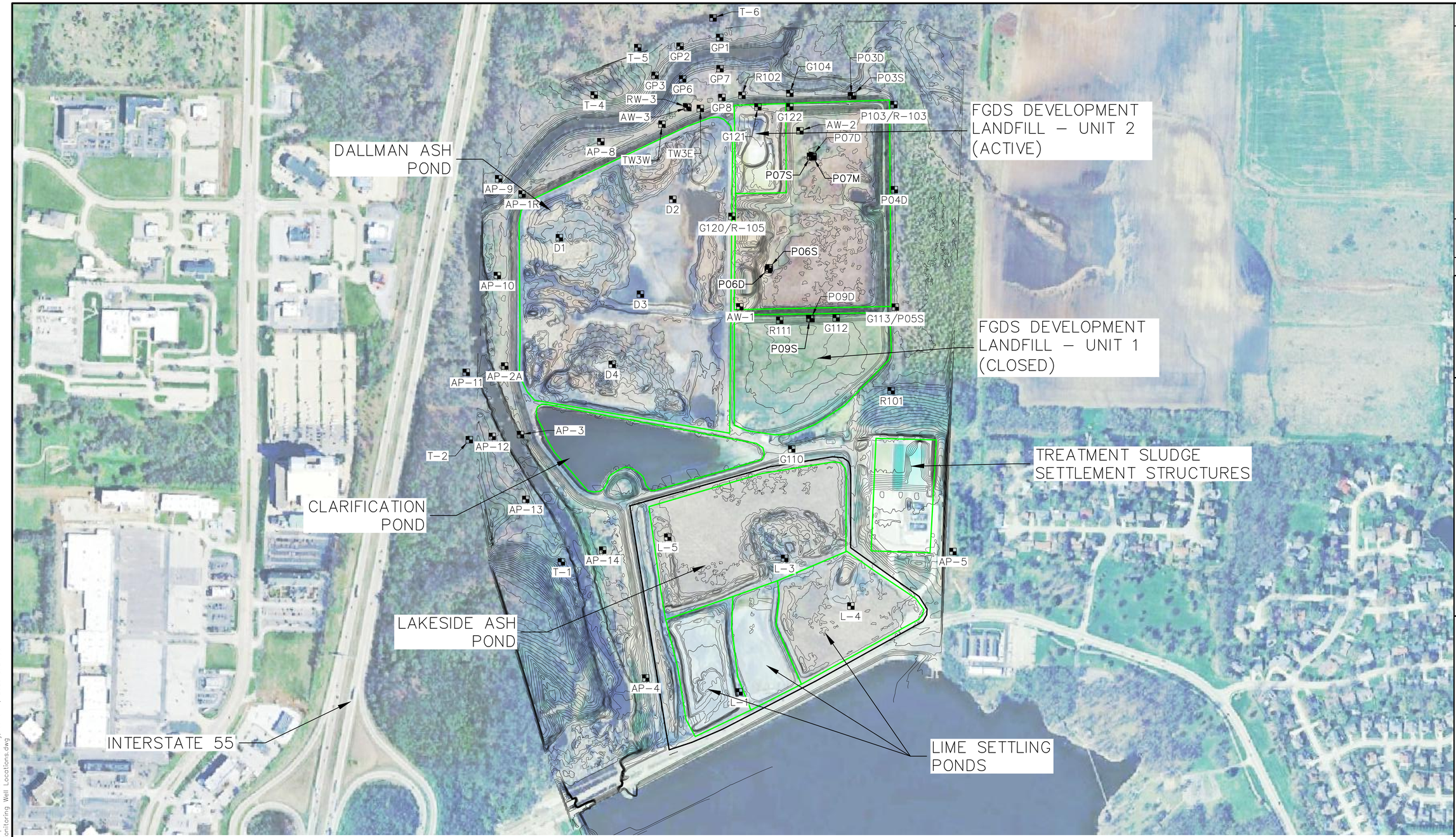
FIGURE 2:

Site Features with Current Monitor Well Network



LEGEND

- POND/LANDFILL BOUNDARY
- IMPOUNDMENT BOUNDARY
- ▲ TEMPORARY ASSESSMENT WELL
- ○ PIEZOMETER
- ◔ PART 257 GROUNDWATER MONITORING WELL

NOTE

1. AERIAL IMAGE FROM APRIL 7, 2024, FROM GOOGLE EARTH.

N

0 250 500 1000

SCALE: IN FEET

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MONITORING WELL LOCATIONS

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: APRIL 2025

PROJECT ID: 240338/0016

SHEET NUMBER:

FIG. 3

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Tab: FIG 3 Last Saved: April 4, 2025, by Ben Karpus Plotted: Wednesday, June 11, 2025 8:21:38 AM
J:\S\Springfield CWLP\CWLP Ash Pond\DWG\2025\Monitoring Well Locations.dwg

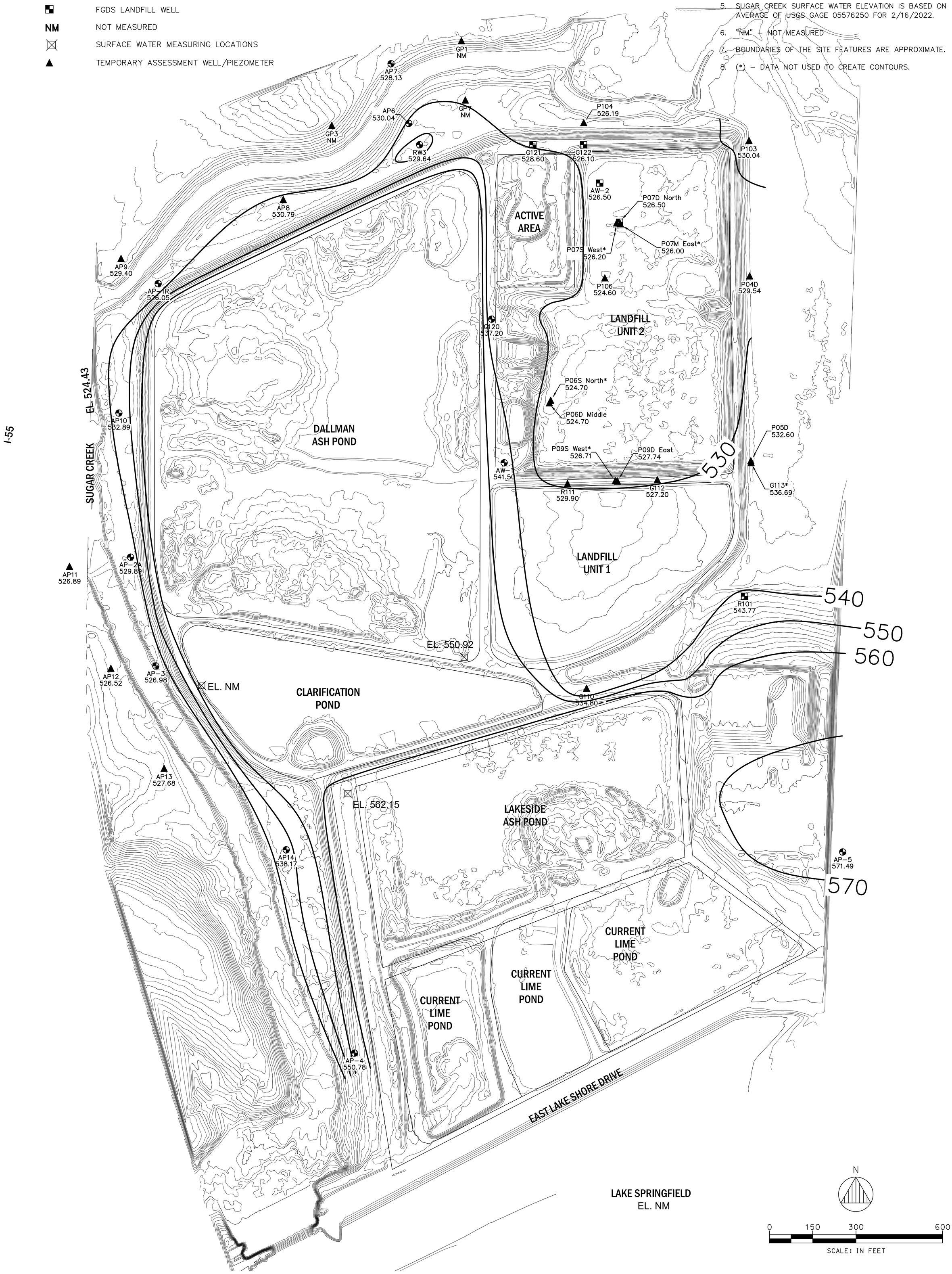
APPENDIX A:
Potentiometric Surface Maps

LEGEND

- 550 — EXISTING GROUND CONTOURS
- —540— GROUNDWATER CONTOURS
- CCR SURFACE IMPOUNDMENT WELL
- FGDS LANDFILL WELL
- NM NOT MEASURED
- SURFACE WATER MEASURING LOCATIONS
- TEMPORARY ASSESSMENT WELL/PIEZOMETER

NOTES

1. FLIGHT DATE: APRIL 2023.
2. POTENTIOMETRIC CONTOUR INTERVAL SHOWN IS 10 FEET.
3. TOPOGRAPHIC CONTOUR INTERVAL SHOWN IS 2 FEET.
4. SAMPLING DATE: 2/16/2022.
5. SUGAR CREEK SURFACE WATER ELEVATION IS BASED ON AVERAGE OF USGS GAGE 05576250 FOR 2/16/2022.
6. "NM" – NOT MEASURED
7. BOUNDARIES OF THE SITE FEATURES ARE APPROXIMATE.
8. (*) – DATA NOT USED TO CREATE CONTOURS.



SHEET NUMBER: 1	PROJECT ID: 240338/0014	DATE: APRIL 2025	POTENTIOMETRIC SURFACE MAP 1ST QUARTER 2022

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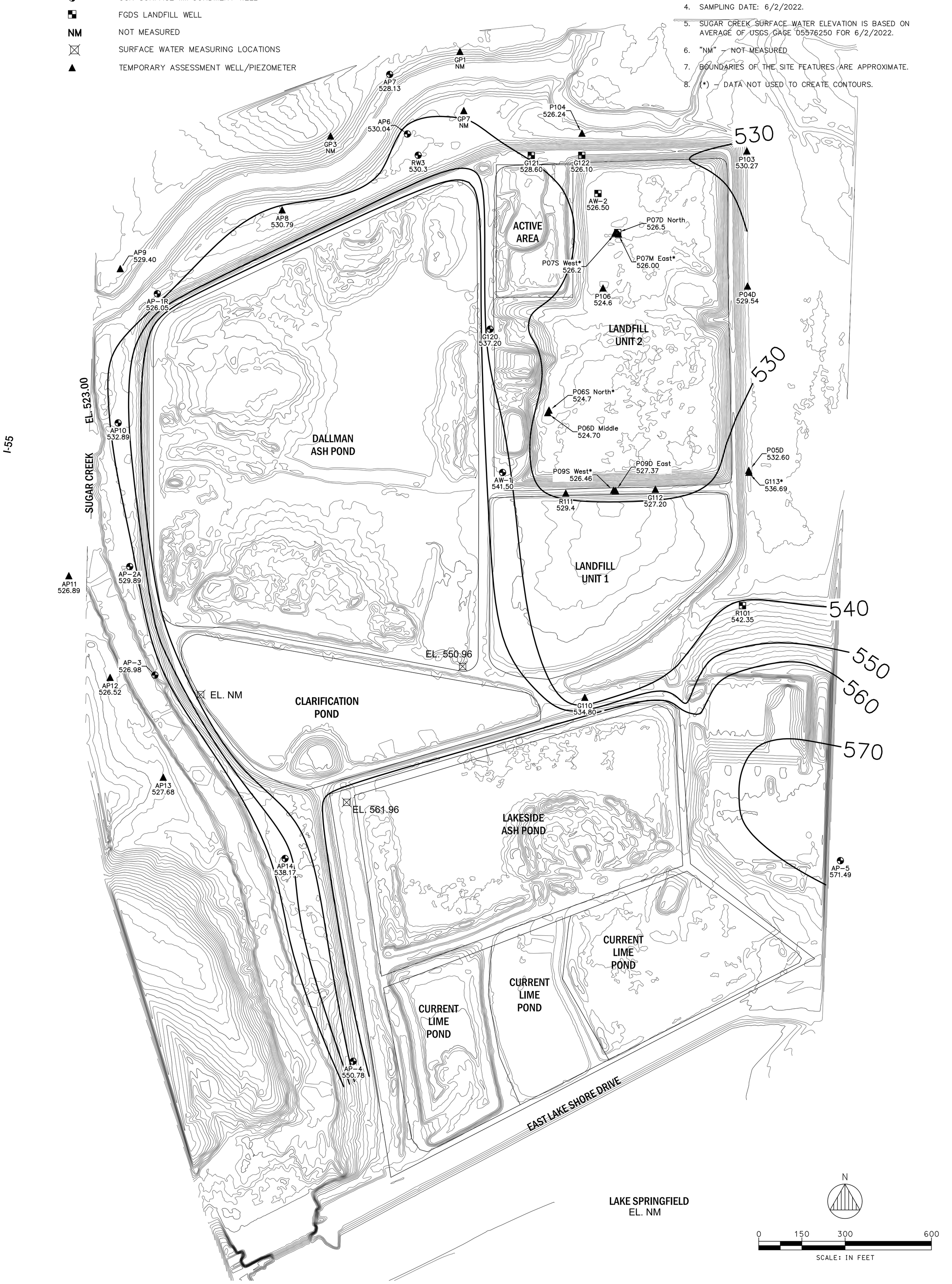
LEGEND

- 550 — EXISTING GROUND CONTOURS
- —540— GROUNDWATER CONTOURS
- CCR SURFACE IMPOUNDMENT WELL
- FGDS LANDFILL WELL
- NM — NOT MEASURED
- SURFACE WATER MEASURING LOCATIONS
- TEMPORARY ASSESSMENT WELL/PIEZOMETER

NOTES

1. FLIGHT DATE: APRIL 2023.
2. POTENTIOMETRIC CONTOUR INTERVAL SHOWN IS 10 FEET.
3. TOPOGRAPHIC CONTOUR INTERVAL SHOWN IS 2 FEET.
4. SAMPLING DATE: 6/2/2022.
5. SUGAR CREEK SURFACE WATER ELEVATION IS BASED ON AVERAGE OF USGS GAGE 05576250 FOR 6/2/2022.
6. "NM" – NOT MEASURED
7. BOUNDARIES OF THE SITE FEATURES ARE APPROXIMATE.
8. (*) – DATA NOT USED TO CREATE CONTOURS.



POTENTIOMETRIC SURFACE MAP
2ND QUARTER 2022

PREPARED FOR

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SHEET NUMBER: 2

PROJECT ID: 240338/0014

DATE: APRIL 2025

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LEGEND

- 550 — EXISTING GROUND CONTOURS
- —540— GROUNDWATER CONTOURS
- CCR SURFACE IMPOUNDMENT WELL
- FGDS LANDFILL WELL
- NM — NOT MEASURED
- SURFACE WATER MEASURING LOCATIONS
- TEMPORARY ASSESSMENT WELL/PIEZOMETER

NOTES

1. FLIGHT DATE: APRIL 2023.
2. POTENTIOMETRIC CONTOUR INTERVAL SHOWN IS 10 FEET.
3. TOPOGRAPHIC CONTOUR INTERVAL SHOWN IS 2 FEET.
4. SAMPLING DATE: 8/23/2022.
5. SUGAR CREEK SURFACE WATER ELEVATION IS BASED ON AVERAGE OF USGS GAGE 05576250 FOR 8/23/2022.
6. "NM" = NOT MEASURED.
7. BOUNDARIES OF THE SITE FEATURES ARE APPROXIMATE.
8. (*) – DATA NOT USED TO CREATE CONTOURS.

SHEET NUMBER: 3	PROJECT ID: 240338/0014	DATE: APRIL 2025	POTENTIOMETRIC SURFACE MAP 3RD QUARTER 2022 PREPARED FOR CITY WATER, LIGHT, AND POWER SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

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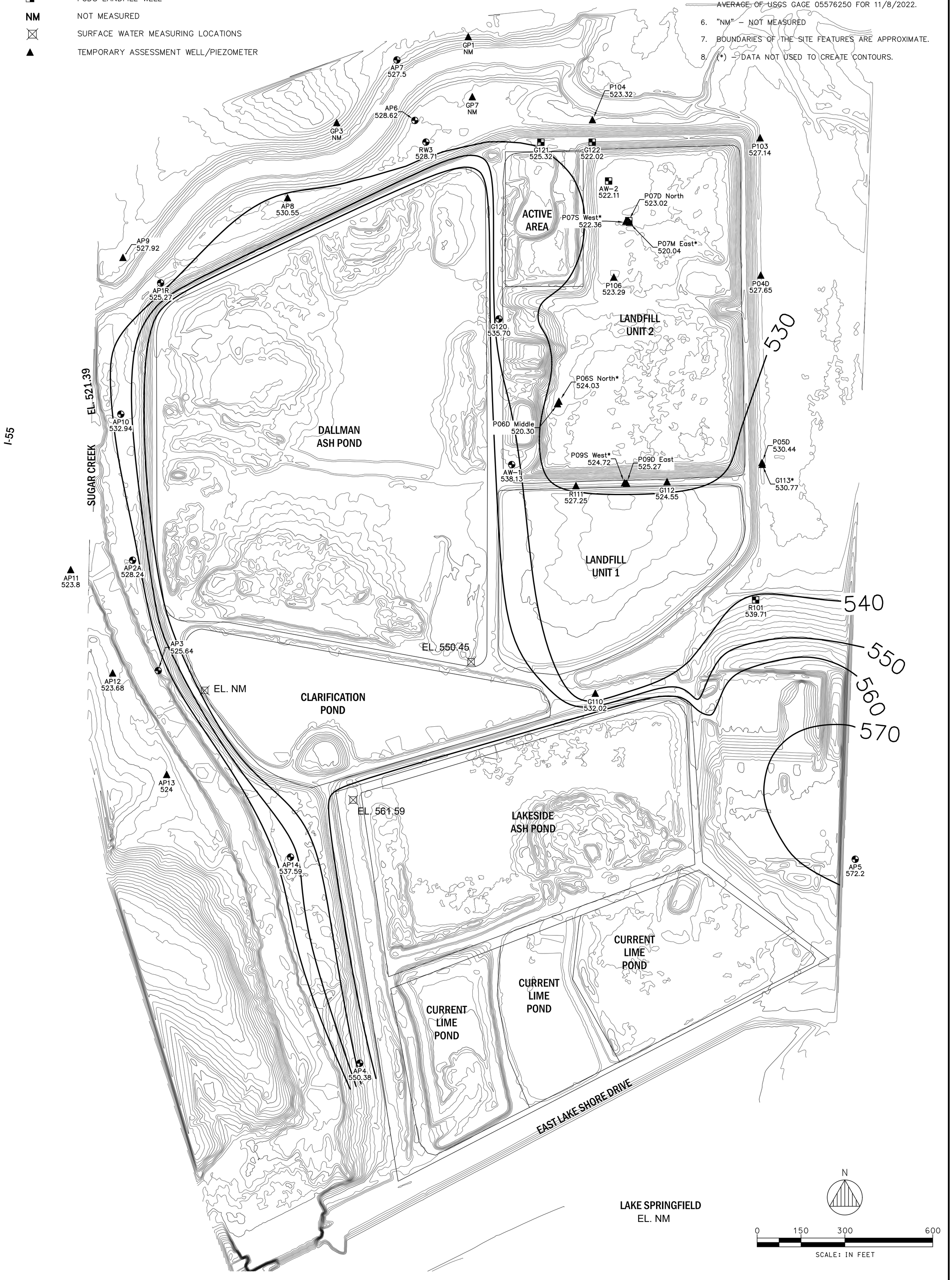
LEGEND

- 550 — EXISTING GROUND CONTOURS
- —540— GROUNDWATER CONTOURS
- CCR SURFACE IMPOUNDMENT WELL
- FGDS LANDFILL WELL
- NM — NOT MEASURED
- SURFACE WATER MEASURING LOCATIONS
- TEMPORARY ASSESSMENT WELL/PIEZOMETER

NOTES

1. FLIGHT DATE: APRIL 2023.
2. POTENTIOMETRIC CONTOUR INTERVAL SHOWN IS 10 FEET.
3. TOPOGRAPHIC CONTOUR INTERVAL SHOWN IS 2 FEET.
4. SAMPLING DATE: 11/8/2022.
5. SUGAR CREEK SURFACE WATER ELEVATION IS BASED ON AVERAGE OF USGS GAGE 05576250 FOR 11/8/2022.
6. "NM" – NOT MEASURED
7. BOUNDARIES OF THE SITE FEATURES ARE APPROXIMATE.
8. (*) – DATA NOT USED TO CREATE CONTOURS.



SHEET NUMBER: 4	PROJECT ID: 240338/0014	DATE: APRIL 2025	POTENTIOMETRIC SURFACE MAP 4TH QUARTER 2022
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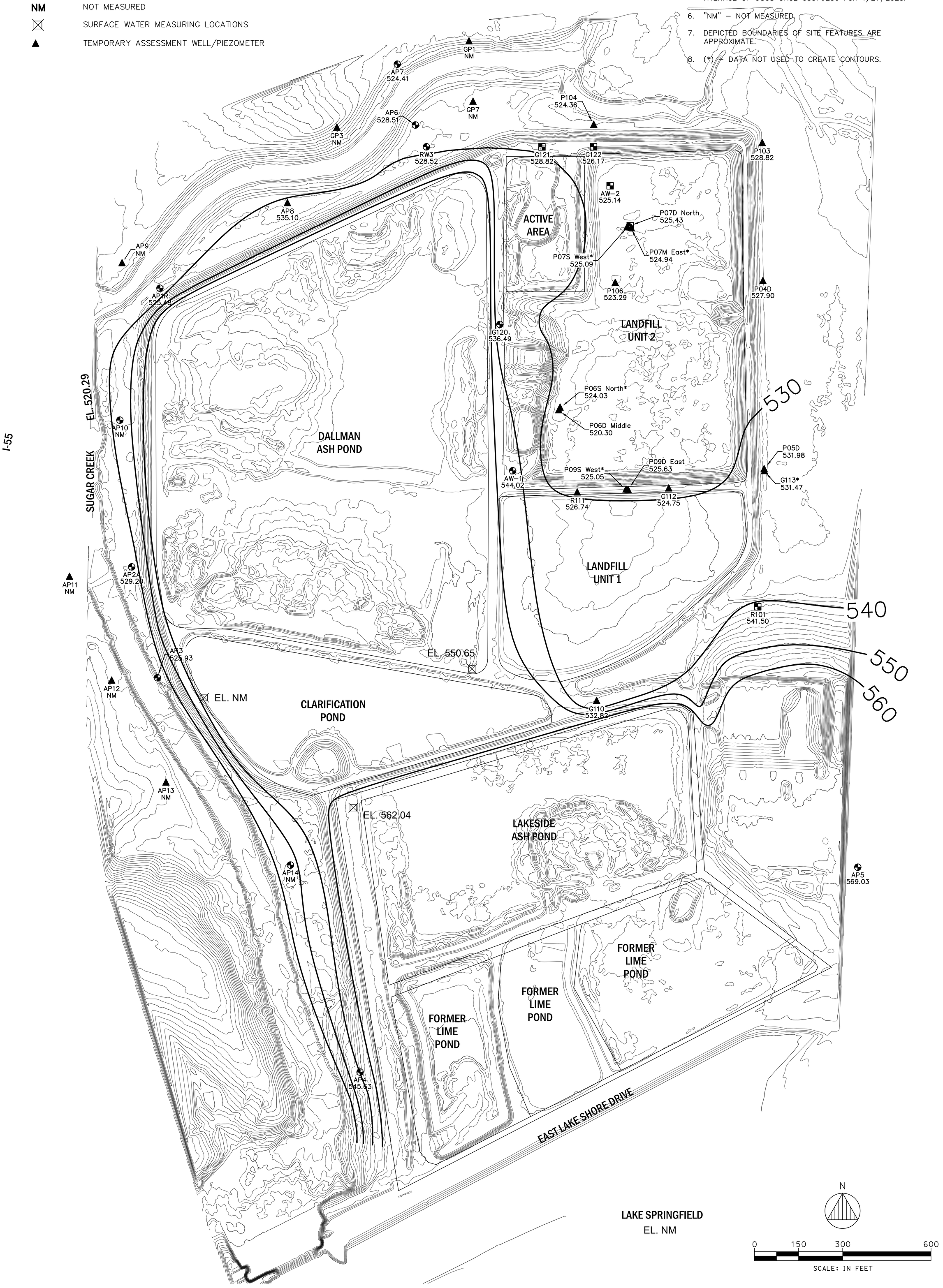
LEGEND

- 550 — EXISTING GROUND CONTOURS
- —540— GROUNDWATER CONTOURS
- CCR SURFACE IMPOUNDMENT WELL
- FGDS LANDFILL WELL
- NM — NOT MEASURED
- SURFACE WATER MEASURING LOCATIONS
- TEMPORARY ASSESSMENT WELL/PIEZOMETER

NOTES

1. FLIGHT DATE: APRIL 2023.
2. POTENTIOMETRIC CONTOUR INTERVAL SHOWN IS 10 FEET.
3. TOPOGRAPHIC CONTOUR INTERVAL SHOWN IS 2 FEET.
4. SAMPLING DATE: 1/27/2023.
5. SUGAR CREEK SURFACE WATER ELEVATION IS BASED ON AVERAGE OF USGS GAGE 05576250 FOR 1/27/2023.
6. "NM" – NOT MEASURED.
7. DEPICTED BOUNDARIES OF SITE FEATURES ARE APPROXIMATE.
8. (*) – DATA NOT USED TO CREATE CONTOURS.



SHEET NUMBER: 5	PROJECT ID: 240338/0014	DATE: APRIL 2025	POTENTIOMETRIC SURFACE MAP 1ST QUARTER 2023

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LEGEND

- 550 — EXISTING GROUND CONTOURS
- —540— GROUNDWATER CONTOURS
- CCR SURFACE IMPOUNDMENT WELL
- FGDS LANDFILL WELL
- NM NOT MEASURED
- SURFACE WATER MEASURING LOCATIONS
- TEMPORARY ASSESSMENT WELL/PIEZOMETER

NOTES

1. FLIGHT DATE: APRIL 2023.
2. POTENTIOMETRIC CONTOUR INTERVAL SHOWN IS 10 FEET.
3. TOPOGRAPHIC CONTOUR INTERVAL SHOWN IS 2 FEET.
4. SAMPLING DATE: 4/12/2023.
5. SUGAR CREEK SURFACE WATER ELEVATION IS BASED ON AVERAGE OF USGS GAGE 05576250 FOR 4/12/2023.
6. "NM" – NOT MEASURED
7. BOUNDARIES OF THE SITE FEATURES ARE APPROXIMATE.
8. (*) – DATA NOT USED TO CREATE CONTOURS.

GP1 530.51
AP7 527.43
GP7 528.46
AP6 529.03
GP3 539.63
RW3 529.68
P104 524.26
G121 527.48
G122 524.58
P103 529.69
AW–2 524.05
AP8 535.95
ACTIVE AREA
P07D North 523.62
P07M East* 522.73
P07S West* 522.37
AP9 525.07
AP1R 525.45
P106 523.29
P04D 527.91
G120 536.81
LANDFILL UNIT 2
P06S North* 524.03
P06D Middle 520.30
530
EL. 520.22
AP10 534.45
DALLMAN ASH POND
P05D 532.23
P09D East 525.73
P09S West* 525.54
G113* 532.87
AW–1 541.05
R111 527.74
G112 525.73
SUGAR CREEK
I-55
AP2A 528.86
AP11 523.90
LANDFILL UNIT 1
R101 541.00
540
AP3 525.77
EL. 550.30
550
AP12 525.74
EL. NM
CLARIFICATION POND
560
G110 532.45
570
AP13 528.09
EL. 562.52
LAKESIDE ASH POND
AP14 537.20
AP5 570.85
FORMER LIME POND
FORMER LIME POND
FORMER LIME POND
AP4 546.08
EAST LAKE SHORE DRIVE
LAKE SPRINGFIELD
EL. NM

N

0 150 300 600
SCALE: IN FEET

SHEET NUMBER: 6	PROJECT ID: 240338/0014	DATE: APRIL 2025	POTENTIOMETRIC SURFACE MAP 2ND QUARTER 2023 PREPARED FOR CITY WATER, LIGHT, AND POWER SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

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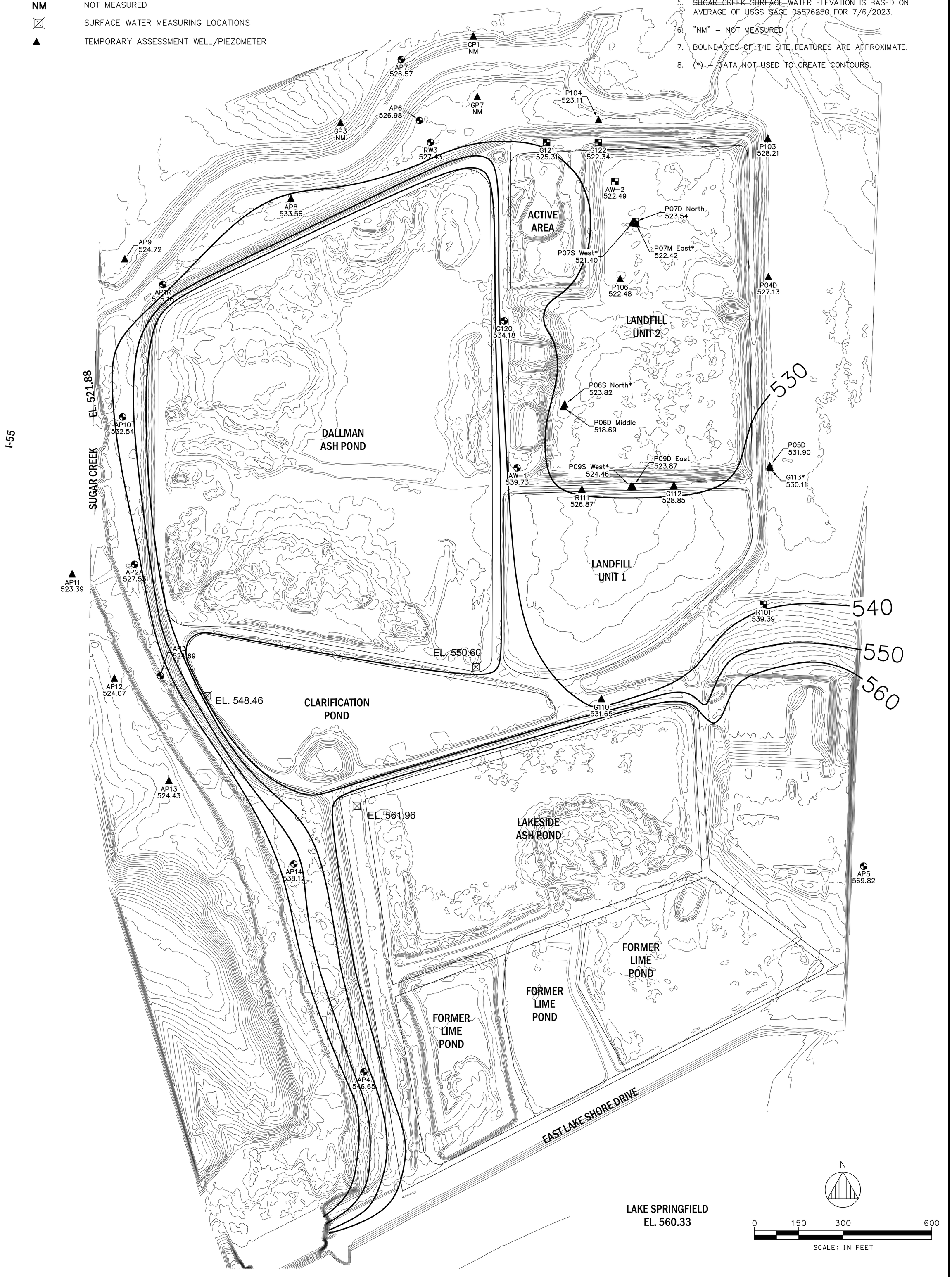
LEGEND

- 550 — EXISTING GROUND CONTOURS
- —540— GROUNDWATER CONTOURS
- CCR SURFACE IMPOUNDMENT WELL
- FGDS LANDFILL WELL
- NM — NOT MEASURED
- SURFACE WATER MEASURING LOCATIONS
- TEMPORARY ASSESSMENT WELL/PIEZOMETER

NOTES

1. FLIGHT DATE: APRIL 2023.
2. POTENTIOMETRIC CONTOUR INTERVAL SHOWN IS 10 FEET.
3. TOPOGRAPHIC CONTOUR INTERVAL SHOWN IS 2 FEET.
4. SAMPLING DATE: 7/6/2023.
5. SUGAR CREEK SURFACE WATER ELEVATION IS BASED ON AVERAGE OF USGS GAGE 05576250 FOR 7/6/2023.
6. "NM" – NOT MEASURED
7. BOUNDARIES OF THE SITE FEATURES ARE APPROXIMATE.
8. (*) – DATA NOT USED TO CREATE CONTOURS.



SHEET NUMBER: 7	PROJECT ID: 240338/0014	DATE: APRIL 2025	POTENTIOMETRIC SURFACE MAP 3RD QUARTER 2023

PREPARED FOR

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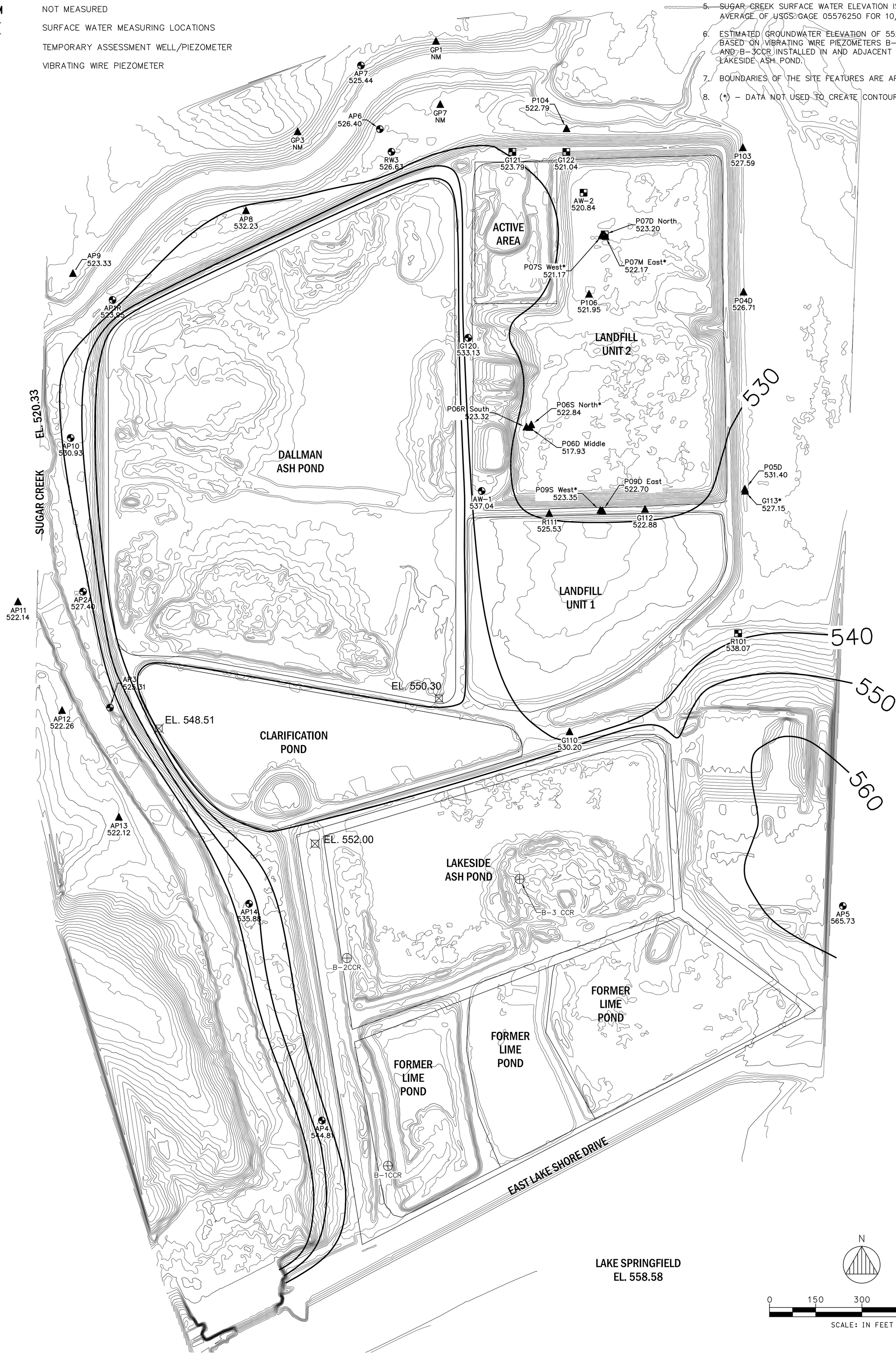
LEGEND

- 550 — EXISTING GROUND CONTOURS
- —540— GROUNDWATER CONTOURS
- CCR SURFACE IMPOUNDMENT WELL
- FGDS LANDFILL WELL
- NM — NOT MEASURED
- SURFACE WATER MEASURING LOCATIONS
- TEMPORARY ASSESSMENT WELL/PIEZOMETER
- VIBRATING WIRE PIEZOMETER

NOTES

1. FLIGHT DATE: APRIL 2023.
2. POTENTIOMETRIC CONTOUR INTERVAL SHOWN IS 10 FEET.
3. TOPOGRAPHIC CONTOUR INTERVAL SHOWN IS 2 FEET.
4. SAMPLING DATE: 10/26/2023.
5. SUGAR CREEK SURFACE WATER ELEVATION IS BASED ON AVERAGE OF USGS GAGE 05576250 FOR 10/26/2023.
6. ESTIMATED GROUNDWATER ELEVATION OF 552 FT MSL IS BASED ON VIBRATING WIRE PIEZOMETERS B-1CCR, B-2CCR, AND B-3CCR INSTALLED IN AND ADJACENT TO THE LAKESIDE ASH POND.
7. BOUNDARIES OF THE SITE FEATURES ARE APPROXIMATE.
8. (*) – DATA NOT USED TO CREATE CONTOURS.



8

SHEET NUMBER:

PROJECT ID: 240338/0014

DATE: APRIL 2025

POTENTIOMETRIC SURFACE MAP
4TH QUARTER 2023

PREPARED FOR

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LEGEND

- 550 — EXISTING GROUND CONTOURS
- —540— GROUNDWATER CONTOURS
- ▲ TEMPORARY ASSESSMENT WELL/PIEZOMETER
- ○ PIEZOMETER
- ◕ CCR SURFACE IMPOUNDMENT WELL
- ■ FGDS LANDFILL WELL
- ☒ SURFACE WATER MEASURING LOCATIONS
- NM NOT MEASURED

NOTES

1. FLIGHT DATE: APRIL 2023.
2. POTENTIOMETRIC CONTOUR INTERVAL SHOWN IS 5 FEET.
3. TOPOGRAPHIC CONTOUR INTERVAL SHOWN IS 2 FEET.
4. SAMPLING DATE: 2/22/2024.
5. SUGAR CREEK SURFACE WATER ELEVATION IS BASED ON AVERAGE OF USGS GAGE 05576250 FOR 2/22/2024.
6. "NM" – NOT MEASURED.
7. DEPICTED BOUNDARIES OF SITE FEATURES ARE APPROXIMATE.
8. (*) – DATA NOT USED TO CREATE CONTOURS.

T-6 NM
GP1 526.94
T-5 NM
AP-7 526.81
GP7 526.33
GP3 NM
T-4 NM
AP-6 528.61
RW-3 529.32
P104 526.85
P103 528.87
G121 527.79
G122 526.57
AW-2 524.38
P07D North 525.42
ACTIVE AREA
P07M East* 525.02
P07S West* 525.08
AP-8 535.82
AP-9 525.15
AP-1R 526.89
D2 NM
P106 523.24
P04D 528.08
LANDFILL UNIT 2
G120 537.11
D1 NM
P06D Middle 523.96
P06S North* 523.96
530
AP-10 534.68
DALLMAN ASH POND
D3 NM
P05D 531.68
P09S West* 525.22
AW-1 542.55
R111 528.06
G112 526.80
G113* 532.65
P09D East 526.22
LANDFILL UNIT 1
550
AP-11 523.68
SUGAR CREEK EL 520.16
AP-2A 528.99
D4 NM
R101 540.14
540
EL. 550.57
T-2 NM
AP-12 523.25
AP-3 526.08
EL. 546.43
CLARIFICATION POND
G110 532.56
550
AP-13 524.99
DRY
LAKESIDE ASH POND
560
L-5 NM
AP-14 537.88
T-1 NM
L-3 NM
AP-5 567.95
FORMER LIME POND
L-4 NM
FORMER LIME POND
FORMER LIME POND
AP-4 546.62
L-1 NM
EAST LAKE SHORE DRIVE
560

LAKE SPRINGFIELD
EL. 559.52

N

0 150 300 600
SCALE: IN FEET

SHEET NUMBER: 9	PROJECT ID: 240338/0014	DATE: APRIL 2025	

POTENTIOMETRIC SURFACE MAP
1ST QUARTER 2024

PREPARED FOR

CITY WATER, LIGHT, AND POWER

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

ANDREWS ENGINEERING
3300 GINGER CREEK DRIVE
SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

APPROVED BY: MTH	DESIGNED BY: MTH	DRAWN BY: BCK

NO.	DATE	REVISION DESCRIPTION	BY

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LEGEND

- 550 — EXISTING GROUND CONTOURS
- —540— GROUNDWATER CONTOURS
- ▲ TEMPORARY ASSESSMENT WELL/PIEZOMETER
- ○ PIEZOMETER
- ◔ CCR SURFACE IMPOUNDMENT WELL
- ■ FGDS LANDFILL WELL
- ☒ SURFACE WATER MEASURING LOCATIONS
- NM NOT MEASURED

NOTES

1. FLIGHT DATE: APRIL 2023.
2. POTENTIOMETRIC CONTOUR INTERVAL SHOWN IS 5 FEET.
3. TOPOGRAPHIC CONTOUR INTERVAL SHOWN IS 2 FEET.
4. SAMPLING DATE: 5/13/2024.
5. SUGAR CREEK SURFACE WATER ELEVATION IS BASED ON AVERAGE OF USGS GAGE 05576250 FOR 5/13/2024.
6. "NM" - NOT MEASURED.
7. DEPICTED BOUNDARIES OF SITE FEATURES ARE APPROXIMATE.
8. (*) - DATA NOT USED TO CREATE CONTOURS.

T-6 529.88
GP1 526.90
T-5 533.43
AP-7 528.08
GP7 528.34
GP5 532.02
P104 524.26
T-4 533.46
AP-6 528.94
RW-3 528.91
G121 527.57
G122 525.61
P103 529.69
AW-2 524.96
P07D North 525.42
AP-8 535.64
ACTIVE AREA
P07S West* 525.08
P07M East* 525.02
AP-9 527.31
AP-1R 526.78
D2 550.40
P106 523.29
P04D 528.66
LANDFILL UNIT 2
G120 536.22
D1 549.14
P06S North* 523.96
P06D Middle 523.96
AP-10 534.24
DALLMAN ASH POND
D3 549.18
P05D 533.03
AW-1 541.79
G113* 532.92
R111 528.18
G112 526.31
P09S West* 526.36
P09D East 526.20
AP-11 525.66
SUGAR CREEK EL 523.60
D4 549.36
AP-2A 531.43
LANDFILL UNIT 1
R101 540.85
EL. 556.96
AP-12 526.33
AP-3 528.84
T-2 528.14
EL. 548.05
CLARIFICATION POND
G110 532.73
AP-13 527.89
DRY
LAKESIDE ASH POND
L-5 550.08
AP-14 537.81
L-3 553.68
AP-5 569.54
T-1 524.72
FORMER LIME POND
L-4 560.57
FORMER LIME POND
FORMER LIME POND
AP-4 545.84
L-1 553.37
EAST LAKE SHORE DRIVE
530
550
540
560

LAKE SPRINGFIELD
EL. 560.54

N

0 150 300 600
SCALE: IN FEET

10

SHEET NUMBER:

PROJECT ID: 240338/0014

DATE: APRIL 2025

POTENTIOMETRIC SURFACE MAP
2ND QUARTER 2024

PREPARED FOR

CITY WATER, LIGHT, AND POWER

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- ▲ TEMPORARY ASSESSMENT WELL/PIEZOMETER
- ○ PIEZOMETER
- ◔ CCR SURFACE IMPOUNDMENT WELL
- ■ FGDS LANDFILL WELL
- ☒ SURFACE WATER MEASURING LOCATIONS
- NM NOT MEASURED

NOTES

1. FLIGHT DATE: APRIL 2023.
2. POTENTIOMETRIC CONTOUR INTERVAL SHOWN IS 5 FEET.
3. TOPOGRAPHIC CONTOUR INTERVAL SHOWN IS 2 FEET.
4. SAMPLING DATE: 8/12/2024.
5. SUGAR CREEK SURFACE WATER ELEVATION IS BASED ON AVERAGE OF USGS GAGE 05576250 FOR 8/12/2024.
6. "NM" – NOT MEASURED.
7. DEPICTED BOUNDARIES OF SITE FEATURES ARE APPROXIMATE.
8. (*) – DATA NOT USED TO CREATE CONTOURS.

T-6 528.44
GP1 524.71
T-5 529.96
AP-7 525.87
GP7 NM
GP3 529.63
P104 522.33
T-4 530.28
AP-6 526.71
RW-3 527.11
G121 524.99
G122 522.07
P103 528.41
AW-2 521.96
P07D North 528.25
P07S West* 518.80
P07M East* 520.21
AP-8 538.33
AP-9 523.31
AP-1R 524.03
D2 548.42
P106 521.99
P04D 526.78
LANDFILL UNIT 2
G120 534.09
D1 545.72
P06S North* 522.57
P06D Middle 523.96
AP-10 532.11
DALLMAN ASH POND
D3 545.28
530
P05D 531.37
AW-1 538.85
G113* 529.88
R111 526.11
G112 524.33
P09S West* 524.43
P09D East 524.38
AP-11 522.28
EL. 520.28
SUGAR CREEK
AP-2A 527.61
D4 546.39
LANDFILL UNIT 1
R101 539.24
540
AP-12 522.56
AP-3 525.75
EL. 545.69
CLARIFICATION POND
G110 530.20
550
T-2 523.87
AP-13 523.80
EL. NM
LAKESIDE ASH POND
L-5 549.96
560
AP-14 536.23
T-1 521.15
L-3 551.12
AP-5 566.56
FORMER LIME POND
L-4 558.76
FORMER LIME POND
FORMER LIME POND
AP-4 544.83
L-1 551.18
EAST LAKE SHORE DRIVE
560

LAKE SPRINGFIELD
EL. 559.95

N

0 150 300 600
SCALE: IN FEET

11 — SHEET NUMBER:
PROJECT ID: 240338/0014
DATE: APRIL 2025

POTENTIOMETRIC SURFACE MAP
3RD QUARTER 2024

PREPARED FOR
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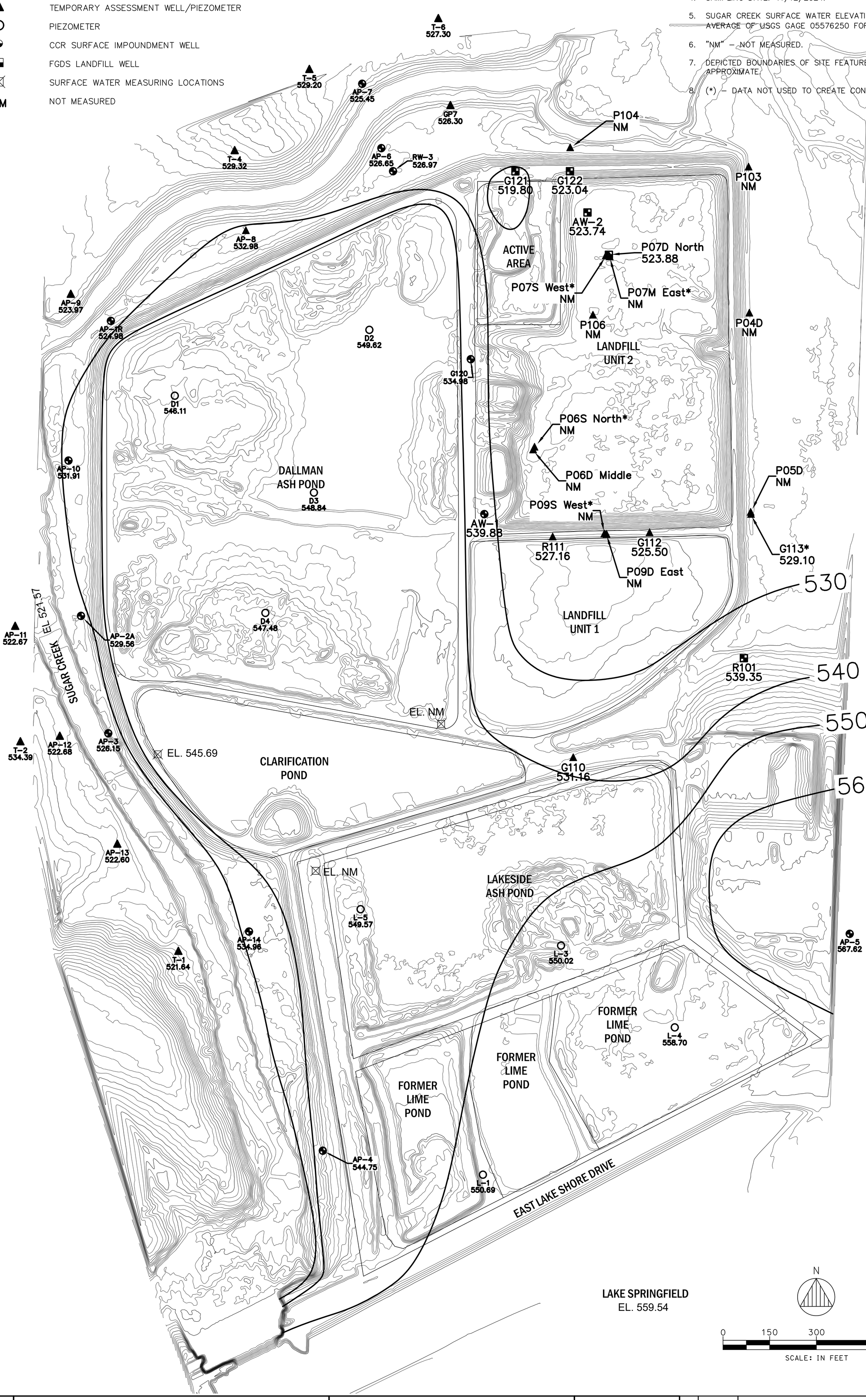
- ☒ SURFACE WATER MEASURING LOCATIONS
- NM NOT MEASURED

NOTES

1. FLIGHT DATE: APRIL 2023.
2. POTENTIOMETRIC CONTOUR INTERVAL SHOWN IS 5 FEET.
3. TOPOGRAPHIC CONTOUR INTERVAL SHOWN IS 2 FEET.
4. SAMPLING DATE: 11/12/2024.
5. SUGAR CREEK SURFACE WATER ELEVATION IS BASED ON AVERAGE OF USGS GAGE 05576250 FOR 11/12/2024.
6. "NM" – NOT MEASURED.
7. DEPICTED BOUNDARIES OF SITE FEATURES ARE APPROXIMATE.
8. (*) – DATA NOT USED TO CREATE CONTOURS.



SHEET NUMBER: 12	PROJECT ID: 240338/0014	DATE: APRIL 2025	POTENTIOMETRIC SURFACE MAP 4TH QUARTER 2024

PREPARED FOR

CITY WATER, LIGHT, AND POWER

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APPENDIX B:
Analytical Summary

City Water, Light and Power
Power Plant Ash Impoundment
2022 - 2024 Groundwater Analytical Summary Data

Well	Parameter	Units	Background	40 CFR 257	MCL 40 CFR 141	GPS	2022-Q1	2022-Q2	2022-Q3	2022-Q4	2023-Q1	2023-Q2	2023-Q3	2023-Q4	2024-Q1	2024-Q2	2024-Q3	2024-Q4
Appendix III																		
AP-1	Boron, total	mg/L	0.14973			**0.14973**	22.3	23.1	22.1	21.4	23.2	21.2	22.5	21.7	23.5	22.7	22.9	23.6
AP-2	Boron, total	mg/L	0.14973			**0.14973**	4.68	4.25	4.32	4.08	3.94	3.7	3.73	3.23	3.38	3.43	3.1	3.52
AP-3	Boron, total	mg/L	0.14973			**0.14973**	15.8	14.7	14.8	14.6	14.5	14.3	14	15.2	14.8	14.5	14.6	14.9
AP-4	Boron, total	mg/L	0.14973			**0.14973**	0.0954	0.0968	0.0927	0.102	0.0918	0.101	0.0845	0.0841	0.0871	0.0834	0.0825	0.082
AP-5	Boron, total	mg/L	0.14973			**0.14973**	< 0.02	0.0341	< 0.02	0.045	0.0353	0.0311	0.0323	0.0455	0.0434	0.0269	0.0339	0.0326
AP-6	Boron, total	mg/L	0.14973			**0.14973**	0.247	0.275	0.0716	0.166	0.13	0.174	0.0753	0.214	0.171	0.238	0.25	0.248
AP-7	Boron, total	mg/L	0.14973			**0.14973**	0.381	0.339	0.204	0.26	0.18	0.391	0.141	0.331	0.173	0.0978	0.244	0.332
AP-8	Boron, total	mg/L	0.14973			**0.14973**	0.125	0.0877	0.0839	0.0927	0.0849	0.11	0.0932	0.0896	0.0866	0.0877	0.0855	0.084
AP-9	Boron, total	mg/L	0.14973			**0.14973**	0.0491	0.122	0.092	0.11	0.0973	0.102	0.0807	0.0956	0.0932	0.0988	0.0979	0.0995
AP-10	Boron, total	mg/L	0.14973			**0.14973**		3.58	3.52	3.35	3.32	3.76	3.81	3.6	3.71	3.92	3.9	3.95
AP-11	Boron, total	mg/L	0.14973			**0.14973**	0.276	0.271	0.0533	0.261	0.282	0.241	0.24	0.256	0.232	0.0555	0.211	0.261
AP-12	Boron, total	mg/L	0.14973			**0.14973**	0.0244	< 0.02	0.0213	0.0294	0.0277	< 0.02	< 0.02	0.038	0.021	< 0.02	0.0241	< 0.02
AP-13	Boron, total	mg/L	0.14973			**0.14973**	0.0403	0.0375	0.268	0.044	0.0485	0.0328	0.0235	0.0386	0.0356	0.0343	0.0357	< 0.02
AP-14	Boron, total	mg/L	0.14973			**0.14973**	23.1	23.3	21.8	21.3	21.3	23	22.6	22.1	21.6	22.3	20	21
AW-1	Boron, total	mg/L	0.14973			**0.14973**		8.24	7.78			8.39		8.66	8.24	9.44	9.19	8.91
G120	Boron, total	mg/L	0.14973			**0.14973**		6.19	5.85			6.92		7.15	7.12	7.43	7.71	7.5
RW-3	Boron, total	mg/L	0.14973			**0.14973**	0.179	0.196	0.177	0.192	0.175	0.186	0.0595	0.117	0.116	0.154	0.122	0.137
T-1	Boron, total	mg/L	0.14973			**0.14973**										0.227	0.141	0.15
T-2	Boron, total	mg/L	0.14973			**0.14973**										0.189	0.0718	0.0507
T-4	Boron, total	mg/L	0.14973			**0.14973**										0.0304	0.0537	0.0565
T-5	Boron, total	mg/L	0.14973			**0.14973**										0.0639	0.0843	0.0791
T-6	Boron, total	mg/L	0.14973			**0.14973**										0.201	0.214	0.21
R111	Boron, total	mg/L	0.14973			**0.14973**	4.19		0.104			4.64	3.89	0.102	< 0.02	0.901	3.5	4.19
AP-1	Calcium, total	mg/L	181.6			**181.6**	245	243	239	242	230	242	285	229	250	248	244	237
AP-2	Calcium, total	mg/L	181.6			**181.6**	265	236	241	248	217	210	244	204	210	194	206	222
AP-3	Calcium, total	mg/L	181.6			**181.6**	150	152	157	160	161	168	189	181	177	176	175	185
AP-4	Calcium, total	mg/L	181.6			**181.6**	123	122	116	121	115	125	132	118	119	123	118	< 0.1
AP-5	Calcium, total	mg/L	181.6			**181.6**	87.2	74.3	102	80.2	78.3	80.4	96.3	90.7	96.7	94.1	96.3	92.6
AP-6	Calcium, total	mg/L	181.6			**181.6**	69.2	66.2	43	57.8	52.4	60.9	49	65.8	61.4	65.8	65.6	66
AP-7	Calcium, total	mg/L	181.6			**181.6**	62.9	64.9	46.4	44.8	49.3	53.6	49.6	50.6	55.6	52.3	59.5	61.9
AP-8	Calcium, total	mg/L	181.6			**181.6**	100	96.5	96.1	100	95.1	99.1	107	101	99.3	99.4	89.5	98.4
AP-9	Calcium, total	mg/L	181.6			**181.6**	46.5	112	102	104	105	108	86.1	97.8	97.9	101	103	104
AP-10	Calcium, total	mg/L	181.6			**181.6**		141	140	142	139	144	138	138	141	141	133	140
AP-11	Calcium, total	mg/L	181.6			**181.6**	127	149	102	141	169	145	118	134	150	217	126	124
AP-12	Calcium, total	mg/L	181.6			**181.6**	201	287	266	260	265	269	271	268	228	240	258	203
AP-13	Calcium, total	mg/L	181.6			**181.6**	106	105	138	112	107	105	106	122	101	109	106	103
AP-14	Calcium, total	mg/L	181.6			**181.6**	225	215	217	236	209	233	235	278	263	245	237	253
AW-1	Calcium, total	mg/L	181.6			**181.6**		195				191		197	203	200	186	193
G120	Calcium, total	mg/L	181.6			**181.6**		263				274		257	265	259	240	263
RW-3	Calcium, total	mg/L	181.6			**181.6**	72.7	75.6	72.3	72.7	67.8	70.5	52.8	58.7	63.4	65.6	63.2	67.2
T-1	Calcium, total	mg/L	181.6			**181.6**										105	183	172
T-2	Calcium, total	mg/L	181.6			**181.6**										150	218	211
T-4	Calcium, total	mg/L	181.6			**181.6**										62.7	77.3	96.8
T-5	Calcium, total	mg/L	181.6			**181.6**										65.4	64.6	70.3
T-6	Calcium, total	mg/L	181.6			**181.6**										91.3	84.3	91.4
R111	Calcium, total	mg/L	181.6			**181.6**	169		40.2			181		15.1	11	93.5	163	169

1. A shaded value indicates an exceedance of the Groundwater Protection Standard (GPS), which is higher of the MCL and the Background.

City Water, Light and Power
Power Plant Ash Impoundment
2022 - 2024 Groundwater Analytical Summary Data

Well	Parameter	Units	Background	40 CFR 257	MCL 40 CFR 141	GPS	2022-Q1	2022-Q2	2022-Q3	2022-Q4	2023-Q1	2023-Q2	2023-Q3	2023-Q4	2024-Q1	2024-Q2	2024-Q3	2024-Q4
AP-1	Chloride, total	mg/L	12.3			**12.3**	55	59	44	61	58	60	36	53	54	29	59	52.1
AP-2	Chloride, total	mg/L	12.3			**12.3**	36	35	34	34	36	37	54	40	39	36	39	35.1
AP-3	Chloride, total	mg/L	12.3			**12.3**	42	42	47	55	60	59	51	57	54	53	55.9	59.5
AP-4	Chloride, total	mg/L	12.3			**12.3**	12	16	13	14	14	14	13	14	13	13	15	12.3
AP-5	Chloride, total	mg/L	12.3			**12.3**	< 4	2	6	< 4	3	4	4	5	8	8	8	7.59
AP-6	Chloride, total	mg/L	12.3			**12.3**	35	38	25	31	27	31	28	33	30	33	37	34.5
AP-7	Chloride, total	mg/L	12.3			**12.3**	64	66	36	58	45	70	39	60	42	43	50	62.1
AP-8	Chloride, total	mg/L	12.3			**12.3**	26	28	27	26	26	26	25	25	24	26	35	23.2
AP-9	Chloride, total	mg/L	12.3			**12.3**	24	64	30	27	36	60	28	26	25	39	29	23.6
AP-10	Chloride, total	mg/L	12.3			**12.3**		29	28	28	27	28	28	27	27	27	30	25.7
AP-11	Chloride, total	mg/L	12.3			**12.3**	83	119	29	105	140	123	79	90	122	429	90	91
AP-12	Chloride, total	mg/L	12.3			**12.3**	113	162	143	147	140	142	139	124	115	121	136	120
AP-13	Chloride, total	mg/L	12.3			**12.3**	35	27	103	26	29	26	26	27	27	26	27	25.8
AP-14	Chloride, total	mg/L	12.3			**12.3**	49	52	59	65	59	71	73	89	82	83	92	94
AW-1	Chloride, total	mg/L	12.3			**12.3**		40				41		40	40	40	41	37.3
G120	Chloride, total	mg/L	12.3			**12.3**		40				40		40	39	39	41	37.4
RW-3	Chloride, total	mg/L	12.3			**12.3**	29	31	31	30	29	32	28	31	27	28	29	25.1
T-1	Chloride, total	mg/L	12.3			**12.3**										49	259	233
T-2	Chloride, total	mg/L	12.3			**12.3**										173	447	509
T-4	Chloride, total	mg/L	12.3			**12.3**										< 4	< 4	< 5
T-5	Chloride, total	mg/L	12.3			**12.3**										< 4	< 4	< 5
T-6	Chloride, total	mg/L	12.3			**12.3**										21	24	19.4
R111	Chloride, total	mg/L	12.3			**12.3**	202		25			219		< 4	6	22	185	202
AP-1	Fluoride, total	mg/L	0.5	4		**4**	0.2	0.21	0.2	0.18	0.2	0.27	0.24	0.26	0.18	0.19	0.2	< 0.5
AP-2	Fluoride, total	mg/L	0.5	4		**4**	0.24	0.24	0.24	0.22	0.24	0.22	0.2	0.27	0.21	0.23	0.25	< 0.5
AP-3	Fluoride, total	mg/L	0.5	4		**4**	0.21	0.24	0.23	0.21	0.22	0.22	0.21	0.25	0.17	0.19	< 0.5	< 0.5
AP-4	Fluoride, total	mg/L	0.5	4		**4**	0.14	0.15	0.15	0.13	0.14	0.14	0.14	0.16	0.16	0.13	0.15	< 0.5
AP-5	Fluoride, total	mg/L	0.5	4		**4**	0.33	0.38	0.29	0.31	0.34	0.32	0.31	0.37	0.28	0.29	0.32	< 0.5
AP-6	Fluoride, total	mg/L	0.5	4		**4**	0.49	0.55	0.31	0.4	0.38	0.51	0.26	0.5	0.37	0.48	0.56	< 0.5
AP-7	Fluoride, total	mg/L	0.5	4		**4**	0.55	0.56	0.37	0.39	0.36	0.53	0.34	0.53	0.44	0.38	0.46	< 0.5
AP-8	Fluoride, total	mg/L	0.5	4		**4**	0.29	0.31	0.3	0.27	0.3	0.33	0.29	0.31	0.26	0.28	0.33	< 0.5
AP-9	Fluoride, total	mg/L	0.5	4		**4**	0.25	0.23	0.25	0.22	0.22	0.2	0.23	0.29	0.26	0.21	0.26	< 0.5
AP-10	Fluoride, total	mg/L	0.5	4		**4**		0.35	0.34	0.3	0.3	0.36	0.32	0.35	0.29	0.28	0.32	< 0.5
AP-11	Fluoride, total	mg/L	0.5	4		**4**	0.21	0.22	0.22	0.2	0.18	0.2	0.21	0.65	0.22	0.22	0.21	< 0.5
AP-12	Fluoride, total	mg/L	0.5	4		**4**	0.17	0.19	0.18	0.17	0.17	0.18	0.18	0.2	0.19	0.16	0.19	< 0.5
AP-13	Fluoride, total	mg/L	0.5	4		**4**	0.23	0.24	0.22	0.21	0.2	0.23	0.22	0.24	0.24	0.2	0.22	< 0.5
AP-14	Fluoride, total	mg/L	0.5	4		**4**	0.28	0.3	0.29	0.26	0.25	0.28	0.27	0.29	0.3	0.24	0.28	< 0.5
AW-1	Fluoride, total	mg/L	0.5	4		**4**		< 0.1				< 0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.5
G120	Fluoride, total	mg/L	0.5	4		**4**		0.18				0.19		0.18	0.17	0.16	0.16	< 0.5
RW-3	Fluoride, total	mg/L	0.5	4		**4**	0.47	0.49	0.48	0.43	0.46	0.52	0.27	0.44	0.37	0.4	0.43	< 0.5
T-1	Fluoride, total	mg/L	0.5	4		**4**										0.2	0.22	< 0.5
T-2	Fluoride, total	mg/L	0.5	4		**4**										0.24	0.23	< 0.5
T-4	Fluoride, total	mg/L	0.5	4		**4**										0.26	0.32	< 0.5
T-5	Fluoride, total	mg/L	0.5	4		**4**										0.18	0.22	< 0.5
T-6	Fluoride, total	mg/L	0.5	4		**4**										0.28	0.32	< 0.5
R111	Fluoride, total	mg/L	0.5	4		**4**	< 0.5		0.11			0.16		< 0.1	< 0.1	< 0.1	0.14	< 0.5

1. A shaded value indicates an exceedance of the Groundwater Protection Standard (GPS), which is higher of the MCL and the Background.

City Water, Light and Power
Power Plant Ash Impoundment
2022 - 2024 Groundwater Analytical Summary Data

Well	Parameter	Units	Background	40 CFR 257	MCL 40 CFR 141	GPS	2022-Q1	2022-Q2	2022-Q3	2022-Q4	2023-Q1	2023-Q2	2023-Q3	2023-Q4	2024-Q1	2024-Q2	2024-Q3	2024-Q4
AP-1	pH	s.u.	6.7 - 7.87			**7.87**	6.57	6.58	6.65	6.68	6.6	6.52	6.51	6.71	6.51	6.31	6.7	6.54
AP-2	pH	s.u.	6.7 - 7.87			**7.87**	6.43	6.43	6.45	6.52	6.46	6.44	6.4	6.57	6.41	6.21	6.58	6.41
AP-3	pH	s.u.	6.7 - 7.87			**7.87**	6.6	6.58	6.6	6.65	6.58	6.64	6.53	6.69	6.55	6.36	6.2	6.48
AP-4	pH	s.u.	6.7 - 7.87			**7.87**	6.92	6.86	6.89	6.95	6.99	6.82	6.86	6.99	6.86	6.83	6.97	6.82
AP-5	pH	s.u.	6.7 - 7.87			**7.87**	7.01	7.17	7.16	7.16	7.06	7.08	7.16	7.17	7.01	6.99	7.07	6.9
AP-6	pH	s.u.	6.7 - 7.87			**7.87**	7.18	7.11	7.2	7.14	7.07	7.02	7.06	7.17	6.97	7.27	7.16	7
AP-7	pH	s.u.	6.7 - 7.87			**7.87**	7.2	6.92	7.12	7.17	7.2	7.11	7.28	7.15	7.15	7.15	7.2	7.17
AP-8	pH	s.u.	6.7 - 7.87			**7.87**	6.91	6.9	6.76	6.99	6.86	6.77	6.75	7.01	6.83	7.03	7.03	6.78
AP-9	pH	s.u.	6.7 - 7.87			**7.87**	7.47	6.63	6.92	6.83	6.85	6.69	6.88	6.81	6.82	6.75	6.89	6.8
AP-10	pH	s.u.	6.7 - 7.87			**7.87**		6.69	6.7	6.76	6.58	6.68	6.57	6.82	6.65	6.54	6.53	6.73
AP-11	pH	s.u.	6.7 - 7.87			**7.87**	6.57	6.51	6.61	6.64	6.42	6.45	6.64	6.6	6.45	6.75	6.44	6.66
AP-12	pH	s.u.	6.7 - 7.87			**7.87**	6.53	6.44	6.56	6.6	6.47	6.43	6.57	6.62	6.53	6.52	6.43	6.59
AP-13	pH	s.u.	6.7 - 7.87			**7.87**	6.71	6.59	6.76	6.79	6.62	6.54	6.66	6.74	6.73	6.7	6.59	6.67
AP-14	pH	s.u.	6.7 - 7.87			**7.87**	6.93	6.95	6.94	7.05	6.69	6.97	6.93	7.06	6.93	6.95	6.76	6.93
AW-1	pH	s.u.	6.7 - 7.87			**7.87**	6.67	6.66	6.64	6.83	6.54	6.47	6.51	6.54	6.55	6.58	6.58	6.56
G120	pH	s.u.	6.7 - 7.87			**7.87**	6.77	6.73	6.7	6.7	6.62	6.54	6.79	6.78	6.47	6.65	6.81	6.55
RW-3	pH	s.u.	6.7 - 7.87			**7.87**	7.27	7.2	7.11	7.21	6.15	7.06	7.13	7.31	7.1	6.7	7.23	7.13
T-1	pH	s.u.	6.7 - 7.87			**7.87**										6.57	6.51	6.57
T-2	pH	s.u.	6.7 - 7.87			**7.87**										6.51	6.37	6.54
T-4	pH	s.u.	6.7 - 7.87			**7.87**										6.31	6.68	6.65
T-5	pH	s.u.	6.7 - 7.87			**7.87**										6.62	6.86	6.82
T-6	pH	s.u.	6.7 - 7.87			**7.87**										6.56	6.77	6.97
R111	pH	s.u.	6.7 - 7.87			**7.87**	5.96	6.86	6.92	6.81	7.69	6.97	6.91	6.42	6.14	6.01	6.84	5.96
AP-1	Sulfate, total	mg/L	55.5			**55.5**	732	791	753	777	56.8	768	443	740	790	805	836	849
AP-2	Sulfate, total	mg/L	55.5			**55.5**	583	532	545	643	485	462	795	380	393	411	417	440
AP-3	Sulfate, total	mg/L	55.5			**55.5**	410	408	384	444	461	483	467	495	512	493	554	558
AP-4	Sulfate, total	mg/L	55.5			**55.5**	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	11	< 10	< 10	< 10
AP-5	Sulfate, total	mg/L	55.5			**55.5**	57	35	66	36	37	44	43	45	50	43	63	59.2
AP-6	Sulfate, total	mg/L	55.5			**55.5**	< 10	< 10	15	13	12	11	22	13	14	< 10	11	< 10
AP-7	Sulfate, total	mg/L	55.5			**55.5**	< 10	< 10	15	13	16	< 10	20	15	17	11	14	< 10
AP-8	Sulfate, total	mg/L	55.5			**55.5**	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	11	< 10
AP-9	Sulfate, total	mg/L	55.5			**55.5**	23	57	27	28	38	64	24	23	23	22	25	17.7
AP-10	Sulfate, total	mg/L	55.5			**55.5**		86	87	96	96	100	100	91	96	100	108	89.4
AP-11	Sulfate, total	mg/L	55.5			**55.5**	67	88	120	89	105	89	65	81	89	134	77	63.4
AP-12	Sulfate, total	mg/L	55.5			**55.5**	402	678	607	691	641	659	632	563	460	499	612	457
AP-13	Sulfate, total	mg/L	55.5			**55.5**	134	135	64	142	133	146	139	151	118	140	135	121
AP-14	Sulfate, total	mg/L	55.5			**55.5**	670	681	639	736	699	707	714	806	679	740	821	909
AW-1	Sulfate, total	mg/L	55.5			**55.5**		344				399		384	369	401	406	388
G120	Sulfate, total	mg/L	55.5			**55.5**		464				500		555	503	535	534	565
RW-3	Sulfate, total	mg/L	55.5			**55.5**	10	< 10	< 10	< 10	< 10	< 10	22	16	14	< 10	14	< 10
T-1	Sulfate, total	mg/L	55.5			**55.5**										36	236	224
T-2	Sulfate, total	mg/L	55.5			**55.5**										135	181	142
T-4	Sulfate, total	mg/L	55.5			**55.5**										87	100	104
T-5	Sulfate, total	mg/L	55.5			**55.5**										27	40	40.4
T-6	Sulfate, total	mg/L	55.5			**55.5**										< 10	11	< 10
R111	Sulfate, total	mg/L	55.5			**55.5**	33.3		< 10			38		< 10	< 10	11	32	33.3

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City Water, Light and Power
Power Plant Ash Impoundment
2022 - 2024 Groundwater Analytical Summary Data

Well	Parameter	Units	Background	40 CFR 257	MCL 40 CFR 141	GPS	2022-Q1	2022-Q2	2022-Q3	2022-Q4	2023-Q1	2023-Q2	2023-Q3	2023-Q4	2024-Q1	2024-Q2	2024-Q3	2024-Q4
AP-1	Total Dissolved Solids	mg/L	609.21			**609.21**	1490	1550	1550	1540	7.4	1540	1190	1360	1400	1490	1530	1640
AP-2	Total Dissolved Solids	mg/L	609.21			**609.21**	1310	1270	1360	1310	1180	1100	1600	1020	1020	1040	1110	1160
AP-3	Total Dissolved Solids	mg/L	609.21			**609.21**	882	942	1030	920	1040	984	990	1080	935	1040	1170	1160
AP-4	Total Dissolved Solids	mg/L	609.21			**609.21**	496	516	540	495	515	534	560	420	520	500	510	565
AP-5	Total Dissolved Solids	mg/L	609.21			**609.21**	406	354	488	358	374	404	400	396	434	405	422	470
AP-6	Total Dissolved Solids	mg/L	609.21			**609.21**	374	458	246	348	322	380	268	322	380	390	396	445
AP-7	Total Dissolved Solids	mg/L	609.21			**609.21**	440	480	290	348	328	444	300	352	330	340	386	470
AP-8	Total Dissolved Solids	mg/L	609.21			**609.21**	502	552	540	505	555	544	555	430	520	590	526	530
AP-9	Total Dissolved Solids	mg/L	609.21			**609.21**	224	618	565	595	586	638	515	524	530	535	558	740
AP-10	Total Dissolved Solids	mg/L	609.21			**609.21**		752	755	730	778	756	725	732	745	720	796	790
AP-11	Total Dissolved Solids	mg/L	609.21			**609.21**	606	778	550	625	820	726	670	640	665	1780	596	686
AP-12	Total Dissolved Solids	mg/L	609.21			**609.21**	998	1600	1540	1440	1440	1580	1640	1320	1290	1620	1670	1300
AP-13	Total Dissolved Solids	mg/L	609.21			**609.21**	486	530	690	525	495	538	530	465	500	910	560	655
AP-14	Total Dissolved Solids	mg/L	609.21			**609.21**	1240	1340	1390	1380	1280	1330	1480	1440	1510	1480	1610	1840
AW-1	Total Dissolved Solids	mg/L	609.21			**609.21**	1080	1060	1090	1100	1150			1220	1120	1010	1190	1100
G120	Total Dissolved Solids	mg/L	609.21			**609.21**	1360	1440	1420	1400	1450			1390	1320	1320	1450	1430
RW-3	Total Dissolved Solids	mg/L	609.21			**609.21**	1030	428	428	425	420		290	340	335	345	344	470
T-1	Total Dissolved Solids	mg/L	609.21			**609.21**										700	1020	1060
T-2	Total Dissolved Solids	mg/L	609.21			**609.21**										1060	1430	1580
T-4	Total Dissolved Solids	mg/L	609.21			**609.21**										255	382	695
T-5	Total Dissolved Solids	mg/L	609.21			**609.21**										280	338	382
T-6	Total Dissolved Solids	mg/L	609.21			**609.21**										475	494	595
R111	Total Dissolved Solids	mg/L	609.21			**609.21**	875	135	805	118	110			68	78	525	832	875
Appendix IV																		
AP-1	Antimony, total	mg/L	0.001	0.006		**0.006**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AP-2	Antimony, total	mg/L	0.001	0.006		**0.006**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0021	< 0.001	< 0.001
AP-3	Antimony, total	mg/L	0.001	0.006		**0.006**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AP-4	Antimony, total	mg/L	0.001	0.006		**0.006**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AP-5	Antimony, total	mg/L	0.001	0.006		**0.006**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AP-6	Antimony, total	mg/L	0.001	0.006		**0.006**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0021
AP-7	Antimony, total	mg/L	0.001	0.006		**0.006**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0016	< 0.001
AP-8	Antimony, total	mg/L	0.001	0.006		**0.006**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AP-09	Antimony, total	mg/L	0.001	0.006		**0.006**	0.0025	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0017	< 0.001
AP-10	Antimony, total	mg/L	0.001	0.006		**0.006**		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0014	< 0.001	< 0.001
AP-11	Antimony, total	mg/L	0.001	0.006		**0.006**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AP-12	Antimony, total	mg/L	0.001	0.006		**0.006**	< 0.001	< 0.001	< 0.001	< 0.001	0.0015	< 0.001	< 0.001	< 0.001	< 0.001	0.0018	< 0.001	< 0.001
AP-13	Antimony, total	mg/L	0.001	0.006		**0.006**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AP-14	Antimony, total	mg/L	0.001	0.006		**0.006**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AW-1	Antimony, total	mg/L	0.001	0.006		**0.006**		< 0.001				< 0.001		< 0.001	< 0.001	< 0.001	0.0016	< 0.001
G120	Antimony, total	mg/L	0.001	0.006		**0.006**		< 0.001				< 0.001		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
RW-3	Antimony, total	mg/L	0.001	0.006		**0.006**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
T-1	Antimony, total	mg/L	0.001	0.006		**0.006**										< 0.001	< 0.001	< 0.001
T-2	Antimony, total	mg/L	0.001	0.006		**0.006**										< 0.001	< 0.001	< 0.001
T-4	Antimony, total	mg/L	0.001	0.006		**0.006**										0.0013	< 0.001	< 0.001
T-5	Antimony, total	mg/L	0.001	0.006		**0.006**										< 0.001	< 0.001	< 0.001
T-6	Antimony, total	mg/L	0.001	0.006		**0.006**										< 0.001	< 0.001	< 0.001
R111	Antimony, total	mg/L	0.001	0.006		**0.006**	< 0.001		< 0.001			< 0.001		< 0.001	< 0.001	< 0.001	0.0014	< 0.001

1. A shaded value indicates an exceedance of the Groundwater Protection Standard (GPS), which is higher of the MCL and the Background.

City Water, Light and Power
Power Plant Ash Impoundment
2022 - 2024 Groundwater Analytical Summary Data

Well	Parameter	Units	Background	40 CFR 257	MCL 40 CFR 141	GPS	2022-Q1	2022-Q2	2022-Q3	2022-Q4	2023-Q1	2023-Q2	2023-Q3	2023-Q4	2024-Q1	2024-Q2	2024-Q3	2024-Q4
AP-1	Arsenic, total	mg/L	0.0375	0.01		**0.0375**	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AP-2	Arsenic, total	mg/L	0.0375	0.01		**0.0375**	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.002	0.002	0.0027	0.002	0.0031	0.0016
AP-3	Arsenic, total	mg/L	0.0375	0.01		**0.0375**	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.0109	0.0182	0.0101	0.0021	0.008	0.0182
AP-4	Arsenic, total	mg/L	0.0375	0.01		**0.0375**	0.0306	< 0.025	0.0309	0.027	< 0.025	0.025	0.0239	0.0225	0.0375	0.0229	0.0207	0.0246
AP-5	Arsenic, total	mg/L	0.0375	0.01		**0.0375**	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AP-6	Arsenic, total	mg/L	0.0375	0.01		**0.0375**	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.004	0.0183	0.0068	0.0121	0.0074	0.0108
AP-7	Arsenic, total	mg/L	0.0375	0.01		**0.0375**	< 0.025	0.0468	0.0376	< 0.025	< 0.025	0.0462	0.0412	0.075	0.0555	0.0395	0.0438	0.0947
AP-8	Arsenic, total	mg/L	0.0375	0.01		**0.0375**	0.0319	0.0352	0.0377	0.034	0.0336	0.0348	0.0513	0.0395	0.0426	0.0461	0.0414	0.0386
AP-09	Arsenic, total	mg/L	0.0375	0.01		**0.0375**	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.0114	0.0062	0.0037	0.0024	0.0028	0.0019
AP-10	Arsenic, total	mg/L	0.0375	0.01		**0.0375**		< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.0013	< 0.001	0.0011	< 0.001	< 0.001	0.0011
AP-11	Arsenic, total	mg/L	0.0375	0.01		**0.0375**	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.001	< 0.001	< 0.001	0.0037	< 0.001	< 0.001
AP-12	Arsenic, total	mg/L	0.0375	0.01		**0.0375**	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.001	0.0149	0.0013	0.0038	0.0015	< 0.001
AP-13	Arsenic, total	mg/L	0.0375	0.01		**0.0375**	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.0031	0.0075	0.0028	0.0032	0.0029	0.0038
AP-14	Arsenic, total	mg/L	0.0375	0.01		**0.0375**	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.0018	0.0036	0.0039	0.0019	0.0016	0.0022
AW-1	Arsenic, total	mg/L	0.0375	0.01		**0.0375**		0.148	0.192			0.152		0.208	0.16	0.153	0.129	0.168
G120	Arsenic, total	mg/L	0.0375	0.01		**0.0375**		0.012				0.0138		0.0162	0.0116	0.0121	0.0104	0.0119
RW-3	Arsenic, total	mg/L	0.0375	0.01		**0.0375**	0.178	0.109	0.11	0.142	0.169	0.185	0.0831	0.74	0.306	0.188	0.107	0.214
T-1	Arsenic, total	mg/L	0.0375	0.01		**0.0375**										< 0.001	0.0048	0.0019
T-2	Arsenic, total	mg/L	0.0375	0.01		**0.0375**										0.0023	0.0053	0.006
T-4	Arsenic, total	mg/L	0.0375	0.01		**0.0375**										0.0013	0.0055	0.0055
T-5	Arsenic, total	mg/L	0.0375	0.01		**0.0375**										< 0.001	< 0.001	0.0016
T-6	Arsenic, total	mg/L	0.0375	0.01		**0.0375**										0.0076	0.0108	0.0158
R111	Arsenic, total	mg/L	0.0375	0.01		**0.0375**	0.0185		0.0111	0.0031		0.021	0.0212	0.0019	0.0015	0.0175	0.0166	0.0185
AP-1	Barium, total	mg/L	0.51918	2		**2**	0.277	0.309	0.246	0.285	0.236	0.329	0.271	0.262	0.292	0.3	0.269	0.269
AP-2	Barium, total	mg/L	0.51918	2		**2**	0.0721	0.073	0.0751	0.0734	0.0744	0.0656	0.0719	0.0716	0.0678	0.0607	0.0751	0.0727
AP-3	Barium, total	mg/L	0.51918	2		**2**	0.08019999	0.0849	0.0883	0.0951	0.111	0.103	0.0993	0.113	0.095	0.077	0.102	0.132
AP-4	Barium, total	mg/L	0.51918	2		**2**	0.413	0.422	0.392	0.399	0.39	0.404	0.396	0.381	0.39	0.407	0.374	0.39
AP-5	Barium, total	mg/L	0.51918	2		**2**	0.0505	0.0345	0.0908	0.042	0.0408	0.0451	0.0461	0.0471	0.0515	0.051	0.0521	0.0525
AP-6	Barium, total	mg/L	0.51918	2		**2**	0.119	0.141	0.066	0.135	0.0938	0.111	0.0844	0.16	0.119	0.147	0.152	0.154
AP-7	Barium, total	mg/L	0.51918	2		**2**	0.125	0.13	0.119	0.13	0.111	0.162	0.106	0.158	0.118	0.0915	0.108	0.148
AP-8	Barium, total	mg/L	0.51918	2		**2**	0.355	0.356	0.355	0.371	0.36	0.375	0.378	0.374	0.374	0.373	0.407	0.364
AP-09	Barium, total	mg/L	0.51918	2		**2**	0.114	0.399	0.403	0.396	0.284	0.295	0.324	0.399	0.378	0.36	0.405	0.434
AP-10	Barium, total	mg/L	0.51918	2		**2**		0.571	0.553	0.57	0.509	0.602	0.596	0.583	0.613	0.605	0.638	0.628
AP-11	Barium, total	mg/L	0.51918	2		**2**	0.108	0.152	0.176	0.184	0.37	0.161	0.113	0.126	0.154	0.238	0.11	0.122
AP-12	Barium, total	mg/L	0.51918	2		**2**	0.171	0.101	0.153	0.0701	0.0794	0.0649	0.0481	0.138	0.0569	0.0707	0.0515	0.0458
AP-13	Barium, total	mg/L	0.51918	2		**2**	0.119	0.161	0.307	0.26	0.175	0.128	0.121	0.177	0.116	0.131	0.127	0.12
AP-14	Barium, total	mg/L	0.51918	2		**2**	0.0411	0.0343	0.0361	0.0438	0.0413	0.0389	0.0349	0.0636	0.0422	0.0329	0.0371	0.0413
AW-1	Barium, total	mg/L	0.51918	2		**2**		0.64				0.622		1.96	2.02	1.48	0.602	0.446
G120	Barium, total	mg/L	0.51918	2		**2**		0.432				0.972		0.556	0.628	0.681	0.614	0.565
RW-3	Barium, total	mg/L	0.51918	2		**2**	0.154	0.151	0.158	0.166	0.168	0.172	0.106	0.165	0.166	0.143	0.146	0.18
T-1	Barium, total	mg/L	0.51918	2		**2**										0.0862	0.118	0.0707
T-2	Barium, total	mg/L	0.51918	2		**2**										0.0771	0.246	0.225
T-4	Barium, total	mg/L	0.51918	2		**2**										0.0382	0.0562	0.0578
T-5	Barium, total	mg/L	0.51918	2		**2**										0.0478	0.0538	0.0564
T-6	Barium, total	mg/L	0.51918	2		**2**										0.314	0.323	0.306
R111	Barium, total	mg/L	0.51918	2		**2**	0.686		0.161			0.704		0.0598	0.0139	0.369	0.639	0.686

1. A shaded value indicates an exceedance of the Groundwater Protection Standard (GPS), which is higher of the MCL and the Background.

City Water, Light and Power
Power Plant Ash Impoundment
2022 - 2024 Groundwater Analytical Summary Data

Well	Parameter	Units	Background	40 CFR 257	MCL 40 CFR 141	GPS	2022-Q1	2022-Q2	2022-Q3	2022-Q4	2023-Q1	2023-Q2	2023-Q3	2023-Q4	2024-Q1	2024-Q2	2024-Q3	2024-Q4
AP-1	Beryllium, total	mg/L	0.0025	0.004		**0.004**	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
AP-2	Beryllium, total	mg/L	0.0025	0.004		**0.004**	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
AP-3	Beryllium, total	mg/L	0.0025	0.004		**0.004**	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
AP-4	Beryllium, total	mg/L	0.0025	0.004		**0.004**	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
AP-5	Beryllium, total	mg/L	0.0025	0.004		**0.004**	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
AP-6	Beryllium, total	mg/L	0.0025	0.004		**0.004**	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
AP-7	Beryllium, total	mg/L	0.0025	0.004		**0.004**	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
AP-8	Beryllium, total	mg/L	0.0025	0.004		**0.004**	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
AP-09	Beryllium, total	mg/L	0.0025	0.004		**0.004**	< 0.0005	< 0.0005	0.0006	0.0011	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
AP-10	Beryllium, total	mg/L	0.0025	0.004		**0.004**		< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
AP-11	Beryllium, total	mg/L	0.0025	0.004		**0.004**	< 0.0005	< 0.0005	0.0005	0.0007	0.0009	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
AP-12	Beryllium, total	mg/L	0.0025	0.004		**0.004**	0.001	0.0005	0.0018	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0015	0.0006	< 0.0005	< 0.0005	< 0.0005
AP-13	Beryllium, total	mg/L	0.0025	0.004		**0.004**	< 0.0005	< 0.0005	0.0016	0.0015	< 0.0005	< 0.0005	< 0.0005	0.0009	< 0.0005	< 0.0005	< 0.0005	< 0.0005
AP-14	Beryllium, total	mg/L	0.0025	0.004		**0.004**	< 0.0005	< 0.0005	0.0009	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
AW-1	Beryllium, total	mg/L	0.0025	0.004		**0.004**		< 0.0005				< 0.0005		< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
G120	Beryllium, total	mg/L	0.0025	0.004		**0.004**		< 0.0005				< 0.0005		< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
RW-3	Beryllium, total	mg/L	0.0025	0.004		**0.004**	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
T-1	Beryllium, total	mg/L	0.0025	0.004		**0.004**										< 0.0005	< 0.0005	< 0.0005
T-2	Beryllium, total	mg/L	0.0025	0.004		**0.004**										< 0.0005	< 0.0005	< 0.0005
T-4	Beryllium, total	mg/L	0.0025	0.004		**0.004**										< 0.0005	< 0.0005	< 0.0005
T-5	Beryllium, total	mg/L	0.0025	0.004		**0.004**										< 0.0005	< 0.0005	< 0.0005
T-6	Beryllium, total	mg/L	0.0025	0.004		**0.004**										< 0.0005	< 0.0005	< 0.0005
R111	Beryllium, total	mg/L	0.0025	0.004		**0.004**	< 0.0005		< 0.0005			< 0.0005		< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
AP-1	Cadmium, total	mg/L	0.0025	0.005		**0.005**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-2	Cadmium, total	mg/L	0.0025	0.005		**0.005**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-3	Cadmium, total	mg/L	0.0025	0.005		**0.005**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-4	Cadmium, total	mg/L	0.0025	0.005		**0.005**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-5	Cadmium, total	mg/L	0.0025	0.005		**0.005**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-6	Cadmium, total	mg/L	0.0025	0.005		**0.005**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-7	Cadmium, total	mg/L	0.0025	0.005		**0.005**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-8	Cadmium, total	mg/L	0.0025	0.005		**0.005**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-09	Cadmium, total	mg/L	0.0025	0.005		**0.005**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-10	Cadmium, total	mg/L	0.0025	0.005		**0.005**		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-11	Cadmium, total	mg/L	0.0025	0.005		**0.005**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-12	Cadmium, total	mg/L	0.0025	0.005		**0.005**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-13	Cadmium, total	mg/L	0.0025	0.005		**0.005**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-14	Cadmium, total	mg/L	0.0025	0.005		**0.005**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AW-1	Cadmium, total	mg/L	0.0025	0.005		**0.005**		< 0.002				< 0.002		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
G120	Cadmium, total	mg/L	0.0025	0.005		**0.005**		< 0.002				< 0.002		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
RW-3	Cadmium, total	mg/L	0.0025	0.005		**0.005**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
T-1	Cadmium, total	mg/L	0.0025	0.005		**0.005**										< 0.002	< 0.002	< 0.002
T-2	Cadmium, total	mg/L	0.0025	0.005		**0.005**										< 0.002	< 0.002	< 0.002
T-4	Cadmium, total	mg/L	0.0025	0.005		**0.005**										< 0.002	< 0.002	< 0.002
T-5	Cadmium, total	mg/L	0.0025	0.005		**0.005**										< 0.002	< 0.002	< 0.002
T-6	Cadmium, total	mg/L	0.0025	0.005		**0.005**										< 0.002	< 0.002	< 0.002
R111	Cadmium, total	mg/L	0.0025	0.005		**0.005**	< 0.002		< 0.002			< 0.002		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

1. A shaded value indicates an exceedance of the Groundwater Protection Standard (GPS), which is higher of the MCL and the Background.

City Water, Light and Power
Power Plant Ash Impoundment
2022 - 2024 Groundwater Analytical Summary Data

Well	Parameter	Units	Background	40 CFR 257	MCL 40 CFR 141	GPS	2022-Q1	2022-Q2	2022-Q3	2022-Q4	2023-Q1	2023-Q2	2023-Q3	2023-Q4	2024-Q1	2024-Q2	2024-Q3	2024-Q4
AP-1	Chromium, total	mg/L	0.0653	0.1		**0.1**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AP-2	Chromium, total	mg/L	0.0653	0.1		**0.1**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AP-3	Chromium, total	mg/L	0.0653	0.1		**0.1**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AP-4	Chromium, total	mg/L	0.0653	0.1		**0.1**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AP-5	Chromium, total	mg/L	0.0653	0.1		**0.1**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AP-6	Chromium, total	mg/L	0.0653	0.1		**0.1**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AP-7	Chromium, total	mg/L	0.0653	0.1		**0.1**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AP-8	Chromium, total	mg/L	0.0653	0.1		**0.1**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AP-09	Chromium, total	mg/L	0.0653	0.1		**0.1**	< 0.005	< 0.005	0.0098	0.0119	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AP-10	Chromium, total	mg/L	0.0653	0.1		**0.1**		< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AP-11	Chromium, total	mg/L	0.0653	0.1		**0.1**	< 0.005	< 0.005	0.0098	0.0158	0.0213	< 0.005	< 0.005	< 0.005	0.0081	< 0.005	< 0.005	< 0.005
AP-12	Chromium, total	mg/L	0.0653	0.1		**0.1**	0.0253	0.0119	0.037	0.0073	< 0.005	< 0.005	< 0.005	0.0332	< 0.005	0.0053	< 0.005	< 0.005
AP-13	Chromium, total	mg/L	0.0653	0.1		**0.1**	< 0.005	< 0.005	0.0369	0.0413	0.0059	< 0.005	< 0.005	0.019	< 0.005	< 0.005	< 0.005	< 0.005
AP-14	Chromium, total	mg/L	0.0653	0.1		**0.1**	< 0.005	< 0.005	< 0.005	< 0.005	0.0058	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AW-1	Chromium, total	mg/L	0.0653	0.1		**0.1**		< 0.005				< 0.005		0.0101	0.0087	0.0105	< 0.005	< 0.005
G120	Chromium, total	mg/L	0.0653	0.1		**0.1**		< 0.005				< 0.005		< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
RW-3	Chromium, total	mg/L	0.0653	0.1		**0.1**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
T-1	Chromium, total	mg/L	0.0653	0.1		**0.1**										< 0.005	0.0096	< 0.005
T-2	Chromium, total	mg/L	0.0653	0.1		**0.1**										< 0.005	< 0.005	< 0.005
T-4	Chromium, total	mg/L	0.0653	0.1		**0.1**										< 0.005	< 0.005	< 0.005
T-5	Chromium, total	mg/L	0.0653	0.1		**0.1**										< 0.005	< 0.005	< 0.005
T-6	Chromium, total	mg/L	0.0653	0.1		**0.1**										< 0.005	< 0.005	< 0.005
R111	Chromium, total	mg/L	0.0653	0.1		**0.1**	< 0.005		< 0.005			< 0.005		< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AP-1	Cobalt, total	mg/L	0.0052		0.006	**0.006**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AP-2	Cobalt, total	mg/L	0.0052		0.006	**0.006**	0.0102	0.0089	0.0115	0.0111	0.0091	0.0102	0.0085	0.0091	0.0068	0.0102	0.0073	0.0085
AP-3	Cobalt, total	mg/L	0.0052		0.006	**0.006**	< 0.005	< 0.005	< 0.005	0.0054	< 0.005	0.0054	< 0.005	0.0051	< 0.005	0.0065	0.0071	< 0.005
AP-4	Cobalt, total	mg/L	0.0052		0.006	**0.006**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AP-5	Cobalt, total	mg/L	0.0052		0.006	**0.006**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AP-6	Cobalt, total	mg/L	0.0052		0.006	**0.006**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AP-7	Cobalt, total	mg/L	0.0052		0.006	**0.006**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AP-8	Cobalt, total	mg/L	0.0052		0.006	**0.006**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AP-09	Cobalt, total	mg/L	0.0052		0.006	**0.006**	< 0.005	< 0.005	0.0053	0.0056	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AP-10	Cobalt, total	mg/L	0.0052		0.006	**0.006**		< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AP-11	Cobalt, total	mg/L	0.0052		0.006	**0.006**	< 0.005	< 0.005	0.005	0.0061	0.011	< 0.005	0.0055	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AP-12	Cobalt, total	mg/L	0.0052		0.006	**0.006**	0.0143	0.0077	0.0219	0.007	< 0.005	< 0.005	< 0.005	0.0236	< 0.005	0.0054	< 0.005	< 0.005
AP-13	Cobalt, total	mg/L	0.0052		0.006	**0.006**	< 0.005	< 0.005	0.0215	0.021	< 0.005	< 0.005	< 0.005	0.0127	< 0.005	< 0.005	< 0.005	< 0.005
AP-14	Cobalt, total	mg/L	0.0052		0.006	**0.006**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0051	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
AW-1	Cobalt, total	mg/L	0.0052		0.006	**0.006**		< 0.005				< 0.005		< 0.005	0.0055	< 0.005	< 0.005	< 0.005
G120	Cobalt, total	mg/L	0.0052		0.006	**0.006**		< 0.005				< 0.005		< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
RW-3	Cobalt, total	mg/L	0.0052		0.006	**0.006**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
T-1	Cobalt, total	mg/L	0.0052		0.006	**0.006**										< 0.005	0.0063	< 0.005
T-2	Cobalt, total	mg/L	0.0052		0.006	**0.006**										0.0075	< 0.005	< 0.005
T-4	Cobalt, total	mg/L	0.0052		0.006	**0.006**										< 0.005	0.005	< 0.005
T-5	Cobalt, total	mg/L	0.0052		0.006	**0.006**										< 0.005	< 0.005	< 0.005
T-6	Cobalt, total	mg/L	0.0052		0.006	**0.006**										< 0.005	< 0.005	< 0.005
R111	Cobalt, total	mg/L	0.0052		0.006	**0.006**	< 0.005		< 0.005			< 0.005		< 0.005	< 0.005	< 0.005	< 0.005	< 0.005

1. A shaded value indicates an exceedance of the Groundwater Protection Standard (GPS), which is higher of the MCL and the Background.

City Water, Light and Power
Power Plant Ash Impoundment
2022 - 2024 Groundwater Analytical Summary Data

Well	Parameter	Units	Background	40 CFR 257	MCL 40 CFR 141	GPS	2022-Q1	2022-Q2	2022-Q3	2022-Q4	2023-Q1	2023-Q2	2023-Q3	2023-Q4	2024-Q1	2024-Q2	2024-Q3	2024-Q4
AP-1	Lead, total	mg/L	0.0075		0.015	**0.015**	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.0075	< 0.0075
AP-2	Lead, total	mg/L	0.0075		0.015	**0.015**	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.0075	< 0.0075
AP-3	Lead, total	mg/L	0.0075		0.015	**0.015**	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.0075	< 0.0075
AP-4	Lead, total	mg/L	0.0075		0.015	**0.015**	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.0075	< 0.0075
AP-5	Lead, total	mg/L	0.0075		0.015	**0.015**	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.0075	< 0.0075
AP-6	Lead, total	mg/L	0.0075		0.015	**0.015**	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.0075	< 0.0075
AP-7	Lead, total	mg/L	0.0075		0.015	**0.015**	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.0075	< 0.0075
AP-8	Lead, total	mg/L	0.0075		0.015	**0.015**	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.0075	< 0.0075
AP-09	Lead, total	mg/L	0.0075		0.015	**0.015**	< 0.015	0.0168	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.0075	< 0.0075
AP-10	Lead, total	mg/L	0.0075		0.015	**0.015**		< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.0075	< 0.0075
AP-11	Lead, total	mg/L	0.0075		0.015	**0.015**	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.0075	< 0.0075
AP-12	Lead, total	mg/L	0.0075		0.015	**0.015**	0.0225	< 0.015	0.0228	< 0.015	< 0.015	< 0.015	< 0.015	0.0161	< 0.015	< 0.015	< 0.0075	< 0.0075
AP-13	Lead, total	mg/L	0.0075		0.015	**0.015**	< 0.015	< 0.015	0.0163	0.0177	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.0075	< 0.0075
AP-14	Lead, total	mg/L	0.0075		0.015	**0.015**	< 0.015	0.0189	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.0075	< 0.0075
AW-1	Lead, total	mg/L	0.0075		0.015	**0.015**		0.0018				< 0.001		< 0.015	< 0.015	0.0051	< 0.0075	< 0.0075
G120	Lead, total	mg/L	0.0075		0.015	**0.015**		< 0.001				0.0037		< 0.015	< 0.015	< 0.001	< 0.0075	< 0.0075
RW-3	Lead, total	mg/L	0.0075		0.015	**0.015**	< 0.015	< 0.001	< 0.015	< 0.015	< 0.015	< 0.001	< 0.015	< 0.015	< 0.015	< 0.015	< 0.0075	< 0.0075
T-1	Lead, total	mg/L	0.0075		0.015	**0.015**										< 0.015	< 0.0075	< 0.0075
T-2	Lead, total	mg/L	0.0075		0.015	**0.015**										< 0.015	< 0.0075	< 0.0075
T-4	Lead, total	mg/L	0.0075		0.015	**0.015**										< 0.015	< 0.0075	< 0.0075
T-5	Lead, total	mg/L	0.0075		0.015	**0.015**										< 0.015	< 0.0075	< 0.0075
T-6	Lead, total	mg/L	0.0075		0.015	**0.015**										< 0.015	< 0.0075	< 0.0075
R111	Lead, total	mg/L	0.0075		0.015	**0.015**	< 0.0075		< 0.001			0.002		< 0.015	< 0.015	< 0.001	< 0.0075	< 0.0075
AP-1	Lithium	mg/L	0.0124		0.04	**0.04**	0.0098	0.0096	0.0087	< 0.05	0.0566	< 0.005	0.0109	0.0085	0.0099	< 0.05	0.0103	0.0094
AP-2	Lithium	mg/L	0.0124		0.04	**0.04**	0.0057	0.0056	0.0055	< 0.05	0.0476	< 0.005	0.0063	0.0056	0.0059	< 0.05	0.0081	0.0068
AP-3	Lithium	mg/L	0.0124		0.04	**0.04**	0.0053	< 0.005	< 0.005	< 0.05	0.0501	< 0.005	0.0063	0.0051	0.0062	< 0.05	0.0064	0.0062
AP-4	Lithium	mg/L	0.0124		0.04	**0.04**	0.0092	0.0092	0.0077	< 0.05	0.0196	< 0.005	0.0078	0.0051	0.0076	< 0.05	0.0072	0.0077
AP-5	Lithium	mg/L	0.0124		0.04	**0.04**	0.0053	< 0.005	0.0104	< 0.05	0.0142	0.0074	0.0046	< 0.005	< 0.005	< 0.05	0.0062	0.0043
AP-6	Lithium	mg/L	0.0124		0.04	**0.04**	0.0071	0.0079	< 0.005	< 0.05	0.014	< 0.005	< 0.003	< 0.005	< 0.005	< 0.05	0.0098	0.0104
AP-7	Lithium	mg/L	0.0124		0.04	**0.04**	0.009	0.0079	< 0.005	< 0.05	< 0.005	0.0113	0.0047	< 0.005	< 0.005	< 0.05	0.0063	0.0079
AP-8	Lithium	mg/L	0.0124		0.04	**0.04**	0.0068	0.0065	0.0065	< 0.05	0.0201	< 0.005	0.0074	< 0.005	0.0069	< 0.05	0.0075	0.0069
AP-09	Lithium	mg/L	0.0124		0.04	**0.04**	< 0.005	0.0073	0.0114	< 0.05	< 0.005	0.0067	0.0054	< 0.005	0.0059	< 0.05	0.0069	0.0066
AP-10	Lithium	mg/L	0.0124		0.04	**0.04**		0.01	0.0087	< 0.05	< 0.005	< 0.005	0.01	< 0.005	0.009	< 0.05	0.0094	0.0101
AP-11	Lithium	mg/L	0.0124		0.04	**0.04**	< 0.005	< 0.005	0.017	< 0.05	0.0115	0.0068	0.0045	< 0.005	< 0.005	< 0.05	0.0044	0.005
AP-12	Lithium	mg/L	0.0124		0.04	**0.04**	0.0257	0.0141	0.0331	< 0.05	< 0.005	0.006	0.0072	0.0352	0.0064	< 0.05	0.0077	0.0065
AP-13	Lithium	mg/L	0.0124		0.04	**0.04**	0.0134	0.0114	0.0299	< 0.05	0.0167	0.0152	0.0133	0.0237	0.0109	< 0.05	0.0124	0.012
AP-14	Lithium	mg/L	0.0124		0.04	**0.04**	0.0074	0.0066	0.0063	< 0.05	0.0716	< 0.005	0.0076	< 0.005	0.0076	< 0.05	0.0078	0.0072
AW-1	Lithium	mg/L	0.0124		0.04	**0.04**								0.0739	0.0184	< 0.05	0.0145	0.0113
G120	Lithium	mg/L	0.0124		0.04	**0.04**								0.0486	0.008	< 0.05	0.0081	0.0086
RW-3	Lithium	mg/L	0.0124		0.04	**0.04**	0.0066	0.0064	0.0064	< 0.05	0.0179	< 0.005	< 0.003	0.0147	< 0.005	< 0.05	0.0038	0.0047
T-1	Lithium	mg/L	0.0124		0.04	**0.04**										< 0.05	0.0266	0.0199
T-2	Lithium	mg/L	0.0124		0.04	**0.04**										< 0.05	0.0394	0.0345
T-4	Lithium	mg/L	0.0124		0.04	**0.04**										< 0.05	0.0164	0.0161
T-5	Lithium	mg/L	0.0124		0.04	**0.04**										< 0.05	0.0095	0.0109
T-6	Lithium	mg/L	0.0124		0.04	**0.04**										< 0.05	0.0149	0.0134
R111	Lithium	mg/L	0.0124		0.04	**0.04**	0.0066							0.0185	< 0.005	< 0.05	0.007	0.0066

1. A shaded value indicates an exceedance of the Groundwater Protection Standard (GPS), which is higher of the MCL and the Background.

City Water, Light and Power
Power Plant Ash Impoundment
2022 - 2024 Groundwater Analytical Summary Data

Well	Parameter	Units	Background	40 CFR 257	MCL 40 CFR 141	GPS	2022-Q1	2022-Q2	2022-Q3	2022-Q4	2023-Q1	2023-Q2	2023-Q3	2023-Q4	2024-Q1	2024-Q2	2024-Q3	2024-Q4
AP-1	Mercury, total	mg/L	0.0005	0.002		**0.002**	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
AP-2	Mercury, total	mg/L	0.0005	0.002		**0.002**	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
AP-3	Mercury, total	mg/L	0.0005	0.002		**0.002**	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
AP-4	Mercury, total	mg/L	0.0005	0.002		**0.002**	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
AP-5	Mercury, total	mg/L	0.0005	0.002		**0.002**	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
AP-6	Mercury, total	mg/L	0.0005	0.002		**0.002**	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
AP-7	Mercury, total	mg/L	0.0005	0.002		**0.002**	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
AP-8	Mercury, total	mg/L	0.0005	0.002		**0.002**	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
AP-09	Mercury, total	mg/L	0.0005	0.002		**0.002**	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
AP-10	Mercury, total	mg/L	0.0005	0.002		**0.002**		< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
AP-11	Mercury, total	mg/L	0.0005	0.002		**0.002**	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.00021	< 0.0002	< 0.0002	< 0.0002
AP-12	Mercury, total	mg/L	0.0005	0.002		**0.002**	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
AP-13	Mercury, total	mg/L	0.0005	0.002		**0.002**	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
AP-14	Mercury, total	mg/L	0.0005	0.002		**0.002**	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
AW-1	Mercury, total	mg/L	0.0005	0.002		**0.002**		< 0.0002				< 0.0002		< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
G120	Mercury, total	mg/L	0.0005	0.002		**0.002**		< 0.0002				< 0.0002		< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
RW-3	Mercury, total	mg/L	0.0005	0.002		**0.002**	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
T-1	Mercury, total	mg/L	0.0005	0.002		**0.002**										< 0.0002	< 0.0002	< 0.0002
T-2	Mercury, total	mg/L	0.0005	0.002		**0.002**										< 0.0002	< 0.0002	< 0.0002
T-4	Mercury, total	mg/L	0.0005	0.002		**0.002**										< 0.0002	< 0.0002	< 0.0002
T-5	Mercury, total	mg/L	0.0005	0.002		**0.002**										< 0.0002	< 0.0002	< 0.0002
T-6	Mercury, total	mg/L	0.0005	0.002		**0.002**										< 0.0002	< 0.0002	< 0.0002
R111	Mercury, total	mg/L	0.0005	0.002		**0.002**	< 0.0002		< 0.0002			< 0.0002		< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
AP-1	Molybdenum, total	mg/L	0.025		0.1	**0.1**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
AP-2	Molybdenum, total	mg/L	0.025		0.1	**0.1**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
AP-3	Molybdenum, total	mg/L	0.025		0.1	**0.1**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
AP-4	Molybdenum, total	mg/L	0.025		0.1	**0.1**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
AP-5	Molybdenum, total	mg/L	0.025		0.1	**0.1**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
AP-6	Molybdenum, total	mg/L	0.025		0.1	**0.1**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
AP-7	Molybdenum, total	mg/L	0.025		0.1	**0.1**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
AP-8	Molybdenum, total	mg/L	0.025		0.1	**0.1**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
AP-09	Molybdenum, total	mg/L	0.025		0.1	**0.1**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
AP-10	Molybdenum, total	mg/L	0.025		0.1	**0.1**		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
AP-11	Molybdenum, total	mg/L	0.025		0.1	**0.1**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
AP-12	Molybdenum, total	mg/L	0.025		0.1	**0.1**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
AP-13	Molybdenum, total	mg/L	0.025		0.1	**0.1**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
AP-14	Molybdenum, total	mg/L	0.025		0.1	**0.1**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
AW-1	Molybdenum, total	mg/L	0.025		0.1	**0.1**								< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
G120	Molybdenum, total	mg/L	0.025		0.1	**0.1**								< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
RW-3	Molybdenum, total	mg/L	0.025		0.1	**0.1**	0.0103	0.0106	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
T-1	Molybdenum, total	mg/L	0.025		0.1	**0.1**										< 0.01	< 0.01	< 0.01
T-2	Molybdenum, total	mg/L	0.025		0.1	**0.1**										< 0.01	< 0.01	< 0.01
T-4	Molybdenum, total	mg/L	0.025		0.1	**0.1**										< 0.01	< 0.01	< 0.01
T-5	Molybdenum, total	mg/L	0.025		0.1	**0.1**										< 0.01	< 0.01	< 0.01
T-6	Molybdenum, total	mg/L	0.025		0.1	**0.1**										< 0.01	< 0.01	< 0.01
R111	Molybdenum, total	mg/L	0.025		0.1	**0.1**	< 0.01							< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

1. A shaded value indicates an exceedance of the Groundwater Protection Standard (GPS), which is higher of the MCL and the Background.

City Water, Light and Power
Power Plant Ash Impoundment
2022 - 2024 Groundwater Analytical Summary Data

Well	Parameter	Units	Background	40 CFR 257	MCL 40 CFR 141	GPS	2022-Q1	2022-Q2	2022-Q3	2022-Q4	2023-Q1	2023-Q2	2023-Q3	2023-Q4	2024-Q1	2024-Q2	2024-Q3	2024-Q4
AP-1	Selenium, total	mg/L	0.025	0.05		**0.05**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AP-2	Selenium, total	mg/L	0.025	0.05		**0.05**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AP-3	Selenium, total	mg/L	0.025	0.05		**0.05**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AP-4	Selenium, total	mg/L	0.025	0.05		**0.05**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AP-5	Selenium, total	mg/L	0.025	0.05		**0.05**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0011	< 0.001	< 0.001	< 0.001
AP-6	Selenium, total	mg/L	0.025	0.05		**0.05**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0022
AP-7	Selenium, total	mg/L	0.025	0.05		**0.05**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AP-8	Selenium, total	mg/L	0.025	0.05		**0.05**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AP-09	Selenium, total	mg/L	0.025	0.05		**0.05**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AP-10	Selenium, total	mg/L	0.025	0.05		**0.05**		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AP-11	Selenium, total	mg/L	0.025	0.05		**0.05**	0.0056	< 0.001	< 0.001	< 0.001	0.0018	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AP-12	Selenium, total	mg/L	0.025	0.05		**0.05**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AP-13	Selenium, total	mg/L	0.025	0.05		**0.05**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AP-14	Selenium, total	mg/L	0.025	0.05		**0.05**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
AW-1	Selenium, total	mg/L	0.025	0.05		**0.05**		< 0.04				< 0.04		< 0.001	< 0.001	< 0.04	< 0.001	< 0.001
G120	Selenium, total	mg/L	0.025	0.05		**0.05**		< 0.04				< 0.04		< 0.001	< 0.001	< 0.04	< 0.001	< 0.001
RW-3	Selenium, total	mg/L	0.025	0.05		**0.05**	< 0.001	< 0.04	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
T-1	Selenium, total	mg/L	0.025	0.05		**0.05**										0.0042	< 0.001	< 0.001
T-2	Selenium, total	mg/L	0.025	0.05		**0.05**										0.0011	< 0.001	< 0.001
T-4	Selenium, total	mg/L	0.025	0.05		**0.05**										0.0012	< 0.001	< 0.001
T-5	Selenium, total	mg/L	0.025	0.05		**0.05**										< 0.001	< 0.001	0.0012
T-6	Selenium, total	mg/L	0.025	0.05		**0.05**										< 0.001	< 0.001	< 0.001
R111	Selenium, total	mg/L	0.025	0.05		**0.05**	< 0.001		< 0.04			< 0.04		< 0.001	< 0.001	< 0.04	< 0.001	< 0.001
AP-1	Thallium, total	mg/L	0.002	0.002		**0.002**	< 0.002	< 0.002	< 0.002	< 0.002	1.52	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-2	Thallium, total	mg/L	0.002	0.002		**0.002**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-3	Thallium, total	mg/L	0.002	0.002		**0.002**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-4	Thallium, total	mg/L	0.002	0.002		**0.002**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-5	Thallium, total	mg/L	0.002	0.002		**0.002**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-6	Thallium, total	mg/L	0.002	0.002		**0.002**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-7	Thallium, total	mg/L	0.002	0.002		**0.002**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-8	Thallium, total	mg/L	0.002	0.002		**0.002**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-09	Thallium, total	mg/L	0.002	0.002		**0.002**	0.0032	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-10	Thallium, total	mg/L	0.002	0.002		**0.002**		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-11	Thallium, total	mg/L	0.002	0.002		**0.002**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-12	Thallium, total	mg/L	0.002	0.002		**0.002**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-13	Thallium, total	mg/L	0.002	0.002		**0.002**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AP-14	Thallium, total	mg/L	0.002	0.002		**0.002**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
AW-1	Thallium, total	mg/L	0.002	0.002		**0.002**		< 0.002				< 0.002		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
G120	Thallium, total	mg/L	0.002	0.002		**0.002**		< 0.002				< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
RW-3	Thallium, total	mg/L	0.002	0.002		**0.002**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
T-1	Thallium, total	mg/L	0.002	0.002		**0.002**										< 0.002	< 0.002	< 0.002
T-2	Thallium, total	mg/L	0.002	0.002		**0.002**										< 0.002	< 0.002	< 0.002
T-4	Thallium, total	mg/L	0.002	0.002		**0.002**										< 0.002	< 0.002	< 0.002
T-5	Thallium, total	mg/L	0.002	0.002		**0.002**										< 0.002	< 0.002	< 0.002
T-6	Thallium, total	mg/L	0.002	0.002		**0.002**										< 0.002	< 0.002	< 0.002
R111	Thallium, total	mg/L	0.002	0.002		**0.002**	< 0.002		< 0.002			< 0.002		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

1. A shaded value indicates an exceedance of the Groundwater Protection Standard (GPS), which is higher of the MCL and the Background.

City Water, Light and Power
Power Plant Ash Impoundment
2022 - 2024 Groundwater Analytical Summary Data

Well	Parameter	Units	Background	40 CFR 257	MCL 40 CFR 141	GPS	2022-Q1	2022-Q2	2022-Q3	2022-Q4	2023-Q1	2023-Q2	2023-Q3	2023-Q4	2024-Q1	2024-Q2	2024-Q3	2024-Q4
AP-1	Radium-226 + Radium-228	pCi/L	3.79	5		**5**	< 2.36	< 2	< 2	0.714	1.38	1.4	< 2	0.85	< 2	< 2	< 2	1.23
AP-2	Radium-226 + Radium-228	pCi/L	3.79	5		**5**	< 2	< 2	< 2	0.431	0.87	2.5	< 2	0.42	< 2	< 2	< 2	< 2
AP-3	Radium-226 + Radium-228	pCi/L	3.79	5		**5**	< 2	< 2	< 2	< 0.5046	0.54	0.36	< 2	0.65	< 2	< 2	< 2	< 2
AP-4	Radium-226 + Radium-228	pCi/L	3.79	5		**5**	< 2.93	< 2	< 2	0.901	1.04	2.89	1.12	1.58	< 2	< 2	< 4	< 2
AP-5	Radium-226 + Radium-228	pCi/L	3.79	5		**5**	< 2	< 2.45	< 2	< 0.1664	1.29	0.57	< 2	1.26	< 2	< 2	< 4	< 2
AP-6	Radium-226 + Radium-228	pCi/L	3.79	5		**5**	< 2	< 2.2	< 2	2.138	0.47	1.29	< 2	0.52	< 2	< 2	< 4	< 2
AP-7	Radium-226 + Radium-228	pCi/L	3.79	5		**5**	< 2	< 2	< 2	< 0.3621	< 2	1.54	< 2	0.8	< 2	< 2	< 4	< 2
AP-8	Radium-226 + Radium-228	pCi/L	3.79	5		**5**	< 2	< 2.16	< 2	1.955	1.98	2.88	< 2	1.55	< 2	< 2	< 4	2.57
AP-9	Radium-226 + Radium-228	pCi/L	3.79	5		**5**	< 2	< 2	< 2	3.012	< 2	0.15	< 2	0.64	< 2	< 2	< 4	1.01
AP-10	Radium-226 + Radium-228	pCi/L	3.79	5		**5**		< 2	< 2	1.942	2.04	2.66	1.12	3.14	< 2	< 2	< 4	1.61
AP-11	Radium-226 + Radium-228	pCi/L	3.79	5		**5**	< 2	< 2	< 2	< -2.1708	< 2	0.47	< 2	0.52	< 2	1.28	< 4	< 2
AP-12	Radium-226 + Radium-228	pCi/L	3.79	5		**5**	< 2	< 2.46	3.44	2.215	< 2	1.07	< 2	0.91	< 2	< 2	< 4	< 2
AP-13	Radium-226 + Radium-228	pCi/L	3.79	5		**5**	< 2	< 2	< 2.17	2.719	1.22	0.24	2.54	0.69	< 2	< 2	< 4	< 2
AP-14	Radium-226 + Radium-228	pCi/L	3.79	5		**5**	< 2	< 2.35	< 2	0.264	< 2	0.45	< 2	0.86	< 2	< 2	< 4	< 2
AW-1	Radium-226 + Radium-228	pCi/L	3.79	5		**5**								0.45	3.39	1.25	< 2	1.17
G120	Radium-226 + Radium-228	pCi/L	3.79	5		**5**								1.1	< 2	1.03	1.22	3.52
RW-3	Radium-226 + Radium-228	pCi/L	3.79	5		**5**	< 2	< 2	< 2	< 0.432	-0.09	0.48	< 2	2.46	< 2	< 2	< 2	1.23
T-1	Radium-226 + Radium-228	pCi/L	3.79	5		**5**										< 2	< 4	< 2
T-2	Radium-226 + Radium-228	pCi/L	3.79	5		**5**										< 2	< 4	< 2
T-4	Radium-226 + Radium-228	pCi/L	3.79	5		**5**										< 2	< 4	< 2
T-5	Radium-226 + Radium-228	pCi/L	3.79	5		**5**										< 2	< 4	< 2
T-6	Radium-226 + Radium-228	pCi/L	3.79	5		**5**										< 2	< 4	1.08
R111	Radium-226 + Radium-228	pCi/L	3.79	5		**5**	1.12							0.56	< 1	< 2	< 2	< 2.12

1. A shaded value indicates an exceedance of the Groundwater Protection Standard (GPS), which is higher of the MCL and the Background.

City Water, Light and Power
Power Plant Ash Impoundment
2024 TCLP & SPLP Anlaytical Results

Parameter	Units	D1 19.5-21.5 4/29/2024 3:00:00 PM	D1 36.5-38.5 4/29/2024 3:30:00 PM	D2 19.5-21.5 4/29/2024 9:30:00 AM	D2 33.5-35.5 4/29/2024 10:00:00 AM	D3 14.5-29.5 4/30/2024 10:15:00 AM	D3 4.5-6.5 4/30/2024 10:15:00 AM	D4 19.5-21.5 4/30/2024 2:45:00 PM	D4 29.5-31.5 4/30/2024 3:00:00 PM	L1 14.5-21.5 5/2/2024 2:50:00 PM	L1 24.5-31.5 5/2/2024 3:30:00 PM	L3 19.5-21.5 5/2/2024 11:15:00 AM	L3 29.5-32.7 5/2/2024 11:00:00 AM	L4 10ft-15.3ft 5/2/2024 8:15:00 AM	L5 19.5-21.5 5/3/2024 8:30:00 AM	L5 32.5-35.2 5/3/2024 9:00:00 AM
		Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid
pH	S.U.	10	9.64	9.25	9.18	9.38	9.93	9.63	10.2	8.13	9.14	8.14	8.79	8.49	8.14	8.27
Chloride, Shake Extract	mg/L	J 1	J 1	7	8	< 4	< 4	J 2	11	J 1	5	J 4	13	25	6	11
Fluoride, Shake Extract	mg/L	0.13	0.19	0.2	J 0.37	0.11	J 0.08	J 0.06	0.14	0.37	0.21	0.2	0.2	0.42	0.36	J 0.08
Sulfate, Shake Extract	mg/L	65	45	226	158	31	45	70	102	103	139	224	574	149	67	73
Antimony, SPLP	mg/L	0.0035	0.0078	0.0141	0.0273	0.007	0.0029	0.0034	0.024	0.0114	0.0012	0.0054	0.0037	J 0.0009	0.0067	0.0025
Antimony, TCLP	mg/L	0.017	0.0237	0.0163	0.0125	0.0197	0.0178	0.0395	0.0376	0.0019	0.0064	0.0066	0.0024	0.0012	0.0072	0.0017
Arsenic, SPLP	mg/L	< 0.01	0.0471	< 0.01	0.039	0.0173	< 0.01	< 0.01	0.0114	0.0276	< 0.01	0.0195	< 0.01	< 0.01	0.0331	< 0.01
Arsenic, TCLP	mg/L	< 0.01	0.0528	0.0505	0.345	0.0155	< 0.01	< 0.01	0.0242	< 0.01	< 0.01	0.0279	0.0337	< 0.01	0.0276	< 0.01
Barium, SPLP	mg/L	< 0.045	< 0.045	J 0.021	< 0.045	< 0.045	< 0.045	< 0.045	< 0.045	< 0.045	J 0.026	J 0.028	J 0.025	< 0.045	0.0596	J 0.023
Barium, TCLP	mg/L	0.358	0.514	0.556	0.352	0.373	0.492	0.238	0.287	0.345	0.172	0.635	0.47	1.04	0.574	1.24
Beryllium, SPLP	mg/L	< 0.001	J 0.0002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Beryllium, TCLP	mg/L	0.0145	0.0085	0.0231	J 0.0002	0.0113	0.0114	0.0056	0.0012	J 0.0007	0.0015	< 0.001	0.0054	< 0.001	0.0049	< 0.001
Boron, SPLP	mg/L	5.11	2.94	4.2	3.05	2.34	2.65	3.77	2.77	< 1	2.69	J 0.32	J 0.6	< 1	1.05	2.15
Boron, TCLP	mg/L	26.6	10.9	9.63	4.05	8.74	25.9	S 26.9	6.25	J 0.32	17.2	J 0.69	1.23	J 0.59	2.32	2.79
Cadmium, SPLP	mg/L	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Cadmium, TCLP	mg/L	0.0293	0.0706	0.0638	< 0.002	0.0475	0.0302	0.0422	0.0063	0.0045	0.0045	0.0154	0.0397	< 0.002	0.149	0.0022
Chromium, SPLP	mg/L	J 0.0049	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chromium, TCLP	mg/L	0.105	0.0707	0.116	< 0.01	0.0438	0.0692	0.0151	< 0.01	< 0.01	< 0.01	< 0.01	0.0185	< 0.01	J 0.0082	< 0.01
Cobalt, SPLP	mg/L	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006
Cobalt, TCLP	mg/L	0.0145	0.0116	0.0182	0.013	J 0.0054	0.0118	0.0107	0.0089	J 0.0054	J 0.0033	0.0065	0.0161	0.0077	0.0218	J 0.0043
Lead, SPLP	mg/L	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075
Lead, TCLP	mg/L	< 0.0075	0.0102	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	< 0.0075	0.0247	< 0.0075	< 0.0075	< 0.0075
Lithium, SPLP	mg/L	0.0033	0.0112	0.0078	0.0065	0.0034	0.0033	0.0075	0.0059	< 0.003	J 0.003	J 0.0015	J 0.003	< 0.003	J 0.0027	0.0033
Lithium, TCLP	mg/L	0.0112	0.0367	0.0228	0.0707	0.01	0.0131	0.0192	0.0374	0.0036	0.0087	0.0053	0.0061	0.0034	0.0153	0.0183
Mercury TCLP	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.00029	< 0.0002	< 0.0002	< 0.0002	0.00028	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Mercury, SPLP	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Molybdenum, SPLP	mg/L	0.216	0.144	0.155	5.21	0.0355	0.0138	0.0495	0.134	0.0145	< 0.01	0.0111	0.0169	< 0.01	J 0.0076	0.0904
Molybdenum, TCLP	mg/L	0.0402	0.0554	0.0571	1.27	0.0415	0.0375	0.105	0.179	< 0.01	0.0118	0.0307	< 0.01	< 0.01	J 0.0081	0.0375
Selenium, SPLP	mg/L	J 0.03	J 0.021	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	J 0.021	J 0.019	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Selenium, TCLP	mg/L	J 0.017	J 0.037	J 0.017	< 0.05	J 0.03	< 0.05	< 0.05	J 0.022	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Thallium, SPLP	mg/L	< 0.002	J 0.001	< 0.002	J 0.0015	J 0.0017	< 0.002	J 0.0017	J 0.0013	< 0.002	< 0.002	< 0.002	< 0.002	J 0.0011	< 0.002	J 0.0019
Thallium, TCLP	mg/L	0.0229	0.0268	0.0257	J 0.0018	0.0185	0.0252	0.0225	0.0243	0.0023	0.0041	0.0086	0.006	J 0.0015	0.0199	0.0021
Radium-226 + Radium-228	pCi/g	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 4.97	< 5.32

Qualifiers
< - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside recovery limits

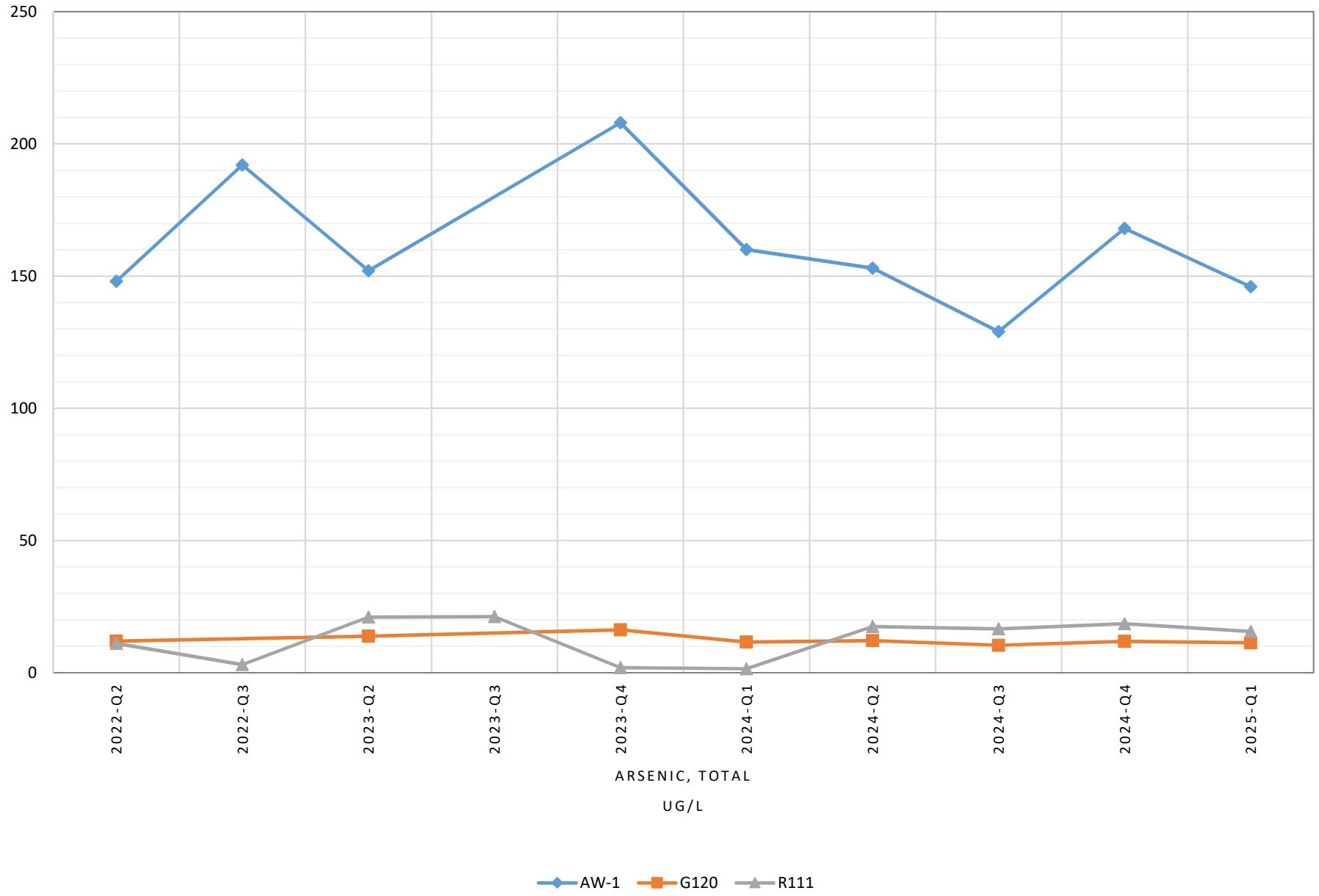
City Water, Light and Power
Power Plant Ash Impoundment
2024 Porewater Anlaytical Results

Parameter	Units	D-1 25ft. 4/29/2024 3:00:00 PM Aqueous	D-2 20ft. 4/29/2024 9:30:00 AM Aqueous	D-3 20ft. 4/30/2024 10:00:00 AM Aqueous	D-4 20ft. 4/30/2024 2:45:00 PM Aqueous	L1-20ft. 5/2/2024 2:50:00 PM Aqueous	L3-20ft. 5/2/2024 10:15:00 AM Aqueous	L4 18ft. 5/2/2024 8:40:00 AM Aqueous	L5 20ft. 5/3/2024 8:30:00 AM Aqueous
pH	S.U.	H 9.85	H 9.27	H 10.1	H 9.1	H 7.86	H 8.1	H 7.35	H 7.62
Chloride, Total	mg/L	63	236	41	139	122	269	154	202
Fluoride, Total	mg/L	0.32	0.21	0.33	0.43	0.5	1.07	1.19	1.32
Sulfate, Total	mg/L	1740	1720	1000	2050	1080	2660	1050	2620
Antimony, Total	mg/L	J 0.061	J 0.024	0.23	0.0812	BJ 0.027	B 0.0655	0.002	<B 0.1
Arsenic, Total	mg/L	1.17	0.279	2.33	0.378	0.717	2.43	0.0512	2.58
Barium, Total	mg/L	2.48	1.13	3.51	0.975	3.48	1.49	0.308	1.6
Beryllium, Total	mg/L	0.254	0.064	0.439	0.0674	0.0542	0.102	0.0024	0.0911
Boron, Total	mg/L	78.6	89	105	73.1	4.91	25.8	2.15	28.9
Cadmium, Total	mg/L	0.222	0.0541	0.492	J 0.068	0.0776	0.26	0.0019	0.296
Chromium, Total	mg/L	3.91	0.902	6.25	1.03	0.993	2.08	0.0632	1.81
Cobalt, Total	mg/L	0.241	0.0579	0.323	J 0.061	0.154	0.336	0.0213	0.296
Lead, Total	mg/L	1.04	0.199	1.46	0.266	B 0.655	B 3.4	0.0526	2.78
Lithium, Total	mg/L	0.428	0.154	0.571	0.228	0.172	0.621	0.0288	0.613
Mercury, Total	mg/L	0.00562	0.00046	H 0.00685	0.00717	0.00198	0.00926	0.0005	0.00559
Molybdenum, Total	mg/L	15.7	8.04	2.61	2.3	0.161	0.218	0.0218	0.282
Selenium, Total	mg/L	J 0.1	< 0.05	J 0.13	J 0.09	0.0906	0.158	0.0066	0.205
Thallium, Total	mg/L	J 0.13	J 0.049	0.274	J 0.066	< 0.04	0.0433	J 0.0012	< 0.1
Radium-226 + Radium-228	pci/L	< 2.86	6.81	< 5	< 6.68	< 2.5	< 4.5	< 2.05	17.74

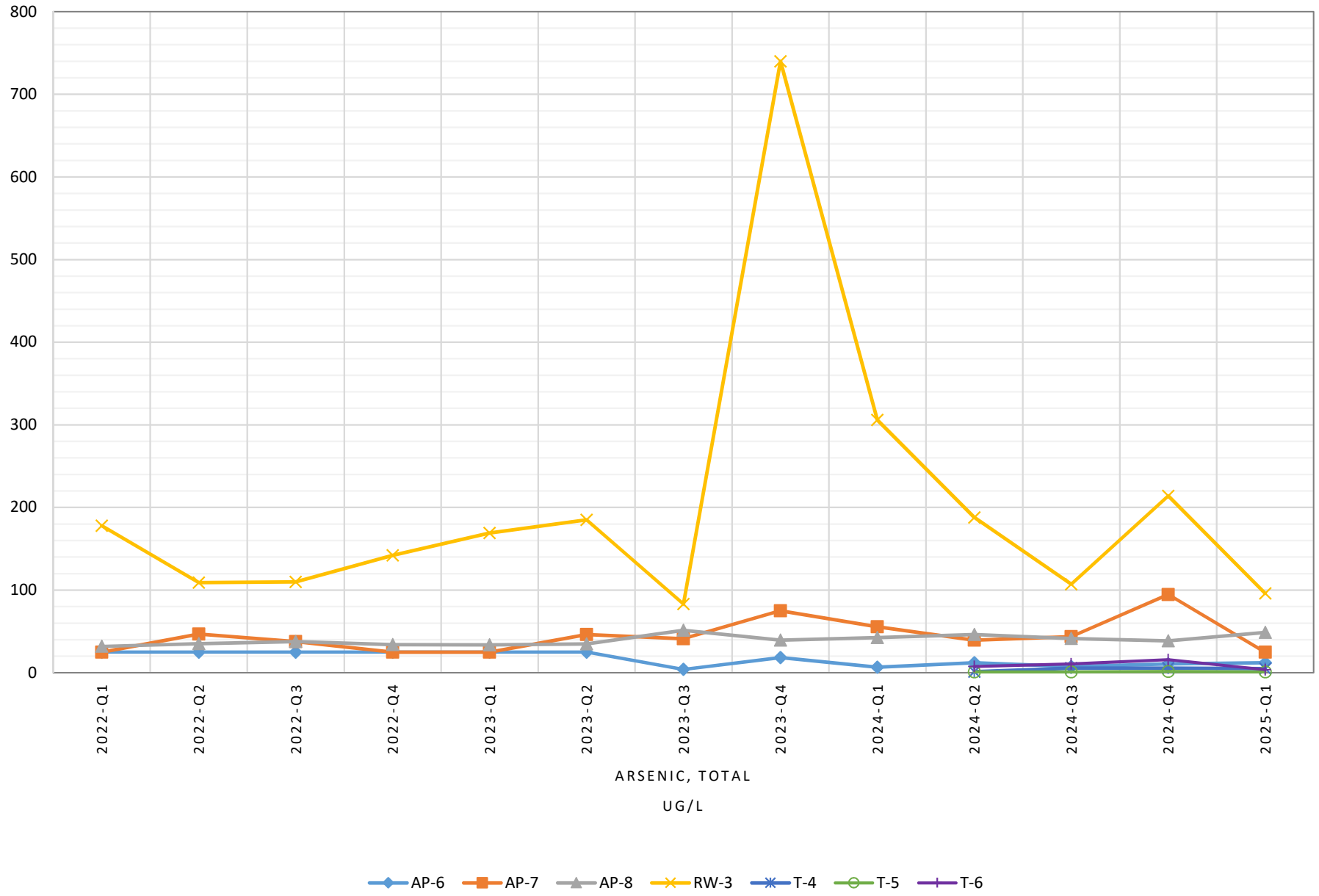
Qualifiers
< - Not Detected at the Reporting Limit
B - Analyte detected in associated Method Blank
H - Hold times exceeded
J - Analyte detected below quantitation limits

Appendix C:
Exceedance Parameter Trend Graphs

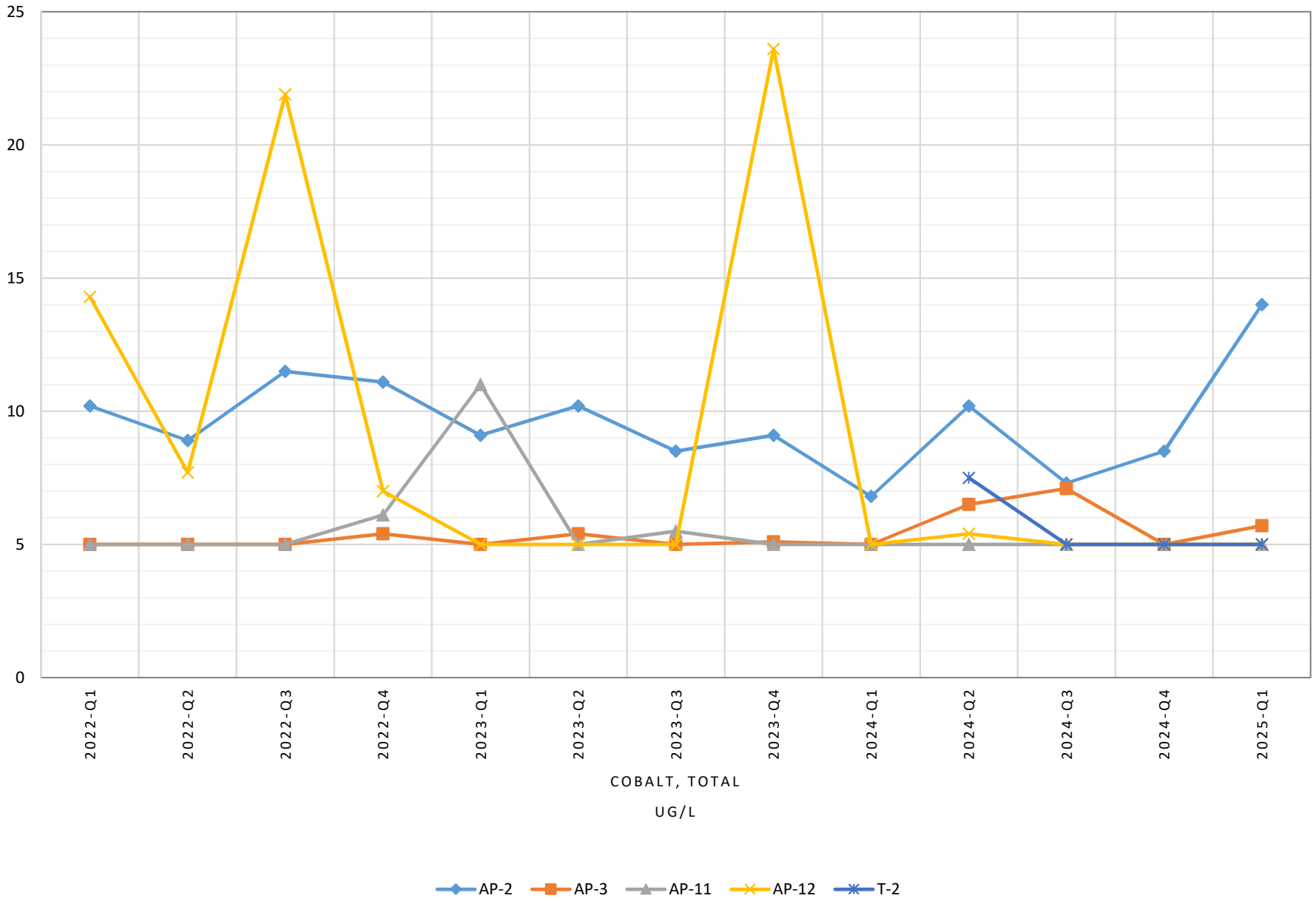
CITY, WATER, LIGHT & POWER



CITY, WATER, LIGHT & POWER



CITY, WATER, LIGHT & POWER



APPENDIX D:
Cross-Sections

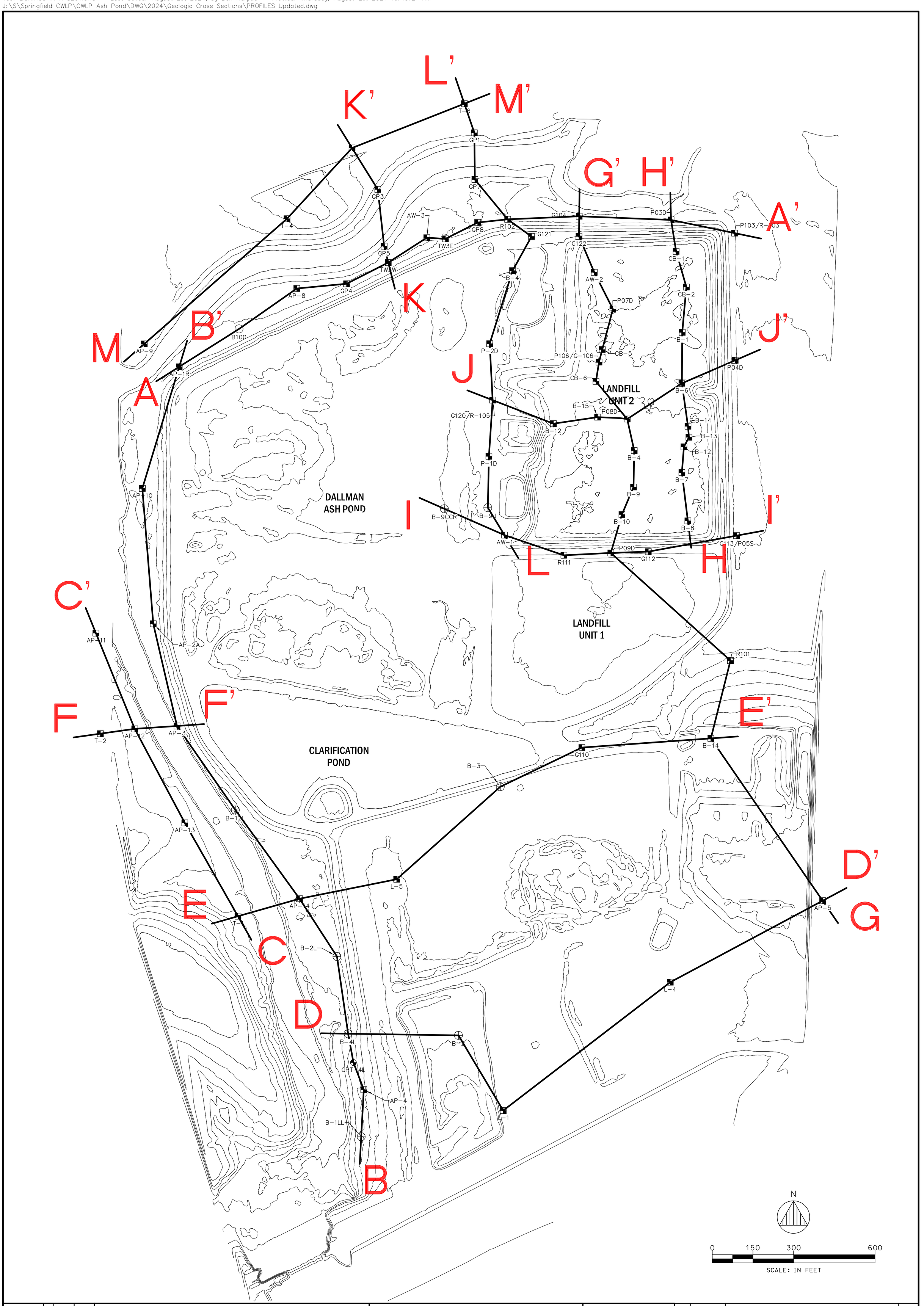


FIG. 1

GEOLOGIC CROSS-SECTION LOCATIONS MAP

PREPARED FOR

CITY WATER, LIGHT, AND POWER

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: AUGUST 2024

PROJECT ID: 240227/0010

SHEET NUMBER:

ANDREWS ENGINEERING
3300 GINGER CREEK DRIVE
SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

APPROVED BY: MTH | DESIGNED BY: MTH | DRAWN BY: BCK

NO.	DATE	REVISION DESCRIPTION	BY

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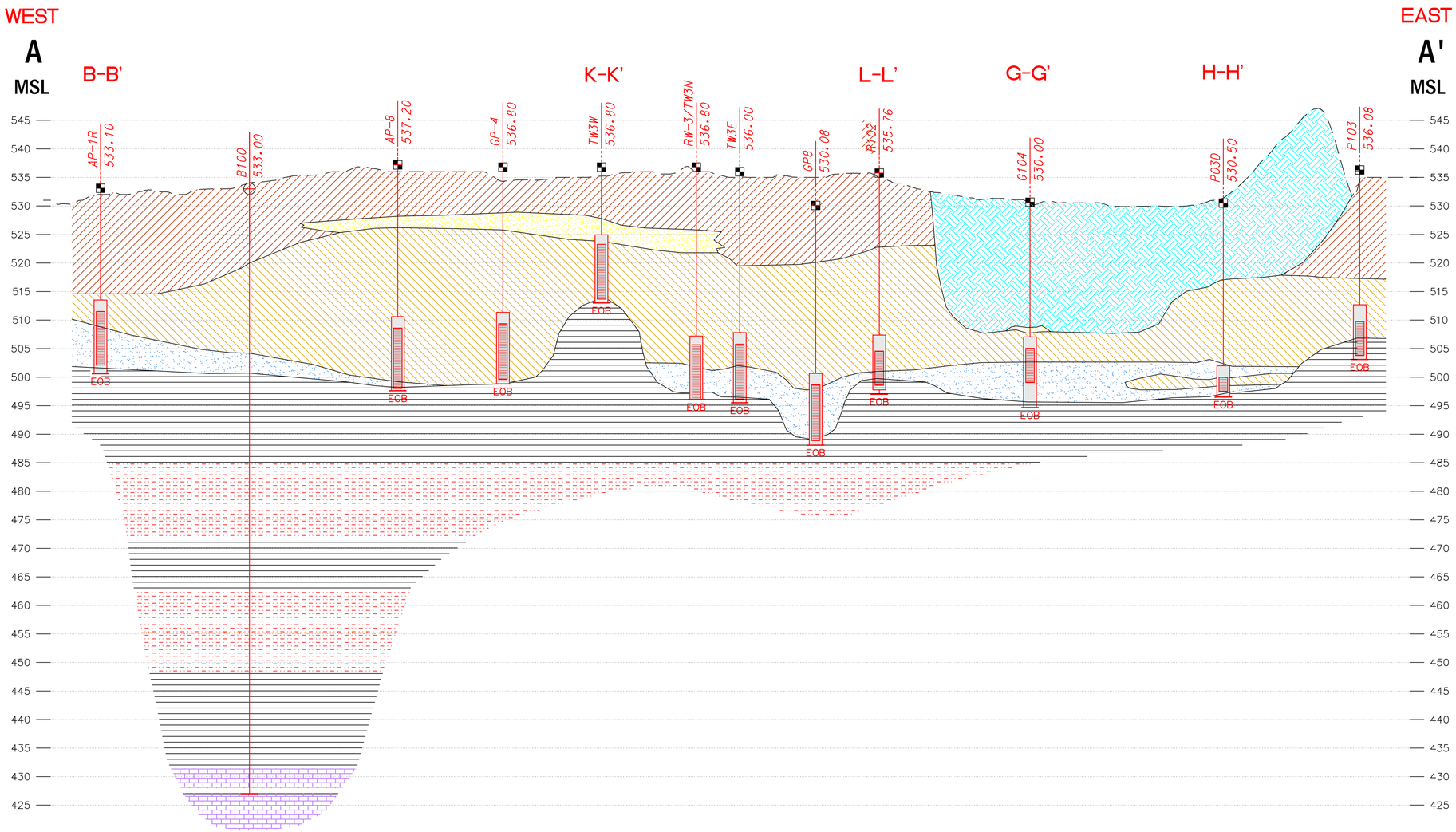
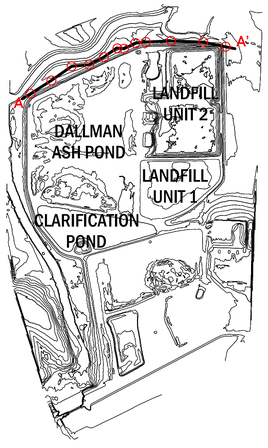


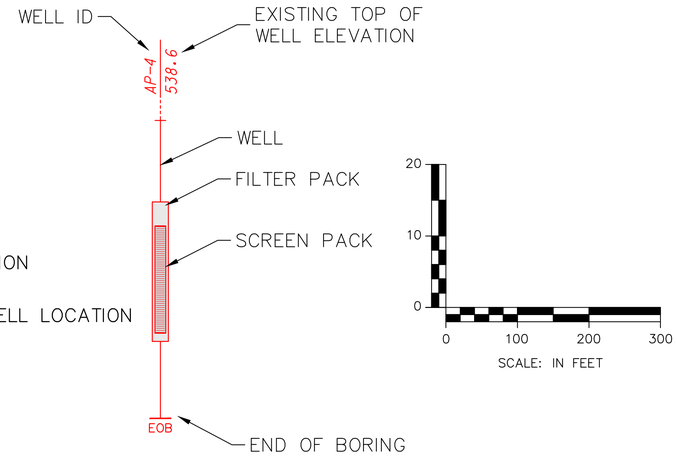


NOTES

1. DEPTH AND THICKNESS OF SUBSURFACE STRATA WERE GENERALIZED FROM AND INTERPOLATED BETWEEN BORINGS. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXISTS ONLY AT THE LOCATION OF THE BORING. SEE BORING LOGS FOR DETAILED DESCRIPTION.
2. SURFACE GENERATED FROM LIDAR DATA DERIVED FROM USGS WEBSITE (FLIGHT DATE: MAY 16, 2023).

LEGEND

- FILL
- UPPER COHESIVE DEPOSIT
- SHALLOW SAND
- LOWER COHESIVE DEPOSIT
- BASAL SAND
- SHALE
- CLAYSTONE
- SANDSTONE
- LIMESTONE
- BORING LOCATION
- MONITORING WELL LOCATION



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PH (217) 787-2334 WWW.ANDREWS-ENG.COM
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

APPROVED BY: MTH | DESIGNED BY: MTH | DRAWN BY: BCK

GEOLOGIC CROSS-SECTION A-A'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: AUGUST 2024

PROJECT ID: 240227/0010

SHEET NUMBER:

A-A'

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SOUTH

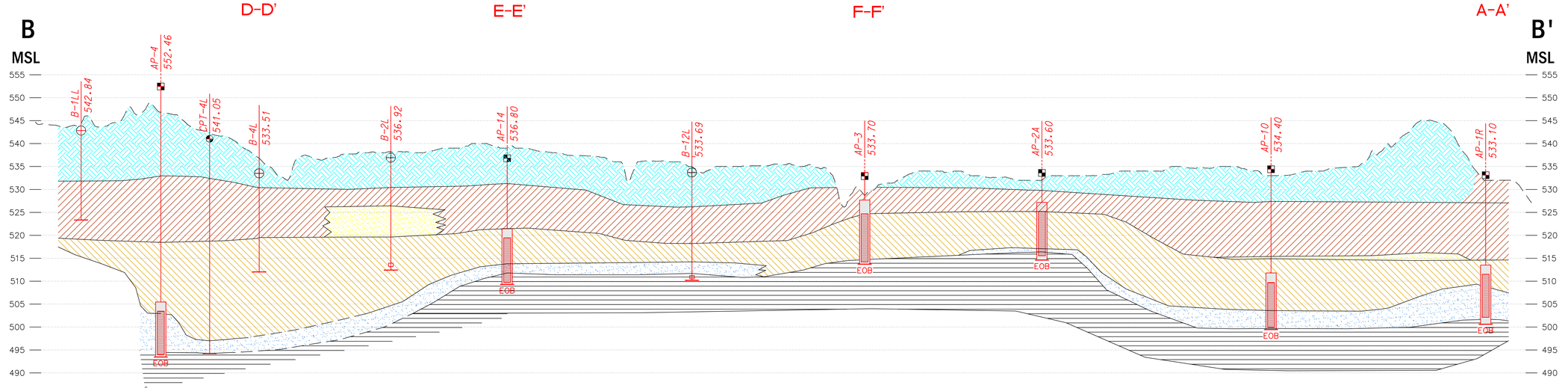
D-D'

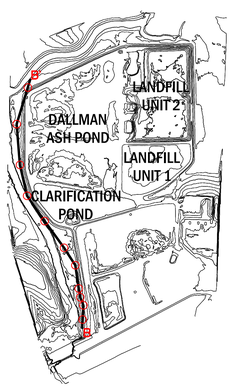
E-E'

F-F'

A-A'

NORTH





NOTES

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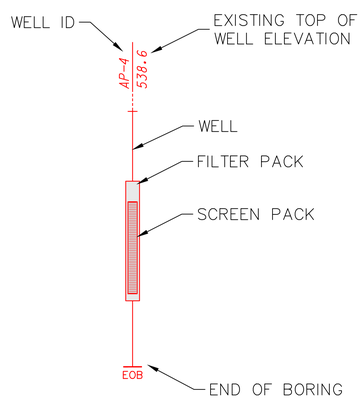
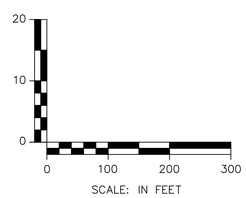
2. SURFACE GENERATED FROM LIDAR DATA DERIVED FROM USGS WEBSITE (FLIGHT DATE: MAY 16, 2023).

LEGEND

- FILL
- UPPER COHESIVE DEPOSIT
- LOWER COHESIVE DEPOSIT
- BASAL SAND
- SHALE
- SHALLOW SAND
- BORING LOCATION
- MONITORING WELL LOCATION
- CPT BORING LOCATION





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PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

APPROVED BY: MTH | DESIGNED BY: MTH | DRAWN BY: BCK

GEOLOGIC CROSS-SECTION B-B'

PLANS PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: AUGUST 2024

PROJECT ID: 240227/0010

SHEET NUMBER:

B-B'

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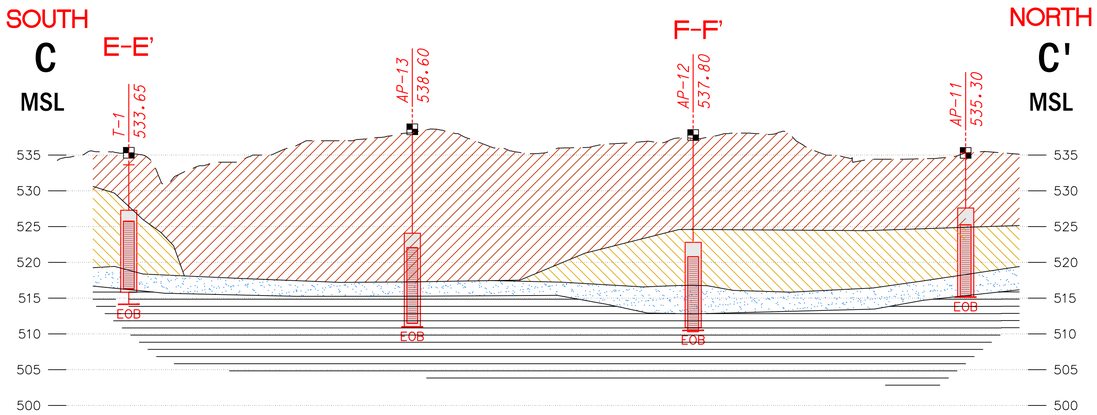
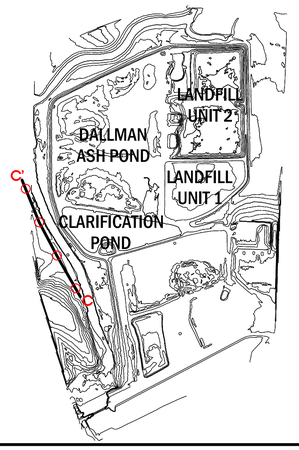




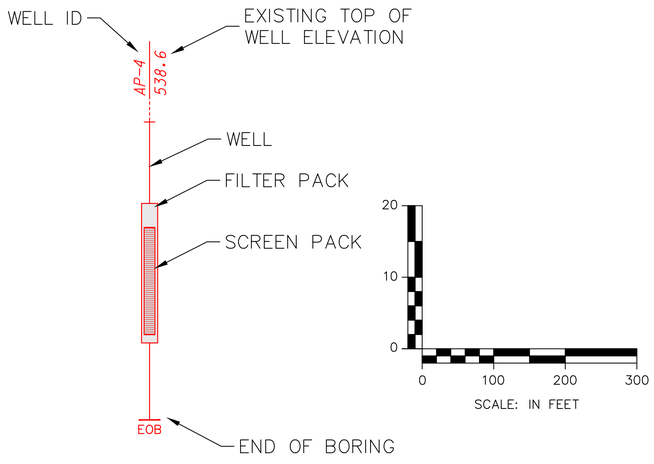
NOTES

1. DEPTH AND THICKNESS OF SUBSURFACE STRATA WERE GENERALIZED FROM AND INTERPOLATED BETWEEN BORINGS. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXISTS ONLY AT THE LOCATION OF THE BORING. SEE BORING LOGS FOR DETAILED DESCRIPTION.

2. SURFACE GENERATED FROM LIDAR DATA DERIVED FROM USGS WEBSITE (FLIGHT DATE: MAY 16, 2023).

LEGEND

- UPPER COHESIVE DEPOSIT
- LOWER COHESIVE DEPOSIT
- BASAL SAND
- SHALE
- MONITORING WELL LOCATION



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DESIGNED BY: MTH | DRAWN BY: BCK | APPROVED BY: MTH

GEOLOGIC CROSS-SECTION C-C'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: AUGUST 2024

PROJECT ID: 240227/0010

SHEET NUMBER: C-C'

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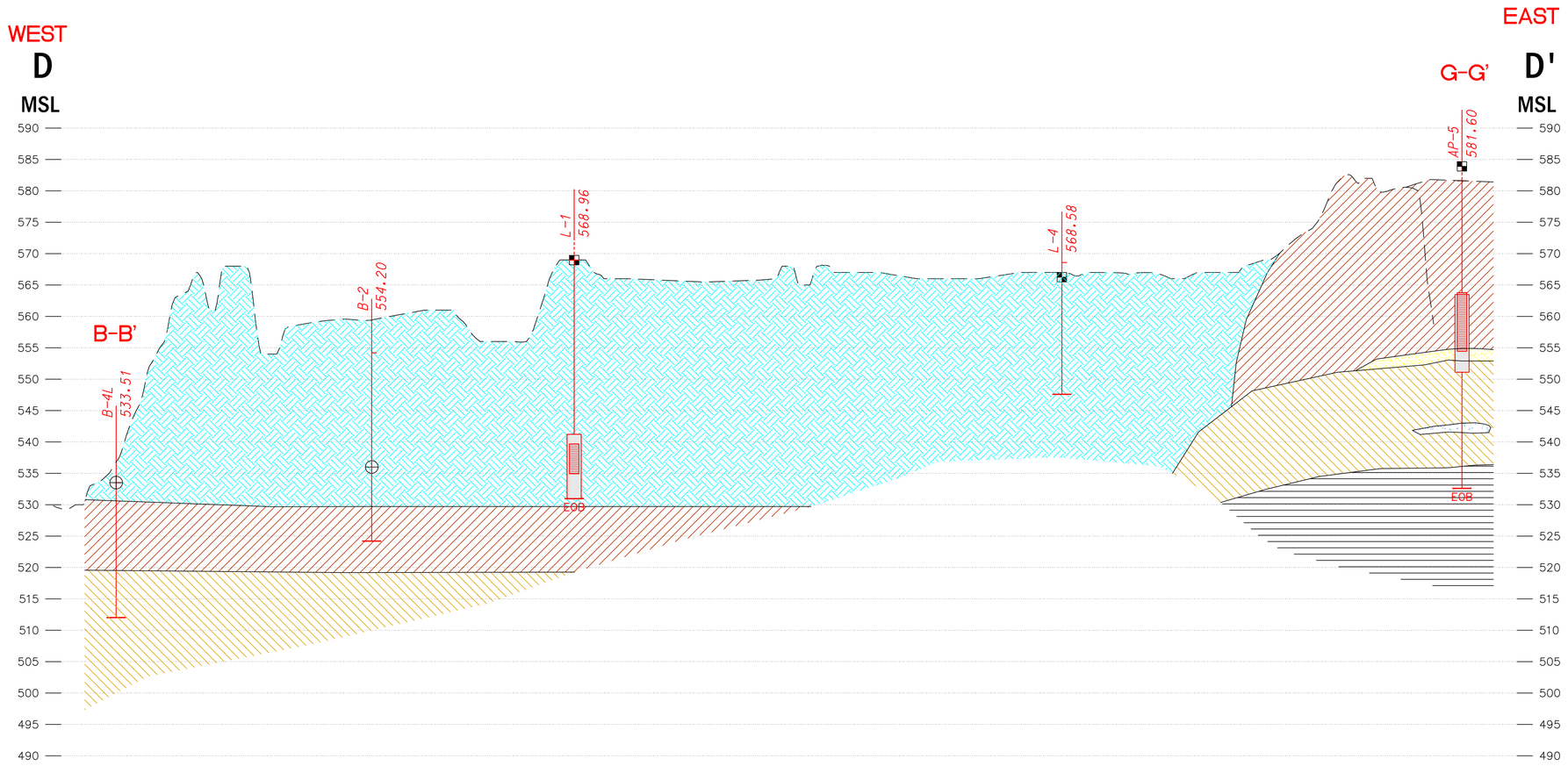

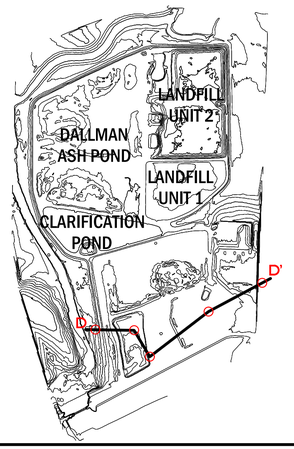

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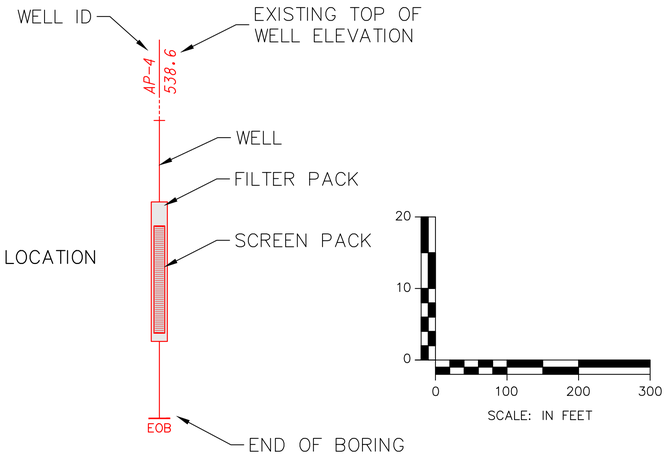
2. SURFACE GENERATED FROM LIDAR DATA DERIVED FROM USGS WEBSITE (FLIGHT DATE: MAY 16, 2023).

LEGEND

- FILL
- UPPER COHESIVE DEPOSIT
- SHALLOW SAND
- LOWER COHESIVE DEPOSIT
- BASAL SAND
- SHALE
- BORING LOCATION
- MONITORING WELL LOCATION



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DESIGNED BY: MTH | DRAWN BY: BCK | APPROVED BY: MTH

GEOLOGIC CROSS-SECTION D-D'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: AUGUST 2024

PROJECT ID: 240227/0010

SHEET NUMBER:

D-D'

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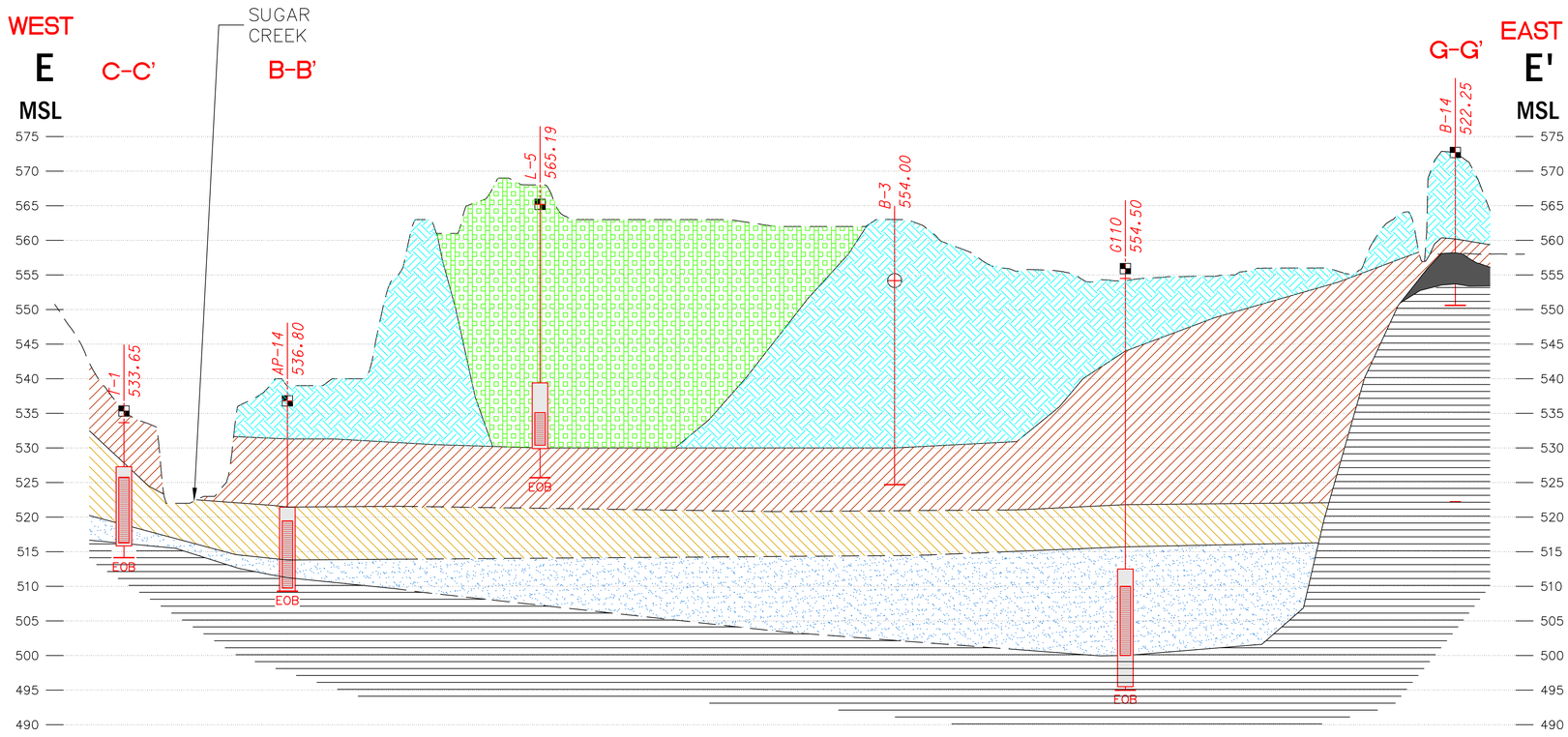

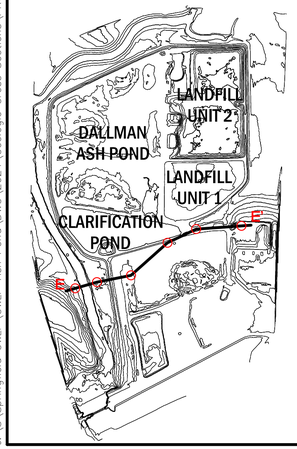

NOTES

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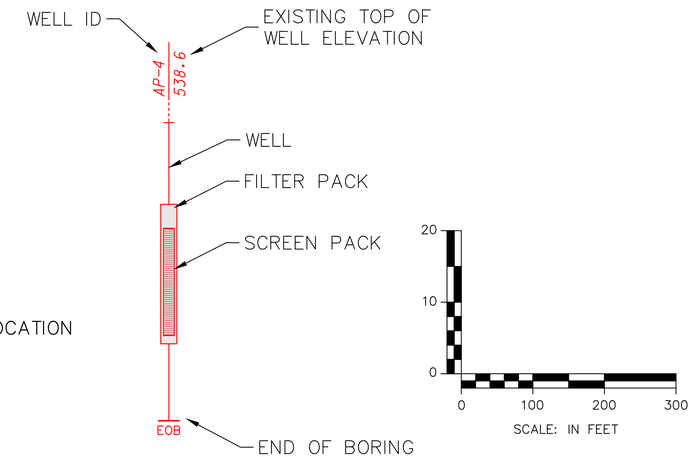
2. SURFACE GENERATED FROM LIDAR DATA DERIVED FROM USGS WEBSITE (FLIGHT DATE: MAY 16, 2023).

LEGEND

- FILL
- UPPER COHESIVE DEPOSIT
- LOWER COHESIVE DEPOSIT
- BASAL SAND
- SHALE
- CCR ASH
- COAL
- BORING LOCATION
- MONITORING WELL LOCATION



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APPROVED BY: MTH | DESIGNED BY: MTH | DRAWN BY: BCK

GEOLOGIC CROSS-SECTION E-E'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: AUGUST 2024

PROJECT ID: 240227/0010

SHEET NUMBER:

E-E'

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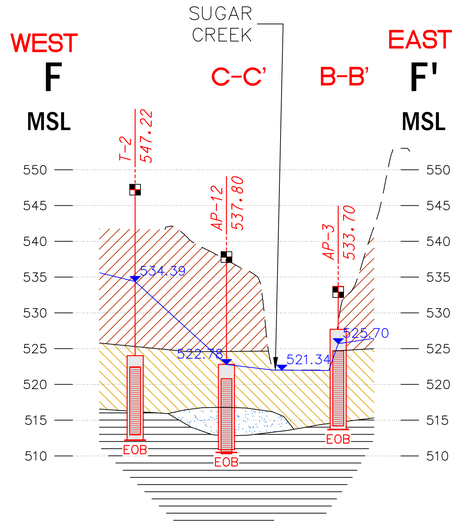
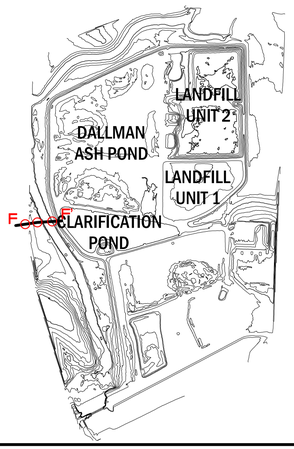


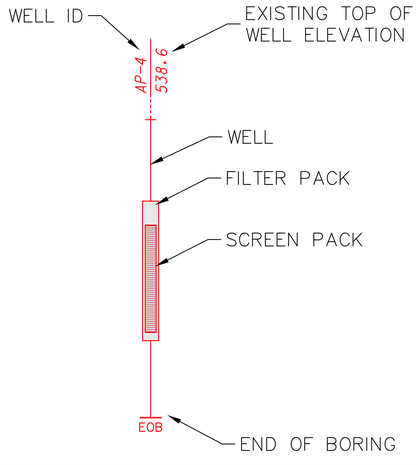


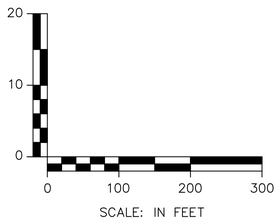
NOTES

1. DEPTH AND THICKNESS OF SUBSURFACE STRATA WERE GENERALIZED FROM AND INTERPOLATED BETWEEN BORINGS. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXISTS ONLY AT THE LOCATION OF THE BORING. SEE BORING LOGS FOR DETAILED DESCRIPTION.
2. SURFACE GENERATED FROM LIDAR DATA DERIVED FROM USGS WEBSITE (FLIGHT DATE: MAY 16, 2023).
3. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE COLLECTED NOVEMBER 12, 2024.

LEGEND

- FILL
- UPPER COHESIVE DEPOSIT
- LOWER COHESIVE DEPOSIT
- BASAL SAND
- SHALE
- MONITORING WELL LOCATION





NO.	DATE	REVISION DESCRIPTION	BY

ANDREWS ENGINEERING
3300 GINGER CREEK DRIVE
SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

DESIGNED BY: MTH | DRAWN BY: BCK | APPROVED BY: MTH

GEOLOGIC CROSS-SECTION F-F'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: AUGUST 2024

PROJECT ID: 240227/0010

SHEET NUMBER: F-F'

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J:\S\Springfield CWLP\CWLP Ash Pond\DWG\2025\PROFILES Updated.dwg

SOUTH

G

MSL

D–D’

E–E’

I–I’

J–J’

A–A’

NORTH

G'

MSL

585 580 575 570 565 560 555 550 545 540 535 530 525 520 515 510 505 500 495 490 485

AP-5 581.60 EOB

B-14 522.25

R101 543.78

P090 553.20

B-10 523.60

B-9 522.70

B-4 522.60

P8D 522.70

GB-6 527.00

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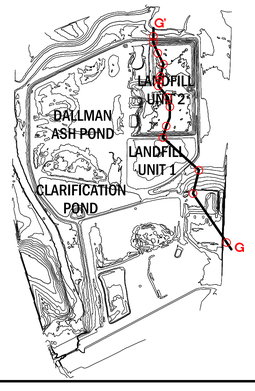
EOB



NOTES

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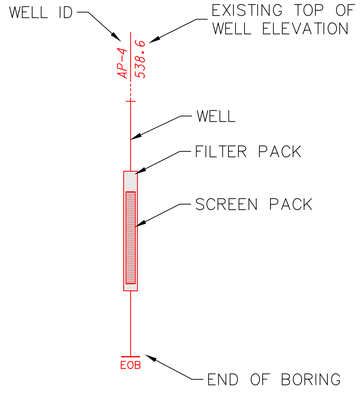
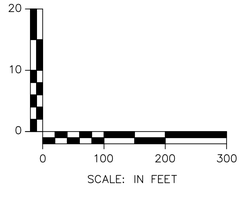
2. SURFACE GENERATED FROM LIDAR DATA DERIVED FROM USGS WEBSITE (FLIGHT DATE: MAY 16, 2023).

LEGEND

- FILL
- UPPER COHESIVE DEPOSIT
- SHALLOW SAND
- LOWER COHESIVE DEPOSIT
- BASAL SAND
- SHALE
- COAL
- MONITORING WELL LOCATION





NO.	DATE	REVISION DESCRIPTION	BY
NO.	DATE	REVISION DESCRIPTION	BY

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3300 GINGER CREEK DRIVE
SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWENG.COM
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

APPROVED BY: MTH | DESIGNED BY: MTH | DRAWN BY: BCK

GEOLOGIC CROSS-SECTION G–G’

PLANS PREPARED FOR

CITY WATER, LIGHT, AND POWER

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: AUGUST 2024

PROJECT ID: 240227/0010

SHEET NUMBER:

G–G’

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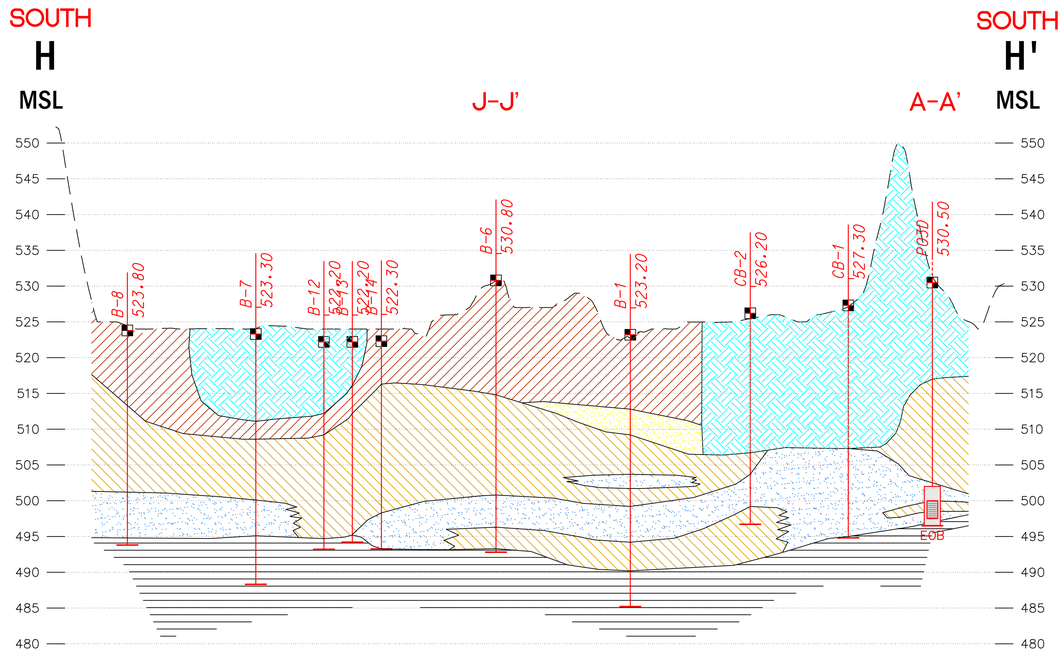

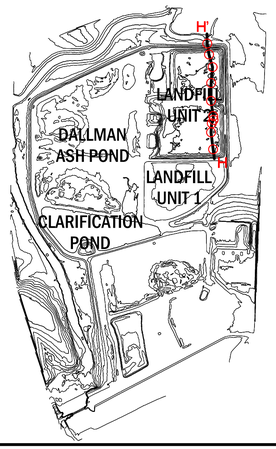

NOTES

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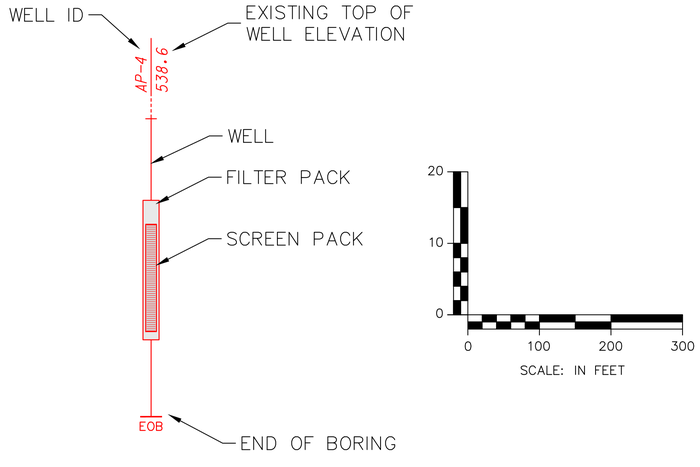
LEGEND

- FILL
- UPPER COHESIVE DEPOSIT
- SHALLOW SAND
- LOWER COHESIVE DEPOSIT
- BASAL SAND
- SHALE
- MONITORING WELL LOCATION



NO.	DATE	REVISION DESCRIPTION	BY

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3300 GINGER CREEK DRIVE
SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
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DESIGNED BY: MTH | DRAWN BY: BCK | APPROVED BY: MTH

GEOLOGIC CROSS-SECTION H-H'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: AUGUST 2024
PROJECT ID: 240227/0010
SHEET NUMBER:
H-H'

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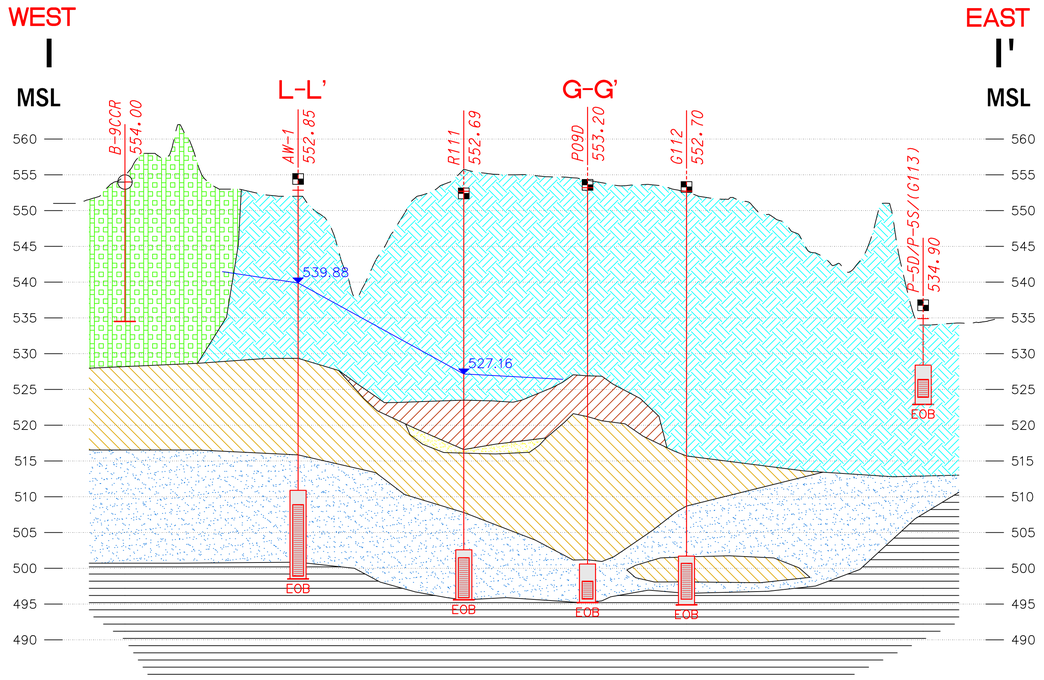

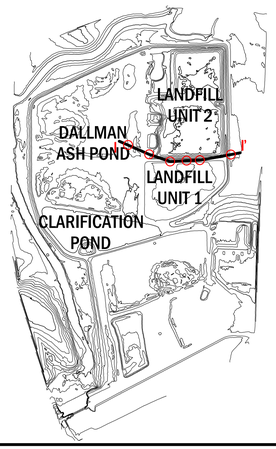

NOTES

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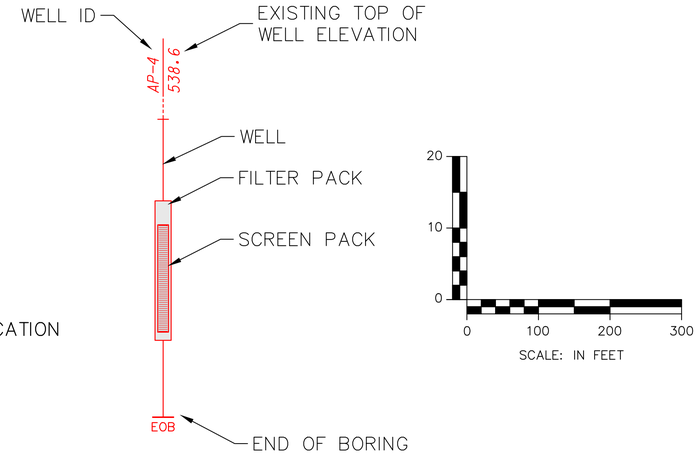
3. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE COLLECTED NOVEMBER 12, 2024.

LEGEND

- FILL
- UPPER COHESIVE DEPOSIT
- SHALLOW SAND
- LOWER COHESIVE DEPOSIT
- BASAL SAND
- SHALE
- CCR ASH
- BORING LOCATION
- MONITORING WELL LOCATION



NO.	DATE	REVISION DESCRIPTION	BY

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SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

DESIGNED BY: MTH | DRAWN BY: BCK | APPROVED BY: MTH

GEOLOGIC CROSS-SECTION I-I'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: AUGUST 2024

PROJECT ID: 240227/0010

SHEET NUMBER: I-I'

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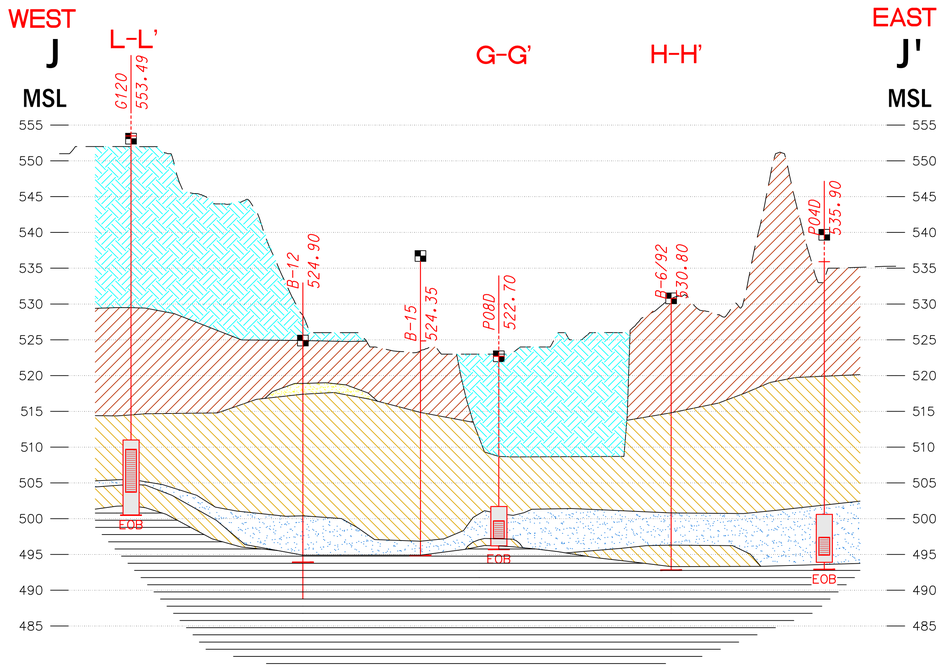

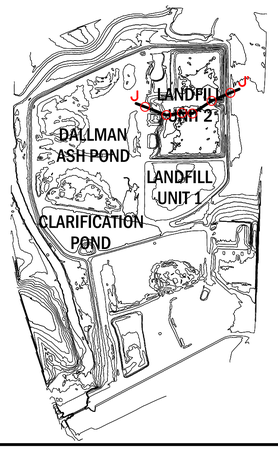

NOTES

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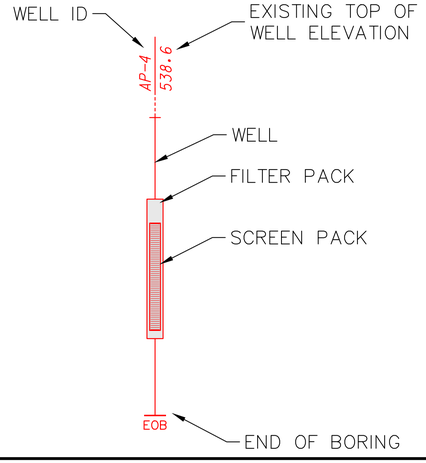
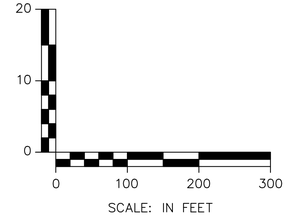
LEGEND

- FILL
- UPPER COHESIVE DEPOSIT
- SHALLOW SAND
- LOWER COHESIVE DEPOSIT
- BASAL SAND
- SHALE
- MONITORING WELL LOCATION





NO.	DATE	REVISION DESCRIPTION	BY

ANDREWS ENGINEERING
3300 GINGER CREEK DRIVE
SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

DESIGNED BY: MTH | DRAWN BY: BCK | APPROVED BY: MTH

GEOLOGIC CROSS-SECTION J-J'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: AUGUST 2024

PROJECT ID: 240227/0010

SHEET NUMBER:

J-J'

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Tab: JJ Last Saved: August 29, 2024, by Ben Karpus Plotted: Thursday, August 29, 2024 9:19:35 AM
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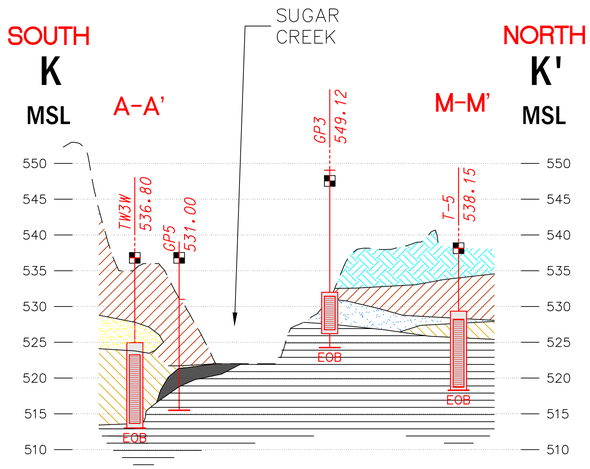

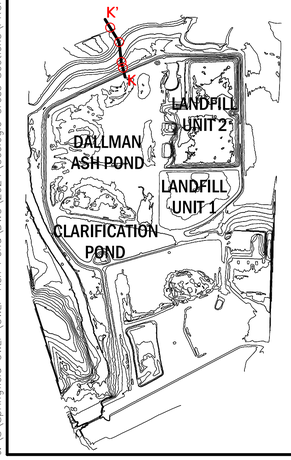

NOTES

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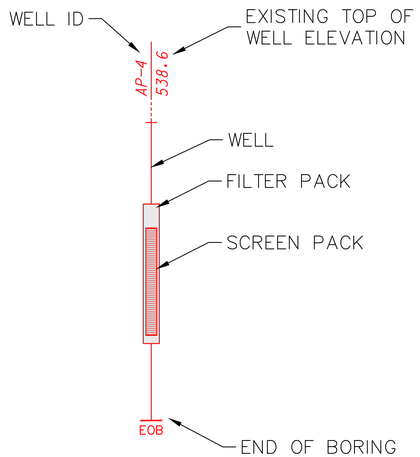
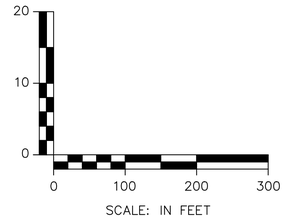
2. SURFACE GENERATED FROM LIDAR DATA DERIVED FROM USGS WEBSITE (FLIGHT DATE: MAY 16, 2023).

LEGEND

- FILL
- UPPER COHESIVE DEPOSIT
- LOWER COHESIVE DEPOSIT
- BASAL SAND
- SHALE
- COAL
- MONITORING WELL LOCATION





NO.	DATE	REVISION DESCRIPTION	BY

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3300 GINGER CREEK DRIVE
SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

DESIGNED BY: MTH | DRAWN BY: BCK | APPROVED BY: MTH

GEOLOGIC CROSS-SECTION K-K'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE:
AUGUST 2024

PROJECT ID:
240227/0010

SHEET NUMBER:

K-K'

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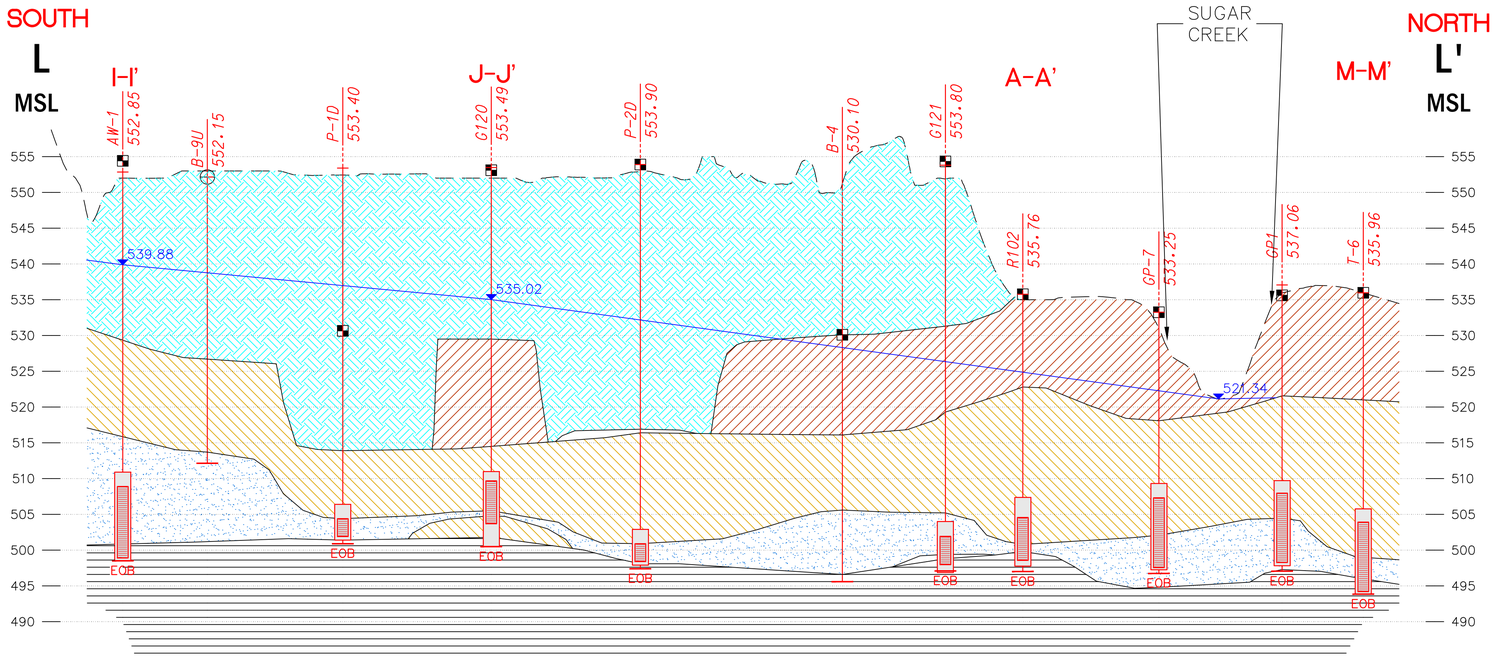
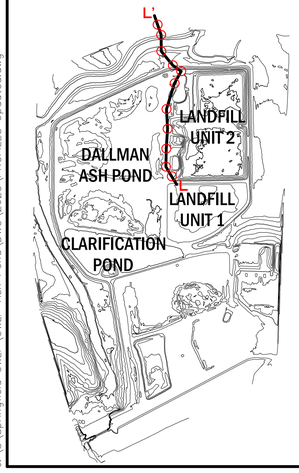


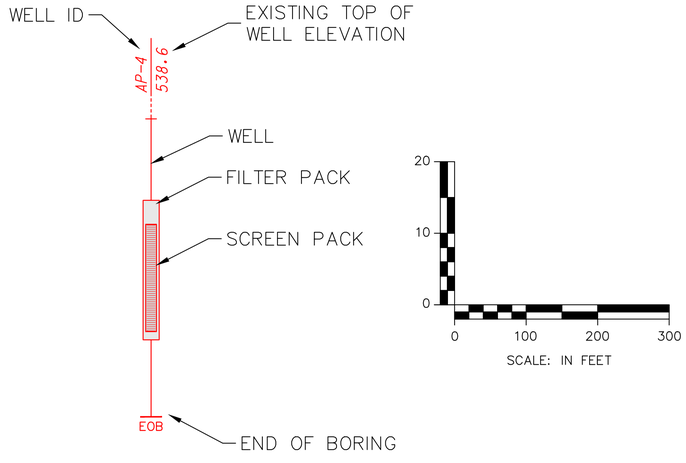


NOTES

1. DEPTH AND THICKNESS OF SUBSURFACE STRATA WERE GENERALIZED FROM AND INTERPOLATED BETWEEN BORINGS. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXISTS ONLY AT THE LOCATION OF THE BORING. SEE BORING LOGS FOR DETAILED DESCRIPTION.
2. SURFACE GENERATED FROM LIDAR DATA DERIVED FROM USGS WEBSITE (FLIGHT DATE: MAY 16, 2023).
3. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE COLLECTED NOVEMBER 12, 2024.

LEGEND

- FILL
- UPPER COHESIVE DEPOSIT
- LOWER COHESIVE DEPOSIT
- BASAL SAND
- SHALE
- BORING LOCATION
- MONITORING WELL LOCATION



NO.	DATE	REVISION DESCRIPTION	BY

ANDREWS ENGINEERING
3300 GINGER CREEK DRIVE
SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

DESIGNED BY: MTH | DRAWN BY: BCK | APPROVED BY: MTH

GEOLOGIC CROSS-SECTION L-L'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: AUGUST 2024

PROJECT ID: 240227/0010

SHEET NUMBER: L-L'

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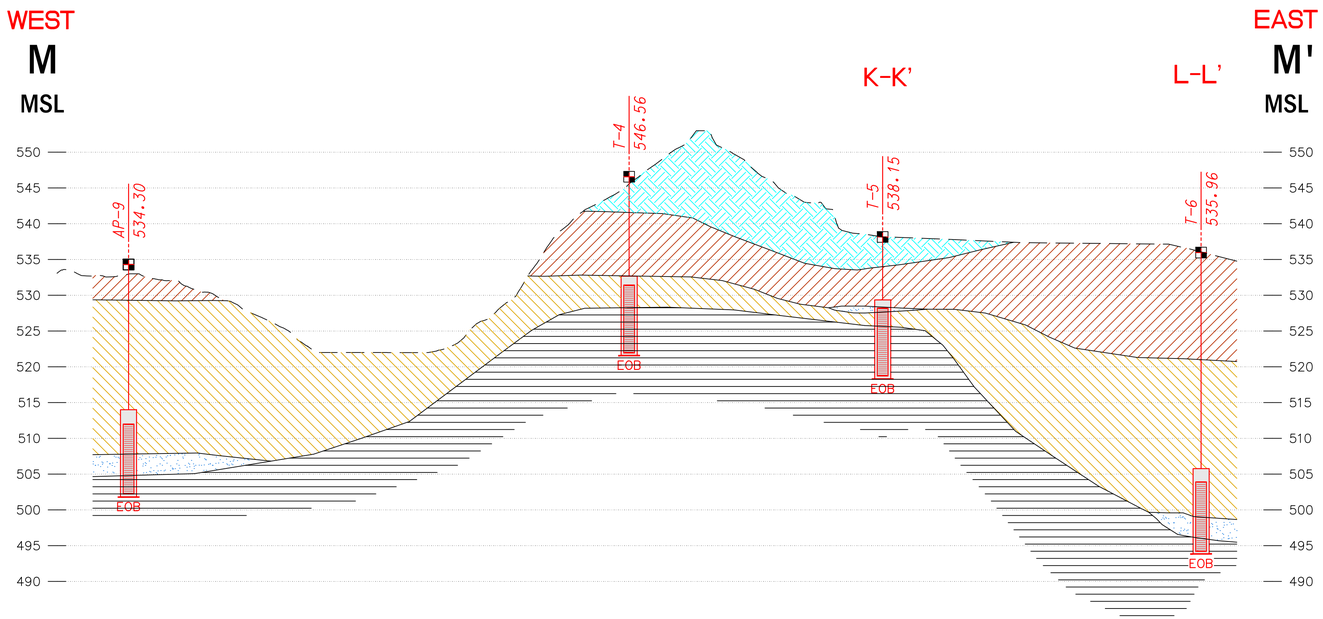

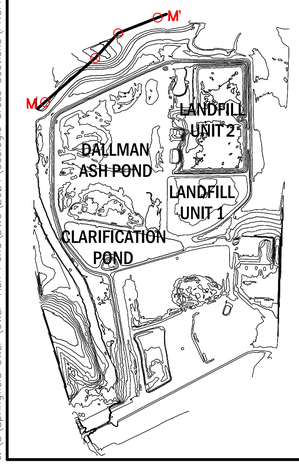

NOTES

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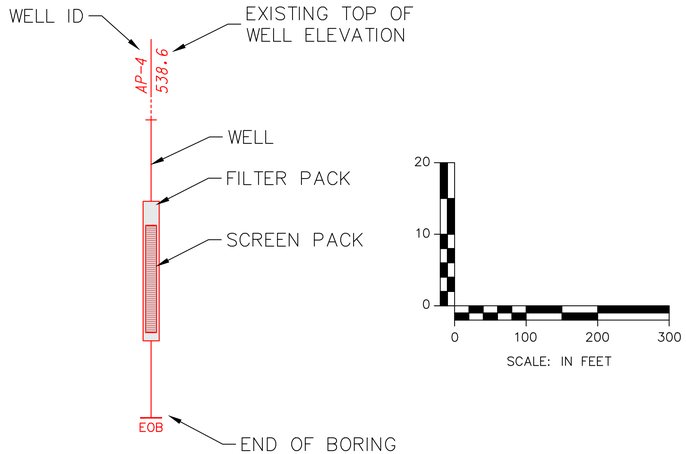
LEGEND

- FILL
- UPPER COHESIVE DEPOSIT
- LOWER COHESIVE DEPOSIT
- BASAL SAND
- SHALE
- MONITORING WELL LOCATION



NO.	DATE	REVISION DESCRIPTION	BY

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SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

DESIGNED BY: MTH | DRAWN BY: BCK | APPROVED BY: MTH

GEOLOGIC CROSS-SECTION M-M'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: AUGUST 2024

PROJECT ID: 240227/0010

SHEET NUMBER:

M-M'

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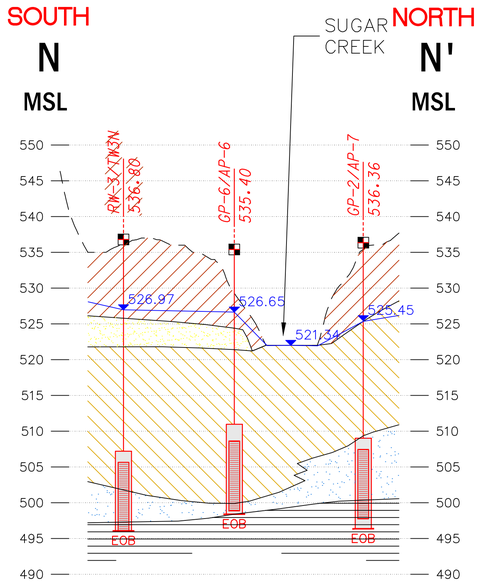

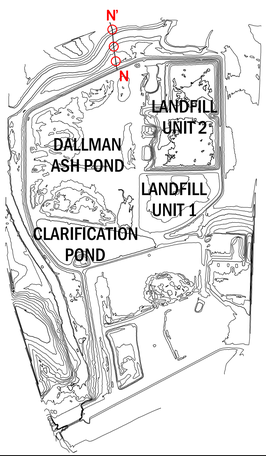

NOTES

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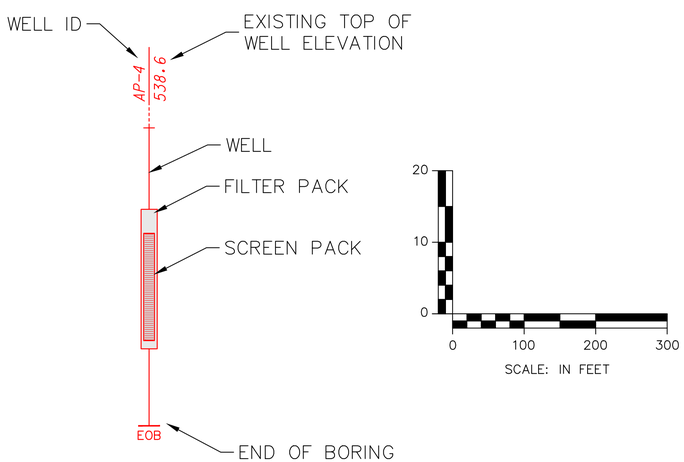
3. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE COLLECTED NOVEMBER 12, 2024.

LEGEND

- UPPER COHESIVE DEPOSIT
- SHALLOW SAND
- LOWER COHESIVE DEPOSIT
- BASAL SAND
- SHALE
- MONITORING WELL LOCATION



NO.	DATE	REVISION DESCRIPTION	BY

ANDREWS ENGINEERING
3300 GINGER CREEK DRIVE
SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

DESIGNED BY: MTH | DRAWN BY: BCK | APPROVED BY: MTH

GEOLOGIC CROSS-SECTION N-N'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: NOVEMBER 2024

PROJECT ID: 240227/0010

SHEET NUMBER:

N-N'

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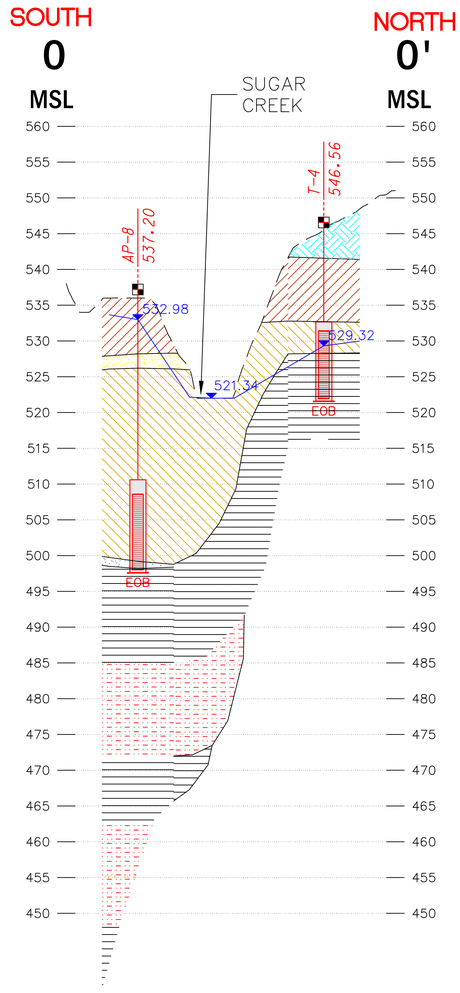
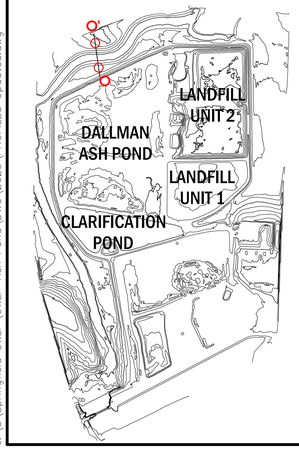
Tab: NN Last Saved: April 24, 2025, by Ben Korpus Plotted: Thursday, April 24, 2025 4:19:54 PM
J:\S\Springfield CWLP\CWLP Ash Pond\DWG\2025\PROFILES Updated.dwg



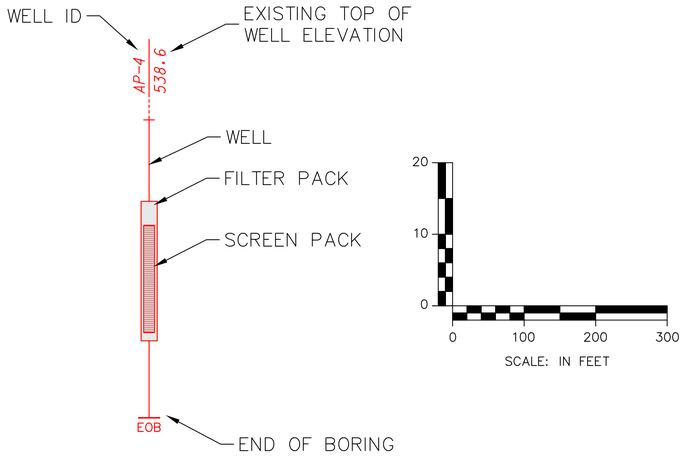


NOTES

1. DEPTH AND THICKNESS OF SUBSURFACE STRATA WERE GENERALIZED FROM AND INTERPOLATED BETWEEN BORINGS. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXISTS ONLY AT THE LOCATION OF THE BORING. SEE BORING LOGS FOR DETAILED DESCRIPTION.
2. SURFACE GENERATED FROM LIDAR DATA DERIVED FROM USGS WEBSITE (FLIGHT DATE: MAY 16, 2023).
3. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE COLLECTED NOVEMBER 12, 2024.

LEGEND

- UPPER COHESIVE DEPOSIT
- SHALLOW SAND
- LOWER COHESIVE DEPOSIT
- BASAL SAND
- SHALE
- CLAYSTONE
- MONITORING WELL LOCATION



NO.	DATE	REVISION DESCRIPTION	BY

ANDREWS ENGINEERING
3300 GINGER CREEK DRIVE
SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO
PONTIAC, IL • DESIGNED BY: MTH | DRAWN BY: BCK | APPROVED BY: MTH

GEOLOGIC CROSS-SECTION O-O'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: APRIL 2025

PROJECT ID: 240338/0014

SHEET NUMBER:

O-O'

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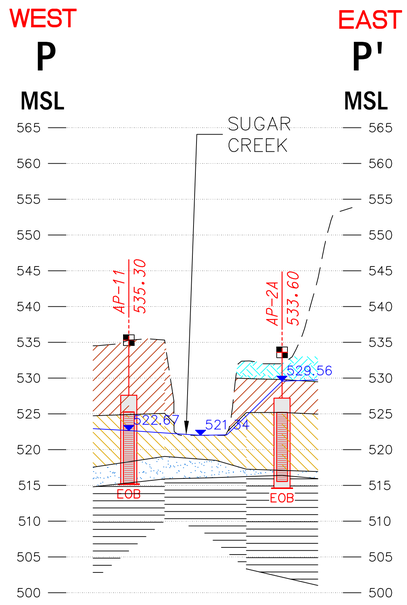

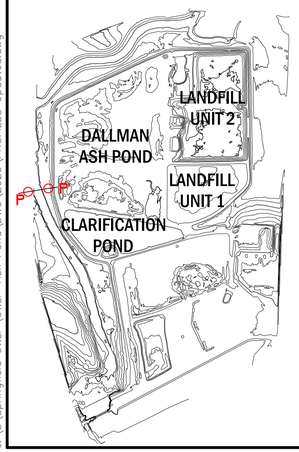

NOTES

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2. SURFACE GENERATED FROM LIDAR DATA DERIVED FROM USGS WEBSITE (FLIGHT DATE: MAY 16, 2023).
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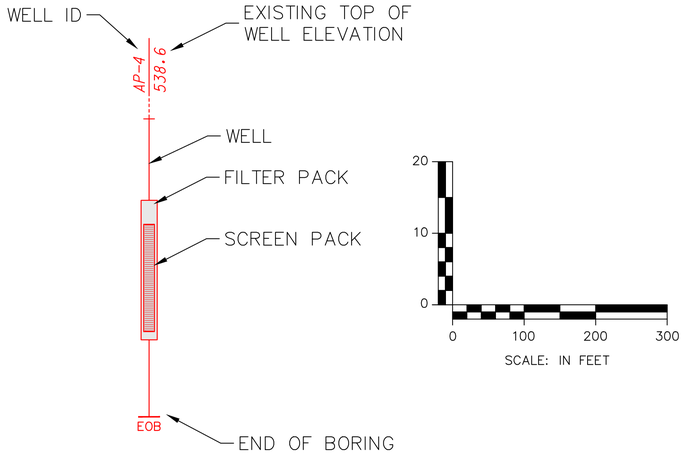
LEGEND

- UPPER COHESIVE DEPOSIT
- SHALLOW SAND
- LOWER COHESIVE DEPOSIT
- BASAL SAND
- SHALE
- MONITORING WELL LOCATION



NO.	DATE	REVISION DESCRIPTION	BY

ANDREWS ENGINEERING
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SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

DESIGNED BY: MTH | DRAWN BY: BCK | APPROVED BY: MTH

GEOLOGIC CROSS-SECTION P-P'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: APRIL 2025

PROJECT ID: 240338/0014

SHEET NUMBER: P-P'

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Tab: PP Last Saved: April 24, 2025, by Ben Korpus Plotted: Thursday, April 24, 2025 4:20:14 PM
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APPENDIX E:
Laboratory Analytical Reports

May 28, 2024

Eric Staley
City Water, Light & Power
3100 Stevenson Drive
2nd Floor Maintenance Building
Springfield, IL 62712
TEL: (217) 757-8610
FAX: (217) 757-8615

Illinois	100226
Illinois	1004652024-2
Kansas	E-10374
Louisiana	05002
Louisiana	05003
Oklahoma	9978

RE: CWLP Borings **WorkOrder:** 24050235

Dear Eric Staley:

TEKLAB, INC received 4 samples on 5/2/2024 1:11:00 PM for the analysis presented in the following report.

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

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

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

Sincerely,

Shelly A Hennessy

Shelly A. Hennessy
Project Manager
(618)344-1004 ex 36
SHennessy@teklabinc.com

Report Contents

http://www.teklabinc.com/

Client: City Water, Light & Power
Client Project: CWLP Borings

Work Order: 24050235
Report Date: 28-May-24

This reporting package includes the following:

Cover Letter	1
Report Contents	2
Definitions	3
Case Narrative	5
Accreditations	6
Laboratory Results	7
Receiving Check List	11
Chain of Custody	Appended

Client: City Water, Light & Power **Work Order:** 24050235

Client Project: CWLP Borings **Report Date:** 28-May-24

Abbr Definition

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

Definitions

Client: City Water, Light & Power
Work Order: 24050235
Client Project: CWLP Borings
Report Date: 28-May-24

Qualifiers

- # - Unknown hydrocarbon
- B - Analyte detected in associated Method Blank
- C - RL shown is a Client Requested Quantitation Limit
- E - Value above quantitation range
- H - Holding times exceeded
- I - Associated internal standard was outside method criteria
- J - Analyte detected below quantitation limits
- M - Manual Integration used to determine area response
- ND - Not Detected at the Reporting Limit
- R - RPD outside accepted recovery limits
- S - Spike Recovery outside recovery limits
- T - TIC(Tentatively identified compound)
- X - Value exceeds Maximum Contaminant Level

Case Narrative

http://www.teklabinc.com/

Client: City Water, Light & Power
Work Order: 24050235
Client Project: CWLP Borings
Report Date: 28-May-24

Cooler Receipt Temp: 2.9 °C

Radium-226 and Radium-228 analysis was performed by Summit Environmental Technologies, Inc. See attached report for results.

Locations

Collinsville

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

Springfield

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

Kansas City

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

Collinsville Air

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

Chicago

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

Client: City Water, Light & Power

Work Order: 24050235

Client Project: CWLP Borings

Report Date: 28-May-24

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2025	Collinsville
Illinois	IEPA	1004652024-2	NELAP	4/30/2025	Collinsville
Kansas	KDHE	E-10374	NELAP	4/30/2025	Collinsville
Louisiana	LDEQ	05002	NELAP	6/30/2024	Collinsville
Louisiana	LDEQ	05003	NELAP	6/30/2024	Collinsville
Oklahoma	ODEQ	9978	NELAP	8/31/2024	Collinsville
Arkansas	ADEQ	88-0966		3/14/2025	Collinsville
Illinois	IDPH	17584		5/31/2025	Collinsville
Iowa	IDNR	430		6/1/2026	Collinsville
Kentucky	UST	0073		1/31/2025	Collinsville
Mississippi	MSDH			4/30/2025	Collinsville
Missouri	MDNR	930		1/31/2025	Collinsville
Missouri	MDNR	00930		10/31/2026	Collinsville

Client: City Water, Light & Power
Work Order: 24050235
Client Project: CWLP Borings
Report Date: 28-May-24
Lab ID: 24050235-001
Client Sample ID: D2 33.5-35.5
Matrix: SOLID
Collection Date: 04/29/2024 10:00

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
ASTM D3987, SW-846 9036, IN SHAKE EXTRACT (TOTAL)									
Sulfate, SHAKE	*	61	100		**158**	mg/L	10	05/09/2024 14:01	R347057
ASTM D3987, SW-846 9214, IN SHAKE EXTRACT									
Fluoride	*	0.37	1.0	J	**0.37**	mg/L	10	05/10/2024 9:26	R347102
Elevated reporting limit due to matrix interference.									
ASTM D3987, SW-846 9251, IN SHAKE EXTRACT									
Chloride, SHAKE	*	1	4		**8**	mg/L	1	05/09/2024 13:56	R347069
SW-846 9045C									
pH (1:1)	NELAP	0	1.00		**9.18**		1	05/06/2024 11:24	R346778
SW-846 1311, 3010A, 6010B, METALS IN TCLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**0.345**	mg/L	1	05/07/2024 17:27	222522
Barium	NELAP	0.0150	0.0450		**0.352**	mg/L	1	05/07/2024 17:27	222522
Beryllium	NELAP	0.0002	0.0010	J	**0.0002**	mg/L	1	05/07/2024 17:27	222522
Boron	NELAP	0.250	1.00		**4.05**	mg/L	1	05/07/2024 17:27	222522
Cadmium	NELAP	0.0005	0.0020		**< 0.0020**	mg/L	1	05/07/2024 17:27	222522
Chromium	NELAP	0.0034	0.0100		**< 0.0100**	mg/L	1	05/07/2024 17:27	222522
Cobalt	NELAP	0.0020	0.0060		**0.0130**	mg/L	1	05/07/2024 17:27	222522
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/07/2024 17:27	222522
Molybdenum	NELAP	0.0037	0.0100		**1.27**	mg/L	1	05/07/2024 17:27	222522
Selenium	NELAP	0.0170	0.0500		**< 0.0500**	mg/L	1	05/07/2024 17:27	222522
SW-846 1311, 3010A, 6020A, METALS IN TCLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0125**	mg/L	5	05/09/2024 9:41	222522
Lithium	*	0.0015	0.0030		**0.0707**	mg/L	5	05/09/2024 9:41	222522
Thallium	NELAP	0.0010	0.0020	J	**0.0018**	mg/L	5	05/09/2024 9:41	222522
SW-846 1311, 7470A IN TCLP EXTRACT									
Mercury	NELAP	0.00010	0.00020		**< 0.00020**	mg/L	1	05/15/2024 0:32	222519
SW-846 1312, 3005A, 6010B, METALS IN SPLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**0.0390**	mg/L	1	05/08/2024 17:27	222567
Barium	NELAP	0.0150	0.0450		**< 0.0450**	mg/L	1	05/07/2024 16:58	222567
Beryllium	NELAP	0.0002	0.0010		**< 0.0010**	mg/L	1	05/07/2024 16:58	222567
Boron	NELAP	0.250	1.00		**3.05**	mg/L	1	05/07/2024 16:58	222567
Cadmium	NELAP	0.0005	0.0020		**< 0.0020**	mg/L	1	05/07/2024 16:58	222567
Chromium	NELAP	0.0034	0.0100		**< 0.0100**	mg/L	1	05/07/2024 16:58	222567
Cobalt	NELAP	0.0020	0.0060		**< 0.0060**	mg/L	1	05/07/2024 16:58	222567
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/07/2024 16:58	222567
Molybdenum	NELAP	0.0037	0.0100		**5.21**	mg/L	1	05/07/2024 16:58	222567
Selenium	NELAP	0.0170	0.0500		**< 0.0500**	mg/L	1	05/07/2024 16:58	222567
SW-846 1312, 3005A, 6020A, METALS IN SPLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0273**	mg/L	5	05/09/2024 10:45	222567
Lithium	*	0.0015	0.0030		**0.0065**	mg/L	5	05/09/2024 10:45	222567
Thallium	NELAP	0.0010	0.0020	J	**0.0015**	mg/L	5	05/09/2024 10:45	222567
SW-846 1312, 7470A IN SPLP EXTRACT									
Mercury	NELAP	0.00006	0.00020		**< 0.00020**	mg/L	1	05/18/2024 17:08	223125
EPA 903/904, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R347896
Radium-228	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R347896

Client: City Water, Light & Power
Work Order: 24050235
Client Project: CWLP Borings
Report Date: 28-May-24
Lab ID: 24050235-002
Client Sample ID: D1 36.5-38.5
Matrix: SOLID
Collection Date: 04/29/2024 15:30

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
ASTM D3987, SW-846 9036, IN SHAKE EXTRACT (TOTAL)									
Sulfate, SHAKE	*	6	10		**45**	mg/L	1	05/09/2024 14:04	R347057
ASTM D3987, SW-846 9214, IN SHAKE EXTRACT									
Fluoride	*	0.04	0.10		**0.19**	mg/L	1	05/09/2024 13:44	R347045
ASTM D3987, SW-846 9251, IN SHAKE EXTRACT									
Chloride, SHAKE	*	1	4	J	**1**	mg/L	1	05/09/2024 14:04	R347069
SW-846 9045C									
pH (1:1)	NELAP	0	1.00		**9.64**		1	05/06/2024 11:30	R346778
SW-846 1311, 3010A, 6010B, METALS IN TCLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**0.0528**	mg/L	1	05/07/2024 17:45	222522
Barium	NELAP	0.0150	0.0450		**0.514**	mg/L	1	05/07/2024 17:45	222522
Beryllium	NELAP	0.0002	0.0010		**0.0085**	mg/L	1	05/07/2024 17:45	222522
Boron	NELAP	0.250	1.00		**10.9**	mg/L	1	05/07/2024 17:45	222522
Cadmium	NELAP	0.0005	0.0020		**0.0706**	mg/L	1	05/07/2024 17:45	222522
Chromium	NELAP	0.0034	0.0100		**0.0707**	mg/L	1	05/07/2024 17:45	222522
Cobalt	NELAP	0.0020	0.0060		**0.0116**	mg/L	1	05/07/2024 17:45	222522
Lead	NELAP	0.0040	0.0075		**0.0102**	mg/L	1	05/08/2024 13:13	222522
Molybdenum	NELAP	0.0037	0.0100		**0.0554**	mg/L	1	05/07/2024 17:45	222522
Selenium	NELAP	0.017	0.050	J	**0.037**	mg/L	1	05/07/2024 17:45	222522
SW-846 1311, 3010A, 6020A, METALS IN TCLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0237**	mg/L	5	05/09/2024 9:36	222522
Lithium	*	0.0015	0.0030		**0.0367**	mg/L	5	05/09/2024 9:36	222522
Thallium	NELAP	0.0010	0.0020		**0.0268**	mg/L	5	05/08/2024 14:55	222522
SW-846 1311, 7470A IN TCLP EXTRACT									
Mercury	NELAP	0.00010	0.00020		**< 0.00020**	mg/L	1	05/15/2024 0:39	222519
SW-846 1312, 3005A, 6010B, METALS IN SPLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**0.0471**	mg/L	1	05/08/2024 17:23	222567
Barium	NELAP	0.0150	0.0450		**< 0.0450**	mg/L	1	05/07/2024 17:03	222567
Beryllium	NELAP	0.0002	0.0010	J	**0.0002**	mg/L	1	05/07/2024 17:03	222567
Boron	NELAP	0.250	1.00		**2.94**	mg/L	1	05/07/2024 17:03	222567
Cadmium	NELAP	0.0005	0.0020		**< 0.0020**	mg/L	1	05/07/2024 17:03	222567
Chromium	NELAP	0.0034	0.0100		**< 0.0100**	mg/L	1	05/07/2024 17:03	222567
Cobalt	NELAP	0.0020	0.0060		**< 0.0060**	mg/L	1	05/07/2024 17:03	222567
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/07/2024 17:03	222567
Molybdenum	NELAP	0.0037	0.0100		**0.144**	mg/L	1	05/07/2024 17:03	222567
Selenium	NELAP	0.017	0.050	J	**0.021**	mg/L	1	05/07/2024 17:03	222567
SW-846 1312, 3005A, 6020A, METALS IN SPLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0078**	mg/L	5	05/08/2024 15:04	222567
Lithium	*	0.0015	0.0030		**0.0112**	mg/L	5	05/09/2024 10:24	222567
Thallium	NELAP	0.0010	0.0020	J	**0.0010**	mg/L	5	05/08/2024 15:04	222567
SW-846 1312, 7470A IN SPLP EXTRACT									
Mercury	NELAP	0.00006	0.00020		**< 0.00020**	mg/L	1	05/18/2024 17:12	223125
EPA 903/904, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R347896
Radium-228	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R347896

Client: City Water, Light & Power **Work Order:** 24050235

Client Project: CWLP Borings **Report Date:** 28-May-24

Lab ID: 24050235-003 **Client Sample ID:** D3 14.5-29.5

Matrix: SOLID **Collection Date:** 04/30/2024 10:15

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
ASTM D3987, SW-846 9036, IN SHAKE EXTRACT (TOTAL)									
Sulfate, SHAKE	*	6	10		**31**	mg/L	1	05/09/2024 14:28	R347057
ASTM D3987, SW-846 9214, IN SHAKE EXTRACT									
Fluoride	*	0.04	0.10		**0.11**	mg/L	1	05/09/2024 13:47	R347045
ASTM D3987, SW-846 9251, IN SHAKE EXTRACT									
Chloride, SHAKE	*	1	4		**< 4**	mg/L	1	05/09/2024 14:28	R347069
SW-846 9045C									
pH (1:1)	NELAP	0	1.00		**9.38**		1	05/06/2024 11:33	R346778
SW-846 1311, 3010A, 6010B, METALS IN TCLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**0.0155**	mg/L	1	05/08/2024 13:15	222522
Barium	NELAP	0.0150	0.0450		**0.373**	mg/L	1	05/07/2024 17:46	222522
Beryllium	NELAP	0.0002	0.0010		**0.0113**	mg/L	1	05/07/2024 17:46	222522
Boron	NELAP	0.250	1.00		**8.74**	mg/L	1	05/07/2024 17:46	222522
Cadmium	NELAP	0.0005	0.0020		**0.0475**	mg/L	1	05/07/2024 17:46	222522
Chromium	NELAP	0.0034	0.0100		**0.0438**	mg/L	1	05/07/2024 17:46	222522
Cobalt	NELAP	0.0020	0.0060	J	**0.0054**	mg/L	1	05/07/2024 17:46	222522
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/07/2024 17:46	222522
Molybdenum	NELAP	0.0037	0.0100		**0.0415**	mg/L	1	05/07/2024 17:46	222522
Selenium	NELAP	0.017	0.050	J	**0.030**	mg/L	1	05/07/2024 17:46	222522
SW-846 1311, 3010A, 6020A, METALS IN TCLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0197**	mg/L	5	05/10/2024 7:34	222522
Lithium	*	0.0015	0.0030		**0.0100**	mg/L	5	05/09/2024 10:29	222522
Thallium	NELAP	0.0010	0.0020		**0.0185**	mg/L	5	05/08/2024 15:29	222522
SW-846 1311, 7470A IN TCLP EXTRACT									
Mercury	NELAP	0.00010	0.00020		**< 0.00020**	mg/L	1	05/15/2024 0:42	222519
SW-846 1312, 3005A, 6010B, METALS IN SPLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**0.0173**	mg/L	1	05/08/2024 17:29	222567
Barium	NELAP	0.0150	0.0450		**< 0.0450**	mg/L	1	05/07/2024 17:04	222567
Beryllium	NELAP	0.0002	0.0010		**< 0.0010**	mg/L	1	05/07/2024 17:04	222567
Boron	NELAP	0.250	1.00		**2.34**	mg/L	1	05/07/2024 17:04	222567
Cadmium	NELAP	0.0005	0.0020		**< 0.0020**	mg/L	1	05/07/2024 17:04	222567
Chromium	NELAP	0.0034	0.0100		**< 0.0100**	mg/L	1	05/07/2024 17:04	222567
Cobalt	NELAP	0.0020	0.0060		**< 0.0060**	mg/L	1	05/07/2024 17:04	222567
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/07/2024 17:04	222567
Molybdenum	NELAP	0.0037	0.0100		**0.0355**	mg/L	1	05/07/2024 17:04	222567
Selenium	NELAP	0.0170	0.0500		**< 0.0500**	mg/L	1	05/07/2024 17:04	222567
SW-846 1312, 3005A, 6020A, METALS IN SPLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0070**	mg/L	5	05/09/2024 11:07	222567
Lithium	*	0.0015	0.0030		**0.0034**	mg/L	5	05/09/2024 11:07	222567
Thallium	NELAP	0.0010	0.0020	J	**0.0017**	mg/L	5	05/09/2024 11:07	222567
SW-846 1312, 7470A IN SPLP EXTRACT									
Mercury	NELAP	0.00006	0.00020		**< 0.00020**	mg/L	1	05/18/2024 17:14	223125

Client: City Water, Light & Power **Work Order:** 24050235

Client Project: CWLP Borings **Report Date:** 28-May-24

Lab ID: 24050235-004 **Client Sample ID:** D4 29.5-31.5

Matrix: SOLID **Collection Date:** 04/30/2024 15:00

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
ASTM D3987, SW-846 9036, IN SHAKE EXTRACT (TOTAL)									
Sulfate, SHAKE	*	61	100		**102**	mg/L	10	05/09/2024 14:41	R347057
ASTM D3987, SW-846 9214, IN SHAKE EXTRACT									
Fluoride	*	0.04	0.10		**0.14**	mg/L	1	05/09/2024 13:49	R347045
ASTM D3987, SW-846 9251, IN SHAKE EXTRACT									
Chloride, SHAKE	*	1	4		**11**	mg/L	1	05/09/2024 14:36	R347069
SW-846 9045C									
pH (1:1)	NELAP	0	1.00		**10.2**		1	05/06/2024 11:35	R346778
SW-846 1311, 3010A, 6010B, METALS IN TCLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**0.0242**	mg/L	1	05/07/2024 17:49	222522
Barium	NELAP	0.0150	0.0450		**0.287**	mg/L	1	05/07/2024 17:49	222522
Beryllium	NELAP	0.0002	0.0010		**0.0012**	mg/L	1	05/07/2024 17:49	222522
Boron	NELAP	0.250	1.00		**6.25**	mg/L	1	05/07/2024 17:49	222522
Cadmium	NELAP	0.0005	0.0020		**0.0063**	mg/L	1	05/07/2024 17:49	222522
Chromium	NELAP	0.0034	0.0100		**< 0.0100**	mg/L	1	05/07/2024 17:49	222522
Cobalt	NELAP	0.0020	0.0060		**0.0089**	mg/L	1	05/07/2024 17:49	222522
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/07/2024 17:49	222522
Molybdenum	NELAP	0.0037	0.0100		**0.179**	mg/L	1	05/07/2024 17:49	222522
Selenium	NELAP	0.017	0.050	J	**0.022**	mg/L	1	05/07/2024 17:49	222522
SW-846 1311, 3010A, 6020A, METALS IN TCLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0376**	mg/L	5	05/09/2024 10:18	222522
Lithium	*	0.0015	0.0030		**0.0374**	mg/L	5	05/09/2024 10:18	222522
Thallium	NELAP	0.0010	0.0020		**0.0243**	mg/L	5	05/08/2024 15:00	222522
SW-846 1311, 7470A IN TCLP EXTRACT									
Mercury	NELAP	0.00010	0.00020		**< 0.00020**	mg/L	1	05/19/2024 16:25	223122
SW-846 1312, 3005A, 6010B, METALS IN SPLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**0.0114**	mg/L	1	05/08/2024 17:31	222567
Barium	NELAP	0.0150	0.0450		**< 0.0450**	mg/L	1	05/07/2024 17:05	222567
Beryllium	NELAP	0.0002	0.0010		**< 0.0010**	mg/L	1	05/07/2024 17:05	222567
Boron	NELAP	0.250	1.00		**2.77**	mg/L	1	05/07/2024 17:05	222567
Cadmium	NELAP	0.0005	0.0020		**< 0.0020**	mg/L	1	05/07/2024 17:05	222567
Chromium	NELAP	0.0034	0.0100		**< 0.0100**	mg/L	1	05/07/2024 17:05	222567
Cobalt	NELAP	0.0020	0.0060		**< 0.0060**	mg/L	1	05/07/2024 17:05	222567
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/07/2024 17:05	222567
Molybdenum	NELAP	0.0037	0.0100		**0.134**	mg/L	1	05/07/2024 17:05	222567
Selenium	NELAP	0.017	0.050	J	**0.021**	mg/L	1	05/07/2024 17:05	222567
SW-846 1312, 3005A, 6020A, METALS IN SPLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0240**	mg/L	5	05/09/2024 11:44	222567
Lithium	*	0.0015	0.0030		**0.0059**	mg/L	5	05/09/2024 11:44	222567
Thallium	NELAP	0.0010	0.0020	J	**0.0013**	mg/L	5	05/08/2024 16:14	222567
SW-846 1312, 7470A IN SPLP EXTRACT									
Mercury	NELAP	0.00006	0.00020		**< 0.00020**	mg/L	1	05/18/2024 17:21	223125
EPA 903/904, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R347896
Radium-228	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R347896

Receiving Check List

http://www.teklabinc.com/

Client: City Water, Light & Power
Client Project: CWLP Borings

Work Order: 24050235
Report Date: 28-May-24

Carrier: Paul Reeves
Received By: NR

Completed by: Amber Dilallo
On: 03-May-24

Reviewed by: Ellie Hopkins
On: 03-May-24

Pages to follow: Chain of custody 1 Extra pages included 14

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	Temp °C 2.9
Type of thermal preservation?	None ☐	Ice ☑	Blue Ice ☐	Dry Ice ☐
Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☐	No ☑		
All samples received within holding time?	Yes ☑	No ☐		
Reported field parameters measured:	Field ☐	Lab ☐	NA ☑	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐		

When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.

Water – at least one vial per sample has zero headspace?	Yes ☐	No ☐	No VOA vials ☑
Water - TOX containers have zero headspace?	Yes ☐	No ☐	No TOX containers ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	NA ☑
NPDES/CWA TCN interferences checked/treated in the field?	Yes ☐	No ☐	NA ☑

Any No responses must be detailed below or on the COC.

Samples requiring pH should be analyzed as soon as possible after collection. Samples submitted for pH analysis are analyzed as soon as practicable upon arrival at the laboratory. - amberdilallo - 5/3/2024 10:02:55 AM

Limited volume for D3 sample; additional volume for Radium-226 and -228 was submitted on WO#24050346. SAH 5/28/24

Print PDF

CHAIN OF CUSTODY

Pg __ of __ Workorder # 24050235

TEKLAB INC, 5445 Horseshoe Lake Road, Collinsville, IL 62234 Phone (618) 344-1004 Fax (618) 344-1005

Client: City, Water, Light & Power
Address: 3100 Stevenson Dr.
City/State/Zip: Springfield, IL 62712
Contact: Colleen Grey Phone: 217-787-2334
Email: cgrey@andrews-eng.com Fax:

Samples on: [X] ICE [ ] BLUE ICE [ ] NO ICE 2.9 °C #7
Preserved in: [ ] LAB [ ] FIELD
FOR LAB USE ONLY
LAB NOTES:

TEKLAB

Client Comments:
TCLP & SPLP for all metals

Courier

email results to C. Grey and datamanagement@andrews-eng.com

Are these samples known to be involved in litigation? If yes, a surcharge will apply: [ ] Yes [ ] No
Are these samples known to be hazardous? [ ] Yes [ ] No
Are there any required reporting limits to be met on the requested analysis?. If yes, please provide limits in the comment section: [ ] Yes [ ] No

PROJECT NAME/NUMBER: CWLP Borings

SAMPLE COLLECTOR'S NAME: S. Van Hook

RESULTS REQUESTED
[✓] Standard [ ] 1-2 Day (100% Surcharge)
[ ] Other _____ [ ] 3 Day (50% Surcharge)

BILLING INSTRUCTIONS

Lab Use Only	Sample ID	Date/Time Sampled	Matrix	# and Type of Containers: UNP	HNO3	NaOH	H2SO4	HCL	MeOH	NaHSO4	TSP	Other	INDICATE ANALYSIS REQUESTED: Rad 226 and 228	TCLP & SPLP Sb, As, Ba, Be	TCLP & SPLP B, Cd, Cr, Co, Pb, Se, Tl	TCLP & SPLP Li, Mo	TCLP & SPLP Hg	Neutral Leach Cl, F+, SO4	pH
24050235-001	D2 33.5-35.5	4/29/24 10AM	Soil	2									✓	✓	✓	✓	✓	✓	✓
002	D1 36.5-38.5	4/29/24 3:30PM	Soil	2									✓	✓	✓	✓	✓	✓	✓
003	D3 14.5-29.5	4/30/24 10:15am	Soil	2									✓	✓	✓	✓	✓	✓	✓
004	D4 29.5-31.5	4/30/24 3:00PM	Soil	2									✓	✓	✓	✓	✓	✓	✓
			Soil	2									✓	✓	✓	✓	✓	✓	✓
			Soil	2									✓	✓	✓	✓	✓	✓	✓
			Soil	2									✓	✓	✓	✓	✓	✓	✓
			Soil	2									✓	✓	✓	✓	✓	✓	✓
			Soil	2									✓	✓	✓	✓	✓	✓	✓
			Soil	2									✓	✓	✓	✓	✓	✓	✓
			Soil	2									✓	✓	✓	✓	✓	✓	✓
			Soil	2									✓	✓	✓	✓	✓	✓	✓

Relinquished By	Date/Time	Received By	Date/Time
Steve Van Hook	5/1/24 7:00pm	ASI Secure Storage	5/1/24 7:00P
ASI Secure Storage CMay	5/2/24 7:40A	Paul Mix	5.2.24 0740
Paul Mix	5.2.24 1311	Mitch Klett	5/2/24 1311

*The individual signing this agreement on behalf of the client, acknowledges that he/she has read and understands the terms and conditions of this agreement, and that he/she has the authority to sign on behalf of the client. See www.teklabinc.com for terms and conditions

UM 5/2

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

May 23, 2024

Shelly Hennessy
TEKLAB Inc,
5445 Horseshoe lake Road
Collinsville, IL 62234
TEL:
FAX:

RE: 24050235

Dear Shelly Hennessy:

Order No.: 24050488

Summit Environmental Technologies, Inc. received 3 sample(s) on 5/7/2024 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative.

Quality control data is within laboratory defined or method specified acceptance limits except where noted.

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

Sincerely,

Jennifer Woolf

Project Manager

3310 Win St.
Cuyahoga Falls, Ohio 44223

Arkansas 88-0735, California 2943, Colorado, Connecticut PH-0108, Florida NELAC E87688, Idaho OH00923, Illinois 200061, Indiana C-OH-13, ISO/IEC 17025:2017 119125 L22-544, Kansas E-10347, Kentucky (Underground Storage Tank) 3, Kentucky 90146, Maryland 339, Michigan 9988, Minnesota 1780279, Nevada OH009232020-1, New Hampshire 2996, New Jersey OH006, New York 11777, North Carolina 39705 and 631, North Dakota R-201, Ohio DW, Ohio VAP CL0052, Oklahoma 2019-155, Oregon OH200001, Pennsylvania 68-01335, Rhode Island LA000317, South Carolina 92016001, Texas T104704466-19-16, Utah OH009232020-12, Virginia VELAP 10381, West Virginia 9957C

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Case Narrative

WO#: **24050488**
Date: **5/23/2024**

CLIENT: TEKLAB Inc,
Project: 24050235

WorkOrder Narrative:
24050488: This report in its entirety consists of the following documents: Cover Letter, Case Narrative, Analytical Results, QC Summary Report, Applicable Accreditation Information, Chain-of-Custody, Cooler Receipt Form, and other applicable forms as necessary. All documents contain the Summit Environmental Technologies, Inc., Work Order Number assigned to this report.

Summit Environmental Technologies, Inc., holds the accreditations/certifications listed at the bottom of the cover letter that may or may not pertain to this report. Please refer to the "Accreditation Program Analytes Report" for accredited analytes list.

The information contained in this analytical report is the sole property of Summit Environmental Technologies, Inc. and that of the customer. It cannot be reproduced in any form without the consent of Summit Environmental Technologies, Inc. or the customer for which this report was issued. The results contained in this report are only representative of the samples received. Conditions can vary at different times and at different sampling conditions. Summit Environmental Technologies, Inc. is not responsible for use or interpretation of the data included herein.

All results for Solid Samples are reported on an "as received" or "wet weight" basis unless indicated as "dry weight" using the "-dry" designation on the reporting units.

This report is believed to meet all of the requirements of the accrediting agency, where applicable. Any comments or problems with the analytical events associated with this report are noted below.

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC
Analytical Laboratories

Summit Environmental Technologies, In
3310 Win S
Cuyahoga Falls, Ohio 4422
TEL: (330) 253-8211 FAX: (330) 253-44
Website: http://www.settek.co

Qualifiers and Acronyms

WO#: **24050488**
Date: **5/23/2024**

These commonly used Qualifiers and Acronyms may or may not be present in this report.

Qualifiers

U	The compound was analyzed for but was not detected above the MDL.
J	The reported value is greater than the Method Detection Limit but less than the Reporting Limit.
H	The hold time for sample preparation and/or analysis was exceeded. Not Clean Water Act compliant.
D	The result is reported from a dilution.
E	The result exceeded the linear range of the calibration or is estimated due to interference.
MC	The result is below the Minimum Compound Limit.
*****	The result exceeds the Regulatory Limit or Maximum Contamination Limit.
m	Manual integration was used to determine the area response.
d	Manual integration in which peak was deleted
N	The result is presumptive based on a Mass Spectral library search assuming a 1:1 response.
P	The second column confirmation exceeded 25% difference.
C	The result has been confirmed by GC/MS.
X	The result was not confirmed when GC/MS Analysis was performed.
B	The analyte was detected in the Method Blank at a concentration greater than the RL.
MB+	The analyte was detected in the Method Blank at a concentration greater than the MDL.
G	The ICB or CCB contained reportable amounts of analyte.
QC-/+	The CCV recovery failed low (-) or high (+).
R/QDR	The RPD was outside of accepted recovery limits.
QL-/+	The LCS or LCSD recovery failed low (-) or high (+).
QLR	The LCS/LCSD RPD was outside of accepted recovery limits.
QM-/+	The MS or MSD recovery failed low (-) or high (+).
QMR	The MS/MSD RPD was outside of accepted recovery limits.
QV-/+	The ICV recovery failed low (-) or high (+).
S	The spike result was outside of accepted recovery limits.
W	Samples were received outside temperature limits (0° – 6° C). Not Clean Water Act compliant.
Z	Deviation; A deviation from the method was performed; Please refer to the Case Narrative for additional information

Acronyms

ND	Not Detected	**RL**	Reporting Limit
QC	Quality Control	**MDL**	Method Detection Limit
MB	Method Blank	**LOD**	Level of Detection
LCS	Laboratory Control Sample	**LOQ**	Level of Quantitation
LCSD	Laboratory Control Sample Duplicate	**PQL**	Practical Quantitation Limit
QCS	Quality Control Sample	**CRQL**	Contract Required Quantitation Limit
DUP	Duplicate	**PL**	Permit Limit
MS	Matrix Spike	**RegLvl**	Regulatory Limit
MSD	Matrix Spike Duplicate	**MCL**	Maximum Contamination Limit
RPD	Relative Percent Different	**MinCL**	Minimum Compound Limit
ICV	Initial Calibration Verification	**RA**	Reanalysis
ICB	Initial Calibration Blank	**RE**	Reextraction
CCV	Continuing Calibration Verification	**TIC**	Tentatively Identified Compound
CCB	Continuing Calibration Blank	**RT**	Retention Time
RLC	Reporting Limit Check	**CF**	Calibration Factor

This list of Qualifiers and Acronyms reflects the most commonly utilized Qualifiers and Acronyms for reporting. Please refer to the Analytical Notes in the Case Narrative for any Qualifiers or Acronyms that do not appear in this list or for additional information regarding the use of these Qualifiers on reported data.

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC
Analytical Laboratories

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Workorder Sample Summary

WO#: **24050488**

23-May-24

CLIENT: TEKLAB Inc,
Project: 24050235

Lab SampleID	Client Sample ID	Tag No	Date Collected	Date Received	Matrix
24050488-001	24050235-001		4/29/2024 10:00:00 AM	5/7/2024 11:30:00 AM	Solid
24050488-002	24050235-002		4/29/2024 3:30:00 PM	5/7/2024 11:30:00 AM	Solid
24050488-003	24050235-004		4/30/2024 3:00:00 PM	5/7/2024 11:30:00 AM	Solid

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
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TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

DATES REPORT

WO#: **24050488**

23-May-24

Client: TEKLAB Inc,

Project: 24050235

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
24050488-001A	24050235-001	4/29/2024 10:00:00 AM	Solid	Radium-226 Analysis (9315)		5/16/2024 11:10:22 AM	5/23/2024 10:51:41 AM
				Radium-228 Analysis (9320)		5/16/2024 11:10:22 AM	5/22/2024 3:06:59 PM
24050488-002A	24050235-002	4/29/2024 3:30:00 PM		Radium-226 Analysis (9315)		5/16/2024 11:10:22 AM	5/23/2024 10:51:41 AM
				Radium-228 Analysis (9320)		5/16/2024 11:10:22 AM	5/22/2024 3:06:59 PM
24050488-003A	24050235-004	4/30/2024 3:00:00 PM		Radium-226 Analysis (9315)		5/16/2024 11:10:22 AM	5/23/2024 10:51:41 AM
				Radium-228 Analysis (9320)		5/16/2024 11:10:22 AM	5/22/2024 3:06:59 PM

Original

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Analytical Report

(consolidated)

WO#: **24050488**

Date Reported: **5/23/2024**

CLIENT: TEKLAB Inc,

Collection Date: 4/29/2024 10:00:00 AM

Project: 24050235

Lab ID: 24050488-001

Matrix: SOLID

Client Sample ID: 24050235-001

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**SW9315**	**E903-904**	Analyst: **SMZ**
RADIUM-226 ANALYSIS (9315)							
Radium-226	ND	1.00		pCi/g	± 0.100	1	5/23/2024 10:51:41 AM
Yield	1.00					1	5/23/2024 10:51:41 AM
RAD226/228					**SW9320**	**E903-904**	Analyst: **SMZ**
RADIUM-228 ANALYSIS (9320)							
Radium-228	ND	2.00		pCi/g	± 0.330	1	5/22/2024 3:06:59 PM
Yield	1.00					1	5/22/2024 3:06:59 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected
R	RPD outside accepted recovery limits
W	Sample container temperature is out of limit as specified at testcode
M	Manual Integration used to determine area response
PL	Permit Limit
RL	Reporting Detection Limit

Original

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Analytical Laboratories

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Website: http://www.settek.com

Analytical Report

(consolidated)

WO#: **24050488**

Date Reported: **5/23/2024**

CLIENT: TEKLAB Inc,

Collection Date: 4/29/2024 3:30:00 PM

Project: 24050235

Lab ID: 24050488-002

Matrix: SOLID

Client Sample ID: 24050235-002

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**SW9315**	**E903-904**	Analyst: **SMZ**
RADIUM-226 ANALYSIS (9315)							
Radium-226	ND	1.00		pCi/g	± 0.130	1	5/23/2024 10:51:41 AM
Yield	1.00					1	5/23/2024 10:51:41 AM
RAD226/228					**SW9320**	**E903-904**	Analyst: **SMZ**
RADIUM-228 ANALYSIS (9320)							
Radium-228	ND	2.00		pCi/g	± 0.270	1	5/22/2024 3:06:59 PM
Yield	1.00					1	5/22/2024 3:06:59 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected
R	RPD outside accepted recovery limits
W	Sample container temperature is out of limit as specified at testcode
M	Manual Integration used to determine area response
PL	Permit Limit
RL	Reporting Detection Limit

Original

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Analytical Laboratories

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Analytical Report

(consolidated)

WO#: **24050488**

Date Reported: **5/23/2024**

CLIENT: TEKLAB Inc,

Collection Date: 4/30/2024 3:00:00 PM

Project: 24050235

Lab ID: 24050488-003

Matrix: SOLID

Client Sample ID: 24050235-004

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RAD226/228					**SW9315**	**E903-904**	Analyst: **SMZ**
RADIUM-226 ANALYSIS (9315)							
Radium-226	ND	1.00		pCi/g	± 0.160	1	5/23/2024 10:51:41 AM
Yield	1.00					1	5/23/2024 10:51:41 AM
RAD226/228					**SW9320**	**E903-904**	Analyst: **SMZ**
RADIUM-228 ANALYSIS (9320)							
Radium-228	ND	2.00		pCi/g	± 0.300	1	5/22/2024 3:06:59 PM
Yield	1.00					1	5/22/2024 3:06:59 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected
R	RPD outside accepted recovery limits
W	Sample container temperature is out of limit as specified at testcode
M	Manual Integration used to determine area response
PL	Permit Limit
RL	Reporting Detection Limit

Original

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Analytical Laboratories

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Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **24050488**

23-May-24

Client: TEKLAB Inc,
Project: 24050235 **BatchID:** **75515**

Sample ID: **MB-75515** SampType: **MBLK** TestCode: **Radium-228_** Units: **pCi/g** Prep Date: **5/16/2024** RunNo: **186135**
Client ID: **PBS** Batch ID: **75515** TestNo: **SW9320** **E903-904** Analysis Date: **5/22/2024** SeqNo: **5043898**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	2.00									
Yield	1.00										

Sample ID: **LCS-75515** SampType: **LCS** TestCode: **Radium-228_** Units: **pCi/g** Prep Date: **5/16/2024** RunNo: **186135**
Client ID: **LCSS** Batch ID: **75515** TestNo: **SW9320** **E903-904** Analysis Date: **5/22/2024** SeqNo: **5043899**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	3.62	2.00	5.000	0	72.4	50	130				

Sample ID: **LCSD-75515** SampType: **LCSD** TestCode: **Radium-228_** Units: **pCi/g** Prep Date: **5/16/2024** RunNo: **186135**
Client ID: **LCSS02** Batch ID: **75515** TestNo: **SW9320** **E903-904** Analysis Date: **5/22/2024** SeqNo: **5043900**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	3.01	2.00	5.000	0	60.2	50	130	3.620	18.4	20	

Sample ID: **24041932-001ADUP** SampType: **DUP** TestCode: **Radium-228_** Units: **pCi/g** Prep Date: **5/16/2024** RunNo: **186135**
Client ID: **BatchQC** Batch ID: **75515** TestNo: **SW9320** **E903-904** Analysis Date: **5/22/2024** SeqNo: **5043905**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

Original

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
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Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **24050488**

23-May-24

Client: TEKLAB Inc,

Project: 24050235 **BatchID:** **75515**

Sample ID: **24041932-001ADUP** SampType: **DUP** TestCode: **Radium-228_** Units: **pCi/g** Prep Date: **5/16/2024** RunNo: **186135**

Client ID: **BatchQC** Batch ID: **75515** TestNo: **SW9320** **E903-904** Analysis Date: **5/22/2024** SeqNo: **5043905**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	8.89	2.00	10.00	0	88.9	0	0	6.490	31.2	20	RS
Yield	1.00							1.000	0	0	

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

Original

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **24050488**

23-May-24

Client: TEKLAB Inc,
Project: 24050235 **BatchID:** **75515**

Sample ID: **MB-75515**	SampType: **MBLK**	TestCode: **Radium-226_**	Units: **pCi/g**	Prep Date: **5/16/2024**	RunNo: **186145**
Client ID: **PBS**	Batch ID: **75515**	TestNo: **SW9315**	**E903-904**	Analysis Date: **5/23/2024**	SeqNo: **5044082**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00									
Yield	1.00										

Sample ID: **LCS-75515**	SampType: **LCS**	TestCode: **Radium-226_**	Units: **pCi/g**	Prep Date: **5/16/2024**	RunNo: **186145**
Client ID: **LCSS**	Batch ID: **75515**	TestNo: **SW9315**	**E903-904**	Analysis Date: **5/23/2024**	SeqNo: **5044083**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	6.20	1.00	5.000	0	124	70	130				

Sample ID: **LCSD-75515**	SampType: **LCSD**	TestCode: **Radium-226_**	Units: **pCi/g**	Prep Date: **5/16/2024**	RunNo: **186145**
Client ID: **LCSS02**	Batch ID: **75515**	TestNo: **SW9315**	**E903-904**	Analysis Date: **5/23/2024**	SeqNo: **5044084**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	5.76	1.00	5.000	0	115	60	140	6.200	7.36	40	

Sample ID: **24041932-001ADUP**	SampType: **DUP**	TestCode: **Radium-226_**	Units: **pCi/g**	Prep Date: **5/16/2024**	RunNo: **186145**
Client ID: **BatchQC**	Batch ID: **75515**	TestNo: **SW9315**	**E903-904**	Analysis Date: **5/23/2024**	SeqNo: **5044089**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

Original

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **24050488**

23-May-24

Client: TEKLAB Inc,

Project: 24050235 **BatchID:** **75515**

Sample ID: **24041932-001ADUP** SampType: **DUP** TestCode: **Radium-226_** Units: **pCi/g** Prep Date: **5/16/2024** RunNo: **186145**

Client ID: **BatchQC** Batch ID: **75515** TestNo: **SW9315** **E903-904** Analysis Date: **5/23/2024** SeqNo: **5044089**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	6.51	1.00						6.960	6.68	20	
Yield	1.00							1.000	0	0	

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

Original

TEKLAB, INC. Chain of Custody

5445 Horseshoe Lake Road, Collinsville, IL 62234 Phone (618) 344-1004 Fax (618) 344-1005

Are the samples chilled? YES ☐ NO ☑ With: ☐ Ice ☐ Blue Ice Preserved in: ☐ Lab ☐ Field

Teklab Inc
5445 Horseshoe Lake Road
Collinsville, IL 62234

W.8-0.2 Cooler Temp: 26.6°C Sampler: Client QC Level: 2

Fedex, Cooler

Project# 24050235

Comments: **Please Issue reports and invoices via email only**
Please analyze for Radium 226/228 per your usual methods.
Any changes to analysis/methods must be approved by Teklab, Inc. Batch QC is required.
Samples collected from an IL site.

Contact: Shelly Hennessy Email: shennessy@TekLabInc.com
Requested Due Date: Standard TAT Billing/PO: 36226 Phone: (618) 344-1004 ext. 36

24050488

PLEASE NOTE:

NELAP accreditation is required on the requested analytes and must be documented as such on the final report. If your laboratory does not currently hold a NELAP accreditation for the requested method and/or analytes, please contact Teklab immediately. If your laboratory loses accreditation or is suspended for any analyte/method during the life of the contract, you must contact Teklab immediately.

Lab Use	Sample ID	Sample Date/Time	Preservative	Matrix	Radium 226/228											
							CPM									
	24050235-001	4/29/24 1000	Unpres	Soil	✔		38									
	24050235-002	4/29/24 1530	Unpres	Soil	✔		34									
	24050235-004	4/30/24 1500	Unpres	Soil	✔		38									
			Other	Aqueous												
			Other	Aqueous												
			Other	Aqueous												
			Other	Aqueous												
			Other	Aqueous												
			Other	Aqueous												
			Other	Aqueous												
			Other	Aqueous												

*Relinquished By	Date/Time	Received By	Date/Time
	5/3/24 1700		5/7/24, 1130

Teklab maintains a strict policy of client confidentiality and as such does not provide client/sampler information without proper authorization, and proprietary rights.

SubCocRevA

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC
Analytical Laboratories

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Sample Log-In Check List

Client Name: TEK-IL-62234-A Work Order Number: 24050488 RcptNo: 1

Logged by:	Christina N. Gemma	5/7/2024 11:30:00 AM	C. Gemma
Completed By:	Christina N. Gemma	5/7/2024 5:25:54 PM	C. Gemma
Reviewed By:	Jennifer Woolf	5/8/2024 11:11:39 AM	Jennifer Woolf

Chain of Custody

1. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
2. How was the sample delivered? FedEx

Log In

3. Coolers are present? Yes ☑ No ☐ NA ☐
4. Shipping container/cooler in good condition? Yes ☑ No ☐
   Custody seals intact on shipping container/cooler? Yes ☐ No ☐ Not Present ☑
   No. Seal Date: Signed By:
5. Was an attempt made to cool the samples? Yes ☐ No ☑ NA ☐
6. Were all samples received at a temperature of >0° C to 6.0°C Yes ☐ No ☑ NA ☐
   Not required
7. Sample(s) in proper container(s)? Yes ☑ No ☐
8. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
9. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
10. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
11. Is the headspace in the VOA vials less than 1/4 inch or 6 mm? Yes ☐ No ☐ No VOA Vials ☑
12. Were any sample containers received broken? Yes ☐ No ☑
13. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes ☑ No ☐
14. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
15. Is it clear what analyses were requested? Yes ☑ No ☐
16. Were all holding times able to be met? (If no, notify customer for authorization.) Yes ☑ No ☐

Special Handling (if applicable)

17. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:
By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:
Client Instructions:

18. Additional remarks:

Cooler Information

Cooler No	Temp ºC	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	20.6	Good	Not Present			

June 05, 2024

Eric Staley
City Water, Light & Power
3100 Stevenson Drive
2nd Floor Maintenance Building
Springfield, IL 62712
TEL: (217) 757-8610
FAX: (217) 757-8615

Illinois	100226
Illinois	1004652024-2
Kansas	E-10374
Louisiana	05002
Louisiana	05003
Oklahoma	9978

RE: CWLP Borings **WorkOrder:** 24050346

Dear Eric Staley:

TEKLAB, INC received 10 samples on 5/3/2024 1:50:00 PM for the analysis presented in the following report.

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

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

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

Sincerely,

Shelly A Hennessy

Shelly A. Hennessy
Project Manager
(618)344-1004 ex 36
SHennessy@teklabinc.com

Report Contents

http://www.teklabinc.com/

Client: City Water, Light & Power
Client Project: CWLP Borings

Work Order: 24050346
Report Date: 05-Jun-24

This reporting package includes the following:

Cover Letter	1
Report Contents	2
Definitions	3
Case Narrative	5
Accreditations	6
Laboratory Results	7
Receiving Check List	17
Chain of Custody	Appended

Client: City Water, Light & Power **Work Order:** 24050346

Client Project: CWLP Borings **Report Date:** 05-Jun-24

Abbr Definition

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

Client: City Water, Light & Power
Work Order: 24050346

Client Project: CWLP Borings
Report Date: 05-Jun-24

Qualifiers

- # - Unknown hydrocarbon
- B - Analyte detected in associated Method Blank
- C - RL shown is a Client Requested Quantitation Limit
- E - Value above quantitation range
- H - Holding times exceeded
- I - Associated internal standard was outside method criteria
- J - Analyte detected below quantitation limits
- M - Manual Integration used to determine area response
- ND - Not Detected at the Reporting Limit
- R - RPD outside accepted recovery limits
- S - Spike Recovery outside recovery limits
- T - TIC(Tentatively identified compound)
- X - Value exceeds Maximum Contaminant Level

Case Narrative

http://www.teklabinc.com/

Client: City Water, Light & Power
Work Order: 24050346
Client Project: CWLP Borings
Report Date: 05-Jun-24

Cooler Receipt Temp: 3.3 °C

Radium-226 and Radium-228 analysis was performed by Summit Environmental Technologies, Inc. See attached report for results.

Locations

Collinsville

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

Springfield

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

Kansas City

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

Collinsville Air

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

Chicago

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

Client: City Water, Light & Power

Work Order: 24050346

Client Project: CWLP Borings

Report Date: 05-Jun-24

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2025	Collinsville
Illinois	IEPA	1004652024-2	NELAP	4/30/2025	Collinsville
Kansas	KDHE	E-10374	NELAP	4/30/2025	Collinsville
Louisiana	LDEQ	05002	NELAP	6/30/2024	Collinsville
Louisiana	LDEQ	05003	NELAP	6/30/2024	Collinsville
Oklahoma	ODEQ	9978	NELAP	8/31/2024	Collinsville
Arkansas	ADEQ	88-0966		3/14/2025	Collinsville
Illinois	IDPH	17584		5/31/2025	Collinsville
Iowa	IDNR	430		6/1/2026	Collinsville
Kentucky	UST	0073		1/31/2025	Collinsville
Mississippi	MSDH			4/30/2025	Collinsville
Missouri	MDNR	930		1/31/2025	Collinsville
Missouri	MDNR	00930		10/31/2026	Collinsville

Client: City Water, Light & Power
Work Order: 24050346
Client Project: CWLP Borings
Report Date: 05-Jun-24
Lab ID: 24050346-001
Client Sample ID: L4 10ft-15.3ft
Matrix: SOLID
Collection Date: 05/02/2024 8:15

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
ASTM D3987, SW-846 9036, IN SHAKE EXTRACT (TOTAL)									
Sulfate, SHAKE	*	61	100		**149**	mg/L	10	05/09/2024 14:49	R347057
ASTM D3987, SW-846 9214, IN SHAKE EXTRACT									
Fluoride	*	0.04	0.10		**0.42**	mg/L	1	05/09/2024 13:52	R347045
ASTM D3987, SW-846 9251, IN SHAKE EXTRACT									
Chloride, SHAKE	*	1	4		**25**	mg/L	1	05/09/2024 14:44	R347069
SW-846 9045C									
pH (1:1)	NELAP	0	1.00		**8.49**		1	05/06/2024 11:10	R346778
SW-846 1311, 3010A, 6010B, METALS IN TCLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:00	222742
Barium	NELAP	0.0150	0.0450		**1.04**	mg/L	1	05/10/2024 14:00	222742
Beryllium	NELAP	0.0002	0.0010		**< 0.0010**	mg/L	1	05/10/2024 14:00	222742
Boron	NELAP	0.25	1.0	J	**0.59**	mg/L	1	05/10/2024 14:00	222742
Cadmium	NELAP	0.0005	0.0020		**< 0.0020**	mg/L	1	05/10/2024 14:00	222742
Chromium	NELAP	0.0034	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:00	222742
Cobalt	NELAP	0.0020	0.0060		**0.0077**	mg/L	1	05/10/2024 14:00	222742
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/10/2024 14:00	222742
Molybdenum	NELAP	0.0037	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:00	222742
Selenium	NELAP	0.0170	0.0500		**< 0.0500**	mg/L	1	05/10/2024 14:00	222742
SW-846 1311, 3010A, 6020A, METALS IN TCLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0012**	mg/L	5	05/14/2024 9:03	222742
Lithium	*	0.0015	0.0030		**0.0034**	mg/L	5	05/14/2024 9:03	222742
Thallium	NELAP	0.0010	0.0020	J	**0.0015**	mg/L	5	05/15/2024 12:16	222742
SW-846 1311, 7470A IN TCLP EXTRACT									
Mercury	NELAP	0.00010	0.00020		**< 0.00020**	mg/L	1	05/16/2024 7:17	222743
SW-846 1312, 3005A, 6010B, METALS IN SPLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:13	222744
Barium	NELAP	0.0150	0.0450		**< 0.0450**	mg/L	1	05/10/2024 14:13	222744
Beryllium	NELAP	0.0002	0.0010		**< 0.0010**	mg/L	1	05/10/2024 14:13	222744
Boron	NELAP	0.250	1.00		**< 1.00**	mg/L	1	05/10/2024 14:13	222744
Cadmium	NELAP	0.0005	0.0020		**< 0.0020**	mg/L	1	05/10/2024 14:13	222744
Chromium	NELAP	0.0034	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:13	222744
Cobalt	NELAP	0.0020	0.0060		**< 0.0060**	mg/L	1	05/10/2024 14:13	222744
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/10/2024 14:13	222744
Molybdenum	NELAP	0.0037	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:13	222744
Selenium	NELAP	0.0170	0.0500		**< 0.0500**	mg/L	1	05/10/2024 14:13	222744
SW-846 1312, 3005A, 6020A, METALS IN SPLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010	J	**0.0009**	mg/L	5	05/14/2024 12:23	222744
Lithium	*	0.0015	0.0030		**< 0.0030**	mg/L	5	05/14/2024 12:23	222744
Thallium	NELAP	0.0010	0.0020	J	**0.0011**	mg/L	5	05/15/2024 14:31	222744
SW-846 1312, 7470A IN SPLP EXTRACT									
Mercury	NELAP	0.00006	0.00020		**< 0.00020**	mg/L	1	05/18/2024 16:27	223131
EPA 903/904, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R348283
Radium-228	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R348283

Client: City Water, Light & Power
Work Order: 24050346
Client Project: CWLP Borings
Report Date: 05-Jun-24
Lab ID: 24050346-002
Client Sample ID: L3 29.5-32.7
Matrix: SOLID
Collection Date: 05/02/2024 11:00

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
ASTM D3987, SW-846 9036, IN SHAKE EXTRACT (TOTAL)									
Sulfate, SHAKE	*	307	500		**574**	mg/L	50	05/10/2024 13:21	R347112
ASTM D3987, SW-846 9214, IN SHAKE EXTRACT									
Fluoride	*	0.04	0.10		**0.20**	mg/L	1	05/09/2024 13:53	R347045
ASTM D3987, SW-846 9251, IN SHAKE EXTRACT									
Chloride, SHAKE	*	1	4		**13**	mg/L	1	05/09/2024 14:52	R347069
SW-846 9045C									
pH (1:1)	NELAP	0	1.00		**8.79**		1	05/06/2024 11:12	R346778
SW-846 1311, 3010A, 6010B, METALS IN TCLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**0.0337**	mg/L	1	05/10/2024 14:01	222742
Barium	NELAP	0.0150	0.0450		**0.470**	mg/L	1	05/10/2024 14:01	222742
Beryllium	NELAP	0.0002	0.0010		**0.0054**	mg/L	1	05/10/2024 14:01	222742
Boron	NELAP	0.250	1.00		**1.23**	mg/L	1	05/10/2024 14:01	222742
Cadmium	NELAP	0.0005	0.0020		**0.0397**	mg/L	1	05/10/2024 14:01	222742
Chromium	NELAP	0.0034	0.0100		**0.0185**	mg/L	1	05/10/2024 14:01	222742
Cobalt	NELAP	0.0020	0.0060		**0.0161**	mg/L	1	05/10/2024 14:01	222742
Lead	NELAP	0.0040	0.0075		**0.0247**	mg/L	1	05/10/2024 14:01	222742
Molybdenum	NELAP	0.0037	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:01	222742
Selenium	NELAP	0.0170	0.0500		**< 0.0500**	mg/L	1	05/10/2024 14:01	222742
SW-846 1311, 3010A, 6020A, METALS IN TCLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0024**	mg/L	5	05/14/2024 9:57	222742
Lithium	*	0.0015	0.0030		**0.0061**	mg/L	5	05/14/2024 9:57	222742
Thallium	NELAP	0.0010	0.0020		**0.0060**	mg/L	5	05/15/2024 12:31	222742
SW-846 1311, 7470A IN TCLP EXTRACT									
Mercury	NELAP	0.00010	0.00020		**< 0.00020**	mg/L	1	05/16/2024 7:20	222743
SW-846 1312, 3005A, 6010B, METALS IN SPLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**< 0.0100**	mg/L	1	05/16/2024 17:50	222744
Barium	NELAP	0.015	0.045	J	**0.025**	mg/L	1	05/10/2024 14:14	222744
Beryllium	NELAP	0.0002	0.0010		**< 0.0010**	mg/L	1	05/10/2024 14:14	222744
Boron	NELAP	0.25	1.0	J	**0.60**	mg/L	1	05/10/2024 14:14	222744
Cadmium	NELAP	0.0005	0.0020		**< 0.0020**	mg/L	1	05/10/2024 14:14	222744
Chromium	NELAP	0.0034	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:14	222744
Cobalt	NELAP	0.0020	0.0060		**< 0.0060**	mg/L	1	05/10/2024 14:14	222744
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/10/2024 14:14	222744
Molybdenum	NELAP	0.0037	0.0100		**0.0169**	mg/L	1	05/10/2024 14:14	222744
Selenium	NELAP	0.0170	0.0500		**< 0.0500**	mg/L	1	05/10/2024 14:14	222744
SW-846 1312, 3005A, 6020A, METALS IN SPLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0037**	mg/L	5	05/14/2024 12:28	222744
Lithium	*	0.0015	0.0030	J	**0.0030**	mg/L	5	05/14/2024 12:28	222744
Thallium	NELAP	0.0010	0.0020		**< 0.0020**	mg/L	5	05/15/2024 14:36	222744
SW-846 1312, 7470A IN SPLP EXTRACT									
Mercury	NELAP	0.00006	0.00020		**< 0.00020**	mg/L	1	05/18/2024 16:29	223131
EPA 903/904, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pCi/Kg	1	05/31/2024 0:00	R348283
Radium-228	*	0	0		**See Attached**	pCi/Kg	1	05/31/2024 0:00	R348283

Client: City Water, Light & Power
Work Order: 24050346
Client Project: CWLP Borings
Report Date: 05-Jun-24
Lab ID: 24050346-003
Client Sample ID: L3 19.5-21.5
Matrix: SOLID
Collection Date: 05/02/2024 11:15

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
ASTM D3987, SW-846 9036, IN SHAKE EXTRACT (TOTAL)									
Sulfate, SHAKE	*	61	100		**224**	mg/L	10	05/09/2024 15:05	R347057
ASTM D3987, SW-846 9214, IN SHAKE EXTRACT									
Fluoride	*	0.04	0.10		**0.20**	mg/L	1	05/09/2024 13:56	R347045
ASTM D3987, SW-846 9251, IN SHAKE EXTRACT									
Chloride, SHAKE	*	1	4	J	**4**	mg/L	1	05/09/2024 15:00	R347069
SW-846 9045C									
pH (1:1)	NELAP	0	1.00		**8.14**		1	05/06/2024 11:14	R346778
SW-846 1311, 3010A, 6010B, METALS IN TCLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**0.0279**	mg/L	1	05/16/2024 17:49	222740
Barium	NELAP	0.0150	0.0450		**0.635**	mg/L	1	05/10/2024 14:56	222740
Beryllium	NELAP	0.0002	0.0010		**< 0.0010**	mg/L	1	05/10/2024 14:56	222740
Boron	NELAP	0.25	1.0	J	**0.69**	mg/L	1	05/10/2024 14:56	222740
Cadmium	NELAP	0.0005	0.0020		**0.0154**	mg/L	1	05/10/2024 14:56	222740
Chromium	NELAP	0.0034	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:56	222740
Cobalt	NELAP	0.0020	0.0060		**0.0065**	mg/L	1	05/14/2024 12:11	222740
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/10/2024 14:56	222740
Molybdenum	NELAP	0.0037	0.0100		**0.0307**	mg/L	1	05/10/2024 14:56	222740
Selenium	NELAP	0.0170	0.0500		**< 0.0500**	mg/L	1	05/10/2024 14:56	222740
SW-846 1311, 3010A, 6020A, METALS IN TCLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0066**	mg/L	5	05/14/2024 9:42	222740
Lithium	*	0.0015	0.0030		**0.0053**	mg/L	5	05/14/2024 9:42	222740
Thallium	NELAP	0.0010	0.0020		**0.0086**	mg/L	5	05/15/2024 13:21	222740
SW-846 1311, 7470A IN TCLP EXTRACT									
Mercury	NELAP	0.00010	0.00020		**0.00028**	mg/L	1	05/14/2024 14:21	222612
SW-846 1312, 3005A, 6010B, METALS IN SPLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**0.0195**	mg/L	1	05/10/2024 14:15	222744
Barium	NELAP	0.015	0.045	J	**0.028**	mg/L	1	05/10/2024 14:15	222744
Beryllium	NELAP	0.0002	0.0010		**< 0.0010**	mg/L	1	05/10/2024 14:15	222744
Boron	NELAP	0.25	1.0	J	**0.32**	mg/L	1	05/10/2024 14:15	222744
Cadmium	NELAP	0.0005	0.0020		**< 0.0020**	mg/L	1	05/10/2024 14:15	222744
Chromium	NELAP	0.0034	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:15	222744
Cobalt	NELAP	0.0020	0.0060		**< 0.0060**	mg/L	1	05/10/2024 14:15	222744
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/10/2024 14:15	222744
Molybdenum	NELAP	0.0037	0.0100		**0.0111**	mg/L	1	05/10/2024 14:15	222744
Selenium	NELAP	0.0170	0.0500		**< 0.0500**	mg/L	1	05/10/2024 14:15	222744
SW-846 1312, 3005A, 6020A, METALS IN SPLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0054**	mg/L	5	05/14/2024 12:33	222744
Lithium	*	0.0015	0.0030	J	**0.0015**	mg/L	5	05/14/2024 12:33	222744
Thallium	NELAP	0.0010	0.0020		**< 0.0020**	mg/L	5	05/15/2024 14:41	222744
SW-846 1312, 7470A IN SPLP EXTRACT									
Mercury	NELAP	0.00006	0.00020		**< 0.00020**	mg/L	1	05/18/2024 16:36	223131
EPA 903/904, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R348283
Radium-228	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R348283

Client: City Water, Light & Power
Work Order: 24050346
Client Project: CWLP Borings
Report Date: 05-Jun-24
Lab ID: 24050346-004
Client Sample ID: L1 24.5-31.5
Matrix: SOLID
Collection Date: 05/02/2024 15:30

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
ASTM D3987, SW-846 9036, IN SHAKE EXTRACT (TOTAL)									
Sulfate, SHAKE	*	61	100		**139**	mg/L	10	05/09/2024 15:29	R347057
ASTM D3987, SW-846 9214, IN SHAKE EXTRACT									
Fluoride	*	0.04	0.10		**0.21**	mg/L	1	05/10/2024 9:32	R347102
ASTM D3987, SW-846 9251, IN SHAKE EXTRACT									
Chloride, SHAKE	*	1	4		**5**	mg/L	1	05/09/2024 15:24	R347069
SW-846 9045C									
pH (1:1)	NELAP	0	1.00		**9.14**		1	05/06/2024 11:15	R346778
SW-846 1311, 3010A, 6010B, METALS IN TCLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:56	222740
Barium	NELAP	0.0150	0.0450		**0.172**	mg/L	1	05/10/2024 14:56	222740
Beryllium	NELAP	0.0002	0.0010		**0.0015**	mg/L	1	05/10/2024 14:56	222740
Boron	NELAP	0.250	1.00		**17.2**	mg/L	1	05/10/2024 14:56	222740
Cadmium	NELAP	0.0005	0.0020		**0.0045**	mg/L	1	05/10/2024 14:56	222740
Chromium	NELAP	0.0034	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:56	222740
Cobalt	NELAP	0.0020	0.0060	J	**0.0033**	mg/L	1	05/10/2024 14:56	222740
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/10/2024 14:56	222740
Molybdenum	NELAP	0.0037	0.0100		**0.0118**	mg/L	1	05/10/2024 14:56	222740
Selenium	NELAP	0.0170	0.0500		**< 0.0500**	mg/L	1	05/10/2024 14:56	222740
SW-846 1311, 3010A, 6020A, METALS IN TCLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0064**	mg/L	5	05/14/2024 9:47	222740
Lithium	*	0.0015	0.0030		**0.0087**	mg/L	5	05/14/2024 9:47	222740
Thallium	NELAP	0.0010	0.0020		**0.0041**	mg/L	5	05/15/2024 13:26	222740
SW-846 1311, 7470A IN TCLP EXTRACT									
Mercury	NELAP	0.00010	0.00020		**< 0.00020**	mg/L	1	05/15/2024 16:51	222741
SW-846 1312, 3005A, 6010B, METALS IN SPLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:16	222744
Barium	NELAP	0.015	0.045	J	**0.026**	mg/L	1	05/10/2024 14:16	222744
Beryllium	NELAP	0.0002	0.0010		**< 0.0010**	mg/L	1	05/10/2024 14:16	222744
Boron	NELAP	0.250	1.00		**2.69**	mg/L	1	05/10/2024 14:16	222744
Cadmium	NELAP	0.0005	0.0020		**< 0.0020**	mg/L	1	05/10/2024 14:16	222744
Chromium	NELAP	0.0034	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:16	222744
Cobalt	NELAP	0.0020	0.0060		**< 0.0060**	mg/L	1	05/10/2024 14:16	222744
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/10/2024 14:16	222744
Molybdenum	NELAP	0.0037	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:16	222744
Selenium	NELAP	0.0170	0.0500		**< 0.0500**	mg/L	1	05/10/2024 14:16	222744
SW-846 1312, 3005A, 6020A, METALS IN SPLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0012**	mg/L	5	05/14/2024 12:39	222744
Lithium	*	0.0015	0.0030	J	**0.0030**	mg/L	5	05/14/2024 12:39	222744
Thallium	NELAP	0.0010	0.0020		**< 0.0020**	mg/L	5	05/15/2024 14:45	222744
SW-846 1312, 7470A IN SPLP EXTRACT									
Mercury	NELAP	0.00006	0.00020		**< 0.00020**	mg/L	1	05/18/2024 16:43	223131
EPA 903/904, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R348283
Radium-228	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R348283

Client: City Water, Light & Power
Work Order: 24050346
Client Project: CWLP Borings
Report Date: 05-Jun-24
Lab ID: 24050346-005
Client Sample ID: L1 14.5-21.5
Matrix: SOLID
Collection Date: 05/02/2024 14:50

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
ASTM D3987, SW-846 9036, IN SHAKE EXTRACT (TOTAL)									
Sulfate, SHAKE	*	61	100		**103**	mg/L	10	05/09/2024 15:37	R347057
ASTM D3987, SW-846 9214, IN SHAKE EXTRACT									
Fluoride	*	0.04	0.10		**0.37**	mg/L	1	05/10/2024 9:35	R347102
ASTM D3987, SW-846 9251, IN SHAKE EXTRACT									
Chloride, SHAKE	*	1	4	J	**1**	mg/L	1	05/09/2024 15:32	R347069
SW-846 9045C									
pH (1:1)	NELAP	0	1.00		**8.13**		1	05/06/2024 11:16	R346778
SW-846 1311, 3010A, 6010B, METALS IN TCLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:57	222740
Barium	NELAP	0.0150	0.0450		**0.345**	mg/L	1	05/10/2024 14:57	222740
Beryllium	NELAP	0.0002	0.0010	J	**0.0007**	mg/L	1	05/10/2024 14:57	222740
Boron	NELAP	0.25	1.0	J	**0.32**	mg/L	1	05/10/2024 14:57	222740
Cadmium	NELAP	0.0005	0.0020		**0.0045**	mg/L	1	05/10/2024 14:57	222740
Chromium	NELAP	0.0034	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:57	222740
Cobalt	NELAP	0.0020	0.0060	J	**0.0054**	mg/L	1	05/10/2024 14:57	222740
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/10/2024 14:57	222740
Molybdenum	NELAP	0.0037	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:57	222740
Selenium	NELAP	0.0170	0.0500		**< 0.0500**	mg/L	1	05/10/2024 14:57	222740
SW-846 1311, 3010A, 6020A, METALS IN TCLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0019**	mg/L	5	05/14/2024 10:18	222740
Lithium	*	0.0015	0.0030		**0.0036**	mg/L	5	05/14/2024 10:18	222740
Thallium	NELAP	0.0010	0.0020		**0.0023**	mg/L	5	05/15/2024 13:36	222740
SW-846 1311, 7470A IN TCLP EXTRACT									
Mercury	NELAP	0.00010	0.00020		**< 0.00020**	mg/L	1	05/15/2024 16:54	222741
SW-846 1312, 3005A, 6010B, METALS IN SPLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**0.0276**	mg/L	1	05/10/2024 14:16	222744
Barium	NELAP	0.0150	0.0450		**< 0.0450**	mg/L	1	05/10/2024 14:16	222744
Beryllium	NELAP	0.0002	0.0010		**< 0.0010**	mg/L	1	05/10/2024 14:16	222744
Boron	NELAP	0.250	1.00		**< 1.00**	mg/L	1	05/10/2024 14:16	222744
Cadmium	NELAP	0.0005	0.0020		**< 0.0020**	mg/L	1	05/10/2024 14:16	222744
Chromium	NELAP	0.0034	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:16	222744
Cobalt	NELAP	0.0020	0.0060		**< 0.0060**	mg/L	1	05/10/2024 14:16	222744
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/10/2024 14:16	222744
Molybdenum	NELAP	0.0037	0.0100		**0.0145**	mg/L	1	05/10/2024 14:16	222744
Selenium	NELAP	0.017	0.050	J	**0.019**	mg/L	1	05/10/2024 14:16	222744
SW-846 1312, 3005A, 6020A, METALS IN SPLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0114**	mg/L	5	05/14/2024 13:05	222744
Lithium	*	0.0015	0.0030		**< 0.0030**	mg/L	5	05/14/2024 13:05	222744
Thallium	NELAP	0.0010	0.0020		**< 0.0020**	mg/L	5	05/15/2024 15:05	222744
SW-846 1312, 7470A IN SPLP EXTRACT									
Mercury	NELAP	0.00006	0.00020		**< 0.00020**	mg/L	1	05/18/2024 16:45	223131
EPA 903/904, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R348283
Radium-228	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R348283

Client: City Water, Light & Power
Work Order: 24050346
Client Project: CWLP Borings
Report Date: 05-Jun-24
Lab ID: 24050346-006
Client Sample ID: D3 9.5-11.5
Matrix: SOLID
Collection Date: 04/30/2024 10:15

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 903/904, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R348283
Radium-228	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R348283

Client: City Water, Light & Power
Work Order: 24050346
Client Project: CWLP Borings
Report Date: 05-Jun-24
Lab ID: 24050346-007
Client Sample ID: D3 4.5-6.5
Matrix: SOLID
Collection Date: 04/30/2024 10:15

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
ASTM D3987, SW-846 9036, IN SHAKE EXTRACT (TOTAL)									
Sulfate, SHAKE	*	6	10		**45**	mg/L	1	05/09/2024 15:42	R347057
ASTM D3987, SW-846 9214, IN SHAKE EXTRACT									
Fluoride	*	0.04	0.10	J	**0.08**	mg/L	1	05/10/2024 9:36	R347102
ASTM D3987, SW-846 9251, IN SHAKE EXTRACT									
Chloride, SHAKE	*	1	4		**< 4**	mg/L	1	05/09/2024 15:42	R347069
SW-846 9045C									
pH (1:1)	NELAP	0	1.00		**9.93**		1	05/06/2024 11:18	R346778
SW-846 1311, 3010A, 6010B, METALS IN TCLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:59	222740
Barium	NELAP	0.0150	0.0450		**0.492**	mg/L	1	05/10/2024 14:59	222740
Beryllium	NELAP	0.0002	0.0010		**0.0114**	mg/L	1	05/10/2024 14:59	222740
Boron	NELAP	0.500	2.00		**25.9**	mg/L	2	05/13/2024 11:33	222740
Cadmium	NELAP	0.0005	0.0020		**0.0302**	mg/L	1	05/10/2024 14:59	222740
Chromium	NELAP	0.0034	0.0100		**0.0692**	mg/L	1	05/10/2024 14:59	222740
Cobalt	NELAP	0.0020	0.0060		**0.0118**	mg/L	1	05/10/2024 14:59	222740
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/10/2024 14:59	222740
Molybdenum	NELAP	0.0037	0.0100		**0.0375**	mg/L	1	05/10/2024 14:59	222740
Selenium	NELAP	0.0170	0.0500		**< 0.0500**	mg/L	1	05/10/2024 14:59	222740
SW-846 1311, 3010A, 6020A, METALS IN TCLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0178**	mg/L	5	05/14/2024 9:52	222740
Lithium	*	0.0015	0.0030		**0.0131**	mg/L	5	05/14/2024 9:52	222740
Thallium	NELAP	0.0010	0.0020		**0.0252**	mg/L	5	05/15/2024 13:31	222740
SW-846 1311, 7470A IN TCLP EXTRACT									
Mercury	NELAP	0.00010	0.00020		**< 0.00020**	mg/L	1	05/15/2024 16:56	222741
SW-846 1312, 3005A, 6010B, METALS IN SPLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**< 0.0100**	mg/L	1	05/16/2024 17:50	222744
Barium	NELAP	0.0150	0.0450		**< 0.0450**	mg/L	1	05/10/2024 14:24	222744
Beryllium	NELAP	0.0002	0.0010		**< 0.0010**	mg/L	1	05/10/2024 14:24	222744
Boron	NELAP	0.250	1.00		**2.65**	mg/L	1	05/10/2024 14:24	222744
Cadmium	NELAP	0.0005	0.0020		**< 0.0020**	mg/L	1	05/10/2024 14:24	222744
Chromium	NELAP	0.0034	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:24	222744
Cobalt	NELAP	0.0020	0.0060		**< 0.0060**	mg/L	1	05/10/2024 14:24	222744
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/10/2024 14:24	222744
Molybdenum	NELAP	0.0037	0.0100		**0.0138**	mg/L	1	05/10/2024 14:24	222744
Selenium	NELAP	0.0170	0.0500		**< 0.0500**	mg/L	1	05/10/2024 14:24	222744
SW-846 1312, 3005A, 6020A, METALS IN SPLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0029**	mg/L	5	05/14/2024 12:44	222744
Lithium	*	0.0015	0.0030		**0.0033**	mg/L	5	05/14/2024 12:44	222744
Thallium	NELAP	0.0010	0.0020		**< 0.0020**	mg/L	5	05/15/2024 14:50	222744
SW-846 1312, 7470A IN SPLP EXTRACT									
Mercury	NELAP	0.00006	0.00020		**< 0.00020**	mg/L	1	05/18/2024 16:47	223131
EPA 903/904, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R348283
Radium-228	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R348283

Client: City Water, Light & Power
Work Order: 24050346
Client Project: CWLP Borings
Report Date: 05-Jun-24
Lab ID: 24050346-008
Client Sample ID: D1 19.5-21.5
Matrix: SOLID
Collection Date: 04/29/2024 15:00

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
ASTM D3987, SW-846 9036, IN SHAKE EXTRACT (TOTAL)									
Sulfate, SHAKE	*	31	50		**65**	mg/L	5	05/10/2024 13:23	R347112
ASTM D3987, SW-846 9214, IN SHAKE EXTRACT									
Fluoride	*	0.04	0.10		**0.13**	mg/L	1	05/10/2024 9:39	R347102
ASTM D3987, SW-846 9251, IN SHAKE EXTRACT									
Chloride, SHAKE	*	1	4	J	**1**	mg/L	1	05/09/2024 15:50	R347069
SW-846 9045C									
pH (1:1)	NELAP	0	1.00		**10.0**		1	05/06/2024 11:20	R346778
SW-846 1311, 3010A, 6010B, METALS IN TCLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**< 0.0100**	mg/L	1	05/10/2024 15:06	222740
Barium	NELAP	0.0150	0.0450		**0.358**	mg/L	1	05/10/2024 15:06	222740
Beryllium	NELAP	0.0002	0.0010		**0.0145**	mg/L	1	05/10/2024 15:06	222740
Boron	NELAP	0.500	2.00		**26.6**	mg/L	2	05/13/2024 11:33	222740
Cadmium	NELAP	0.0005	0.0020		**0.0293**	mg/L	1	05/10/2024 15:06	222740
Chromium	NELAP	0.0034	0.0100		**0.105**	mg/L	1	05/10/2024 15:06	222740
Cobalt	NELAP	0.0020	0.0060		**0.0145**	mg/L	1	05/10/2024 15:06	222740
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/10/2024 15:06	222740
Molybdenum	NELAP	0.0037	0.0100		**0.0402**	mg/L	1	05/10/2024 15:06	222740
Selenium	NELAP	0.017	0.050	J	**0.017**	mg/L	1	05/10/2024 15:06	222740
SW-846 1311, 3010A, 6020A, METALS IN TCLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0170**	mg/L	5	05/14/2024 11:46	222740
Lithium	*	0.0015	0.0030		**0.0112**	mg/L	5	05/14/2024 11:46	222740
Thallium	NELAP	0.0010	0.0020		**0.0229**	mg/L	5	05/15/2024 14:26	222740
SW-846 1311, 7470A IN TCLP EXTRACT									
Mercury	NELAP	0.00010	0.00020		**< 0.00020**	mg/L	1	05/15/2024 17:07	222741
SW-846 1312, 3005A, 6010B, METALS IN SPLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:25	222744
Barium	NELAP	0.0150	0.0450		**< 0.0450**	mg/L	1	05/10/2024 14:25	222744
Beryllium	NELAP	0.0002	0.0010		**< 0.0010**	mg/L	1	05/10/2024 14:25	222744
Boron	NELAP	0.250	1.00		**5.11**	mg/L	1	05/10/2024 14:25	222744
Cadmium	NELAP	0.0005	0.0020		**< 0.0020**	mg/L	1	05/10/2024 14:25	222744
Chromium	NELAP	0.0034	0.010	J	**0.0049**	mg/L	1	05/10/2024 14:25	222744
Cobalt	NELAP	0.0020	0.0060		**< 0.0060**	mg/L	1	05/10/2024 14:25	222744
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/10/2024 14:25	222744
Molybdenum	NELAP	0.0037	0.0100		**0.216**	mg/L	1	05/10/2024 14:25	222744
Selenium	NELAP	0.017	0.050	J	**0.030**	mg/L	1	05/10/2024 14:25	222744
SW-846 1312, 3005A, 6020A, METALS IN SPLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0035**	mg/L	5	05/14/2024 12:49	222744
Lithium	*	0.0015	0.0030		**0.0033**	mg/L	5	05/14/2024 12:49	222744
Thallium	NELAP	0.0010	0.0020		**< 0.0020**	mg/L	5	05/15/2024 14:55	222744
SW-846 1312, 7470A IN SPLP EXTRACT									
Mercury	NELAP	0.00006	0.00020		**< 0.00020**	mg/L	1	05/18/2024 16:49	223131
EPA 903/904, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R348283
Radium-228	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R348283

Client: City Water, Light & Power
Work Order: 24050346
Client Project: CWLP Borings
Report Date: 05-Jun-24
Lab ID: 24050346-009
Client Sample ID: D2 19.5-21.5
Matrix: SOLID
Collection Date: 04/29/2024 9:30

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
ASTM D3987, SW-846 9036, IN SHAKE EXTRACT (TOTAL)									
Sulfate, SHAKE	*	61	100		**226**	mg/L	10	05/09/2024 16:20	R347057
ASTM D3987, SW-846 9214, IN SHAKE EXTRACT									
Fluoride	*	0.04	0.10		**0.20**	mg/L	1	05/10/2024 9:42	R347102
ASTM D3987, SW-846 9251, IN SHAKE EXTRACT									
Chloride, SHAKE	*	1	4		**7**	mg/L	1	05/09/2024 16:14	R347069
SW-846 9045C									
pH (1:1)	NELAP	0	1.00		**9.25**		1	05/06/2024 11:21	R346778
SW-846 1311, 3010A, 6010B, METALS IN TCLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**0.0505**	mg/L	1	05/10/2024 14:03	222742
Barium	NELAP	0.0150	0.0450		**0.556**	mg/L	1	05/10/2024 14:03	222742
Beryllium	NELAP	0.0002	0.0010		**0.0231**	mg/L	1	05/10/2024 14:03	222742
Boron	NELAP	0.250	1.00		**9.63**	mg/L	1	05/10/2024 14:03	222742
Cadmium	NELAP	0.0005	0.0020		**0.0638**	mg/L	1	05/10/2024 14:03	222742
Chromium	NELAP	0.0034	0.0100		**0.116**	mg/L	1	05/10/2024 14:03	222742
Cobalt	NELAP	0.0020	0.0060		**0.0182**	mg/L	1	05/10/2024 14:03	222742
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/10/2024 14:03	222742
Molybdenum	NELAP	0.0037	0.0100		**0.0571**	mg/L	1	05/10/2024 14:03	222742
Selenium	NELAP	0.017	0.050	J	**0.017**	mg/L	1	05/10/2024 14:03	222742
SW-846 1311, 3010A, 6020A, METALS IN TCLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0163**	mg/L	5	05/14/2024 9:36	222742
Lithium	*	0.0015	0.0030		**0.0228**	mg/L	5	05/14/2024 9:36	222742
Thallium	NELAP	0.0010	0.0020		**0.0257**	mg/L	5	05/15/2024 12:11	222742
SW-846 1311, 7470A IN TCLP EXTRACT									
Mercury	NELAP	0.00010	0.00020		**< 0.00020**	mg/L	1	05/16/2024 7:24	222743
SW-846 1312, 3005A, 6010B, METALS IN SPLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:26	222744
Barium	NELAP	0.015	0.045	J	**0.021**	mg/L	1	05/10/2024 14:26	222744
Beryllium	NELAP	0.0002	0.0010		**< 0.0010**	mg/L	1	05/10/2024 14:26	222744
Boron	NELAP	0.250	1.00		**4.20**	mg/L	1	05/10/2024 14:26	222744
Cadmium	NELAP	0.0005	0.0020		**< 0.0020**	mg/L	1	05/10/2024 14:26	222744
Chromium	NELAP	0.0034	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:26	222744
Cobalt	NELAP	0.0020	0.0060		**< 0.0060**	mg/L	1	05/10/2024 14:26	222744
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/10/2024 14:26	222744
Molybdenum	NELAP	0.0037	0.0100		**0.155**	mg/L	1	05/10/2024 14:26	222744
Selenium	NELAP	0.0170	0.0500		**< 0.0500**	mg/L	1	05/10/2024 14:26	222744
SW-846 1312, 3005A, 6020A, METALS IN SPLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0141**	mg/L	5	05/14/2024 12:54	222744
Lithium	*	0.0015	0.0030		**0.0078**	mg/L	5	05/14/2024 12:54	222744
Thallium	NELAP	0.0010	0.0020		**< 0.0020**	mg/L	5	05/15/2024 15:00	222744
SW-846 1312, 7470A IN SPLP EXTRACT									
Mercury	NELAP	0.00006	0.00020		**< 0.00020**	mg/L	1	05/18/2024 16:54	223131
EPA 903/904, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R348283
Radium-228	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R348283

Client: City Water, Light & Power
Work Order: 24050346
Client Project: CWLP Borings
Report Date: 05-Jun-24
Lab ID: 24050346-010
Client Sample ID: D4 19.5-21.5
Matrix: SOLID
Collection Date: 04/30/2024 14:45

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
ASTM D3987, SW-846 9036, IN SHAKE EXTRACT (TOTAL)									
Sulfate, SHAKE	*	31	50		**70**	mg/L	5	05/10/2024 13:26	R347112
ASTM D3987, SW-846 9214, IN SHAKE EXTRACT									
Fluoride	*	0.04	0.10	J	**0.06**	mg/L	1	05/10/2024 9:52	R347102
ASTM D3987, SW-846 9251, IN SHAKE EXTRACT									
Chloride, SHAKE	*	1	4	J	**2**	mg/L	1	05/09/2024 16:22	R347069
SW-846 9045C									
pH (1:1)	NELAP	0	1.00		**9.63**		1	05/06/2024 11:22	R346778
SW-846 1311, 3010A, 6010B, METALS IN TCLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**< 0.0100**	mg/L	1	05/10/2024 15:07	222740
Barium	NELAP	0.0150	0.0450		**0.238**	mg/L	1	05/10/2024 15:07	222740
Beryllium	NELAP	0.0002	0.0010		**0.0056**	mg/L	1	05/10/2024 15:07	222740
Boron	NELAP	0.500	2.00	S	**26.9**	mg/L	2	05/13/2024 11:34	222740
Cadmium	NELAP	0.0005	0.0020		**0.0422**	mg/L	1	05/10/2024 15:07	222740
Chromium	NELAP	0.0034	0.0100		**0.0151**	mg/L	1	05/10/2024 15:07	222740
Cobalt	NELAP	0.0020	0.0060		**0.0107**	mg/L	1	05/10/2024 15:07	222740
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/10/2024 15:07	222740
Molybdenum	NELAP	0.0037	0.0100		**0.105**	mg/L	1	05/10/2024 15:07	222740
Selenium	NELAP	0.0170	0.0500		**< 0.0500**	mg/L	1	05/10/2024 15:07	222740
Matrix spike control limits are not applicable due to high sample/spike ratio.									
SW-846 1311, 3010A, 6020A, METALS IN TCLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0395**	mg/L	5	05/14/2024 11:51	222740
Lithium	*	0.0015	0.0030		**0.0192**	mg/L	5	05/14/2024 11:51	222740
Thallium	NELAP	0.0010	0.0020		**0.0225**	mg/L	5	05/15/2024 13:55	222740
SW-846 1311, 7470A IN TCLP EXTRACT									
Mercury	NELAP	0.00010	0.00020		**0.00029**	mg/L	1	05/15/2024 17:12	222741
SW-846 1312, 3005A, 6010B, METALS IN SPLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:26	222744
Barium	NELAP	0.0150	0.0450		**< 0.0450**	mg/L	1	05/10/2024 14:26	222744
Beryllium	NELAP	0.0002	0.0010		**< 0.0010**	mg/L	1	05/10/2024 14:26	222744
Boron	NELAP	0.250	1.00		**3.77**	mg/L	1	05/10/2024 14:26	222744
Cadmium	NELAP	0.0005	0.0020		**< 0.0020**	mg/L	1	05/10/2024 14:26	222744
Chromium	NELAP	0.0034	0.0100		**< 0.0100**	mg/L	1	05/10/2024 14:26	222744
Cobalt	NELAP	0.0020	0.0060		**< 0.0060**	mg/L	1	05/10/2024 14:26	222744
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/10/2024 14:26	222744
Molybdenum	NELAP	0.0037	0.0100		**0.0495**	mg/L	1	05/10/2024 14:26	222744
Selenium	NELAP	0.0170	0.0500		**< 0.0500**	mg/L	1	05/10/2024 14:26	222744
SW-846 1312, 3005A, 6020A, METALS IN SPLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0034**	mg/L	5	05/14/2024 14:18	222744
Lithium	*	0.0015	0.0030		**0.0075**	mg/L	5	05/14/2024 14:18	222744
Thallium	NELAP	0.0010	0.0020	J	**0.0017**	mg/L	5	05/15/2024 16:15	222744
SW-846 1312, 7470A IN SPLP EXTRACT									
Mercury	NELAP	0.00006	0.00020		**< 0.00020**	mg/L	1	05/18/2024 16:56	223131
EPA 903/904, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R348283
Radium-228	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R348283

Receiving Check List

http://www.teklabinc.com/

Client: City Water, Light & Power
Client Project: CWLP Borings

Work Order: 24050346
Report Date: 05-Jun-24

Carrier: Paul Reeves

Received By: LM

Completed by: Amber Dilallo
On: 03-May-24

Reviewed by: Ellie Hopkins
On: 03-May-24

Pages to follow: Chain of custody 1 Extra pages included 25

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	Temp °C 3.3
Type of thermal preservation?	None ☐	Ice ☑	Blue Ice ☐	Dry Ice ☐
Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☑	No ☐		
Reported field parameters measured:	Field ☐	Lab ☐	NA ☑	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐		
When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.				
Water – at least one vial per sample has zero headspace?	Yes ☐	No ☐	No VOA vials ☑	
Water - TOX containers have zero headspace?	Yes ☐	No ☐	No TOX containers ☑	
Water - pH acceptable upon receipt?	Yes ☐	No ☐	NA ☑	
NPDES/CWA TCN interferences checked/treated in the field?	Yes ☐	No ☐	NA ☑	

Any No responses must be detailed below or on the COC.

Samples requiring pH should be analyzed as soon as possible after collection. Samples submitted for pH analysis are analyzed as soon as practicable upon arrival at the laboratory. - amberdilallo - 5/3/2024 2:35:35 PM

CHAIN OF CUSTODY

Pg __ of __ Workorder # 24050346

TEKLAB INC, 5445 Horseshoe Lake Road, Collinsville, IL 62234 Phone (618) 344-1004 Fax (618) 344-1005

Client: City, Water, Light & Power
Address: 3100 Stevenson Dr.
City/State/Zip: Springfield, IL 62712
Contact: Colleen Grey Phone: 217-787-2334
Email: cgrey@andrews-eng.com Fax:

Are these samples known to be involved in litigation? If yes, a surcharge will apply: ☐ Yes ☐ No
Are these samples known to be hazardous? ☐ Yes ☐ No
Are there any required reporting limits to be met on the requested analysis?. If yes, please provide limits in the comment section: ☐ Yes ☐ No

Samples on: ☒ ICE ☐ BLUE ICE ☐ NO ICE 3.3 °C LT6475
Preserved in: ☐ LAB ☐ FIELD FOR LAB USE ONLY
LAB NOTES:

TEKLAB

Client Comments:
TCLP & SPLP for all metals

Courier

email results to C. Grey and datamanagement@andrews-eng.com SAV 5/6/24
*Add'l volume for 24050235-003; use ID D3 9.5-11.5 per Steve Van Hook

PROJECT NAME/NUMBER	SAMPLE COLLECTOR'S NAME
CWLP Borings	S. Van Hook

RESULTS REQUESTED
☑ Standard ☐ 1-2 Day (100% Surcharge)
☐ Other ☐ 3 Day (50% Surcharge)

BILLING INSTRUCTIONS

Lab Use Only	Sample ID	Date/Time Sampled	Matrix	# and Type of Containers: UNP	HNO3	NaOH	H2SO4	HCL	MeOH	NaHSO4	TSP	Other	INDICATE ANALYSIS REQUESTED: Rad 226 and 228	TCLP & SPLP Sb, As, Ba, Be	TCLP & SPLP B, Cd, Cr, Co, Pb, Se, Tl	TCLP & SPLP Li, Mo	TCLP & SPLP Hg	Neutral Leach Cl, F+, SO4	pH
24050346 001	L4 10'-15.5'	5/2/24 8:15am	Soil	2									✓	✓	✓	✓	✓	✓	✓
002	L3 29.5-32'	5/2/24 11AM	Soil	2									✓	✓	✓	✓	✓	✓	✓
003	L3 19.5-21.5	5/2/24 11:15AM	Soil	2									✓	✓	✓	✓	✓	✓	✓
004	L4 24.5-31.5	5/2/24 3:30pm	Soil	2									✓	✓	✓	✓	✓	✓	✓
005	L1 14.5-21.5	5/2/24 2:50PM	Soil	2									✓	✓	✓	✓	✓	✓	✓
* 006	D3 9.5'-29.5'	4/30/24 10:15AM	Soil	2									✓	✓	✓	✓	✓	✓	✓ RAD ONLY SAV 5/6/24
007	D3 4.5-6.5	4/30/24 10:15AM	Soil	2									✓	✓	✓	✓	✓	✓	✓
008	D1 19.5-21.5	4/29/24 3:00PM	Soil	2									✓	✓	✓	✓	✓	✓	✓
009	D2 19.5-21.5	4/29/24 9:30am	Soil	2									✓	✓	✓	✓	✓	✓	✓
010	D4 19.5-21.5	4/30/24 2:45pm	Soil	2									✓	✓	✓	✓	✓	✓	✓
			Soil	2															

Relinquished By	Date/Time	Received By	Date/Time
[signature]	5/2/24 7:00pm	AEI Secure Storage	5/2/24 1900
AEI Secure Storage	5/3/24 07:28	[signature]	5.3.24 0728
[signature]	5.3.24 1350	[signature]	5/3/24 1350

*The individual signing this agreement on behalf of the client, acknowledges that he/she has read and understands the terms and conditions of this agreement, and that he/she has the authority to sign on behalf of the client. See www.teklabinc.com for terms and conditions

5/3

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

June 05, 2024

Shelly Hennessy
TEKLAB Inc,
5445 Horseshoe lake Road
Collinsville, IL 62234
TEL:
FAX:

RE: 24050346

Dear Shelly Hennessy:

Order No.: 24050783

Summit Environmental Technologies, Inc. received 10 sample(s) on 5/9/2024 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative.

Quality control data is within laboratory defined or method specified acceptance limits except where noted.

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

Sincerely,

Jennifer Woolf

Project Manager

3310 Win St.
Cuyahoga Falls, Ohio 44223

Arkansas 88-0735, California 2943, Colorado, Connecticut PH-0108, Florida NELAC E87688, Idaho OH00923, Illinois 200061, Indiana C-OH-13, ISO/IEC 17025:2017 119125 L22-544, Kansas E-10347, Kentucky (Underground Storage Tank) 3, Kentucky 90146, Maryland 339, Michigan 9988, Minnesota 1780279, Nevada OH009232020-1, New Hampshire 2996, New Jersey OH006, New York 11777, North Carolina 39705 and 631, North Dakota R-201, Ohio DW, Ohio VAP CL0052, Oklahoma 2019-155, Oregon OH200001, Pennsylvania 68-01335, Rhode Island LA000317, South Carolina 92016001, Texas T104704466-19-16, Utah OH009232020-12, Virginia VELAP 10381, West Virginia 9957C

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Website: http://www.settek.com

Case Narrative

WO#: **24050783**
Date: **6/5/2024**

CLIENT: TEKLAB Inc,
Project: 24050346

WorkOrder Narrative:
24050783: This report in its entirety consists of the following documents: Cover Letter, Case Narrative, Analytical Results, QC Summary Report, Applicable Accreditation Information, Chain-of-Custody, Cooler Receipt Form, and other applicable forms as necessary. All documents contain the Summit Environmental Technologies, Inc., Work Order Number assigned to this report.

Summit Environmental Technologies, Inc., holds the accreditations/certifications listed at the bottom of the cover letter that may or may not pertain to this report. Please refer to the "Accreditation Program Analytes Report" for accredited analytes list.

The information contained in this analytical report is the sole property of Summit Environmental Technologies, Inc. and that of the customer. It cannot be reproduced in any form without the consent of Summit Environmental Technologies, Inc. or the customer for which this report was issued. The results contained in this report are only representative of the samples received. Conditions can vary at different times and at different sampling conditions. Summit Environmental Technologies, Inc. is not responsible for use or interpretation of the data included herein.

All results for Solid Samples are reported on an "as received" or "wet weight" basis unless indicated as "dry weight" using the "-dry" designation on the reporting units.

This report is believed to meet all of the requirements of the accrediting agency, where applicable. Any comments or problems with the analytical events associated with this report are noted below.

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC
Analytical Laboratories

Summit Environmental Technologies, In
3310 Win S
Cuyahoga Falls, Ohio 4422
TEL: (330) 253-8211 FAX: (330) 253-44&
Website: http://www.settek.co

Qualifiers and Acronyms

WO#: **24050783**
Date: **6/5/2024**

These commonly used Qualifiers and Acronyms may or may not be present in this report.

Qualifiers

U	The compound was analyzed for but was not detected above the MDL.
J	The reported value is greater than the Method Detection Limit but less than the Reporting Limit.
H	The hold time for sample preparation and/or analysis was exceeded. Not Clean Water Act compliant.
D	The result is reported from a dilution.
E	The result exceeded the linear range of the calibration or is estimated due to interference.
MC	The result is below the Minimum Compound Limit.
*****	The result exceeds the Regulatory Limit or Maximum Contamination Limit.
m	Manual integration was used to determine the area response.
d	Manual integration in which peak was deleted
N	The result is presumptive based on a Mass Spectral library search assuming a 1:1 response.
P	The second column confirmation exceeded 25% difference.
C	The result has been confirmed by GC/MS.
X	The result was not confirmed when GC/MS Analysis was performed.
B	The analyte was detected in the Method Blank at a concentration greater than the RL.
MB+	The analyte was detected in the Method Blank at a concentration greater than the MDL.
G	The ICB or CCB contained reportable amounts of analyte.
QC-/+	The CCV recovery failed low (-) or high (+).
R/QDR	The RPD was outside of accepted recovery limits.
QL-/+	The LCS or LCSD recovery failed low (-) or high (+).
QLR	The LCS/LCSD RPD was outside of accepted recovery limits.
QM-/+	The MS or MSD recovery failed low (-) or high (+).
QMR	The MS/MSD RPD was outside of accepted recovery limits.
QV-/+	The ICV recovery failed low (-) or high (+).
S	The spike result was outside of accepted recovery limits.
W	Samples were received outside temperature limits (0° – 6° C). Not Clean Water Act compliant.
Z	Deviation; A deviation from the method was performed; Please refer to the Case Narrative for additional information

Acronyms

ND	Not Detected	**RL**	Reporting Limit
QC	Quality Control	**MDL**	Method Detection Limit
MB	Method Blank	**LOD**	Level of Detection
LCS	Laboratory Control Sample	**LOQ**	Level of Quantitation
LCSD	Laboratory Control Sample Duplicate	**PQL**	Practical Quantitation Limit
QCS	Quality Control Sample	**CRQL**	Contract Required Quantitation Limit
DUP	Duplicate	**PL**	Permit Limit
MS	Matrix Spike	**RegLvl**	Regulatory Limit
MSD	Matrix Spike Duplicate	**MCL**	Maximum Contamination Limit
RPD	Relative Percent Different	**MinCL**	Minimum Compound Limit
ICV	Initial Calibration Verification	**RA**	Reanalysis
ICB	Initial Calibration Blank	**RE**	Reextraction
CCV	Continuing Calibration Verification	**TIC**	Tentatively Identified Compound
CCB	Continuing Calibration Blank	**RT**	Retention Time
RLC	Reporting Limit Check	**CF**	Calibration Factor

This list of Qualifiers and Acronyms reflects the most commonly utilized Qualifiers and Acronyms for reporting. Please refer to the Analytical Notes in the Case Narrative for any Qualifiers or Acronyms that do not appear in this list or for additional information regarding the use of these Qualifiers on reported data.

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Analytical Laboratories

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Website: http://www.settek.com

Workorder Sample Summary

WO#: **24050783**
05-Jun-24

CLIENT: TEKLAB Inc,
Project: 24050346

Lab SampleID	Client Sample ID	Tag No	Date Collected	Date Received	Matrix
24050783-001	24050346-001		5/2/2024 8:15:00 AM	5/9/2024 11:40:00 AM	Solid
24050783-002	24050346-002		5/2/2024 11:00:00 AM	5/9/2024 11:40:00 AM	Solid
24050783-003	24050346-003		5/2/2024 11:15:00 AM	5/9/2024 11:40:00 AM	Solid
24050783-004	24050346-004		5/2/2024 3:30:00 PM	5/9/2024 11:40:00 AM	Solid
24050783-005	24050346-005		5/2/2024 2:50:00 PM	5/9/2024 11:40:00 AM	Solid
24050783-006	24050346-006		4/30/2024 10:15:00 AM	5/9/2024 11:40:00 AM	Solid
24050783-007	24050346-007		4/30/2024 10:15:00 AM	5/9/2024 11:40:00 AM	Solid
24050783-008	24050346-008		4/30/2024 3:00:00 PM	5/9/2024 11:40:00 AM	Solid
24050783-009	24050346-009		4/30/2024 9:30:00 AM	5/9/2024 11:40:00 AM	Solid
24050783-010	24050346-010		4/30/2024 2:45:00 PM	5/9/2024 11:40:00 AM	Solid

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DATES REPORT

WO#: **24050783**

05-Jun-24

Client: TEKLAB Inc,
Project: 24050346

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
24050783-001A	24050346-001	5/2/2024 8:15:00 AM	Solid	Radium-226 Analysis (9315)		5/16/2024 11:10:22 AM	5/23/2024 10:51:41 AM
				Radium-228 Analysis (9320)		5/16/2024 11:10:22 AM	5/22/2024 3:06:59 PM
24050783-002A	24050346-002	5/2/2024 11:00:00 AM		Radium-226 Analysis (9315)		5/28/2024 1:38:00 PM	6/3/2024 11:07:59 AM
				Radium-228 Analysis (9320)		5/28/2024 1:38:00 PM	5/31/2024 1:16:12 PM
24050783-003A	24050346-003	5/2/2024 11:15:00 AM		Radium-226 Analysis (9315)		5/16/2024 11:10:22 AM	5/23/2024 10:51:41 AM
				Radium-228 Analysis (9320)		5/16/2024 11:10:22 AM	5/22/2024 3:06:59 PM
24050783-004A	24050346-004	5/2/2024 3:30:00 PM		Radium-226 Analysis (9315)		5/16/2024 11:10:22 AM	5/23/2024 10:51:41 AM
				Radium-228 Analysis (9320)		5/16/2024 11:10:22 AM	5/22/2024 3:06:59 PM
24050783-005A	24050346-005	5/2/2024 2:50:00 PM		Radium-226 Analysis (9315)		5/16/2024 11:10:22 AM	5/23/2024 10:51:41 AM
				Radium-228 Analysis (9320)		5/16/2024 11:10:22 AM	5/22/2024 3:06:59 PM
24050783-006A	24050346-006	4/30/2024 10:15:00 AM		Radium-226 Analysis (9315)		5/16/2024 11:10:22 AM	5/23/2024 10:51:41 AM
				Radium-228 Analysis (9320)		5/16/2024 11:10:22 AM	5/22/2024 3:06:59 PM
24050783-007A	24050346-007			Radium-226 Analysis (9315)		5/16/2024 11:10:22 AM	5/23/2024 10:51:41 AM
				Radium-228 Analysis (9320)		5/16/2024 11:10:22 AM	5/22/2024 3:06:59 PM
24050783-008A	24050346-008	4/30/2024 3:00:00 PM		Radium-226 Analysis (9315)		5/16/2024 11:10:22 AM	5/23/2024 10:51:41 AM
				Radium-228 Analysis (9320)		5/16/2024 11:10:22 AM	5/22/2024 3:06:59 PM
24050783-009A	24050346-009	4/30/2024 9:30:00 AM		Radium-226 Analysis (9315)		5/16/2024 11:10:22 AM	5/23/2024 10:51:41 AM
				Radium-228 Analysis (9320)		5/16/2024 11:10:22 AM	5/22/2024 3:06:59 PM
24050783-010A	24050346-010	4/30/2024 2:45:00 PM		Radium-226 Analysis (9315)		5/16/2024 11:10:22 AM	5/23/2024 10:51:41 AM
				Radium-228 Analysis (9320)		5/16/2024 11:10:22 AM	5/22/2024 3:06:59 PM

Original

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Analytical Report

(consolidated)

WO#: **24050783**

Date Reported: **6/5/2024**

CLIENT: TEKLAB Inc,

Collection Date: 5/2/2024 8:15:00 AM

Project: 24050346

Lab ID: 24050783-001

Matrix: SOLID

Client Sample ID: 24050346-001

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RADIUM-226 ANALYSIS (9315)					**SW9315**	**E903-904**	Analyst: **SMZ**
Radium-226	ND	1.00		pCi/g	± 0.0700	1	5/23/2024 10:51:41 AM
Yield	1.00					1	5/23/2024 10:51:41 AM
RADIUM-228 ANALYSIS (9320)					**SW9320**	**E903-904**	Analyst: **SMZ**
Radium-228	ND	2.00		pCi/g	± 0.290	1	5/22/2024 3:06:59 PM
Yield	1.00					1	5/22/2024 3:06:59 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode		

Original

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
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Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
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Analytical Report

(consolidated)

WO#: **24050783**

Date Reported: **6/5/2024**

CLIENT: TEKLAB Inc,

Collection Date: 5/2/2024 11:00:00 AM

Project: 24050346

Lab ID: 24050783-002

Matrix: SOLID

Client Sample ID: 24050346-002

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RADIUM-226 ANALYSIS (9315)					**SW9315**	**E903-904**	Analyst: **SMZ**
Radium-226	ND	1.00		pCi/g	± 0.0800	1	6/3/2024 11:07:59 AM
Yield	1.00					1	6/3/2024 11:07:59 AM
RADIUM-228 ANALYSIS (9320)					**SW9320**	**E903-904**	Analyst: **SMZ**
Radium-228	ND	2.00		pCi/g	± 0.260	1	5/31/2024 1:16:12 PM
Yield	1.00					1	5/31/2024 1:16:12 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected
R	RPD outside accepted recovery limits
W	Sample container temperature is out of limit as specified at testcode
M	Manual Integration used to determine area response
PL	Permit Limit
RL	Reporting Detection Limit

Original

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

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TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Analytical Report

(consolidated)

WO#: **24050783**

Date Reported: **6/5/2024**

CLIENT: TEKLAB Inc,

Collection Date: 5/2/2024 11:15:00 AM

Project: 24050346

Lab ID: 24050783-003

Matrix: SOLID

Client Sample ID: 24050346-003

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RADIUM-226 ANALYSIS (9315)					**SW9315**	**E903-904**	Analyst: **SMZ**
Radium-226	ND	1.00		pCi/g	± 0.140	1	5/23/2024 10:51:41 AM
Yield	1.00					1	5/23/2024 10:51:41 AM
RADIUM-228 ANALYSIS (9320)					**SW9320**	**E903-904**	Analyst: **SMZ**
Radium-228	ND	2.00		pCi/g	± 0.300	1	5/22/2024 3:06:59 PM
Yield	1.00					1	5/22/2024 3:06:59 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode		

Original

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

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3310 Win St.
Cuyahoga Falls, Ohio 44223
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Website: http://www.settek.com

Analytical Report

(consolidated)

WO#: **24050783**

Date Reported: **6/5/2024**

CLIENT: TEKLAB Inc,

Collection Date: 5/2/2024 3:30:00 PM

Project: 24050346

Lab ID: 24050783-004

Matrix: SOLID

Client Sample ID: 24050346-004

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RADIUM-226 ANALYSIS (9315)					**SW9315**	**E903-904**	Analyst: **SMZ**
Radium-226	ND	1.00		pCi/g	± 0.100	1	5/23/2024 10:51:41 AM
Yield	1.00					1	5/23/2024 10:51:41 AM
RADIUM-228 ANALYSIS (9320)					**SW9320**	**E903-904**	Analyst: **SMZ**
Radium-228	ND	2.00		pCi/g	± 0.250	1	5/22/2024 3:06:59 PM
Yield	1.00					1	5/22/2024 3:06:59 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode		

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SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
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Analytical Report

(consolidated)

WO#: **24050783**

Date Reported: **6/5/2024**

CLIENT: TEKLAB Inc,

Collection Date: 5/2/2024 2:50:00 PM

Project: 24050346

Lab ID: 24050783-005

Matrix: SOLID

Client Sample ID: 24050346-005

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RADIUM-226 ANALYSIS (9315)					**SW9315**	**E903-904**	Analyst: **SMZ**
Radium-226	ND	1.00		pCi/g	± 0.0800	1	5/23/2024 10:51:41 AM
Yield	1.00					1	5/23/2024 10:51:41 AM
RADIUM-228 ANALYSIS (9320)					**SW9320**	**E903-904**	Analyst: **SMZ**
Radium-228	ND	2.00		pCi/g	± 0.210	1	5/22/2024 3:06:59 PM
Yield	1.00					1	5/22/2024 3:06:59 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode		

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Analytical Report

(consolidated)

WO#: **24050783**

Date Reported: **6/5/2024**

CLIENT: TEKLAB Inc,

Collection Date: 4/30/2024 10:15:00 AM

Project: 24050346

Lab ID: 24050783-006

Matrix: SOLID

Client Sample ID: 24050346-006

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RADIUM-226 ANALYSIS (9315)					**SW9315**	**E903-904**	Analyst: **SMZ**
Radium-226	ND	1.00		pCi/g	± 0.140	1	5/23/2024 10:51:41 AM
Yield	1.00					1	5/23/2024 10:51:41 AM
RADIUM-228 ANALYSIS (9320)					**SW9320**	**E903-904**	Analyst: **SMZ**
Radium-228	ND	2.00		pCi/g	± 0.280	1	5/22/2024 3:06:59 PM
Yield	1.00					1	5/22/2024 3:06:59 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode		

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Analytical Report

(consolidated)

WO#: **24050783**

Date Reported: **6/5/2024**

CLIENT: TEKLAB Inc,

Collection Date: 4/30/2024 10:15:00 AM

Project: 24050346

Lab ID: 24050783-007

Matrix: SOLID

Client Sample ID: 24050346-007

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RADIUM-226 ANALYSIS (9315)					**SW9315**	**E903-904**	Analyst: **SMZ**
Radium-226	ND	1.00		pCi/g	± 0.100	1	5/23/2024 10:51:41 AM
Yield	1.00					1	5/23/2024 10:51:41 AM
RADIUM-228 ANALYSIS (9320)					**SW9320**	**E903-904**	Analyst: **SMZ**
Radium-228	ND	2.00		pCi/g	± 0.380	1	5/22/2024 3:06:59 PM
Yield	1.00					1	5/22/2024 3:06:59 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode		

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Analytical Report

(consolidated)

WO#: **24050783**

Date Reported: **6/5/2024**

CLIENT: TEKLAB Inc,

Collection Date: 4/30/2024 3:00:00 PM

Project: 24050346

Lab ID: 24050783-008

Matrix: SOLID

Client Sample ID: 24050346-008

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RADIUM-226 ANALYSIS (9315)					**SW9315**	**E903-904**	Analyst: **SMZ**
Radium-226	ND	1.00		pCi/g	± 0.160	1	5/23/2024 10:51:41 AM
Yield	1.00					1	5/23/2024 10:51:41 AM
RADIUM-228 ANALYSIS (9320)					**SW9320**	**E903-904**	Analyst: **SMZ**
Radium-228	ND	2.00		pCi/g	± 0.290	1	5/22/2024 3:06:59 PM
Yield	1.00					1	5/22/2024 3:06:59 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode		

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Analytical Report

(consolidated)

WO#: **24050783**

Date Reported: **6/5/2024**

CLIENT: TEKLAB Inc,

Collection Date: 4/30/2024 9:30:00 AM

Project: 24050346

Lab ID: 24050783-009

Matrix: SOLID

Client Sample ID: 24050346-009

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RADIUM-226 ANALYSIS (9315)					**SW9315**	**E903-904**	Analyst: **SMZ**
Radium-226	ND	1.00		pCi/g	± 0.120	1	5/23/2024 10:51:41 AM
Yield	1.00					1	5/23/2024 10:51:41 AM
RADIUM-228 ANALYSIS (9320)					**SW9320**	**E903-904**	Analyst: **SMZ**
Radium-228	ND	2.00		pCi/g	± 0.290	1	5/22/2024 3:06:59 PM
Yield	1.00					1	5/22/2024 3:06:59 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode		

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Analytical Report

(consolidated)

WO#: **24050783**

Date Reported: **6/5/2024**

CLIENT: TEKLAB Inc,

Collection Date: 4/30/2024 2:45:00 PM

Project: 24050346

Lab ID: 24050783-010

Matrix: SOLID

Client Sample ID: 24050346-010

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RADIUM-226 ANALYSIS (9315)					**SW9315**	**E903-904**	Analyst: **SMZ**
Radium-226	ND	1.00		pCi/g	± 0.120	1	5/23/2024 10:51:41 AM
Yield	1.00					1	5/23/2024 10:51:41 AM
RADIUM-228 ANALYSIS (9320)					**SW9320**	**E903-904**	Analyst: **SMZ**
Radium-228	ND	2.00		pCi/g	± 0.280	1	5/22/2024 3:06:59 PM
Yield	1.00					1	5/22/2024 3:06:59 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode		

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QC SUMMARY REPORT

WO#: **24050783**

05-Jun-24

Client: TEKLAB Inc,
Project: 24050346 **BatchID:** **75515**

Sample ID: **MB-75515**	SampType: **MBLK**	TestCode: **Radium-228_**	Units: **pCi/g**	Prep Date: **5/16/2024**	RunNo: **186135**
Client ID: **PBS**	Batch ID: **75515**	TestNo: **SW9320**	**E903-904**	Analysis Date: **5/22/2024**	SeqNo: **5043898**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	2.00									
Yield	1.00										

Sample ID: **LCS-75515**	SampType: **LCS**	TestCode: **Radium-228_**	Units: **pCi/g**	Prep Date: **5/16/2024**	RunNo: **186135**
Client ID: **LCSS**	Batch ID: **75515**	TestNo: **SW9320**	**E903-904**	Analysis Date: **5/22/2024**	SeqNo: **5043899**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	3.62	2.00	5.000	0	72.4	50	130				

Sample ID: **LCSD-75515**	SampType: **LCSD**	TestCode: **Radium-228_**	Units: **pCi/g**	Prep Date: **5/16/2024**	RunNo: **186135**
Client ID: **LCSS02**	Batch ID: **75515**	TestNo: **SW9320**	**E903-904**	Analysis Date: **5/22/2024**	SeqNo: **5043900**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	3.01	2.00	5.000	0	60.2	50	130	3.620	18.4	20	

Sample ID: **24041932-001ADUP**	SampType: **DUP**	TestCode: **Radium-228_**	Units: **pCi/g-dry**	Prep Date: **5/16/2024**	RunNo: **186135**
Client ID: **BatchQC**	Batch ID: **75515**	TestNo: **SW9320**	**E903-904**	Analysis Date: **5/22/2024**	SeqNo: **5043905**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

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QC SUMMARY REPORT

WO#: **24050783**

05-Jun-24

Client: TEKLAB Inc,
Project: 24050346 **BatchID:** **75515**

Sample ID: **24041932-001ADUP** SampType: **DUP** TestCode: **Radium-228_** Units: **pCi/g-dry** Prep Date: **5/16/2024** RunNo: **186135**
Client ID: **BatchQC** Batch ID: **75515** TestNo: **SW9320** **E903-904** Analysis Date: **5/22/2024** SeqNo: **5043905**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	10.4	2.34	11.68	0	88.9	0	0	7.583	31.2	20	RS
Yield	1.17							1.168	0	0	

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

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QC SUMMARY REPORT

WO#: **24050783**

05-Jun-24

Client: TEKLAB Inc,
Project: 24050346 **BatchID:** **75515**

Sample ID: **MB-75515**	SampType: **MBLK**	TestCode: **Radium-226_**	Units: **pCi/g**	Prep Date: **5/16/2024**	RunNo: **186145**
Client ID: **PBS**	Batch ID: **75515**	TestNo: **SW9315**	**E903-904**	Analysis Date: **5/23/2024**	SeqNo: **5044082**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00									
Yield	1.00										

Sample ID: **LCS-75515**	SampType: **LCS**	TestCode: **Radium-226_**	Units: **pCi/g**	Prep Date: **5/16/2024**	RunNo: **186145**
Client ID: **LCSS**	Batch ID: **75515**	TestNo: **SW9315**	**E903-904**	Analysis Date: **5/23/2024**	SeqNo: **5044083**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	6.20	1.00	5.000	0	124	70	130				

Sample ID: **LCSD-75515**	SampType: **LCSD**	TestCode: **Radium-226_**	Units: **pCi/g**	Prep Date: **5/16/2024**	RunNo: **186145**
Client ID: **LCSS02**	Batch ID: **75515**	TestNo: **SW9315**	**E903-904**	Analysis Date: **5/23/2024**	SeqNo: **5044084**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	5.76	1.00	5.000	0	115	60	140	6.200	7.36	40	

Sample ID: **24041932-001ADUP**	SampType: **DUP**	TestCode: **Radium-226_**	Units: **pCi/g-dry**	Prep Date: **5/16/2024**	RunNo: **186145**
Client ID: **BatchQC**	Batch ID: **75515**	TestNo: **SW9315**	**E903-904**	Analysis Date: **5/23/2024**	SeqNo: **5044089**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

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QC SUMMARY REPORT

WO#: **24050783**

05-Jun-24

Client: TEKLAB Inc,
Project: 24050346 **BatchID:** **75515**

Sample ID: **24041932-001ADUP** SampType: **DUP** TestCode: **Radium-226_** Units: **pCi/g-dry** Prep Date: **5/16/2024** RunNo: **186145**
Client ID: **BatchQC** Batch ID: **75515** TestNo: **SW9315** **E903-904** Analysis Date: **5/23/2024** SeqNo: **5044089**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	7.61	1.17						8.133	6.68	20	
Yield	1.17							1.168	0	0	

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

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QC SUMMARY REPORT

WO#: **24050783**

05-Jun-24

Client: TEKLAB Inc,
Project: 24050346 **BatchID:** **75738**

Sample ID: **MB-75738**	SampType: **MBLK**	TestCode: **Radium-228_**	Units: **pCi/g**	Prep Date: **5/28/2024**	RunNo: **186695**
Client ID: **PBS**	Batch ID: **75738**	TestNo: **SW9320**	**E903-904**	Analysis Date: **5/31/2024**	SeqNo: **5059001**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	2.00									
Yield	1.00										

Sample ID: **LCS-75738**	SampType: **LCS**	TestCode: **Radium-228_**	Units: **pCi/g**	Prep Date: **5/28/2024**	RunNo: **186695**
Client ID: **LCSS**	Batch ID: **75738**	TestNo: **SW9320**	**E903-904**	Analysis Date: **5/31/2024**	SeqNo: **5059002**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	3.33	2.00	5.000	0	66.6	50	130				

Sample ID: **LCSD-75738**	SampType: **LCSD**	TestCode: **Radium-228_**	Units: **pCi/g**	Prep Date: **5/28/2024**	RunNo: **186695**
Client ID: **LCSS02**	Batch ID: **75738**	TestNo: **SW9320**	**E903-904**	Analysis Date: **5/31/2024**	SeqNo: **5059003**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	3.40	2.00	5.000	0	68.0	50	130	3.330	2.08	20	

Sample ID: **24050783-002ADUP**	SampType: **DUP**	TestCode: **Radium-228_**	Units: **pCi/g**	Prep Date: **5/28/2024**	RunNo: **186695**
Client ID: **24050346-002**	Batch ID: **75738**	TestNo: **SW9320**	**E903-904**	Analysis Date: **5/31/2024**	SeqNo: **5059008**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

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QC SUMMARY REPORT

WO#: **24050783**

05-Jun-24

Client: TEKLAB Inc,
Project: 24050346 **BatchID:** **75738**

Sample ID: **24050783-002ADUP** SampType: **DUP** TestCode: **Radium-228_** Units: **pCi/g** Prep Date: **5/28/2024** RunNo: **186695**
Client ID: **24050346-002** Batch ID: **75738** TestNo: **SW9320** **E903-904** Analysis Date: **5/31/2024** SeqNo: **5059008**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	2.00	10.00	0	0	0	0	0	0	20	
Yield	1.00							1.000	0	0	

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

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QC SUMMARY REPORT

WO#: **24050783**

05-Jun-24

Client: TEKLAB Inc,
Project: 24050346 **BatchID:** **75738**

Sample ID: **MB-75738**	SampType: **MBLK**	TestCode: **Radium-226_**	Units: **pCi/g**	Prep Date: **5/28/2024**	RunNo: **186696**
Client ID: **PBS**	Batch ID: **75738**	TestNo: **SW9315**	**E903-904**	Analysis Date: **6/3/2024**	SeqNo: **5059009**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00									
Yield	1.00										

Sample ID: **LCS-75738**	SampType: **LCS**	TestCode: **Radium-226_**	Units: **pCi/g**	Prep Date: **5/28/2024**	RunNo: **186696**
Client ID: **LCSS**	Batch ID: **75738**	TestNo: **SW9315**	**E903-904**	Analysis Date: **6/3/2024**	SeqNo: **5059010**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	4.94	1.00	5.000	0	98.8	70	130				

Sample ID: **LCSD-75738**	SampType: **LCSD**	TestCode: **Radium-226_**	Units: **pCi/g**	Prep Date: **5/28/2024**	RunNo: **186696**
Client ID: **LCSS02**	Batch ID: **75738**	TestNo: **SW9315**	**E903-904**	Analysis Date: **6/3/2024**	SeqNo: **5059011**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	4.81	1.00	5.000	0	96.2	60	140	4.940	2.67	40	

Sample ID: **24050783-002ADUP**	SampType: **DUP**	TestCode: **Radium-226_**	Units: **pCi/g**	Prep Date: **5/28/2024**	RunNo: **186696**
Client ID: **24050346-002**	Batch ID: **75738**	TestNo: **SW9315**	**E903-904**	Analysis Date: **6/3/2024**	SeqNo: **5059016**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

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QC SUMMARY REPORT

WO#: **24050783**

05-Jun-24

Client: TEKLAB Inc,
Project: 24050346 **BatchID:** **75738**

Sample ID: **24050783-002ADUP** SampType: **DUP** TestCode: **Radium-226_** Units: **pCi/g** Prep Date: **5/28/2024** RunNo: **186696**
Client ID: **24050346-002** Batch ID: **75738** TestNo: **SW9315** **E903-904** Analysis Date: **6/3/2024** SeqNo: **5059016**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00						0	0	20	
Yield	1.00							1.000	0	0	

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

Original

Pg 1 of 1 24050783

TEKLAB, INC. Chain of Custody

5445 Horseshoe Lake Road, Collinsville, IL 62234 Phone (618) 344-1004 Fax (618) 344-1005

Are the samples chilled? YES ☐ NO ☑ With: ☐ Ice ☐ Blue Ice Preserved in: ☐ Lab ☐ Field

Teklab Inc
5445 Horseshoe Lake Road
Collinsville, IL 62234

18.4-0.2= Cooler Temp: 18.2c Sampler: Client QC Level: 2

Fedex, Cooler

Project# 24050346

Comments: **Please Issue reports and invoices via email only**
Please analyze for Radium 226/228 per your usual methods.
Any changes to analysis/methods must be approved by Teklab, Inc. Batch QC is required.
Samples collected from an IL site.

Contact: Shelly Hennessy Email: shennessy@TekLabInc.com
Requested Due Date: Standard TAT Billing/PO: 36236 Phone: (618) 344-1004 ext. 36

PLEASE NOTE:

NELAP accreditation is required on the requested analytes and must be documented as such on the final report. If your laboratory does not currently hold a NELAP accreditation for the requested method and/or analytes, please contact Teklab immediately. If your laboratory loses accreditation or is suspended for any analyte/method during the life of the contract, you must contact Teklab immediately.

Lab Use	Sample ID	Sample Date/Time	Preservative	Matrix	Radium 226/228		CPM
	24050346-001	5/2/24 0815	Unpres	Soil	✔		24
	24050346-002	5/2/24 1100	Unpres	Soil	✔		36
	24050346-003	5/2/24 1115	Unpres	Soil	✔		24
	24050346-004	5/2/24 1530	Unpres	Soil	✔		24
	24050346-005	5/2/24 1450	Unpres	Soil	✔		28
	24050346-006	4/30/24 1015	Unpres	Soil	✔		20
	24050346-007	4/30/24 1015	Unpres	Soil	✔		30
	24050346-008	4/29/24 1500	Unpres	Soil	✔		24
	24050346-009	4/29/24 0930	Unpres	Soil	✔		38
	24050346-010	4/30/24 1445	Unpres	Soil	✔		34
			Other	Aqueous			

*Relinquished By	Date/Time	Received By	Date/Time
[signature]	5/16/24 1700	[signature]	5/19/24, 1140

Teklab maintains a strict policy of client confidentiality and as such does not provide client/sampler information without proper authorization. and proprietary rights, Teklab, Inc. protects clients' confidential information as directed by local, state or federal laws. (Teklab QAM Section 9.1, TNI V1 M2 Section 4.1.5 c)

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Sample Log-In Check List

Client Name: TEK-IL-62234-A Work Order Number: 24050783 RcptNo: 1

Logged by:	Tegan A. Richards	5/9/2024 11:40:00 AM	Tegan Richards
Completed By:	Tegan A. Richards	5/10/2024 12:09:39 PM	Tegan Richards
Reviewed By:	Jennifer Woolf	5/10/2024 5:04:45 PM	Jennifer Woolf

Chain of Custody

1. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
2. How was the sample delivered? FedEx

Log In

3. Coolers are present? Yes ☑ No ☐ NA ☐
4. Shipping container/cooler in good condition? Yes ☑ No ☐
   Custody seals intact on shipping container/cooler? Yes ☐ No ☐ Not Present ☑
   No. Seal Date: Signed By:
5. Was an attempt made to cool the samples? Yes ☐ No ☑ NA ☐
6. Were all samples received at a temperature of >0° C to 6.0°C Yes ☐ No ☑ NA ☐
   Not required
7. Sample(s) in proper container(s)? Yes ☑ No ☐
8. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
9. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
10. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
11. Is the headspace in the VOA vials less than 1/4 inch or 6 mm? Yes ☐ No ☐ No VOA Vials ☑
12. Were any sample containers received broken? Yes ☐ No ☑
13. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes ☑ No ☐
14. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
15. Is it clear what analyses were requested? Yes ☑ No ☐
16. Were all holding times able to be met? (If no, notify customer for authorization.) Yes ☑ No ☐

Special Handling (if applicable)

17. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:
By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:
Client Instructions:

18. Additional remarks:

Cooler Information

Cooler No	Temp ºC	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	18.2	Good	Not Present			

May 28, 2024

Eric Staley
City Water, Light & Power
3100 Stevenson Drive
2nd Floor Maintenance Building
Springfield, IL 62712
TEL: (217) 757-8610
FAX: (217) 757-8615

Illinois	100226
Illinois	1004652024-2
Kansas	E-10374
Louisiana	05002
Louisiana	05003
Oklahoma	9978

RE: CWLP Borings **WorkOrder:** 24050428

Dear Eric Staley:

TEKLAB, INC received 2 samples on 5/6/2024 12:00:00 PM for the analysis presented in the following report.

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

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

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

Sincerely,

Shelly A Hennessy

Shelly A. Hennessy
Project Manager
(618)344-1004 ex 36
SHennessy@teklabinc.com

Report Contents

Client: City Water, Light & Power
Client Project: CWLP Borings

Work Order: 24050428
Report Date: 28-May-24

This reporting package includes the following:

Cover Letter	1
Report Contents	2
Definitions	3
Case Narrative	5
Accreditations	6
Laboratory Results	7
Receiving Check List	9
Chain of Custody	Appended

Client: City Water, Light & Power **Work Order:** 24050428

Client Project: CWLP Borings **Report Date:** 28-May-24

Abbr Definition

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

Client: City Water, Light & Power
Work Order: 24050428

Client Project: CWLP Borings
Report Date: 28-May-24

Qualifiers

- # - Unknown hydrocarbon
- B - Analyte detected in associated Method Blank
- C - RL shown is a Client Requested Quantitation Limit
- E - Value above quantitation range
- H - Holding times exceeded
- I - Associated internal standard was outside method criteria
- J - Analyte detected below quantitation limits
- M - Manual Integration used to determine area response
- ND - Not Detected at the Reporting Limit
- R - RPD outside accepted recovery limits
- S - Spike Recovery outside recovery limits
- T - TIC(Tentatively identified compound)
- X - Value exceeds Maximum Contaminant Level

Client: City Water, Light & Power

Client Project: CWLP Borings

Work Order: 24050428

Report Date: 28-May-24

Cooler Receipt Temp: 3.5 °C

Radium-226 and Radium-228 analysis was performed by Summit Environmental Technologies, Inc. See attached report for results.

Locations

Collinsville

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

Springfield

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

Kansas City

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

Collinsville Air

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

Chicago

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

Client: City Water, Light & Power

Work Order: 24050428

Client Project: CWLP Borings

Report Date: 28-May-24

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2025	Collinsville
Illinois	IEPA	1004652024-2	NELAP	4/30/2025	Collinsville
Kansas	KDHE	E-10374	NELAP	4/30/2025	Collinsville
Louisiana	LDEQ	05002	NELAP	6/30/2024	Collinsville
Louisiana	LDEQ	05003	NELAP	6/30/2024	Collinsville
Oklahoma	ODEQ	9978	NELAP	8/31/2024	Collinsville
Arkansas	ADEQ	88-0966		3/14/2025	Collinsville
Illinois	IDPH	17584		5/31/2025	Collinsville
Iowa	IDNR	430		6/1/2026	Collinsville
Kentucky	UST	0073		1/31/2025	Collinsville
Mississippi	MSDH			4/30/2025	Collinsville
Missouri	MDNR	930		1/31/2025	Collinsville
Missouri	MDNR	00930		10/31/2026	Collinsville

Client: City Water, Light & Power
Work Order: 24050428
Client Project: CWLP Borings
Report Date: 28-May-24
Lab ID: 24050428-001
Client Sample ID: L5 19.5-21.5
Matrix: SOLID
Collection Date: 05/03/2024 8:30

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
ASTM D3987, SW-846 9036, IN SHAKE EXTRACT (TOTAL)									
Sulfate, SHAKE	*	31	50		**67**	mg/L	5	05/15/2024 13:32	R347372
ASTM D3987, SW-846 9214, IN SHAKE EXTRACT									
Fluoride	*	0.04	0.10		**0.36**	mg/L	1	05/13/2024 9:06	R347147
ASTM D3987, SW-846 9251, IN SHAKE EXTRACT									
Chloride, SHAKE	*	1	4		**6**	mg/L	1	05/14/2024 20:03	R347274
SW-846 9045C									
pH (1:1)	NELAP	0	1.00		**8.14**		1	05/07/2024 10:21	R346852
SW-846 1311, 3010A, 6010B, METALS IN TCLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**0.0276**	mg/L	1	05/15/2024 12:27	222893
Barium	NELAP	0.0150	0.0450		**0.574**	mg/L	1	05/15/2024 12:27	222893
Beryllium	NELAP	0.0002	0.0010		**0.0049**	mg/L	1	05/15/2024 12:27	222893
Boron	NELAP	0.250	1.00		**2.32**	mg/L	1	05/21/2024 8:27	223096
Cadmium	NELAP	0.0005	0.0020		**0.149**	mg/L	1	05/15/2024 12:27	222893
Chromium	NELAP	0.0034	0.010	J	**0.0082**	mg/L	1	05/15/2024 12:27	222893
Cobalt	NELAP	0.0020	0.0060		**0.0218**	mg/L	1	05/15/2024 12:27	222893
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/15/2024 12:27	222893
Molybdenum	NELAP	0.0037	0.010	J	**0.0081**	mg/L	1	05/15/2024 12:27	222893
Selenium	NELAP	0.0170	0.0500		**< 0.0500**	mg/L	1	05/15/2024 12:27	222893
SW-846 1311, 3010A, 6020A, METALS IN TCLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0072**	mg/L	5	05/16/2024 18:27	222893
Lithium	*	0.0015	0.0030		**0.0153**	mg/L	5	05/16/2024 18:27	222893
Thallium	NELAP	0.0010	0.0020		**0.0199**	mg/L	5	05/16/2024 18:27	222893
SW-846 1311, 7470A IN TCLP EXTRACT									
Mercury	NELAP	0.00010	0.00020		**< 0.00020**	mg/L	1	05/18/2024 12:42	222892
SW-846 1312, 3005A, 6010B, METALS IN SPLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**0.0331**	mg/L	1	05/17/2024 17:00	222963
Barium	NELAP	0.0150	0.0450		**0.0596**	mg/L	1	05/17/2024 17:00	222963
Beryllium	NELAP	0.0002	0.0010		**< 0.0010**	mg/L	1	05/17/2024 17:00	222963
Boron	NELAP	0.250	1.00		**1.05**	mg/L	1	05/17/2024 17:00	222963
Cadmium	NELAP	0.0005	0.0020		**< 0.0020**	mg/L	1	05/17/2024 17:00	222963
Chromium	NELAP	0.0034	0.0100		**< 0.0100**	mg/L	1	05/17/2024 17:00	222963
Cobalt	NELAP	0.0020	0.0060		**< 0.0060**	mg/L	1	05/17/2024 17:00	222963
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/17/2024 17:00	222963
Molybdenum	NELAP	0.0037	0.010	J	**0.0076**	mg/L	1	05/17/2024 17:00	222963
Selenium	NELAP	0.0170	0.0500		**< 0.0500**	mg/L	1	05/17/2024 17:00	222963
SW-846 1312, 3005A, 6020A, METALS IN SPLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0067**	mg/L	5	05/17/2024 9:22	222963
Lithium	*	0.0015	0.0030	J	**0.0027**	mg/L	5	05/16/2024 14:37	222963
Thallium	NELAP	0.0010	0.0020		**< 0.0020**	mg/L	5	05/16/2024 14:37	222963
SW-846 1312, 7470A IN SPLP EXTRACT									
Mercury	NELAP	0.00006	0.00020		**< 0.00020**	mg/L	1	05/18/2024 14:08	222116
EPA 903/904, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R347896
Radium-228	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R347896

Client: City Water, Light & Power
Work Order: 24050428
Client Project: CWLP Borings
Report Date: 28-May-24
Lab ID: 24050428-002
Client Sample ID: L5 32.5-35.2
Matrix: SOLID
Collection Date: 05/03/2024 9:00

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
ASTM D3987, SW-846 9036, IN SHAKE EXTRACT (TOTAL)									
Sulfate, SHAKE	*	31	50		**73**	mg/L	5	05/15/2024 13:35	R347372
ASTM D3987, SW-846 9214, IN SHAKE EXTRACT									
Fluoride	*	0.04	0.10	J	**0.08**	mg/L	1	05/13/2024 9:11	R347147
ASTM D3987, SW-846 9251, IN SHAKE EXTRACT									
Chloride, SHAKE	*	1	4		**11**	mg/L	1	05/14/2024 20:11	R347274
SW-846 9045C									
pH (1:1)	NELAP	0	1.00		**8.27**		1	05/07/2024 10:22	R346852
SW-846 1311, 3010A, 6010B, METALS IN TCLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**< 0.0100**	mg/L	1	05/17/2024 17:06	222894
Barium	NELAP	0.0150	0.0450		**1.24**	mg/L	1	05/15/2024 12:38	222894
Beryllium	NELAP	0.0002	0.0010		**< 0.0010**	mg/L	1	05/15/2024 12:38	222894
Boron	NELAP	0.250	1.00		**2.79**	mg/L	1	05/20/2024 9:22	223102
Cadmium	NELAP	0.0005	0.0020		**0.0022**	mg/L	1	05/15/2024 12:38	222894
Chromium	NELAP	0.0034	0.0100		**< 0.0100**	mg/L	1	05/15/2024 12:38	222894
Cobalt	NELAP	0.0020	0.0060	J	**0.0043**	mg/L	1	05/15/2024 12:38	222894
Lead	NELAP	0.0045	0.0075		**< 0.0075**	mg/L	1	05/15/2024 12:38	222894
Molybdenum	NELAP	0.0037	0.0100		**0.0375**	mg/L	1	05/15/2024 12:38	222894
Selenium	NELAP	0.0170	0.0500		**< 0.0500**	mg/L	1	05/15/2024 12:38	222894
SW-846 1311, 3010A, 6020A, METALS IN TCLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0004	0.0010		**0.0017**	mg/L	5	05/16/2024 18:07	222894
Lithium	*	0.0015	0.0030		**0.0183**	mg/L	5	05/16/2024 18:07	222894
Thallium	NELAP	0.0010	0.0020		**0.0021**	mg/L	5	05/16/2024 18:07	222894
SW-846 1311, 7470A IN TCLP EXTRACT									
Mercury	NELAP	0.00010	0.00020		**< 0.00020**	mg/L	1	05/18/2024 13:19	222895
SW-846 1312, 3005A, 6010B, METALS IN SPLP EXTRACT BY ICP									
Arsenic	NELAP	0.0087	0.0100		**< 0.0100**	mg/L	1	05/17/2024 17:02	222963
Barium	NELAP	0.015	0.045	J	**0.023**	mg/L	1	05/17/2024 17:02	222963
Beryllium	NELAP	0.0002	0.0010		**< 0.0010**	mg/L	1	05/17/2024 17:02	222963
Boron	NELAP	0.250	1.00		**2.15**	mg/L	1	05/17/2024 17:02	222963
Cadmium	NELAP	0.0005	0.0020		**< 0.0020**	mg/L	1	05/17/2024 17:02	222963
Chromium	NELAP	0.0034	0.0100		**< 0.0100**	mg/L	1	05/17/2024 17:02	222963
Cobalt	NELAP	0.0020	0.0060		**< 0.0060**	mg/L	1	05/17/2024 17:02	222963
Lead	NELAP	0.0040	0.0075		**< 0.0075**	mg/L	1	05/17/2024 17:02	222963
Molybdenum	NELAP	0.0037	0.0100		**0.0904**	mg/L	1	05/17/2024 17:02	222963
Selenium	NELAP	0.0170	0.0500		**< 0.0500**	mg/L	1	05/17/2024 17:02	222963
SW-846 1312, 3005A, 6020A, METALS IN SPLP EXTRACT BY ICPMS									
Antimony	NELAP	0.0005	0.0010		**0.0025**	mg/L	5	05/16/2024 14:21	222963
Lithium	*	0.0015	0.0030		**0.0033**	mg/L	5	05/16/2024 14:21	222963
Thallium	NELAP	0.0010	0.0020	J	**0.0019**	mg/L	5	05/16/2024 14:21	222963
SW-846 1312, 7470A IN SPLP EXTRACT									
Mercury	NELAP	0.00006	0.00020		**< 0.00020**	mg/L	1	05/18/2024 14:11	222116
EPA 903/904, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R347896
Radium-228	*	0	0		**See Attached**	pCi/Kg	1	05/22/2024 0:00	R347896

Receiving Check List

http://www.teklabinc.com/

Client: City Water, Light & Power
Client Project: CWLP Borings

Work Order: 24050428
Report Date: 28-May-24

Carrier: Paul Reeves

Received By: NR

Completed by: Amber Dilallo
On: 06-May-24

Reviewed by: Ellie Hopkins
On: 06-May-24

Pages to follow: Chain of custody 1 Extra pages included 16

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	Temp °C 3.5
Type of thermal preservation?	None ☐	Ice ☑	Blue Ice ☐	Dry Ice ☐
Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☑	No ☐		
Reported field parameters measured:	Field ☐	Lab ☐	NA ☑	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐		
When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.				
Water – at least one vial per sample has zero headspace?	Yes ☐	No ☐	No VOA vials ☑	
Water - TOX containers have zero headspace?	Yes ☐	No ☐	No TOX containers ☑	
Water - pH acceptable upon receipt?	Yes ☐	No ☐	NA ☑	
NPDES/CWA TCN interferences checked/treated in the field?	Yes ☐	No ☐	NA ☑	

Any No responses must be detailed below or on the COC.

Samples requiring pH should be analyzed as soon as possible after collection. Samples submitted for pH analysis are analyzed as soon as practicable upon arrival at the laboratory. - amberdilallo - 5/6/2024 1:04:15 PM

Print PDF

CHAIN OF CUSTODY

Pg __ of __ Workorder # 24050424

TEKLAB INC, 5445 Horseshoe Lake Road, Collinsville, IL 62234 Phone (618) 344-1004 Fax (618) 344-1005

Client: City, Water, Light & Power
Address: 3100 Stevenson Dr.
City/State/Zip: Springfield, IL 62712
Contact: Colleen Grey Phone: 217-787-2334
Email: cgrey@andrews-eng.com Fax:

Samples on: [X] ICE [ ] BLUE ICE [ ] NO ICE 3-5 °C CT6 #7
Preserved in: [ ] LAB [ ] FIELD FOR LAB USE ONLY
LAB NOTES: TEKLAB

Are these samples known to be involved in litigation? If yes, a surcharge will apply: [ ] Yes [ ] No
Are these samples known to be hazardous? [ ] Yes [ ] No
Are there any required reporting limits to be met on the requested analysis?. If yes, please provide limits in the comment section: [ ] Yes [ ] No

Client Comments: Courier
TCLP & SPLP for all metals

email results to C. Grey and datamanagement@andrews-eng.com

PROJECT NAME/NUMBER	SAMPLE COLLECTOR'S NAME
CWLP Borings	S. Van Hook

RESULTS REQUESTED
[✓] Standard [ ] 1-2 Day (100% Surcharge)
[ ] Other ____ [ ] 3 Day (50% Surcharge)

BILLING INSTRUCTIONS

Lab Use Only	Sample ID	Date/Time Sampled	Matrix	# and Type of Containers: UNP	HNO3	NaOH	H2SO4	HCL	MeOH	NaHSO4	TSP	Other	INDICATE ANALYSIS REQUESTED: Rad 226 and 228	TCLP & SPLP Sb, As, Ba, Be	TCLP & SPLP B, Cd, Cr, Co, Pb, Se, Tl	TCLP & SPLP Li, Mo	TCLP & SPLP Hg	Neutral Leach Cl, F-, SO4	pH
24050424-01	LS 19.5 - 21.5	5/3/2024 8:30AM	Soil	2									✓	✓	✓	✓	✓	✓	✓
-02	LS 32.5 - 35.2	5/3/2024 9:00AM	Soil	2									✓	✓	✓	✓	✓	✓	✓
			Soil	2															
			Soil	2															
			Soil	2															
			Soil	2															
			Soil	2															
			Soil	2															
			Soil	2															
			Soil	2															
			Soil	2															
			Soil	2															

Relinquished By	Date/Time	Received By	Date/Time
Steve Van Hook	5/3/2024 12:30pm	Paul Mix	5.6.24 0820
Paul Mix	5.6.24 1200	Rich Reed	5/6/24 1200

*The individual signing this agreement on behalf of the client, acknowledges that he/she has read and understands the terms and conditions of this agreement, and that he/she has the authority to sign on behalf of the client. See www.teklabinc.com for terms and conditions

MR 5/6

Summit Environmental Technologies, Inc.
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Website: http://www.settek.com

May 28, 2024

Shelly Hennessy
TEKLAB Inc,
5445 Horseshoe lake Road
Collinsville, IL 62234
TEL:
FAX:

RE: 24050428

Dear Shelly Hennessy:

Order No.: 24050795

Summit Environmental Technologies, Inc. received 2 sample(s) on 5/9/2024 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative.

Quality control data is within laboratory defined or method specified acceptance limits except where noted.

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

Sincerely,

Jennifer Woolf

Project Manager

3310 Win St.
Cuyahoga Falls, Ohio 44223

Arkansas 88-0735, California 2943, Colorado, Connecticut PH-0108, Florida NELAC E87688, Idaho OH00923, Illinois 200061, Indiana C-OH-13, ISO/IEC 17025:2017 119125 L22-544, Kansas E-10347, Kentucky (Underground Storage Tank) 3, Kentucky 90146, Maryland 339, Michigan 9988, Minnesota 1780279, Nevada OH009232020-1, New Hampshire 2996, New Jersey OH006, New York 11777, North Carolina 39705 and 631, North Dakota R-201, Ohio DW, Ohio VAP CL0052, Oklahoma 2019-155, Oregon OH200001, Pennsylvania 68-01335, Rhode Island LA000317, South Carolina 92016001, Texas T104704466-19-16, Utah OH009232020-12, Virginia VELAP 10381, West Virginia 9957C

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Case Narrative

WO#: **24050795**
Date: **5/28/2024**

CLIENT: TEKLAB Inc,
Project: 24050428

WorkOrder Narrative:
24050795: This report in its entirety consists of the following documents: Cover Letter, Case Narrative, Analytical Results, QC Summary Report, Applicable Accreditation Information, Chain-of-Custody, Cooler Receipt Form, and other applicable forms as necessary. All documents contain the Summit Environmental Technologies, Inc., Work Order Number assigned to this report.

Summit Environmental Technologies, Inc., holds the accreditations/certifications listed at the bottom of the cover letter that may or may not pertain to this report. Please refer to the "Accreditation Program Analytes Report" for accredited analytes list.

The information contained in this analytical report is the sole property of Summit Environmental Technologies, Inc. and that of the customer. It cannot be reproduced in any form without the consent of Summit Environmental Technologies, Inc. or the customer for which this report was issued. The results contained in this report are only representative of the samples received. Conditions can vary at different times and at different sampling conditions. Summit Environmental Technologies, Inc. is not responsible for use or interpretation of the data included herein.

All results for Solid Samples are reported on an "as received" or "wet weight" basis unless indicated as "dry weight" using the "-dry" designation on the reporting units.

This report is believed to meet all of the requirements of the accrediting agency, where applicable. Any comments or problems with the analytical events associated with this report are noted below.

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC
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Website: http://www.settek.co

Qualifiers and Acronyms

WO#: **24050795**
Date: **5/28/2024**

These commonly used Qualifiers and Acronyms may or may not be present in this report.

Qualifiers

U	The compound was analyzed for but was not detected above the MDL.
J	The reported value is greater than the Method Detection Limit but less than the Reporting Limit.
H	The hold time for sample preparation and/or analysis was exceeded. Not Clean Water Act compliant.
D	The result is reported from a dilution.
E	The result exceeded the linear range of the calibration or is estimated due to interference.
MC	The result is below the Minimum Compound Limit.
*****	The result exceeds the Regulatory Limit or Maximum Contamination Limit.
m	Manual integration was used to determine the area response.
d	Manual integration in which peak was deleted
N	The result is presumptive based on a Mass Spectral library search assuming a 1:1 response.
P	The second column confirmation exceeded 25% difference.
C	The result has been confirmed by GC/MS.
X	The result was not confirmed when GC/MS Analysis was performed.
B	The analyte was detected in the Method Blank at a concentration greater than the RL.
MB+	The analyte was detected in the Method Blank at a concentration greater than the MDL.
G	The ICB or CCB contained reportable amounts of analyte.
QC-/+	The CCV recovery failed low (-) or high (+).
R/QDR	The RPD was outside of accepted recovery limits.
QL-/+	The LCS or LCSD recovery failed low (-) or high (+).
QLR	The LCS/LCSD RPD was outside of accepted recovery limits.
QM-/+	The MS or MSD recovery failed low (-) or high (+).
QMR	The MS/MSD RPD was outside of accepted recovery limits.
QV-/+	The ICV recovery failed low (-) or high (+).
S	The spike result was outside of accepted recovery limits.
W	Samples were received outside temperature limits (0° – 6° C). Not Clean Water Act compliant.
Z	Deviation; A deviation from the method was performed; Please refer to the Case Narrative for additional information

Acronyms

ND	Not Detected	**RL**	Reporting Limit
QC	Quality Control	**MDL**	Method Detection Limit
MB	Method Blank	**LOD**	Level of Detection
LCS	Laboratory Control Sample	**LOQ**	Level of Quantitation
LCSD	Laboratory Control Sample Duplicate	**PQL**	Practical Quantitation Limit
QCS	Quality Control Sample	**CRQL**	Contract Required Quantitation Limit
DUP	Duplicate	**PL**	Permit Limit
MS	Matrix Spike	**RegLvl**	Regulatory Limit
MSD	Matrix Spike Duplicate	**MCL**	Maximum Contamination Limit
RPD	Relative Percent Different	**MinCL**	Minimum Compound Limit
ICV	Initial Calibration Verification	**RA**	Reanalysis
ICB	Initial Calibration Blank	**RE**	Reextraction
CCV	Continuing Calibration Verification	**TIC**	Tentatively Identified Compound
CCB	Continuing Calibration Blank	**RT**	Retention Time
RLC	Reporting Limit Check	**CF**	Calibration Factor

This list of Qualifiers and Acronyms reflects the most commonly utilized Qualifiers and Acronyms for reporting. Please refer to the Analytical Notes in the Case Narrative for any Qualifiers or Acronyms that do not appear in this list or for additional information regarding the use of these Qualifiers on reported data.

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Workorder Sample Summary

WO#: **24050795**

28-May-24

CLIENT: TEKLAB Inc,
Project: 24050428

Lab SampleID	Client Sample ID	Tag No	Date Collected	Date Received	Matrix
24050795-001	24050428-001		5/3/2024 8:30:00 AM	5/9/2024 11:40:00 AM	Solid
24050795-002	24050428-002		5/3/2024 9:00:00 AM	5/9/2024 11:40:00 AM	Solid

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DATES REPORT

WO#: **24050795**

28-May-24

Client: TEKLAB Inc,

Project: 24050428

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
24050795-001A	24050428-001	5/3/2024 8:30:00 AM	Solid	Percent Moisture by SM2540Mod			5/25/2024 3:45:00 PM
				Radium-226 Analysis (9315)		5/16/2024 11:10:22 AM	5/23/2024 10:51:41 AM
				Radium-228 Analysis (9320)		5/16/2024 11:10:22 AM	5/22/2024 3:06:59 PM
24050795-002A	24050428-002	5/3/2024 9:00:00 AM		Percent Moisture by SM2540Mod			5/25/2024 3:45:00 PM
				Radium-226 Analysis (9315)		5/16/2024 11:10:22 AM	5/23/2024 10:51:41 AM
				Radium-228 Analysis (9320)		5/16/2024 11:10:22 AM	5/22/2024 3:06:59 PM

Original

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Analytical Report

(consolidated)

WO#: **24050795**

Date Reported: **5/28/2024**

CLIENT: TEKLAB Inc,

Collection Date: 5/3/2024 8:30:00 AM

Project: 24050428

Lab ID: 24050795-001

Matrix: SOLID

Client Sample ID: 24050428-001

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RADIUM-226 ANALYSIS (9315)				**SW9315**	**E903-904**	Analyst: **SMZ**	
Radium-226	ND	1.66		pCi/g-dry	± 0.160	1	5/23/2024 10:51:41 AM
Yield	1.66			-dry		1	5/23/2024 10:51:41 AM
RADIUM-228 ANALYSIS (9320)				**SW9320**	**E903-904**	Analyst: **SMZ**	
Radium-228	ND	3.31		pCi/g-dry	± 0.320	1	5/22/2024 3:06:59 PM
Yield	1.66			-dry		1	5/22/2024 3:06:59 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected
R	RPD outside accepted recovery limits
W	Sample container temperature is out of limit as specified at testcode
M	Manual Integration used to determine area response
PL	Permit Limit
RL	Reporting Detection Limit

Original

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Analytical Report

(consolidated)

WO#: **24050795**

Date Reported: **5/28/2024**

CLIENT: TEKLAB Inc,

Collection Date: 5/3/2024 9:00:00 AM

Project: 24050428

Lab ID: 24050795-002

Matrix: SOLID

Client Sample ID: 24050428-002

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RADIUM-226 ANALYSIS (9315)				**SW9315**	**E903-904**		Analyst: **SMZ**
Radium-226	ND	1.77		pCi/g-dry	± 0.0600	1	5/23/2024 10:51:41 AM
Yield	1.77			-dry		1	5/23/2024 10:51:41 AM
RADIUM-228 ANALYSIS (9320)				**SW9320**	**E903-904**		Analyst: **SMZ**
Radium-228	ND	3.55		pCi/g-dry	± 0.320	1	5/22/2024 3:06:59 PM
Yield	1.77			-dry		1	5/22/2024 3:06:59 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected
R	RPD outside accepted recovery limits
W	Sample container temperature is out of limit as specified at testcode
M	Manual Integration used to determine area response
PL	Permit Limit
RL	Reporting Detection Limit

Original

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Analytical Report

(base report)

WO#: **24050795**

Date Reported: **5/28/2024**

CLIENT: TEKLAB Inc,
Matrix: SOLID
Lab ID: 24050795-001A
Project: 24050428
Client Sample ID 24050428-001

Tag Number:
Collection Date: 5/3/2024 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PERCENT MOISTURE BY SM2540MOD				**A2540B**		Analyst: **AAA**
Percent Moisture	39.6	0.500		%	1	5/25/2024 3:45:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected
R	RPD outside accepted recovery limits
W	Sample container temperature is out of limit as specified at testcode
M	Manual Integration used to determine area response
PL	Permit Limit
RL	Reporting Detection Limit

Original

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Analytical Report

(base report)

WO#: **24050795**

Date Reported: **5/28/2024**

CLIENT: TEKLAB Inc,
Matrix: SOLID
Lab ID: 24050795-002A
Project: 24050428
Client Sample ID 24050428-002

Tag Number:
Collection Date: 5/3/2024 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PERCENT MOISTURE BY SM2540MOD				**A2540B**		Analyst: **AAA**
Percent Moisture	43.6	0.500		%	1	5/25/2024 3:45:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected
R	RPD outside accepted recovery limits
W	Sample container temperature is out of limit as specified at testcode
M	Manual Integration used to determine area response
PL	Permit Limit
RL	Reporting Detection Limit

Original

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QC SUMMARY REPORT

WO#: **24050795**

28-May-24

Client: TEKLAB Inc,
Project: 24050428 **BatchID:** **75515**

Sample ID: **MB-75515**	SampType: **MBLK**	TestCode: **Radium-228_**	Units: **pCi/g**	Prep Date: **5/16/2024**	RunNo: **186135**
Client ID: **PBS**	Batch ID: **75515**	TestNo: **SW9320**	**E903-904**	Analysis Date: **5/22/2024**	SeqNo: **5043898**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	2.00									
Yield	1.00										

Sample ID: **LCS-75515**	SampType: **LCS**	TestCode: **Radium-228_**	Units: **pCi/g**	Prep Date: **5/16/2024**	RunNo: **186135**
Client ID: **LCSS**	Batch ID: **75515**	TestNo: **SW9320**	**E903-904**	Analysis Date: **5/22/2024**	SeqNo: **5043899**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	3.62	2.00	5.000	0	72.4	50	130				

Sample ID: **LCSD-75515**	SampType: **LCSD**	TestCode: **Radium-228_**	Units: **pCi/g**	Prep Date: **5/16/2024**	RunNo: **186135**
Client ID: **LCSS02**	Batch ID: **75515**	TestNo: **SW9320**	**E903-904**	Analysis Date: **5/22/2024**	SeqNo: **5043900**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	3.01	2.00	5.000	0	60.2	50	130	3.620	18.4	20	

Sample ID: **24041932-001ADUP**	SampType: **DUP**	TestCode: **Radium-228_**	Units: **pCi/g-dry**	Prep Date: **5/16/2024**	RunNo: **186135**
Client ID: **BatchQC**	Batch ID: **75515**	TestNo: **SW9320**	**E903-904**	Analysis Date: **5/22/2024**	SeqNo: **5043905**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

Original

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Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **24050795**

28-May-24

Client: TEKLAB Inc,
Project: 24050428 **BatchID:** **75515**

Sample ID: **24041932-001ADUP** SampType: **DUP** TestCode: **Radium-228_** Units: **pCi/g-dry** Prep Date: **5/16/2024** RunNo: **186135**
Client ID: **BatchQC** Batch ID: **75515** TestNo: **SW9320** **E903-904** Analysis Date: **5/22/2024** SeqNo: **5043905**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	10.4	2.34	11.68	0	88.9	0	0	7.583	31.2	20	RS
Yield	1.17							1.168	0	0	

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

Original

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QC SUMMARY REPORT

WO#: **24050795**

28-May-24

Client: TEKLAB Inc,
Project: 24050428 **BatchID:** **75515**

Sample ID: **MB-75515** SampType: **MBLK** TestCode: **Radium-226_** Units: **pCi/g** Prep Date: **5/16/2024** RunNo: **186145**
Client ID: **PBS** Batch ID: **75515** TestNo: **SW9315** **E903-904** Analysis Date: **5/23/2024** SeqNo: **5044082**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00									
Yield	1.00										

Sample ID: **LCS-75515** SampType: **LCS** TestCode: **Radium-226_** Units: **pCi/g** Prep Date: **5/16/2024** RunNo: **186145**
Client ID: **LCSS** Batch ID: **75515** TestNo: **SW9315** **E903-904** Analysis Date: **5/23/2024** SeqNo: **5044083**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	6.20	1.00	5.000	0	124	70	130				

Sample ID: **LCSD-75515** SampType: **LCSD** TestCode: **Radium-226_** Units: **pCi/g** Prep Date: **5/16/2024** RunNo: **186145**
Client ID: **LCSS02** Batch ID: **75515** TestNo: **SW9315** **E903-904** Analysis Date: **5/23/2024** SeqNo: **5044084**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	5.76	1.00	5.000	0	115	60	140	6.200	7.36	40	

Sample ID: **24041932-001ADUP** SampType: **DUP** TestCode: **Radium-226_** Units: **pCi/g-dry** Prep Date: **5/16/2024** RunNo: **186145**
Client ID: **BatchQC** Batch ID: **75515** TestNo: **SW9315** **E903-904** Analysis Date: **5/23/2024** SeqNo: **5044089**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

Original

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Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **24050795**

28-May-24

Client: TEKLAB Inc,
Project: 24050428 **BatchID:** **75515**

Sample ID: **24041932-001ADUP** SampType: **DUP** TestCode: **Radium-226_** Units: **pCi/g-dry** Prep Date: **5/16/2024** RunNo: **186145**
Client ID: **BatchQC** Batch ID: **75515** TestNo: **SW9315** **E903-904** Analysis Date: **5/23/2024** SeqNo: **5044089**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	7.61	1.17						8.133	6.68	20	
Yield	1.17							1.168	0	0	

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

Original

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Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **24050795**

28-May-24

Client: TEKLAB Inc,
Project: 24050428 **BatchID:** **R186329**

Sample ID: **MB-R186329** SampType: **MBLK** TestCode: **PctMoist_S(2** Units: **%** Prep Date: RunNo: **186329**
Client ID: **PBS** Batch ID: **R186329** TestNo: **A2540B** Analysis Date: **5/25/2024** SeqNo: **5049039**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	ND	0.500									

Sample ID: **24051805-006ADUP** SampType: **DUP** TestCode: **PctMoist_S(2** Units: **%** Prep Date: RunNo: **186329**
Client ID: **BatchQC** Batch ID: **R186329** TestNo: **A2540B** Analysis Date: **5/25/2024** SeqNo: **5049048**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	17.8	0.500						17.37	2.41	5	

Sample ID: **24051777-003ADUP** SampType: **DUP** TestCode: **PctMoist_S(2** Units: **%** Prep Date: RunNo: **186329**
Client ID: **BatchQC** Batch ID: **R186329** TestNo: **A2540B** Analysis Date: **5/25/2024** SeqNo: **5049058**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	7.92	0.500						7.909	0.187	5	

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

Original

Pg ___ of ___ 24050795

TEKLAB, INC. Chain of Custody

5445 Horseshoe Lake Road, Collinsville, IL 62234 Phone (618) 344-1004 Fax (618) 344-1005

Are the samples chilled? YES ☐ NO ☑ With: ☐ Ice ☐ Blue Ice Preserved in: ☐ Lab ☐ Field

18.4-0.2 = Cooler Temp: 18.2 Sampler: Client QC Level: 2

Teklab Inc
5445 Horseshoe Lake Road
Collinsville, IL 62234

Fedex, Cooler

Project# 24050428

Comments: **Please Issue reports and invoices via email only**
Please analyze for Radium 226/228 per your usual methods.
Any changes to analysis/methods must be approved by Teklab, Inc. Batch QC is required.
Samples collected from an IL site.

Contact: Shelly Hennessy Email: shennessy@TekLabInc.com
Requested Due Date: Standard TAT Billing/PO: 36234 Phone: (618) 344-1004 ext. 36

PLEASE NOTE:

NELAP accreditation is required on the requested analytes and must be documented as such on the final report. If your laboratory does not currently hold a NELAP accreditation for the requested method and/or analytes, please contact Teklab immediately. If your laboratory loses accreditation or is suspended for any analyte/method during the life of the contract, you must contact Teklab immediately.

Lab Use	Sample ID	Sample Date/Time	Preservative	Matrix	Radium 226/228		CPM										
	24050428-001	5/3/24 0830	Unpres	Soil	✔		32										
	24050428-002	5/3/24 0900	Unpres	Soil	✔		22										
			Other	Aqueous													
			Other	Aqueous													
			Other	Aqueous													
			Other	Aqueous													
			Other	Aqueous													
			Other	Aqueous													
			Other	Aqueous													
			Other	Aqueous													
			Other	Aqueous													

*Relinquished By	Date/Time	Received By	Date/Time
Omar Rivera	5/9/24 1200		5/9/24, 1140

Teklab maintains a strict policy of client confidentiality and as such does not provide client/sampler information without proper authorization. and proprietary rights,

SubCocRevA

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Sample Log-In Check List

Client Name: TEK-IL-62234-A Work Order Number: 24050795 RcptNo: 1

Logged by:	Tegan A. Richards	5/9/2024 11:40:00 AM	Tegan Richards
Completed By:	Tegan A. Richards	5/10/2024 12:25:27 PM	Tegan Richards
Reviewed By:	Jennifer Woolf	5/10/2024 5:06:15 PM	Jennifer Woolf

Chain of Custody

1. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
2. How was the sample delivered? FedEx

Log In

3. Coolers are present? Yes ☑ No ☐ NA ☐
4. Shipping container/cooler in good condition? Yes ☑ No ☐
   Custody seals intact on shipping container/cooler? Yes ☐ No ☐ Not Present ☑
   No. Seal Date: Signed By:
5. Was an attempt made to cool the samples? Yes ☐ No ☑ NA ☐
6. Were all samples received at a temperature of >0° C to 6.0°C Yes ☐ No ☑ NA ☐
   Not required
7. Sample(s) in proper container(s)? Yes ☑ No ☐
8. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
9. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
10. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
11. Is the headspace in the VOA vials less than 1/4 inch or 6 mm? Yes ☐ No ☐ No VOA Vials ☑
12. Were any sample containers received broken? Yes ☐ No ☑
13. Does paperwork match bottle labels? Yes ☑ No ☐
    (Note discrepancies on chain of custody)
14. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
15. Is it clear what analyses were requested? Yes ☑ No ☐
16. Were all holding times able to be met? Yes ☑ No ☐
    (If no, notify customer for authorization.)

Special Handling (if applicable)

17. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:
By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:
Client Instructions:

18. Additional remarks:

Cooler Information

Cooler No	Temp ºC	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	18.2	Good	Not Present			

May 29, 2024

Eric Staley
City Water, Light & Power
3100 Stevenson Drive
2nd Floor Maintenance Building
Springfield, IL 62712
TEL: (217) 757-8610
FAX: (217) 757-8615

Illinois	100226
Illinois	1004652024-2
Kansas	E-10374
Louisiana	05002
Louisiana	05003
Oklahoma	9978

RE: CWLP Borings **WorkOrder:** 24050236

Dear Eric Staley:

TEKLAB, INC received 4 samples on 5/2/2024 1:11:00 PM for the analysis presented in the following report.

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

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

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

Sincerely,

Shelly A Hennessy

Shelly A. Hennessy
Project Manager
(618)344-1004 ex 36
SHennessy@teklabinc.com

Report Contents

http://www.teklabinc.com/

Client: City Water, Light & Power
Client Project: CWLP Borings

Work Order: 24050236
Report Date: 29-May-24

This reporting package includes the following:

Cover Letter	1
Report Contents	2
Definitions	3
Case Narrative	5
Accreditations	6
Laboratory Results	7
Receiving Check List	11
Chain of Custody	Appended

Client: City Water, Light & Power **Work Order:** 24050236

Client Project: CWLP Borings **Report Date:** 29-May-24

Abbr Definition

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

Definitions

Client: City Water, Light & Power
Work Order: 24050236
Client Project: CWLP Borings
Report Date: 29-May-24

Qualifiers

- # - Unknown hydrocarbon
- B - Analyte detected in associated Method Blank
- C - RL shown is a Client Requested Quantitation Limit
- E - Value above quantitation range
- H - Holding times exceeded
- I - Associated internal standard was outside method criteria
- J - Analyte detected below quantitation limits
- M - Manual Integration used to determine area response
- ND - Not Detected at the Reporting Limit
- R - RPD outside accepted recovery limits
- S - Spike Recovery outside recovery limits
- T - TIC(Tentatively identified compound)
- X - Value exceeds Maximum Contaminant Level

Case Narrative

http://www.teklabinc.com/

Client: City Water, Light & Power
Work Order: 24050236
Client Project: CWLP Borings
Report Date: 29-May-24

Cooler Receipt Temp: 5.9 °C

Radium-226 and Radium-228 analysis was performed by Summit Environmental Technologies, Inc. See attached report for results.

Locations

Collinsville

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

Springfield

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

Kansas City

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

Collinsville Air

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

Chicago

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

Client: City Water, Light & Power

Work Order: 24050236

Client Project: CWLP Borings

Report Date: 29-May-24

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2025	Collinsville
Illinois	IEPA	1004652024-2	NELAP	4/30/2025	Collinsville
Kansas	KDHE	E-10374	NELAP	4/30/2025	Collinsville
Louisiana	LDEQ	05002	NELAP	6/30/2024	Collinsville
Louisiana	LDEQ	05003	NELAP	6/30/2024	Collinsville
Oklahoma	ODEQ	9978	NELAP	8/31/2024	Collinsville
Arkansas	ADEQ	88-0966		3/14/2025	Collinsville
Illinois	IDPH	17584		5/31/2025	Collinsville
Iowa	IDNR	430		6/1/2026	Collinsville
Kentucky	UST	0073		1/31/2025	Collinsville
Mississippi	MSDH			4/30/2025	Collinsville
Missouri	MDNR	930		1/31/2025	Collinsville
Missouri	MDNR	00930		10/31/2026	Collinsville

Client: City Water, Light & Power
Work Order: 24050236
Client Project: CWLP Borings
Report Date: 29-May-24
Lab ID: 24050236-001
Client Sample ID: D-2 20ft.
Matrix: GROUNDWATER
Collection Date: 04/29/2024 9:30

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 9036 (TOTAL)									
Sulfate	NELAP	307	500		**1720**	mg/L	50	05/09/2024 11:05	R347057
SW-846 9040B, LABORATORY ANALYZED									
Lab pH	NELAP	0	1.00	H	**9.27**		1	05/03/2024 10:33	R346719
SW-846 9214 (TOTAL)									
Fluoride	NELAP	0.04	0.10		**0.21**	mg/L	1	05/09/2024 12:19	R347045
SW-846 9251 (TOTAL)									
Chloride	NELAP	5	40		**236**	mg/L	10	05/07/2024 18:33	R346935
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)									
Antimony	NELAP	0.022	0.050	J	**0.024**	mg/L	250	05/10/2024 14:10	222410
Arsenic	NELAP	0.0200	0.0500		**0.279**	mg/L	250	05/10/2024 14:10	222410
Barium	NELAP	0.0350	0.0500		**1.13**	mg/L	250	05/10/2024 14:10	222410
Beryllium	NELAP	0.0125	0.0500		**0.0640**	mg/L	250	05/10/2024 14:10	222410
Boron	NELAP	0.462	1.25		**89.0**	mg/L	250	05/10/2024 14:10	222410
Cadmium	NELAP	0.0075	0.0500		**0.0541**	mg/L	250	05/13/2024 13:49	222410
Chromium	NELAP	0.0350	0.0750		**0.902**	mg/L	250	05/10/2024 14:10	222410
Cobalt	NELAP	0.0058	0.0500		**0.0579**	mg/L	250	05/13/2024 13:49	222410
Lead	NELAP	0.0300	0.0500		**0.199**	mg/L	250	05/10/2024 14:10	222410
Lithium	*	0.0725	0.150		**0.154**	mg/L	250	05/10/2024 14:10	222410
Molybdenum	NELAP	0.0300	0.0750		**8.04**	mg/L	250	05/15/2024 3:31	222410
Selenium	NELAP	0.0300	0.0500		**< 0.0500**	mg/L	250	05/10/2024 14:10	222410
Thallium	NELAP	0.048	0.10	J	**0.049**	mg/L	250	05/10/2024 14:10	222410

Elevated reporting limit due to matrix interference.

Contamination present in the CCB for Sb. Sample results below the reporting limit are reportable per the TNI Standard.

SW-846 7470A (TOTAL)									
Mercury	NELAP	0.00006	0.00020		**0.00046**	mg/L	1	05/24/2024 12:57	223373
EPA 903.0/904.0, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pci/L	1	05/20/2024 0:00	R347715
Radium-228	*	0	0		**See Attached**	pci/L	1	05/20/2024 0:00	R347715

Client: City Water, Light & Power
Work Order: 24050236
Client Project: CWLP Borings
Report Date: 29-May-24
Lab ID: 24050236-002
Client Sample ID: D-1 25ft.
Matrix: GROUNDWATER
Collection Date: 04/29/2024 15:00

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 9036 (TOTAL)									
Sulfate	NELAP	307	500		**1740**	mg/L	50	05/09/2024 11:08	R347057
SW-846 9040B, LABORATORY ANALYZED									
Lab pH	NELAP	0	1.00	H	**9.85**		1	05/03/2024 10:34	R346719
SW-846 9214 (TOTAL)									
Fluoride	NELAP	0.04	0.10		**0.32**	mg/L	1	05/09/2024 12:22	R347045
SW-846 9251 (TOTAL)									
Chloride	NELAP	5	40		**63**	mg/L	10	05/07/2024 18:41	R346935
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)									
Antimony	NELAP	0.060	0.10	J	**0.061**	mg/L	500	05/10/2024 13:02	222414
Arsenic	NELAP	0.0400	0.100		**1.17**	mg/L	500	05/10/2024 13:02	222414
Barium	NELAP	0.0700	0.100		**2.48**	mg/L	500	05/10/2024 13:02	222414
Beryllium	NELAP	0.0250	0.100		**0.254**	mg/L	500	05/10/2024 13:02	222414
Boron	NELAP	0.925	2.50		**78.6**	mg/L	500	05/10/2024 13:02	222414
Cadmium	NELAP	0.0150	0.100		**0.222**	mg/L	500	05/13/2024 17:43	222414
Chromium	NELAP	0.0700	0.150		**3.91**	mg/L	500	05/10/2024 13:02	222414
Cobalt	NELAP	0.0115	0.100		**0.241**	mg/L	500	05/13/2024 17:43	222414
Lead	NELAP	0.0600	0.100		**1.04**	mg/L	500	05/10/2024 13:02	222414
Lithium	*	0.145	0.300		**0.428**	mg/L	500	05/10/2024 13:02	222414
Molybdenum	NELAP	0.0600	0.150		**15.7**	mg/L	500	05/15/2024 5:53	222414
Selenium	NELAP	0.060	0.10	J	**0.10**	mg/L	500	05/10/2024 13:02	222414
Thallium	NELAP	0.095	0.20	J	**0.13**	mg/L	500	05/10/2024 13:02	222414
Elevated reporting limit due to matrix interference.									
SW-846 7470A (TOTAL)									
Mercury	NELAP	0.00006	0.00020		**0.00562**	mg/L	1	05/14/2024 17:39	222568
EPA 903.0/904.0, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pci/L	1	05/20/2024 0:00	R347715
Radium-228	*	0	0		**See Attached**	pci/L	1	05/20/2024 0:00	R347715

Client: City Water, Light & Power
Work Order: 24050236
Client Project: CWLP Borings
Report Date: 29-May-24
Lab ID: 24050236-003
Client Sample ID: D-3 20ft.
Matrix: GROUNDWATER
Collection Date: 04/30/2024 10:00

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 9036 (TOTAL)									
Sulfate	NELAP	307	500		**1000**	mg/L	50	05/09/2024 11:13	R347057
SW-846 9040B, LABORATORY ANALYZED									
Lab pH	NELAP	0	1.00	H	**10.1**		1	05/03/2024 10:36	R346719
SW-846 9214 (TOTAL)									
Fluoride	NELAP	0.04	0.10		**0.33**	mg/L	1	05/09/2024 12:23	R347045
SW-846 9251 (TOTAL)									
Chloride	NELAP	1	4		**41**	mg/L	1	05/07/2024 18:43	R346935
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)									
Antimony	NELAP	0.0650	0.100		**0.230**	mg/L	500	05/10/2024 10:39	222461
Arsenic	NELAP	0.0800	0.200		**2.33**	mg/L	1000	05/10/2024 9:43	222461
Barium	NELAP	0.0700	0.100		**3.51**	mg/L	500	05/10/2024 10:39	222461
Beryllium	NELAP	0.0250	0.100		**0.439**	mg/L	500	05/10/2024 10:39	222461
Boron	NELAP	0.925	2.50		**105**	mg/L	500	05/10/2024 10:39	222461
Cadmium	NELAP	0.0300	0.200		**0.492**	mg/L	1000	05/14/2024 15:24	222461
Chromium	NELAP	0.140	0.300		**6.25**	mg/L	1000	05/10/2024 9:43	222461
Cobalt	NELAP	0.0230	0.200		**0.323**	mg/L	1000	05/10/2024 9:43	222461
Lead	NELAP	0.0600	0.100		**1.46**	mg/L	500	05/10/2024 10:39	222461
Lithium	*	0.145	0.300		**0.571**	mg/L	500	05/10/2024 10:39	222461
Molybdenum	NELAP	0.140	0.300		**2.61**	mg/L	1000	05/16/2024 7:35	222461
Selenium	NELAP	0.12	0.20	J	**0.13**	mg/L	1000	05/10/2024 9:43	222461
Thallium	NELAP	0.0950	0.200		**0.274**	mg/L	500	05/10/2024 10:39	222461
Elevated reporting limit due to matrix interference.									
SW-846 7470A (TOTAL)									
Mercury	NELAP	0.00055	0.00200	H	**0.00685**	mg/L	10	05/29/2024 12:19	223513
Sample required re-analysis out of hold time.									
EPA 903.0/904.0, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pci/L	1	05/20/2024 0:00	R347715
Radium-228	*	0	0		**See Attached**	pci/L	1	05/20/2024 0:00	R347715

Client: City Water, Light & Power
Work Order: 24050236
Client Project: CWLP Borings
Report Date: 29-May-24
Lab ID: 24050236-004
Client Sample ID: D-4 20ft.
Matrix: GROUNDWATER
Collection Date: 04/30/2024 14:45

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 9036 (TOTAL)									
Sulfate	NELAP	307	500		**2050**	mg/L	50	05/09/2024 11:16	R347057
SW-846 9040B, LABORATORY ANALYZED									
Lab pH	NELAP	0	1.00	H	**9.10**		1	05/03/2024 10:37	R346719
SW-846 9214 (TOTAL)									
Fluoride	NELAP	0.04	0.10		**0.43**	mg/L	1	05/09/2024 12:25	R347045
SW-846 9251 (TOTAL)									
Chloride	NELAP	5	40		**139**	mg/L	10	05/07/2024 18:57	R346935
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)									
Antimony	NELAP	0.0180	0.0400		**0.0812**	mg/L	200	05/15/2024 10:35	222764
Arsenic	NELAP	0.0400	0.100		**0.378**	mg/L	500	05/15/2024 10:29	222764
Barium	NELAP	0.0350	0.0500		**0.975**	mg/L	250	05/16/2024 9:42	222764
Beryllium	NELAP	0.0002	0.0010		**0.0674**	mg/L	5	05/14/2024 23:46	222764
Boron	NELAP	0.462	1.25		**73.1**	mg/L	250	05/16/2024 9:42	222764
Cadmium	NELAP	0.015	0.10	J	**0.068**	mg/L	500	05/15/2024 10:29	222764
Chromium	NELAP	0.0700	0.150		**1.03**	mg/L	500	05/15/2024 10:29	222764
Cobalt	NELAP	0.012	0.10	J	**0.061**	mg/L	500	05/15/2024 10:29	222764
Lead	NELAP	0.0240	0.0400		**0.266**	mg/L	200	05/15/2024 10:35	222764
Lithium	*	0.0725	0.150		**0.228**	mg/L	250	05/16/2024 9:42	222764
Molybdenum	NELAP	0.0600	0.150		**2.30**	mg/L	500	05/15/2024 10:29	222764
Selenium	NELAP	0.060	0.10	J	**0.090**	mg/L	500	05/15/2024 10:29	222764
Thallium	NELAP	0.038	0.080	J	**0.066**	mg/L	200	05/15/2024 10:35	222764
Elevated reporting limit due to sample composition.									
SW-846 7470A (TOTAL)									
Mercury	NELAP	0.00006	0.00020		**0.00717**	mg/L	1	05/14/2024 17:44	222568
EPA 903.0/904.0, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pci/L	1	05/20/2024 0:00	R347715
Radium-228	*	0	0		**See Attached**	pci/L	1	05/20/2024 0:00	R347715

Receiving Check List

http://www.teklabinc.com/

Client: City Water, Light & Power
Client Project: CWLP Borings

Work Order: 24050236
Report Date: 29-May-24

Carrier: Paul Reeves
Received By: NR

Completed by: Amber Dilallo
On: 02-May-24

Reviewed by: Ellie Hopkins
On: 02-May-24

Pages to follow: Chain of custody 1 Extra pages included 18

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	Temp °C 5.9
Type of thermal preservation?	None ☐	Ice ☑	Blue Ice ☐	Dry Ice ☐
Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☐	No ☑		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☐	No ☑		
Reported field parameters measured:	Field ☐	Lab ☑	NA ☐	

Sample analyses to be measured in the field and/or within 15 minutes of collection were analyzed in the lab as soon as practicable. These analyses include Chlorine (demand, free and/or residual), Carbon Dioxide, Dissolved Oxygen, Ferrous Iron, pH, and Sulfite.

Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Water – at least one vial per sample has zero headspace?	Yes ☐	No ☐	No VOA vials ☑
Water - TOX containers have zero headspace?	Yes ☐	No ☐	No TOX containers ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☑	NA ☐
NPDES/CWA TCN interferences checked/treated in the field?	Yes ☐	No ☐	NA ☑

When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.

Any No responses must be detailed below or on the COC.

Samples were preserved with Nitric Acid (97606) upon arrival at the laboratory. - amberdilallo - 5/2/2024 3:15:00 PM

pH strip #96651. - amberdilallo - 5/2/2024 3:15:13 PM

D-1 25ft. labeled as collected at 1430 rather than 1500. Collen Grey was notified of this error via work order summary. - amberdilallo - 5/2/2024 3:15:45 PM

CHAIN OF CUSTODY

Pg __ of __ Workorder # 240502360

TEKLAB INC, 5445 Horseshoe Lake Road, Collinsville, IL 62234 Phone (618) 344-1004 Fax (618) 344-1005

Client: City, Water, Light & Power
Address: 3100 Stevenson Dr.
City/State/Zip: Springfield, IL 62712
Contact: Colleen Grey Phone: 217-787-2334
Email: cgrey@andrews-eng.com Fax:

Samples on: [X] ICE [ ] BLUE ICE [ ] NO ICE 5.9 °C #7
Preserved in: [X] LAB [ ] FIELD FOR LAB USE ONLY
LAB NOTES: Added HNO3 (970600) to all um 5/2 *14:30 on container (ump) 960057

Client Comments:
email results to C. Grey and datamanagement@andrews-eng.com

Are these samples known to be involved in litigation? If yes, a surcharge will apply: [ ] Yes [ ] No
Are these samples known to be hazardous? [ ] Yes [ ] No
Are there any required reporting limits to be met on the requested analysis?. If yes, please provide limits in the comment section: [ ] Yes [ ] No

PROJECT NAME/NUMBER	SAMPLE COLLECTOR'S NAME
CWLP Borings	S. Van Hook

RESULTS REQUESTED
[✓] Standard [ ] 1-2 Day (100% Surcharge)
[ ] Other _____ [ ] 3 Day (50% Surcharge)

BILLING INSTRUCTIONS

Lab Use Only	Sample ID	Date/Time Sampled	Matrix	# and Type of Containers: UNP	HNO3	NaOH	H2SO4	HCL	MeOH	NaHSO4	TSP	Other	INDICATE ANALYSIS REQUESTED: Rad 226 and 228	Sb, As, Ba, Be	B, Cd, Cr, Co, Pb, Se, Tl	Li, Mo	Hg	Cl, F+, SO4	pH
240502360-001	D-2 20ft.	4/29/24 9:30am	Groundwater	3	1								✓	✓	✓	✓	✓	✓	✓
002	D-1 25ft.	4/29/24 3pm*	Groundwater	3	1								✓	✓	✓	✓	✓	✓	✓
003	D-3 20ft.	4/30/24 10am	Groundwater	3	1								✓	✓	✓	✓	✓	✓	✓
004	D-4 20ft.	4/30/24 2:45pm	Groundwater	3	1								✓	✓	✓	✓	✓	✓	✓
			Groundwater	3	1								✓	✓	✓	✓	✓	✓	✓
			Groundwater	3	1								✓	✓	✓	✓	✓	✓	✓
			Groundwater	3	1								✓	✓	✓	✓	✓	✓	✓
			Groundwater	3	1								✓	✓	✓	✓	✓	✓	✓
			Groundwater	3	1								✓	✓	✓	✓	✓	✓	✓
			Groundwater	3	1								✓	✓	✓	✓	✓	✓	✓
			Groundwater	3	1								✓	✓	✓	✓	✓	✓	✓

Relinquished By	Date/Time	Received By	Date/Time
Steven Van Hook	4/30/24 5:30pm	ASI Secure Storage	4/30/24 17:30
eurofins Custody Seal #1697609			
ASI Secure Storage cmg	5/2/24 7:40		5-2-24 0746
	5-2-24 1311	Mark Reed	5/2/24 1311

*The individual signing this agreement on behalf of the client, acknowledges that he/she has read and understands the terms and conditions of this agreement, and that he/she has the authority to sign on behalf of the client. See www.teklabinc.com for terms and conditions

Summit Environmental Technologies, Inc.
3310 Win St.
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TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

May 22, 2024

Shelly Hennessy
TEKLAB Inc,
5445 Horseshoe lake Road
Collinsville, IL 62234
TEL:
FAX:

RE: 24050236

Dear Shelly Hennessy:

Order No.: 24050483

Summit Environmental Technologies, Inc. received 4 sample(s) on 5/6/2024 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative.

Quality control data is within laboratory defined or method specified acceptance limits except where noted.

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

Sincerely,

Jennifer Woolf

Project Manager

3310 Win St.
Cuyahoga Falls, Ohio 44223

Arkansas 88-0735, California 2943, Colorado, Connecticut PH-0108, Florida NELAC E87688, Idaho OH00923, Illinois 200061, Indiana C-OH-13, ISO/IEC 17025:2017 119125 L22-544, Kansas E-10347, Kentucky (Underground Storage Tank) 3, Kentucky 90146, Maryland 339, Michigan 9988, Minnesota 1780279, Nevada OH009232020-1, New Hampshire 2996, New Jersey OH006, New York 11777, North Carolina 39705 and 631, North Dakota R-201, Ohio DW, Ohio VAP CL0052, Oklahoma 2019-155, Oregon OH200001, Pennsylvania 68-01335, Rhode Island LA000317, South Carolina 92016001, Texas T104704466-19-16, Utah OH009232020-12, Virginia VELAP 10381, West Virginia 9957C

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Case Narrative

WO#: **24050483**
Date: **5/22/2024**

CLIENT: TEKLAB Inc,
Project: 24050236

WorkOrder Narrative:
24050483: This report in its entirety consists of the following documents: Cover Letter, Case Narrative, Analytical Results, QC Summary Report, Applicable Accreditation Information, Chain-of-Custody, Cooler Receipt Form, and other applicable forms as necessary. All documents contain the Summit Environmental Technologies, Inc., Work Order Number assigned to this report.

Summit Environmental Technologies, Inc., holds the accreditations/certifications listed at the bottom of the cover letter that may or may not pertain to this report. Please refer to the "Accreditation Program Analytes Report" for accredited analytes list.

The information contained in this analytical report is the sole property of Summit Environmental Technologies, Inc. and that of the customer. It cannot be reproduced in any form without the consent of Summit Environmental Technologies, Inc. or the customer for which this report was issued. The results contained in this report are only representative of the samples received. Conditions can vary at different times and at different sampling conditions. Summit Environmental Technologies, Inc. is not responsible for use or interpretation of the data included herein.

All results for Solid Samples are reported on an "as received" or "wet weight" basis unless indicated as "dry weight" using the "-dry" designation on the reporting units.

This report is believed to meet all of the requirements of the accrediting agency, where applicable. Any comments or problems with the analytical events associated with this report are noted below.

Sample Fraction:
Per Chain of Custody note: Analyze Aqueous layer only.

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC
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Cuyahoga Falls, Ohio 4422
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Website: http://www.settek.co

Qualifiers and Acronyms

WO#: **24050483**
Date: **5/22/2024**

These commonly used Qualifiers and Acronyms may or may not be present in this report.

Qualifiers

U	The compound was analyzed for but was not detected above the MDL.
J	The reported value is greater than the Method Detection Limit but less than the Reporting Limit.
H	The hold time for sample preparation and/or analysis was exceeded. Not Clean Water Act compliant.
D	The result is reported from a dilution.
E	The result exceeded the linear range of the calibration or is estimated due to interference.
MC	The result is below the Minimum Compound Limit.
*****	The result exceeds the Regulatory Limit or Maximum Contamination Limit.
m	Manual integration was used to determine the area response.
d	Manual integration in which peak was deleted
N	The result is presumptive based on a Mass Spectral library search assuming a 1:1 response.
P	The second column confirmation exceeded 25% difference.
C	The result has been confirmed by GC/MS.
X	The result was not confirmed when GC/MS Analysis was performed.
B	The analyte was detected in the Method Blank at a concentration greater than the RL.
MB+	The analyte was detected in the Method Blank at a concentration greater than the MDL.
G	The ICB or CCB contained reportable amounts of analyte.
QC-/+	The CCV recovery failed low (-) or high (+).
R/QDR	The RPD was outside of accepted recovery limits.
QL-/+	The LCS or LCSD recovery failed low (-) or high (+).
QLR	The LCS/LCSD RPD was outside of accepted recovery limits.
QM-/+	The MS or MSD recovery failed low (-) or high (+).
QMR	The MS/MSD RPD was outside of accepted recovery limits.
QV-/+	The ICV recovery failed low (-) or high (+).
S	The spike result was outside of accepted recovery limits.
W	Samples were received outside temperature limits (0° – 6° C). Not Clean Water Act compliant.
Z	Deviation; A deviation from the method was performed; Please refer to the Case Narrative for additional information

Acronyms

ND	Not Detected	**RL**	Reporting Limit
QC	Quality Control	**MDL**	Method Detection Limit
MB	Method Blank	**LOD**	Level of Detection
LCS	Laboratory Control Sample	**LOQ**	Level of Quantitation
LCSD	Laboratory Control Sample Duplicate	**PQL**	Practical Quantitation Limit
QCS	Quality Control Sample	**CRQL**	Contract Required Quantitation Limit
DUP	Duplicate	**PL**	Permit Limit
MS	Matrix Spike	**RegLvl**	Regulatory Limit
MSD	Matrix Spike Duplicate	**MCL**	Maximum Contamination Limit
RPD	Relative Percent Different	**MinCL**	Minimum Compound Limit
ICV	Initial Calibration Verification	**RA**	Reanalysis
ICB	Initial Calibration Blank	**RE**	Reextraction
CCV	Continuing Calibration Verification	**TIC**	Tentatively Identified Compound
CCB	Continuing Calibration Blank	**RT**	Retention Time
RLC	Reporting Limit Check	**CF**	Calibration Factor

This list of Qualifiers and Acronyms reflects the most commonly utilized Qualifiers and Acronyms for reporting. Please refer to the Analytical Notes in the Case Narrative for any Qualifiers or Acronyms that do not appear in this list or for additional information regarding the use of these Qualifiers on reported data.

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Website: http://www.settek.com

Workorder Sample Summary

WO#: **24050483**
22-May-24

CLIENT: TEKLAB Inc,
Project: 24050236

Lab SampleID	Client Sample ID	Tag No	Date Collected	Date Received	Matrix
24050483-001	24050236-001		4/29/2024 9:30:00 AM	5/6/2024 10:00:00 AM	Non-Potable Water
24050483-002	24050236-002		4/29/2024 3:00:00 PM	5/6/2024 10:00:00 AM	Non-Potable Water
24050483-003	24050236-003		4/30/2024 10:00:00 AM	5/6/2024 10:00:00 AM	Non-Potable Water
24050483-004	24050236-004		4/30/2024 2:45:00 PM	5/6/2024 10:00:00 AM	Non-Potable Water

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DATES REPORT

WO#: **24050483**

22-May-24

Client: TEKLAB Inc,

Project: 24050236

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
24050483-001A	24050236-001	4/29/2024 9:30:00 AM	Non-Potable Water	Radium-226 (EPA 903.0)		5/9/2024 12:47:56 PM	5/21/2024 10:28:00 AM
				Radium-228 (EPA 904.0)		5/9/2024 12:47:56 PM	5/20/2024 3:04:00 PM
24050483-002A	24050236-002	4/29/2024 3:00:00 PM		Radium-226 (EPA 903.0)		5/9/2024 12:47:56 PM	5/21/2024 10:28:00 AM
				Radium-228 (EPA 904.0)		5/9/2024 12:47:56 PM	5/20/2024 3:04:00 PM
24050483-003A	24050236-003	4/30/2024 10:00:00 AM		Radium-226 (EPA 903.0)		5/9/2024 12:47:56 PM	5/21/2024 10:28:00 AM
				Radium-228 (EPA 904.0)		5/9/2024 12:47:56 PM	5/20/2024 3:04:00 PM
24050483-004A	24050236-004	4/30/2024 2:45:00 PM		Radium-226 (EPA 903.0)		5/9/2024 12:47:56 PM	5/21/2024 10:28:00 AM
				Radium-228 (EPA 904.0)		5/9/2024 12:47:56 PM	5/20/2024 3:04:00 PM

Original

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
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Analytical Report

(consolidated)

WO#: **24050483**

Date Reported: **5/22/2024**

CLIENT: TEKLAB Inc,

Collection Date: 4/29/2024 9:30:00 AM

Project: 24050236

Lab ID: 24050483-001

Matrix: NON-POTABLE WATER

Client Sample ID: 24050236-001

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **DHF**
Radium-226	4.63	1.67		pCi/L	± 0.590	1	5/21/2024 10:28:00 AM
Yield	1.00					1	5/21/2024 10:28:00 AM
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **DHF**
Radium-228	2.18	1.67		pCi/L	± 0.800	1	5/20/2024 3:04:00 PM
Yield	1.00					1	5/20/2024 3:04:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode		

Original

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Analytical Report

(consolidated)

WO#: **24050483**

Date Reported: **5/22/2024**

CLIENT: TEKLAB Inc,

Collection Date: 4/29/2024 3:00:00 PM

Project: 24050236

Lab ID: 24050483-002

Matrix: NON-POTABLE WATER

Client Sample ID: 24050236-002

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **DHF**
Radium-226	ND	1.43		pCi/L	± 0.250	1	5/21/2024 10:28:00 AM
Yield	1.00					1	5/21/2024 10:28:00 AM
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **DHF**
Radium-228	ND	1.43		pCi/L	± 0.570	1	5/20/2024 3:04:00 PM
Yield	1.00					1	5/20/2024 3:04:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected
R	RPD outside accepted recovery limits
W	Sample container temperature is out of limit as specified at testcode
M	Manual Integration used to determine area response
PL	Permit Limit
RL	Reporting Detection Limit

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Analytical Report

(consolidated)

WO#: **24050483**

Date Reported: **5/22/2024**

CLIENT: TEKLAB Inc,

Collection Date: 4/30/2024 10:00:00 AM

Project: 24050236

Lab ID: 24050483-003

Matrix: NON-POTABLE WATER

Client Sample ID: 24050236-003

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **DHF**
Radium-226	ND	2.50		pCi/L	± 0.470	1	5/21/2024 10:28:00 AM
Yield	1.00					1	5/21/2024 10:28:00 AM
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **DHF**
Radium-228	ND	2.50		pCi/L	± 0.800	1	5/20/2024 3:04:00 PM
Yield	1.00					1	5/20/2024 3:04:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected
R	RPD outside accepted recovery limits
W	Sample container temperature is out of limit as specified at testcode
M	Manual Integration used to determine area response
PL	Permit Limit
RL	Reporting Detection Limit

Original

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Analytical Report

(consolidated)

WO#: **24050483**

Date Reported: **5/22/2024**

CLIENT: TEKLAB Inc,

Collection Date: 4/30/2024 2:45:00 PM

Project: 24050236

Lab ID: 24050483-004

Matrix: NON-POTABLE WATER

Client Sample ID: 24050236-004

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **DHF**
Radium-226	ND	3.34		pCi/L	± 0.580	1	5/21/2024 10:28:00 AM
Yield	1.00					1	5/21/2024 10:28:00 AM
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **DHF**
Radium-228	ND	3.34		pCi/L	± 1.24	1	5/20/2024 3:04:00 PM
Yield	1.00					1	5/20/2024 3:04:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
ND	Not Detected	PL	Permit Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode		

Original

Summit Environmental Technologies, Inc.
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Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **24050483**

22-May-24

Client: TEKLAB Inc,
Project: 24050236 **BatchID:** **75217**

Sample ID: **24050495-001ADUP** SampType: **DUP** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **5/9/2024** RunNo: **185962**
Client ID: **BatchQC** Batch ID: **75217** TestNo: **E904.0** **E903-904** Analysis Date: **5/20/2024** SeqNo: **5040011**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	1.00		0	0			0	0	30	R
Yield	1.00			0	0			1.000	0		

Sample ID: **24050495-002ADUP** SampType: **DUP** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **5/9/2024** RunNo: **185962**
Client ID: **BatchQC** Batch ID: **75217** TestNo: **E904.0** **E903-904** Analysis Date: **5/20/2024** SeqNo: **5040013**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	1.00		0	0			0	0	30	R
Yield	1.00			0	0			1.000	0		

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode				

Original

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QC SUMMARY REPORT

WO#: **24050483**

22-May-24

Client: TEKLAB Inc,
Project: 24050236 **BatchID:** **75217**

Sample ID: **MB-75217**	SampType: **MBLK**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **5/9/2024**	RunNo: **185962**
Client ID: **PBW**	Batch ID: **75217**	TestNo: **E904.0**	**E903-904**	Analysis Date: **5/20/2024**	SeqNo: **5040004**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	1.00		0	0						
Yield	1.00			0	0						

Sample ID: **LCS-75217**	SampType: **LCS**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **5/9/2024**	RunNo: **185962**
Client ID: **LCSW**	Batch ID: **75217**	TestNo: **E904.0**	**E903-904**	Analysis Date: **5/20/2024**	SeqNo: **5040005**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	3.36	1.00	5.000	0	67.2	50	130				QLR
Yield	1.00			0	0						

Sample ID: **LCSD-75217**	SampType: **LCSD**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **5/9/2024**	RunNo: **185962**
Client ID: **LCSS02**	Batch ID: **75217**	TestNo: **E904.0**	**E903-904**	Analysis Date: **5/20/2024**	SeqNo: **5040006**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	5.00	1.00	5.000	0	100	50	130	3.360	39.2	20	R
Yield	0.960			0	0			1.000	4.08		

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode				

Original

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC
Analytical Laboratories

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **24050483**

22-May-24

Client: TEKLAB Inc,
Project: 24050236 **BatchID:** **75217**

Sample ID: **RLC-75217** SampType: **RLC** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **5/9/2024** RunNo: **185962**
Client ID: **BatchQC** Batch ID: **75217** TestNo: **E904.0** **E903-904** Analysis Date: **5/20/2024** SeqNo: **5040008**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	1.14	1.00	1.000	0	114	50	150				
Yield	1.00			0	0						

Sample ID: **RLCD-75217** SampType: **RLC** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **5/9/2024** RunNo: **185962**
Client ID: **BatchQC** Batch ID: **75217** TestNo: **E904.0** **E903-904** Analysis Date: **5/20/2024** SeqNo: **5040009**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	1.00	1.000	0	87.0	50	150				
Yield	1.00			0	0						

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode				

Original

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Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **24050483**

22-May-24

Client: TEKLAB Inc,
Project: 24050236 **BatchID:** **75217**

Sample ID: **24050495-001ADUP** SampType: **DUP** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **5/9/2024** RunNo: **185975**
Client ID: **BatchQC** Batch ID: **75217** TestNo: **E903.0** **E903-904** Analysis Date: **5/21/2024** SeqNo: **5040150**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00						0	0	30	
Yield	1.00							1.000	0	0	

Sample ID: **24050495-002ADUP** SampType: **DUP** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **5/9/2024** RunNo: **185975**
Client ID: **BatchQC** Batch ID: **75217** TestNo: **E903.0** **E903-904** Analysis Date: **5/21/2024** SeqNo: **5040152**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00						0	0	30	
Yield	1.00							1.000	0	0	

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode				

Original

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Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **24050483**

22-May-24

Client: TEKLAB Inc,
Project: 24050236 **BatchID:** **75217**

Sample ID: **MB-75217**	SampType: **MBLK**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **5/9/2024**	RunNo: **185975**
Client ID: **PBW**	Batch ID: **75217**	TestNo: **E903.0**	**E903-904**	Analysis Date: **5/21/2024**	SeqNo: **5040143**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00									
Yield	0.980										

Sample ID: **LCS-75217**	SampType: **LCS**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **5/9/2024**	RunNo: **185975**
Client ID: **LCSW**	Batch ID: **75217**	TestNo: **E903.0**	**E903-904**	Analysis Date: **5/21/2024**	SeqNo: **5040144**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	4.38	1.00	5.000	0	87.6	70	130				

Sample ID: **LCSD-75217**	SampType: **LCSD**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **5/9/2024**	RunNo: **185975**
Client ID: **LCSS02**	Batch ID: **75217**	TestNo: **E903.0**	**E903-904**	Analysis Date: **5/21/2024**	SeqNo: **5040145**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	4.67	1.00	5.000	0	93.4	70	130	4.380	6.41	20	

Sample ID: **RLC-75217**	SampType: **RLC**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **5/9/2024**	RunNo: **185975**
Client ID: **BatchQC**	Batch ID: **75217**	TestNo: **E903.0**	**E903-904**	Analysis Date: **5/21/2024**	SeqNo: **5040147**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode				

Original

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **24050483**

22-May-24

Client: TEKLAB Inc,
Project: 24050236 **BatchID:** **75217**

Sample ID: **RLC-75217**	SampType: **RLC**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **5/9/2024**	RunNo: **185975**
Client ID: **BatchQC**	Batch ID: **75217**	TestNo: **E903.0**	**E903-904**	Analysis Date: **5/21/2024**	SeqNo: **5040147**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00	1.000	0	95.0	50	150				

Sample ID: **RLCD-75217**	SampType: **RLC**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **5/9/2024**	RunNo: **185975**
Client ID: **BatchQC**	Batch ID: **75217**	TestNo: **E903.0**	**E903-904**	Analysis Date: **5/21/2024**	SeqNo: **5040148**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00	1.000	0	99.0	50	150				

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode				

Original

Pg __ of 24050483

TEKLAB, INC. Chain of Custody

5445 Horseshoe Lake Road, Collinsville, IL 62234 Phone (618) 344-1004 Fax (618) 344-1005

Are the samples chilled? YES ☐ NO ☑ With: ☐ Ice ☐ Blue Ice Preserved in: ☐ Lab ☐ Field

Teklab Inc
5445 Horseshoe Lake Road
Collinsville, IL 62234

Cooler Temp: 19.5 19.7 0.2 Sampler: Client QC Level: 2

Fedex, Cooler

Project# 24050236

Comments: **Please Issue reports and invoices via email only**
Please analyze for Radium 226/228 per your usual methods.
Any changes to analysis/methods must be approved by Teklab, Inc. Batch QC is required.
Samples collected from an IL site. Analyze aqueous layers only.

Contact: Shelly Hennessy Email: shennessy@TekLabInc.com
Requested Due Date: Standard TAT Billing/PO: 36223 Phone: (618) 344-1004 ext. 36

PLEASE NOTE:

NELAP accreditation is required on the requested analytes and must be documented as such on the final report. If your laboratory does not currently hold a NELAP accreditation for the requested method and/or analytes, please contact Teklab immediately. If your laboratory loses accreditation or is suspended for any analyte/method during the life of the contract, you must contact Teklab immediately.

Lab Use	Sample ID	Sample Date/Time	Preservative	Matrix	Radium 226/228	CAM					PH					
	24050236-001	4/29/24 0930	HNO3	Groundwater	✔	42, 22					1,3					
	24050236-002	4/29/24 1500	HNO3	Groundwater	✔	34, 38					1,2					
	24050236-003	4/30/24 1000	HNO3	Groundwater	✔	16, ~~5~~ TR 5/7/24					4,					
	24050236-004	4/30/24 1445	HNO3	Groundwater	✔	34, 32					4,5					
			Other	Aqueous												
			Other	Aqueous												
			Other	Aqueous												
			Other	Aqueous												
			Other	Aqueous												
			Other	Aqueous												
			Other	Aqueous												

*Relinquished By	Date/Time	Received By	Date/Time
[illegible]	5/2/24 1700	[illegible]	5/6/24 1000

One container - 003 arrived broken

Teklab maintains a strict policy of client confidentiality and as such does not provide client/sample information without proper authorization. and proprietary rights, Teklab, Inc. protects clients' confidential information as directed by local, state or federal laws. (Teklab QAM Section 9.1, TNI V1 M2 Section 4.1.5 c)

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Analytical Laboratories

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Website: http://www.settek.com

Sample Log-In Check List

Client Name: TEK-IL-62234-A Work Order Number: 24050483 RcptNo: 1

Logged by:	Tegan A. Richards	5/6/2024 10:00:00 AM	Tegan Richards
Completed By:	Tegan A. Richards	5/7/2024 5:18:50 PM	Tegan Richards
Reviewed By:	Jennifer Woolf	5/8/2024 10:44:21 AM	Jennifer Woolf

Chain of Custody

1. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
2. How was the sample delivered? FedEx

Log In

3. Coolers are present? Yes ☑ No ☐ NA ☐
4. Shipping container/cooler in good condition? Yes ☑ No ☐
   Custody seals intact on shipping container/cooler? Yes ☐ No ☐ Not Present ☑
   No. Seal Date: Signed By:
5. Was an attempt made to cool the samples? Yes ☐ No ☑ NA ☐
6. Were all samples received at a temperature of >0° C to 6.0°C Yes ☐ No ☑ NA ☐
   Not required
7. Sample(s) in proper container(s)? Yes ☑ No ☐
8. Sufficient sample volume for indicated test(s)? Yes ☐ No ☑
9. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
10. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
11. Is the headspace in the VOA vials less than 1/4 inch or 6 mm? Yes ☐ No ☐ No VOA Vials ☑
12. Were any sample containers received broken? Yes ☑ No ☐
13. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes ☑ No ☐
14. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
15. Is it clear what analyses were requested? Yes ☑ No ☐
16. Were all holding times able to be met? (If no, notify customer for authorization.) Yes ☑ No ☐

Special Handling (if applicable)

17. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:
By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:
Client Instructions:

18. Additional remarks:

pH for all but 2 containers >2, one container -003 received broken

Cooler Information

Cooler No	Temp ºC	Condition	Seal Intact	Seal No	Seal Date	Signed By

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Sample Log-In Check List

Client Name: TEK-IL-62234-A Work Order Number: 24050483 RcptNo: 1

May 23, 2024

Eric Staley
City Water, Light & Power
3100 Stevenson Drive
2nd Floor Maintenance Building
Springfield, IL 62712
TEL: (217) 757-8610
FAX: (217) 757-8615

Illinois	100226
Illinois	1004652024-2
Kansas	E-10374
Louisiana	05002
Louisiana	05003
Oklahoma	9978

RE: CWLP Borings **WorkOrder:** 24050347

Dear Eric Staley:

TEKLAB, INC received 3 samples on 5/3/2024 1:50:00 PM for the analysis presented in the following report.

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

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

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

Sincerely,

Shelly A Hennessy

Shelly A. Hennessy
Project Manager
(618)344-1004 ex 36
SHennessy@teklabinc.com

Report Contents

Client: City Water, Light & Power
Client Project: CWLP Borings

Work Order: 24050347
Report Date: 23-May-24

This reporting package includes the following:

Cover Letter	1
Report Contents	2
Definitions	3
Case Narrative	5
Accreditations	6
Laboratory Results	7
Receiving Check List	10
Chain of Custody	Appended

Client: City Water, Light & Power **Work Order:** 24050347

Client Project: CWLP Borings **Report Date:** 23-May-24

Abbr Definition

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

Definitions

Client: City Water, Light & Power
Work Order: 24050347
Client Project: CWLP Borings
Report Date: 23-May-24

Qualifiers

- # - Unknown hydrocarbon
- B - Analyte detected in associated Method Blank
- C - RL shown is a Client Requested Quantitation Limit
- E - Value above quantitation range
- H - Holding times exceeded
- I - Associated internal standard was outside method criteria
- J - Analyte detected below quantitation limits
- M - Manual Integration used to determine area response
- ND - Not Detected at the Reporting Limit
- R - RPD outside accepted recovery limits
- S - Spike Recovery outside recovery limits
- T - TIC(Tentatively identified compound)
- X - Value exceeds Maximum Contaminant Level

Case Narrative

http://www.teklabinc.com/

Client: City Water, Light & Power
Work Order: 24050347
Client Project: CWLP Borings
Report Date: 23-May-24

Cooler Receipt Temp: 3.7 °C

Radium-226 and Radium-228 analysis was performed by Summit Environmental Technologies, Inc. See attached report for results.

Locations

Collinsville

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

Springfield

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

Kansas City

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

Collinsville Air

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

Chicago

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

Client: City Water, Light & Power

Work Order: 24050347

Client Project: CWLP Borings

Report Date: 23-May-24

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2025	Collinsville
Illinois	IEPA	1004652024-2	NELAP	4/30/2025	Collinsville
Kansas	KDHE	E-10374	NELAP	4/30/2025	Collinsville
Louisiana	LDEQ	05002	NELAP	6/30/2024	Collinsville
Louisiana	LDEQ	05003	NELAP	6/30/2024	Collinsville
Oklahoma	ODEQ	9978	NELAP	8/31/2024	Collinsville
Arkansas	ADEQ	88-0966		3/14/2025	Collinsville
Illinois	IDPH	17584		5/31/2025	Collinsville
Iowa	IDNR	430		6/1/2026	Collinsville
Kentucky	UST	0073		1/31/2025	Collinsville
Mississippi	MSDH			4/30/2025	Collinsville
Missouri	MDNR	930		1/31/2025	Collinsville
Missouri	MDNR	00930		10/31/2026	Collinsville

Client: City Water, Light & Power
Work Order: 24050347
Client Project: CWLP Borings
Report Date: 23-May-24
Lab ID: 24050347-001
Client Sample ID: L4 18ft.
Matrix: GROUNDWATER
Collection Date: 05/02/2024 8:40

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 9036 (TOTAL)									
Sulfate	NELAP	307	500		**1050**	mg/L	50	05/09/2024 11:21	R347057
SW-846 9040B, LABORATORY ANALYZED									
Lab pH	NELAP	0	1.00	H	**7.35**		1	05/06/2024 14:09	R346778
SW-846 9214 (TOTAL)									
Fluoride	NELAP	0.04	0.10		**1.19**	mg/L	1	05/10/2024 14:31	R347102
SW-846 9251 (TOTAL)									
Chloride	NELAP	5	40		**154**	mg/L	10	05/07/2024 19:05	R346935
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)									
Antimony	NELAP	0.0004	0.0010		**0.0020**	mg/L	5	05/16/2024 10:42	222862
Arsenic	NELAP	0.0004	0.0010		**0.0512**	mg/L	5	05/08/2024 20:10	222470
Barium	NELAP	0.0008	0.0010		**0.308**	mg/L	5	05/08/2024 20:10	222470
Beryllium	NELAP	0.0002	0.0010		**0.0024**	mg/L	5	05/08/2024 20:10	222470
Boron	NELAP	0.0092	0.0250		**2.15**	mg/L	5	05/08/2024 20:10	222470
Cadmium	NELAP	0.0002	0.0010		**0.0019**	mg/L	5	05/14/2024 4:27	222470
Chromium	NELAP	0.0009	0.0015		**0.0632**	mg/L	5	05/08/2024 20:10	222470
Cobalt	NELAP	0.0002	0.0010		**0.0213**	mg/L	5	05/08/2024 20:10	222470
Lead	NELAP	0.0006	0.0010		**0.0526**	mg/L	5	05/15/2024 14:55	222862
Lithium	*	0.0015	0.0030		**0.0288**	mg/L	5	05/08/2024 20:10	222470
Molybdenum	NELAP	0.0006	0.0015		**0.0218**	mg/L	5	05/10/2024 18:38	222470
Selenium	NELAP	0.0006	0.0010		**0.0066**	mg/L	5	05/08/2024 20:10	222470
Thallium	NELAP	0.0010	0.0020	J	**0.0012**	mg/L	5	05/08/2024 20:10	222470
SW-846 7470A (TOTAL)									
Mercury	NELAP	0.00006	0.00020		**0.00050**	mg/L	1	05/20/2024 14:24	223152
EPA 903.0/904.0, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pci/L	1	05/20/2024 0:00	R347715
Radium-228	*	0	0		**See Attached**	pci/L	1	05/20/2024 0:00	R347715

Client: City Water, Light & Power **Work Order:** 24050347

Client Project: CWLP Borings **Report Date:** 23-May-24

Lab ID: 24050347-002 **Client Sample ID:** L3-20ft.

Matrix: GROUNDWATER **Collection Date:** 05/02/2024 10:15

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 9036 (TOTAL)									
Sulfate	NELAP	614	1000		**2660**	mg/L	100	05/10/2024 12:35	R347112
SW-846 9040B, LABORATORY ANALYZED									
Lab pH	NELAP	0	1.00	H	**8.10**		1	05/06/2024 14:10	R346778
SW-846 9214 (TOTAL)									
Fluoride	NELAP	0.04	0.10		**1.07**	mg/L	1	05/10/2024 10:26	R347102
SW-846 9251 (TOTAL)									
Chloride	NELAP	5	40		**269**	mg/L	10	05/07/2024 19:26	R346935
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)									
Antimony	NELAP	0.0180	0.0400	B	**0.0655**	mg/L	200	05/14/2024 15:36	222470
Arsenic	NELAP	0.0080	0.0200		**2.43**	mg/L	100	05/10/2024 19:03	222470
Barium	NELAP	0.0140	0.0200		**1.49**	mg/L	100	05/10/2024 19:03	222470
Beryllium	NELAP	0.0050	0.0200		**0.102**	mg/L	100	05/14/2024 4:33	222470
Boron	NELAP	0.370	1.00		**25.8**	mg/L	200	05/14/2024 15:36	222470
Cadmium	NELAP	0.0060	0.0400		**0.260**	mg/L	200	05/17/2024 13:03	222470
Chromium	NELAP	0.0280	0.0600		**2.08**	mg/L	200	05/17/2024 13:03	222470
Cobalt	NELAP	0.0046	0.0400		**0.336**	mg/L	200	05/17/2024 13:03	222470
Lead	NELAP	0.0120	0.0200	B	**3.40**	mg/L	100	05/10/2024 19:03	222470
Lithium	*	0.0290	0.0600		**0.621**	mg/L	100	05/14/2024 4:33	222470
Molybdenum	NELAP	0.0240	0.0600		**0.218**	mg/L	200	05/17/2024 13:03	222470
Selenium	NELAP	0.0120	0.0200		**0.158**	mg/L	100	05/10/2024 19:03	222470
Thallium	NELAP	0.0190	0.0400		**0.0433**	mg/L	100	05/10/2024 19:03	222470
Sample result for Sb exceed 10 times the method blank contamination. Data is reportable per the TNI Standard.									
Sample result for Pb exceed 10 times the method blank contamination. Data is reportable per the TNI Standard.									
SW-846 7470A (TOTAL)									
Mercury	NELAP	0.00006	0.00020		**0.00926**	mg/L	1	05/20/2024 15:07	223152
EPA 903.0/904.0, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pci/L	1	05/20/2024 0:00	R347715
Radium-228	*	0	0		**See Attached**	pci/L	1	05/20/2024 0:00	R347715

Client: City Water, Light & Power **Work Order:** 24050347

Client Project: CWLP Borings **Report Date:** 23-May-24

Lab ID: 24050347-003 **Client Sample ID:** L1-20ft.

Matrix: GROUNDWATER **Collection Date:** 05/02/2024 14:50

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 9036 (TOTAL)									
Sulfate	NELAP	307	500		**1080**	mg/L	50	05/09/2024 11:29	R347057
SW-846 9040B, LABORATORY ANALYZED									
Lab pH	NELAP	0	1.00	H	**7.86**		1	05/06/2024 14:12	R346778
SW-846 9214 (TOTAL)									
Fluoride	NELAP	0.04	0.10		**0.50**	mg/L	1	05/10/2024 10:28	R347102
SW-846 9251 (TOTAL)									
Chloride	NELAP	5	40		**122**	mg/L	10	05/07/2024 19:34	R346935
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)									
Antimony	NELAP	0.018	0.040	BJ	**0.027**	mg/L	200	05/14/2024 15:42	222470
Arsenic	NELAP	0.0080	0.0200		**0.717**	mg/L	100	05/10/2024 19:09	222470
Barium	NELAP	0.0140	0.0200		**3.48**	mg/L	100	05/10/2024 19:09	222470
Beryllium	NELAP	0.0050	0.0200		**0.0542**	mg/L	100	05/14/2024 4:39	222470
Boron	NELAP	0.370	1.00		**4.91**	mg/L	200	05/14/2024 15:42	222470
Cadmium	NELAP	0.0060	0.0400		**0.0776**	mg/L	200	05/14/2024 15:42	222470
Chromium	NELAP	0.0280	0.0600		**0.993**	mg/L	200	05/14/2024 15:42	222470
Cobalt	NELAP	0.0046	0.0400		**0.154**	mg/L	200	05/14/2024 15:42	222470
Lead	NELAP	0.0120	0.0200	B	**0.655**	mg/L	100	05/10/2024 19:09	222470
Lithium	*	0.0290	0.0600		**0.172**	mg/L	100	05/14/2024 4:39	222470
Molybdenum	NELAP	0.0120	0.0300		**0.161**	mg/L	100	05/17/2024 12:28	222470
Selenium	NELAP	0.0120	0.0200		**0.0906**	mg/L	100	05/10/2024 19:09	222470
Thallium	NELAP	0.0190	0.0400		**< 0.0400**	mg/L	100	05/10/2024 19:09	222470

Elevated reporting limit for Sb & Tl due to matrix interference.

Contamination present in the MBLK for Sb. Sample results below the reporting limit are reportable per the TNI Standard.

Sample result for Pb exceed 10 times the method blank contamination. Data is reportable per the TNI Standard.

SW-846 7470A (TOTAL)									
Mercury	NELAP	0.00006	0.00020		**0.00198**	mg/L	1	05/20/2024 15:09	223152
EPA 903.0/904.0, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pci/L	1	05/20/2024 0:00	R347715
Radium-228	*	0	0		**See Attached**	pci/L	1	05/20/2024 0:00	R347715

Receiving Check List

http://www.teklabinc.com/

Client: City Water, Light & Power
Client Project: CWLP Borings

Work Order: 24050347
Report Date: 23-May-24

Carrier: Paul Reeves
Received By: LM

Completed by: Amber Dilallo
On: 03-May-24

Reviewed by: Ellie Hopkins
On: 03-May-24

Pages to follow: Chain of custody 1 Extra pages included 15

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	Temp °C 3.7
Type of thermal preservation?	None ☐	Ice ☑	Blue Ice ☐	Dry Ice ☐
Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☐	No ☑		
Reported field parameters measured:	Field ☐	Lab ☑	NA ☐	

Sample analyses to be measured in the field and/or within 15 minutes of collection were analyzed in the lab as soon as practicable. These analyses include Chlorine (demand, free and/or residual), Carbon Dioxide, Dissolved Oxygen, Ferrous Iron, pH, and Sulfite.

Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Water – at least one vial per sample has zero headspace?	Yes ☐	No ☐	No VOA vials ☑
Water - TOX containers have zero headspace?	Yes ☐	No ☐	No TOX containers ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☑	NA ☐
NPDES/CWA TCN interferences checked/treated in the field?	Yes ☐	No ☐	NA ☑

When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.

Any No responses must be detailed below or on the COC.

pH strip #96651. - amberdilallo - 5/3/2024 2:40:59 PM

Samples were preserved with Nitric Acid (97606) upon arrival at the laboratory. - amberdilallo - 5/3/2024 2:47:30 PM

Print PDF

CHAIN OF CUSTODY

Pg __ of __ Workorder # 24050347

TEKLAB INC, 5445 Horseshoe Lake Road, Collinsville, IL 62234 Phone (618) 344-1004 Fax (618) 344-1005

Client: City, Water, Light & Power
Address: 3100 Stevenson Dr.
City/State/Zip: Springfield, IL 62712
Contact: Colleen Grey Phone: 217-787-2334
Email: cgrey@andrews-eng.com Fax:

Samples on: [X] ICE [ ] BLUE ICE [ ] NO ICE 3.2 °C #7
Preserved in: [X] LAB [ ] FIELD FOR LAB USE ONLY
LAB NOTES: Added HNO_3 (97606) 96517

Client Comments:
email results to C. Grey and datamanagement@andrews-eng.com

TEKLAB
Courier

Are these samples known to be involved in litigation? If yes, a surcharge will apply: [ ] Yes [ ] No
Are these samples known to be hazardous? [ ] Yes [ ] No
Are there any required reporting limits to be met on the requested analysis?. If yes, please provide limits in the comment section: [ ] Yes [ ] No

PROJECT NAME/NUMBER	SAMPLE COLLECTOR'S NAME
CWLP Borings	S. Van Hook

RESULTS REQUESTED
[✓] Standard [ ] 1-2 Day (100% Surcharge)
[ ] Other _____ [ ] 3 Day (50% Surcharge)

BILLING INSTRUCTIONS

Lab Use Only	Sample ID	Date/Time Sampled	Matrix	# and Type of Containers									INDICATE ANALYSIS REQUESTED													
				UNP	HNO3	NaOH	H2SO4	HCL	MeOH	NaHSO4	TSP	Other	Rad 226 and 228	Sb, As, Ba, Be	B, Cd, Cr, Co, Pb, Se, Tl	Li, Mo	Hg	Cl, F+, SO4	pH							
24050347 001	L4 18ft.	5/2/24 8:40am	Groundwater	3	1								✓	✓	✓	✓	✓	✓	✓							
002	L3-20ft	5/2/24 10:15am	Groundwater	3	1								✓	✓	✓	✓	✓	✓	✓							
003	L1-20ft	5/2/24 2:50pm	Groundwater	3	1								✓	✓	✓	✓	✓	✓	✓							
			Groundwater	3	1								✓	✓	✓	✓	✓	✓	✓							
			Groundwater	3	1								✓	✓	✓	✓	✓	✓	✓							
			Groundwater	3	1																					
			Groundwater	3	1																					
			Groundwater	3	1																					
			Groundwater	3	1																					
			Groundwater	3	1																					

Relinquished By	Date/Time	Received By	Date/Time
	5/2/24 7:00pm	AEI Secure Storage	5/2/24 19:00
AEI Secure Storage	5/3/24 07:28		5.3.24 0728
	5.3.24 1350		5/3/24 1350

*The individual signing this agreement on behalf of the client, acknowledges that he/she has read and understands the terms and conditions of this agreement, and that he/she has the authority to sign on behalf of the client. See www.teklabinc.com for terms and conditions

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

May 22, 2024

Shelly Hennessy
TEKLAB Inc,
5445 Horseshoe lake Road
Collinsville, IL 62234
TEL:
FAX:

RE: 24050347

Dear Shelly Hennessy:

Order No.: 24050485

Summit Environmental Technologies, Inc. received 3 sample(s) on 5/7/2024 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative.

Quality control data is within laboratory defined or method specified acceptance limits except where noted.

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

Sincerely,

Jennifer Woolf

Project Manager

3310 Win St.
Cuyahoga Falls, Ohio 44223

Arkansas 88-0735, California 2943, Colorado, Connecticut PH-0108, Florida NELAC E87688, Idaho OH00923, Illinois 200061, Indiana C-OH-13, ISO/IEC 17025:2017 119125 L22-544, Kansas E-10347, Kentucky (Underground Storage Tank) 3, Kentucky 90146, Maryland 339, Michigan 9988, Minnesota 1780279, Nevada OH009232020-1, New Hampshire 2996, New Jersey OH006, New York 11777, North Carolina 39705 and 631, North Dakota R-201, Ohio DW, Ohio VAP CL0052, Oklahoma 2019-155, Oregon OH200001, Pennsylvania 68-01335, Rhode Island LA000317, South Carolina 92016001, Texas T104704466-19-16, Utah OH009232020-12, Virginia VELAP 10381, West Virginia 9957C

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

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Website: http://www.settek.com

Case Narrative

WO#: **24050485**
Date: **5/22/2024**

CLIENT: TEKLAB Inc,
Project: 24050347

WorkOrder Narrative:
24050485: This report in its entirety consists of the following documents: Cover Letter, Case Narrative, Analytical Results, QC Summary Report, Applicable Accreditation Information, Chain-of-Custody, Cooler Receipt Form, and other applicable forms as necessary. All documents contain the Summit Environmental Technologies, Inc., Work Order Number assigned to this report.

Summit Environmental Technologies, Inc., holds the accreditations/certifications listed at the bottom of the cover letter that may or may not pertain to this report. Please refer to the "Accreditation Program Analytes Report" for accredited analytes list.

The information contained in this analytical report is the sole property of Summit Environmental Technologies, Inc. and that of the customer. It cannot be reproduced in any form without the consent of Summit Environmental Technologies, Inc. or the customer for which this report was issued. The results contained in this report are only representative of the samples received. Conditions can vary at different times and at different sampling conditions. Summit Environmental Technologies, Inc. is not responsible for use or interpretation of the data included herein.

All results for Solid Samples are reported on an "as received" or "wet weight" basis unless indicated as "dry weight" using the "-dry" designation on the reporting units.

This report is believed to meet all of the requirements of the accrediting agency, where applicable. Any comments or problems with the analytical events associated with this report are noted below.

Analytical Sequence QC Notes:
LCS/LCSD-75217 Radium-228_DW(904.0): LCS and LCSD exhibited a high RPD, individually each LCS/LCSD meets the required criteria.

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC
Analytical Laboratories

Summit Environmental Technologies, In
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Website: http://www.settek.co

Qualifiers and Acronyms

WO#: **24050485**
Date: **5/22/2024**

These commonly used Qualifiers and Acronyms may or may not be present in this report.

Qualifiers

U	The compound was analyzed for but was not detected above the MDL.
J	The reported value is greater than the Method Detection Limit but less than the Reporting Limit.
H	The hold time for sample preparation and/or analysis was exceeded. Not Clean Water Act compliant.
D	The result is reported from a dilution.
E	The result exceeded the linear range of the calibration or is estimated due to interference.
MC	The result is below the Minimum Compound Limit.
*****	The result exceeds the Regulatory Limit or Maximum Contamination Limit.
m	Manual integration was used to determine the area response.
d	Manual integration in which peak was deleted
N	The result is presumptive based on a Mass Spectral library search assuming a 1:1 response.
P	The second column confirmation exceeded 25% difference.
C	The result has been confirmed by GC/MS.
X	The result was not confirmed when GC/MS Analysis was performed.
B	The analyte was detected in the Method Blank at a concentration greater than the RL.
MB+	The analyte was detected in the Method Blank at a concentration greater than the MDL.
G	The ICB or CCB contained reportable amounts of analyte.
QC-/+	The CCV recovery failed low (-) or high (+).
R/QDR	The RPD was outside of accepted recovery limits.
QL-/+	The LCS or LCSD recovery failed low (-) or high (+).
QLR	The LCS/LCSD RPD was outside of accepted recovery limits.
QM-/+	The MS or MSD recovery failed low (-) or high (+).
QMR	The MS/MSD RPD was outside of accepted recovery limits.
QV-/+	The ICV recovery failed low (-) or high (+).
S	The spike result was outside of accepted recovery limits.
W	Samples were received outside temperature limits (0° – 6° C). Not Clean Water Act compliant.
Z	Deviation; A deviation from the method was performed; Please refer to the Case Narrative for additional information

Acronyms

ND	Not Detected	**RL**	Reporting Limit
QC	Quality Control	**MDL**	Method Detection Limit
MB	Method Blank	**LOD**	Level of Detection
LCS	Laboratory Control Sample	**LOQ**	Level of Quantitation
LCSD	Laboratory Control Sample Duplicate	**PQL**	Practical Quantitation Limit
QCS	Quality Control Sample	**CRQL**	Contract Required Quantitation Limit
DUP	Duplicate	**PL**	Permit Limit
MS	Matrix Spike	**RegLvl**	Regulatory Limit
MSD	Matrix Spike Duplicate	**MCL**	Maximum Contamination Limit
RPD	Relative Percent Different	**MinCL**	Minimum Compound Limit
ICV	Initial Calibration Verification	**RA**	Reanalysis
ICB	Initial Calibration Blank	**RE**	Reextraction
CCV	Continuing Calibration Verification	**TIC**	Tentatively Identified Compound
CCB	Continuing Calibration Blank	**RT**	Retention Time
RLC	Reporting Limit Check	**CF**	Calibration Factor

This list of Qualifiers and Acronyms reflects the most commonly utilized Qualifiers and Acronyms for reporting. Please refer to the Analytical Notes in the Case Narrative for any Qualifiers or Acronyms that do not appear in this list or for additional information regarding the use of these Qualifiers on reported data.

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TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Workorder Sample Summary

WO#: **24050485**
22-May-24

CLIENT: TEKLAB Inc,
Project: 24050347

Lab SampleID	Client Sample ID	Tag No	Date Collected	Date Received	Matrix
24050485-001	24050347-001		5/2/2024 8:40:00 AM	5/7/2024 11:30:00 AM	Non-Potable Water
24050485-002	24050347-002		5/2/2024 10:15:00 AM	5/7/2024 11:30:00 AM	Non-Potable Water
24050485-003	24050347-003		5/2/2024 2:50:00 PM	5/7/2024 11:30:00 AM	Non-Potable Water

Summit Environmental Technologies, Inc.
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DATES REPORT

WO#: **24050485**

22-May-24

Client: TEKLAB Inc,

Project: 24050347

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
24050485-001A	24050347-001	5/2/2024 8:40:00 AM	Non-Potable Water	Radium-226 (EPA 903.0)		5/9/2024 12:47:56 PM	5/21/2024 10:28:00 AM
				Radium-228 (EPA 904.0)		5/9/2024 12:47:56 PM	5/20/2024 3:04:00 PM
24050485-002A	24050347-002	5/2/2024 10:15:00 AM		Radium-226 (EPA 903.0)		5/9/2024 12:47:56 PM	5/21/2024 10:28:00 AM
				Radium-228 (EPA 904.0)		5/9/2024 12:47:56 PM	5/20/2024 3:04:00 PM
24050485-003A	24050347-003	5/2/2024 2:50:00 PM		Radium-226 (EPA 903.0)		5/9/2024 12:47:56 PM	5/21/2024 10:28:00 AM
				Radium-228 (EPA 904.0)		5/9/2024 12:47:56 PM	5/20/2024 3:04:00 PM

Original

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Analytical Report

(consolidated)

WO#: **24050485**

Date Reported: **5/22/2024**

CLIENT: TEKLAB Inc,

Collection Date: 5/2/2024 8:40:00 AM

Project: 24050347

Lab ID: 24050485-001

Matrix: NON-POTABLE WATER

Client Sample ID: 24050347-001

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **DHF**
Radium-226	ND	1.00		pCi/L	± 0.170	1	5/21/2024 10:28:00 AM
Yield	0.980					1	5/21/2024 10:28:00 AM
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **DHF**
Radium-228	1.05	1.00		pCi/L	± 0.400	1	5/20/2024 3:04:00 PM
Yield	1.00					1	5/20/2024 3:04:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected
R	RPD outside accepted recovery limits
W	Sample container temperature is out of limit as specified at testcode
M	Manual Integration used to determine area response
PL	Permit Limit
RL	Reporting Detection Limit

Original

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Website: http://www.settek.com

Analytical Report

(consolidated)

WO#: **24050485**

Date Reported: **5/22/2024**

CLIENT: TEKLAB Inc,

Collection Date: 5/2/2024 10:15:00 AM

Project: 24050347

Lab ID: 24050485-002

Matrix: NON-POTABLE WATER

Client Sample ID: 24050347-002

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **DHF**
Radium-226	2.50	2.00		pCi/L	± 0.480	1	5/21/2024 10:28:00 AM
Yield	1.00					1	5/21/2024 10:28:00 AM
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **DHF**
Radium-228	ND	2.00		pCi/L	± 0.720	1	5/20/2024 3:04:00 PM
Yield	1.00					1	5/20/2024 3:04:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected
R	RPD outside accepted recovery limits
W	Sample container temperature is out of limit as specified at testcode
M	Manual Integration used to determine area response
PL	Permit Limit
RL	Reporting Detection Limit

Original

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

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Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Analytical Report

(consolidated)

WO#: **24050485**

Date Reported: **5/22/2024**

CLIENT: TEKLAB Inc,

Collection Date: 5/2/2024 2:50:00 PM

Project: 24050347

Lab ID: 24050485-003

Matrix: NON-POTABLE WATER

Client Sample ID: 24050347-003

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **DHF**
Radium-226	ND	1.25		pCi/L	± 0.230	1	5/21/2024 10:28:00 AM
Yield	1.00					1	5/21/2024 10:28:00 AM
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **DHF**
Radium-228	ND	1.25		pCi/L	± 0.380	1	5/20/2024 3:04:00 PM
Yield	1.00					1	5/20/2024 3:04:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected
R	RPD outside accepted recovery limits
W	Sample container temperature is out of limit as specified at testcode
M	Manual Integration used to determine area response
PL	Permit Limit
RL	Reporting Detection Limit

Original

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **24050485**

22-May-24

Client: TEKLAB Inc,
Project: 24050347 **BatchID:** **75217**

Sample ID: **24050495-001ADUP** SampType: **DUP** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **5/9/2024** RunNo: **185962**
Client ID: **BatchQC** Batch ID: **75217** TestNo: **E904.0** **E903-904** Analysis Date: **5/20/2024** SeqNo: **5040011**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	1.00		0	0			0	0	30	R
Yield	1.00			0	0			1.000	0		

Sample ID: **24050495-002ADUP** SampType: **DUP** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **5/9/2024** RunNo: **185962**
Client ID: **BatchQC** Batch ID: **75217** TestNo: **E904.0** **E903-904** Analysis Date: **5/20/2024** SeqNo: **5040013**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	1.00		0	0			0	0	30	R
Yield	1.00			0	0			1.000	0		

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode				

Original

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC
Analytical Laboratories

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **24050485**

22-May-24

Client: TEKLAB Inc,
Project: 24050347 **BatchID:** **75217**

Sample ID: **MB-75217**	SampType: **MBLK**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **5/9/2024**	RunNo: **185962**
Client ID: **PBW**	Batch ID: **75217**	TestNo: **E904.0**	**E903-904**	Analysis Date: **5/20/2024**	SeqNo: **5040004**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	1.00		0	0						
Yield	1.00			0	0						

Sample ID: **LCS-75217**	SampType: **LCS**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **5/9/2024**	RunNo: **185962**
Client ID: **LCSW**	Batch ID: **75217**	TestNo: **E904.0**	**E903-904**	Analysis Date: **5/20/2024**	SeqNo: **5040005**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	3.36	1.00	5.000	0	67.2	50	130				QLR
Yield	1.00			0	0						

Sample ID: **LCSD-75217**	SampType: **LCSD**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **5/9/2024**	RunNo: **185962**
Client ID: **LCSS02**	Batch ID: **75217**	TestNo: **E904.0**	**E903-904**	Analysis Date: **5/20/2024**	SeqNo: **5040006**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	5.00	1.00	5.000	0	100	50	130	3.360	39.2	20	R
Yield	0.960			0	0			1.000	4.08		

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode				

Original

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **24050485**

22-May-24

Client: TEKLAB Inc,
Project: 24050347 **BatchID:** **75217**

Sample ID: **24050495-001ADUP** SampType: **DUP** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **5/9/2024** RunNo: **185975**
Client ID: **BatchQC** Batch ID: **75217** TestNo: **E903.0** **E903-904** Analysis Date: **5/21/2024** SeqNo: **5040150**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00						0	0	30	
Yield	1.00							1.000	0	0	

Sample ID: **24050495-002ADUP** SampType: **DUP** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **5/9/2024** RunNo: **185975**
Client ID: **BatchQC** Batch ID: **75217** TestNo: **E903.0** **E903-904** Analysis Date: **5/21/2024** SeqNo: **5040152**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00						0	0	30	
Yield	1.00							1.000	0	0	

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode				

Original

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC
Analytical Laboratories

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **24050485**

22-May-24

Client: TEKLAB Inc,
Project: 24050347 **BatchID:** **75217**

Sample ID: **MB-75217** SampType: **MBLK** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **5/9/2024** RunNo: **185975**
Client ID: **PBW** Batch ID: **75217** TestNo: **E903.0** **E903-904** Analysis Date: **5/21/2024** SeqNo: **5040143**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00									
Yield	0.980										

Sample ID: **LCS-75217** SampType: **LCS** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **5/9/2024** RunNo: **185975**
Client ID: **LCSW** Batch ID: **75217** TestNo: **E903.0** **E903-904** Analysis Date: **5/21/2024** SeqNo: **5040144**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	4.38	1.00	5.000	0	87.6	70	130				

Sample ID: **LCSD-75217** SampType: **LCSD** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **5/9/2024** RunNo: **185975**
Client ID: **LCSS02** Batch ID: **75217** TestNo: **E903.0** **E903-904** Analysis Date: **5/21/2024** SeqNo: **5040145**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	4.67	1.00	5.000	0	93.4	70	130	4.380	6.41	20	

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode				

Original

TEKLAB, INC. Chain of Custody

5445 Horseshoe Lake Road, Collinsville, IL 62234 Phone (618) 344-1004 Fax (618) 344-1005

Are the samples chilled? YES ☐ NO ☑ With: ☐ Ice ☐ Blue Ice Preserved in: ☐ Lab ☐ Field

Teklab Inc
5445 Horseshoe Lake Road
Collinsville, IL 62234

Cooler Temp: Sampler: Client QC Level: 2

Comments: **Please Issue reports and invoices via email only**
Please analyze for Radium 226/228 per your usual methods.
Any changes to analysis/methods must be approved by Teklab, Inc. Batch QC is required.
Samples collected from an IL site.

Project# 24050347

Contact: Shelly Hennessy Email: shennessy@TekLabInc.com
Requested Due Date: Standard TAT Billing/PO: 36229 Phone: (618) 344-1004 ext. 43

24050485

PLEASE NOTE:

NELAP accreditation is required on the requested analytes and must be documented as such on the final report. If your laboratory does not currently hold a NELAP accreditation for the requested method and/or analytes, please contact Teklab immediately. If your laboratory loses accreditation or is suspended for any analyte/method during the life of the contract, you must contact Teklab immediately.

Lab Use	Sample ID	Sample Date/Time	Preservative	Matrix	Radium 226/228	COM	pH										
	24050347-001	05/02/2024 0840	HNO3	Groundwater	✔	32	4										
	24050347-002	05/02/2024 1015	HNO3	Groundwater	✔	20	7										
	24050347-003	05/02/2024 1450	HNO3	Groundwater	✔	20	5										
			Other	Aqueous													
			Other	Aqueous													
			Other	Aqueous													
			Other	Aqueous													
			Other	Aqueous													
			Other	Aqueous													
			Other	Aqueous													
			Other	Aqueous													

*Relinquished By	Date/Time	Received By	Date/Time
	5/3/24		
		5/7/24 1130 FedEx ground cooler, no ice 19.9-0.2=19.7	

Teklab maintains a strict policy of client confidentiality and as such does not provide client/sampler information without proper authorization. and proprietary rights.

SubCocRevA

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Sample Log-In Check List

Client Name: TEK-IL-62234-A Work Order Number: 24050485 RcptNo: 1

Logged by:	Christina N. Gemma	5/7/2024 11:30:00 AM	C. Gemma
Completed By:	Christina N. Gemma	5/7/2024 5:22:56 PM	C. Gemma
Reviewed By:	Jennifer Woolf	5/8/2024 10:54:58 AM	Jennifer Woolf

Chain of Custody

1. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
2. How was the sample delivered? FedEx

Log In

3. Coolers are present? Yes ☑ No ☐ NA ☐
4. Shipping container/cooler in good condition? Yes ☑ No ☐
   Custody seals intact on shipping container/cooler? Yes ☐ No ☐ Not Present ☑
   No. Seal Date: Signed By:
5. Was an attempt made to cool the samples? Yes ☐ No ☑ NA ☐
6. Were all samples received at a temperature of >0° C to 6.0°C Yes ☐ No ☑ NA ☐
   Not required
7. Sample(s) in proper container(s)? Yes ☑ No ☐
8. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
9. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
10. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
11. Is the headspace in the VOA vials less than 1/4 inch or 6 mm? Yes ☐ No ☐ No VOA Vials ☑
12. Were any sample containers received broken? Yes ☑ No ☐
13. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes ☑ No ☐
14. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
15. Is it clear what analyses were requested? Yes ☑ No ☐
16. Were all holding times able to be met? (If no, notify customer for authorization.) Yes ☑ No ☐

Special Handling (if applicable)

17. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:
By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:
Client Instructions:

18. Additional remarks:

pH received >2, one of two containers of 003 received broken (no volume remains).

Cooler Information

Cooler No	Temp ºC	Condition	Seal Intact	Seal No	Seal Date	Signed By

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Sample Log-In Check List

Client Name: TEK-IL-62234-A Work Order Number: 24050485 RcptNo: 1

June 18, 2024

Eric Staley
City Water, Light & Power
3100 Stevenson Drive
2nd Floor Maintenance Building
Springfield, IL 62712
TEL: (217) 757-8610
FAX: (217) 757-8615

Illinois	100226
Illinois	1004652024-2
Kansas	E-10374
Louisiana	05002
Louisiana	05003
Oklahoma	9978

RE: CWLP Borings **WorkOrder:** 24050429

Dear Eric Staley:

TEKLAB, INC received 1 sample on 5/6/2024 12:00:00 PM for the analysis presented in the following report.

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

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

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

Sincerely,

Shelly A Hennessy

Shelly A. Hennessy
Project Manager
(618)344-1004 ex 36
SHennessy@teklabinc.com

Report Contents

Client: City Water, Light & Power
Client Project: CWLP Borings

Work Order: 24050429
Report Date: 18-Jun-24

This reporting package includes the following:

Cover Letter	1
Report Contents	2
Definitions	3
Case Narrative	5
Accreditations	6
Laboratory Results	7
Receiving Check List	8
Chain of Custody	Appended

Client: City Water, Light & Power **Work Order:** 24050429

Client Project: CWLP Borings **Report Date:** 18-Jun-24

Abbr Definition

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

Definitions

Client: City Water, Light & Power
Work Order: 24050429
Client Project: CWLP Borings
Report Date: 18-Jun-24

Qualifiers

- # - Unknown hydrocarbon
- B - Analyte detected in associated Method Blank
- C - RL shown is a Client Requested Quantitation Limit
- E - Value above quantitation range
- H - Holding times exceeded
- I - Associated internal standard was outside method criteria
- J - Analyte detected below quantitation limits
- M - Manual Integration used to determine area response
- ND - Not Detected at the Reporting Limit
- R - RPD outside accepted recovery limits
- S - Spike Recovery outside recovery limits
- T - TIC(Tentatively identified compound)
- X - Value exceeds Maximum Contaminant Level

Client: City Water, Light & Power
Work Order: 24050429
Client Project: CWLP Borings
Report Date: 18-Jun-24

Cooler Receipt Temp: 3.5 °C

Radium-226 and Radium-228 analysis was performed by Summit Environmental Technologies, Inc. See attached report for results.

Locations

Collinsville

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

Springfield

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

Kansas City

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

Collinsville Air

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

Chicago

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

Client: City Water, Light & Power

Work Order: 24050429

Client Project: CWLP Borings

Report Date: 18-Jun-24

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2025	Collinsville
Illinois	IEPA	1004652024-2	NELAP	4/30/2025	Collinsville
Kansas	KDHE	E-10374	NELAP	4/30/2025	Collinsville
Louisiana	LDEQ	05002	NELAP	6/30/2024	Collinsville
Louisiana	LDEQ	05003	NELAP	6/30/2024	Collinsville
Oklahoma	ODEQ	9978	NELAP	8/31/2024	Collinsville
Arkansas	ADEQ	88-0966		3/14/2025	Collinsville
Illinois	IDPH	17584		5/31/2025	Collinsville
Iowa	IDNR	430		6/1/2026	Collinsville
Kentucky	UST	0073		1/31/2025	Collinsville
Mississippi	MSDH			4/30/2025	Collinsville
Missouri	MDNR	930		1/31/2025	Collinsville
Missouri	MDNR	00930		10/31/2026	Collinsville

Client: City Water, Light & Power **Work Order:** 24050429

Client Project: CWLP Borings **Report Date:** 18-Jun-24

Lab ID: 24050429-001 **Client Sample ID:** L5 20ft.

Matrix: GROUNDWATER **Collection Date:** 05/03/2024 8:30

Analyses	Certification	MDL	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 9036 (TOTAL)									
Sulfate	NELAP	614	1000		**2620**	mg/L	100	05/10/2024 12:38	R347112
SW-846 9040B, LABORATORY ANALYZED									
Lab pH	NELAP	0	1.00	H	**7.62**		1	05/07/2024 13:01	R346852
SW-846 9214 (TOTAL)									
Fluoride	NELAP	0.04	0.10		**1.32**	mg/L	1	05/10/2024 11:43	R347102
SW-846 9251 (TOTAL)									
Chloride	NELAP	5	40		**202**	mg/L	10	05/07/2024 19:42	R346935
SW-846 3005A, 6020A, METALS BY ICPMS (TOTAL)									
Antimony	NELAP	0.0450	0.100	B	**< 0.100**	mg/L	500	05/14/2024 4:45	222636
Arsenic	NELAP	0.0400	0.100		**2.58**	mg/L	500	05/14/2024 4:45	222636
Barium	NELAP	0.0350	0.0500		**1.60**	mg/L	250	05/14/2024 4:51	222636
Beryllium	NELAP	0.0125	0.0500		**0.0911**	mg/L	250	05/14/2024 4:51	222636
Boron	NELAP	0.925	2.50		**28.9**	mg/L	500	05/14/2024 15:30	222636
Cadmium	*	0.0150	0.100		**0.296**	mg/L	500	05/14/2024 4:45	222636
Chromium	NELAP	0.0750	0.150		**1.81**	mg/L	500	05/14/2024 4:45	222636
Cobalt	NELAP	0.0115	0.100		**0.296**	mg/L	500	05/14/2024 4:45	222636
Lead	NELAP	0.0300	0.0500		**2.78**	mg/L	250	05/14/2024 4:51	222636
Lithium	*	0.145	0.300		**0.613**	mg/L	500	05/14/2024 15:30	222636
Molybdenum	NELAP	0.0600	0.150		**0.282**	mg/L	500	05/14/2024 4:45	222636
Selenium	NELAP	0.0600	0.100		**0.205**	mg/L	500	05/14/2024 4:45	222636
Thallium	NELAP	0.0475	0.100		**< 0.100**	mg/L	250	05/14/2024 4:51	222636

Sample result for Sb exceed 10 times the method blank contamination. Data is reportable per the TNI Standard.

LCS recovered outside upper control limits. Sample results are below the reporting limit. Data is reportable per the TNI Standard.

SW-846 7470A (TOTAL)									
Mercury	NELAP	0.00006	0.00020		**0.00559**	mg/L	1	05/15/2024 15:55	222725
EPA 903.0/904.0, RADIUM 226/228									
Radium-226	*	0	0		**See Attached**	pci/L	1	06/13/2024 0:00	R348957
Radium-228	*	0	0		**See Attached**	pci/L	1	06/13/2024 0:00	R348957

Receiving Check List

http://www.teklabinc.com/

Client: City Water, Light & Power
Client Project: CWLP Borings

Work Order: 24050429
Report Date: 18-Jun-24

Carrier: Paul Reeves
Received By: NR

Completed by: Amber Dilallo
On: 06-May-24

Reviewed by: Ellie Hopkins
On: 06-May-24

Pages to follow: Chain of custody 1 Extra pages included 15

Shipping container/cooler in good condition?	Yes	☑	No	☐	Not Present	☐	Temp °C 3.5
Type of thermal preservation?	None	☐	Ice	☑	Blue Ice	☐	Dry Ice ☐
Chain of custody present?	Yes	☑	No	☐			
Chain of custody signed when relinquished and received?	Yes	☑	No	☐			
Chain of custody agrees with sample labels?	Yes	☑	No	☐			
Samples in proper container/bottle?	Yes	☑	No	☐			
Sample containers intact?	Yes	☑	No	☐			
Sufficient sample volume for indicated test?	Yes	☑	No	☐			
All samples received within holding time?	Yes	☐	No	☑			
Reported field parameters measured:	Field	☐	Lab	☑	NA	☐	

Sample analyses to be measured in the field and/or within 15 minutes of collection were analyzed in the lab as soon as practicable. These analyses include Chlorine (demand, free and/or residual), Carbon Dioxide, Dissolved Oxygen, Ferrous Iron, pH, and Sulfite.

Container/Temp Blank temperature in compliance?	Yes	☑	No	☐			
Water – at least one vial per sample has zero headspace?	Yes	☐	No	☐	No VOA vials	☑	
Water - TOX containers have zero headspace?	Yes	☐	No	☐	No TOX containers	☑	
Water - pH acceptable upon receipt?	Yes	☐	No	☑	NA	☐	
NPDES/CWA TCN interferences checked/treated in the field?	Yes	☐	No	☐	NA	☑	

When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.

Any No responses must be detailed below or on the COC.

Sample was preserved with Nitric Acid (97606) upon arrival at the laboratory. - amberdilallo - 5/6/2024 1:07:35 PM

pH strip #96651. - amberdilallo - 5/6/2024 1:07:37 PM

Print PDF

CHAIN OF CUSTODY

Pg __ of __ Workorder # 24050429

TEKLAB INC, 5445 Horseshoe Lake Road, Collinsville, IL 62234 Phone (618) 344-1004 Fax (618) 344-1005

Client: City, Water, Light & Power
Address: 3100 Stevenson Dr.
City/State/Zip: Springfield, IL 62712
Contact: Colleen Grey Phone: 217-787-2334
Email: cgrey@andrews-eng.com Fax:

Samples on: [X] ICE [ ] BLUE ICE [ ] NO ICE 3.5 °C LG#7
Preserved in: [X] LAB [ ] FIELD FOR LAB USE ONLY
LAB NOTES: Added HNO3 (971 lot) pH ✓ 9/16/24 SM

TEKLAB

Client Comments: Courier
email results to C. Grey and datamanagement@andrews-eng.com

Are these samples known to be involved in litigation? If yes, a surcharge will apply: [ ] Yes [ ] No
Are these samples known to be hazardous? [ ] Yes [ ] No
Are there any required reporting limits to be met on the requested analysis?. If yes, please provide limits in the comment section: [ ] Yes [ ] No

PROJECT NAME/NUMBER	SAMPLE COLLECTOR'S NAME
CWLP Borings	S. Van Hook

RESULTS REQUESTED
[✓] Standard [ ] 1-2 Day (100% Surcharge)
[ ] Other _____ [ ] 3 Day (50% Surcharge)

BILLING INSTRUCTIONS

Lab Use Only	Sample ID	Date/Time Sampled	Matrix	# and Type of Containers: UNP	HNO3	NaOH	H2SO4	HCL	MeOH	NaHSO4	TSP	Other	INDICATE ANALYSIS REQUESTED: Rad 226 and 228	Sb, As, Ba, Be	B, Cd, Cr, Co, Pb, Se, Tl	Li, Mo	Hg	Cl, F+, SO4	pH
24050429-001	LS 20ft.	5/3/24 8:30AM	Groundwater	3	1								✓	✓	✓	✓	✓	✓	✓
			Groundwater	3	1														
			Groundwater	3	1														
			Groundwater	3	1														
			Groundwater	3	1														
			Groundwater	3	1														
			Groundwater	3	1														
			Groundwater	3	1														
			Groundwater	3	1														
			Groundwater	3	1														
			Groundwater	3	1														

Relinquished By	Date/Time	Received By	Date/Time
Steve Van Hook	5/3/2024 12:30 pm	Paul M Yr	5.6.24 0820
Paul M Yr	5.6.24 1200	Mitch Reed	5/6/24 1200

*The individual signing this agreement on behalf of the client, acknowledges that he/she has read and understands the terms and conditions of this agreement, and that he/she has the authority to sign on behalf of the client. See www.teklabinc.com for terms and conditions

MK 5/6

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

June 18, 2024

Shelly Hennessy
TEKLAB Inc,
5445 Horseshoe lake Road
Collinsville, IL 62234
TEL:
FAX:

RE: 24050429

Dear Shelly Hennessy:

Order No.: 24050786

Summit Environmental Technologies, Inc. received 1 sample(s) on 5/9/2024 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative.

Quality control data is within laboratory defined or method specified acceptance limits except where noted.

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

Sincerely,

Jennifer Woolf

Project Manager

3310 Win St.
Cuyahoga Falls, Ohio 44223

Arkansas 88-0735, California 2943, Colorado, Connecticut PH-0108, Florida NELAC E87688, Idaho OH00923, Illinois 200061, Indiana C-OH-13, ISO/IEC 17025:2017 119125 L22-544, Kansas E-10347, Kentucky (Underground Storage Tank) 3, Kentucky 90146, Maryland 339, Michigan 9988, Minnesota 1780279, Nevada OH009232020-1, New Hampshire 2996, New Jersey OH006, New York 11777, North Carolina 39705 and 631, North Dakota R-201, Ohio DW, Ohio VAP CL0052, Oklahoma 2019-155, Oregon OH200001, Pennsylvania 68-01335, Rhode Island LA000317, South Carolina 92016001, Texas T104704466-19-16, Utah OH009232020-12, Virginia VELAP 10381, West Virginia 9957C

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
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Case Narrative

WO#: **24050786**
Date: **6/18/2024**

CLIENT: TEKLAB Inc,
Project: 24050429

WorkOrder Narrative:
24050786: This report in its entirety consists of the following documents: Cover Letter, Case Narrative, Analytical Results, QC Summary Report, Applicable Accreditation Information, Chain-of-Custody, Cooler Receipt Form, and other applicable forms as necessary. All documents contain the Summit Environmental Technologies, Inc., Work Order Number assigned to this report.

Summit Environmental Technologies, Inc., holds the accreditations/certifications listed at the bottom of the cover letter that may or may not pertain to this report. Please refer to the "Accreditation Program Analytes Report" for accredited analytes list.

The information contained in this analytical report is the sole property of Summit Environmental Technologies, Inc. and that of the customer. It cannot be reproduced in any form without the consent of Summit Environmental Technologies, Inc. or the customer for which this report was issued. The results contained in this report are only representative of the samples received. Conditions can vary at different times and at different sampling conditions. Summit Environmental Technologies, Inc. is not responsible for use or interpretation of the data included herein.

All results for Solid Samples are reported on an "as received" or "wet weight" basis unless indicated as "dry weight" using the "-dry" designation on the reporting units.

This report is believed to meet all of the requirements of the accrediting agency, where applicable. Any comments or problems with the analytical events associated with this report are noted below.

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC
Analytical Laboratories

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Website: http://www.settek.co

Qualifiers and Acronyms

WO#: **24050786**
Date: **6/18/2024**

These commonly used Qualifiers and Acronyms may or may not be present in this report.

Qualifiers

U	The compound was analyzed for but was not detected above the MDL.
J	The reported value is greater than the Method Detection Limit but less than the Reporting Limit.
H	The hold time for sample preparation and/or analysis was exceeded. Not Clean Water Act compliant.
D	The result is reported from a dilution.
E	The result exceeded the linear range of the calibration or is estimated due to interference.
MC	The result is below the Minimum Compound Limit.
*****	The result exceeds the Regulatory Limit or Maximum Contamination Limit.
m	Manual integration was used to determine the area response.
d	Manual integration in which peak was deleted
N	The result is presumptive based on a Mass Spectral library search assuming a 1:1 response.
P	The second column confirmation exceeded 25% difference.
C	The result has been confirmed by GC/MS.
X	The result was not confirmed when GC/MS Analysis was performed.
B	The analyte was detected in the Method Blank at a concentration greater than the RL.
MB+	The analyte was detected in the Method Blank at a concentration greater than the MDL.
G	The ICB or CCB contained reportable amounts of analyte.
QC-/+	The CCV recovery failed low (-) or high (+).
R/QDR	The RPD was outside of accepted recovery limits.
QL-/+	The LCS or LCSD recovery failed low (-) or high (+).
QLR	The LCS/LCSD RPD was outside of accepted recovery limits.
QM-/+	The MS or MSD recovery failed low (-) or high (+).
QMR	The MS/MSD RPD was outside of accepted recovery limits.
QV-/+	The ICV recovery failed low (-) or high (+).
S	The spike result was outside of accepted recovery limits.
W	Samples were received outside temperature limits (0° – 6° C). Not Clean Water Act compliant.
Z	Deviation; A deviation from the method was performed; Please refer to the Case Narrative for additional information

Acronyms

ND	Not Detected	**RL**	Reporting Limit
QC	Quality Control	**MDL**	Method Detection Limit
MB	Method Blank	**LOD**	Level of Detection
LCS	Laboratory Control Sample	**LOQ**	Level of Quantitation
LCSD	Laboratory Control Sample Duplicate	**PQL**	Practical Quantitation Limit
QCS	Quality Control Sample	**CRQL**	Contract Required Quantitation Limit
DUP	Duplicate	**PL**	Permit Limit
MS	Matrix Spike	**RegLvl**	Regulatory Limit
MSD	Matrix Spike Duplicate	**MCL**	Maximum Contamination Limit
RPD	Relative Percent Different	**MinCL**	Minimum Compound Limit
ICV	Initial Calibration Verification	**RA**	Reanalysis
ICB	Initial Calibration Blank	**RE**	Reextraction
CCV	Continuing Calibration Verification	**TIC**	Tentatively Identified Compound
CCB	Continuing Calibration Blank	**RT**	Retention Time
RLC	Reporting Limit Check	**CF**	Calibration Factor

This list of Qualifiers and Acronyms reflects the most commonly utilized Qualifiers and Acronyms for reporting. Please refer to the Analytical Notes in the Case Narrative for any Qualifiers or Acronyms that do not appear in this list or for additional information regarding the use of these Qualifiers on reported data.

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Workorder Sample Summary

WO#: **24050786**

18-Jun-24

CLIENT: TEKLAB Inc,
Project: 24050429

Lab SampleID	Client Sample ID	Tag No	Date Collected	Date Received	Matrix
24050786-001	24050429-001		5/3/2024 8:30:00 AM	5/9/2024 11:40:00 AM	Non-Potable Water

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DATES REPORT

WO#: **24050786**

18-Jun-24

Client: TEKLAB Inc,

Project: 24050429

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	Leachate Date	Prep Date	Analysis Date
24050786-001A	24050429-001	5/3/2024 8:30:00 AM	Non-Potable Water	Radium-226 (EPA 903.0)		6/10/2024 3:03:24 PM	6/14/2024 11:38:39 AM
				Radium-226 (EPA 903.0)		5/29/2024 12:23:00 PM	6/5/2024 10:01:00 AM
				Radium-228 (EPA 904.0)		6/10/2024 3:03:24 PM	6/13/2024 2:27:54 PM
				Radium-228 (EPA 904.0)		5/29/2024 12:23:00 PM	6/4/2024 2:54:00 PM

Original

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

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Analytical Report

(consolidated)

WO#: **24050786**

Date Reported: **6/18/2024**

CLIENT: TEKLAB Inc,

Collection Date: 5/3/2024 8:30:00 AM

Project: 24050429

Lab ID: 24050786-001

Matrix: NON-POTABLE WATER

Client Sample ID: 24050429-001

Analyses	Result	RL	Qual	Units	Uncertainty	DF	Date Analyzed
RADIUM-226 (EPA 903.0)					**E903.0**	**E903-904**	Analyst: **SMZ**
Radium-226	12.3	5.00	*	pCi/L	± 1.15	1	6/14/2024 11:38:39 AM
Yield	1.00					1	6/14/2024 11:38:39 AM
RADIUM-228 (EPA 904.0)					**E904.0**	**E903-904**	Analyst: **SMZ**
Radium-228	5.44	5.00	*	pCi/L	± 3.56	1	6/13/2024 2:27:54 PM
Yield	0.580					1	6/13/2024 2:27:54 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected
R	RPD outside accepted recovery limits
W	Sample container temperature is out of limit as specified at testcode
M	Manual Integration used to determine area response
PL	Permit Limit
RL	Reporting Detection Limit

Original

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QC SUMMARY REPORT

WO#: **24050786**

18-Jun-24

Client: TEKLAB Inc,
Project: 24050429 **BatchID:** **75975**

Sample ID: **MB-75975**	SampType: **MBLK**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **6/10/2024**	RunNo: **187502**
Client ID: **PBW**	Batch ID: **75975**	TestNo: **E904.0**	**E903-904**	Analysis Date: **6/13/2024**	SeqNo: **5081626**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	1.00		0	0						
Yield	1.00			0	0						

Sample ID: **LCS-75975**	SampType: **LCS**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **6/10/2024**	RunNo: **187502**
Client ID: **LCSW**	Batch ID: **75975**	TestNo: **E904.0**	**E903-904**	Analysis Date: **6/13/2024**	SeqNo: **5081627**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	3.51	1.00	5.000	0	70.2	50	130				
Yield	1.00			0	0						

Sample ID: **LCSD-75975**	SampType: **LCSD**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **6/10/2024**	RunNo: **187502**
Client ID: **LCSS02**	Batch ID: **75975**	TestNo: **E904.0**	**E903-904**	Analysis Date: **6/13/2024**	SeqNo: **5081628**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	3.55	1.00	5.000	0	71.0	50	130	3.510	1.13	20	
Yield	1.00			0	0			1.000	0		

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

Original

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QC SUMMARY REPORT

WO#: **24050786**

18-Jun-24

Client: TEKLAB Inc,
Project: 24050429 **BatchID:** **75975**

Sample ID: **RLC-75975**	SampType: **RLC**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **6/10/2024**	RunNo: **187502**
Client ID: **BatchQC**	Batch ID: **75975**	TestNo: **E904.0**	**E903-904**	Analysis Date: **6/13/2024**	SeqNo: **5081630**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	1.97	1.00	1.000	0	197	50	150				S

Sample ID: **RLCD-75975**	SampType: **RLC**	TestCode: **Radium-228_**	Units: **pCi/L**	Prep Date: **6/10/2024**	RunNo: **187502**
Client ID: **BatchQC**	Batch ID: **75975**	TestNo: **E904.0**	**E903-904**	Analysis Date: **6/13/2024**	SeqNo: **5081631**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	1.00	1.000	0	0	50	150				S

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

Original

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QC SUMMARY REPORT

WO#: **24050786**

18-Jun-24

Client: TEKLAB Inc,
Project: 24050429 **BatchID:** **75975**

Sample ID: **24060255-001ADUP** SampType: **DUP** TestCode: **Radium-228_** Units: **pCi/L** Prep Date: **6/10/2024** RunNo: **187502**
Client ID: **BatchQC** Batch ID: **75975** TestNo: **E904.0** **E903-904** Analysis Date: **6/13/2024** SeqNo: **5081633**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-228	ND	1.00		0	0			0	0	20	R
Yield	1.00			0	0			1.000	0		

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

Original

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Website: http://www.settek.com

QC SUMMARY REPORT

WO#: **24050786**

18-Jun-24

Client: TEKLAB Inc,
Project: 24050429 **BatchID:** **75975**

Sample ID: **MB-75975**	SampType: **MBLK**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **6/10/2024**	RunNo: **187509**
Client ID: **PBW**	Batch ID: **75975**	TestNo: **E903.0**	**E903-904**	Analysis Date: **6/14/2024**	SeqNo: **5081731**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00									
Yield	1.00										

Sample ID: **LCS-75975**	SampType: **LCS**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **6/10/2024**	RunNo: **187509**
Client ID: **LCSW**	Batch ID: **75975**	TestNo: **E903.0**	**E903-904**	Analysis Date: **6/14/2024**	SeqNo: **5081732**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	4.85	1.00	5.000	0	97.0	70	130				

Sample ID: **LCSD-75975**	SampType: **LCSD**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **6/10/2024**	RunNo: **187509**
Client ID: **LCSS02**	Batch ID: **75975**	TestNo: **E903.0**	**E903-904**	Analysis Date: **6/14/2024**	SeqNo: **5081733**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	5.36	1.00	5.000	0	107	70	130	4.850	9.99	20	

Sample ID: **RLC-75975**	SampType: **RLC**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **6/10/2024**	RunNo: **187509**
Client ID: **BatchQC**	Batch ID: **75975**	TestNo: **E903.0**	**E903-904**	Analysis Date: **6/14/2024**	SeqNo: **5081735**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

Original

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QC SUMMARY REPORT

WO#: **24050786**

18-Jun-24

Client: TEKLAB Inc,
Project: 24050429 **BatchID:** **75975**

Sample ID: **RLC-75975**	SampType: **RLC**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **6/10/2024**	RunNo: **187509**
Client ID: **BatchQC**	Batch ID: **75975**	TestNo: **E903.0**	**E903-904**	Analysis Date: **6/14/2024**	SeqNo: **5081735**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	1.10	1.00	1.000	0	110	50	150				

Sample ID: **RLCD-75975**	SampType: **RLC**	TestCode: **Radium-226_**	Units: **pCi/L**	Prep Date: **6/10/2024**	RunNo: **187509**
Client ID: **BatchQC**	Batch ID: **75975**	TestNo: **E903.0**	**E903-904**	Analysis Date: **6/14/2024**	SeqNo: **5081736**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	1.07	1.00	1.000	0	107	50	150				

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

Original

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QC SUMMARY REPORT

WO#: **24050786**

18-Jun-24

Client: TEKLAB Inc,
Project: 24050429 **BatchID:** **75975**

Sample ID: **24060255-001ADUP** SampType: **DUP** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **6/10/2024** RunNo: **187509**
Client ID: **BatchQC** Batch ID: **75975** TestNo: **E903.0** **E903-904** Analysis Date: **6/14/2024** SeqNo: **5081738**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00						0	0	20	
Yield	1.00							1.000	0	0	

Sample ID: **24060255-002ADUP** SampType: **DUP** TestCode: **Radium-226_** Units: **pCi/L** Prep Date: **6/10/2024** RunNo: **187509**
Client ID: **BatchQC** Batch ID: **75975** TestNo: **E903.0** **E903-904** Analysis Date: **6/14/2024** SeqNo: **5081740**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Radium-226	ND	1.00						0	0	20	
Yield	1.00							1.000	0	0	

Qualifiers:

H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response	ND	Not Detected
PL	Permit Limit	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits	W	Sample container temperature is out of limit as specified at testcode		

Original

TEKLAB, INC. Chain of Custody

5445 Horseshoe Lake Road, Collinsville, IL 62234 Phone (618) 344-1004 Fax (618) 344-1005

240507866

Are the samples chilled? YES ☐ NO ☑ With: ☐ Ice ☐ Blue Ice Preserved in: ☐ Lab ☐ Field

Teklab Inc
5445 Horseshoe Lake Road
Collinsville, IL 62234

18.4-0.2: Cooler Temp: 18.2 Sampler: Client QC Level: 2

Fedex, cooler

Project# 24050429

Comments: **Please Issue reports and invoices via email only**
Please analyze for Radium 226/228 per your usual methods.
Any changes to analysis/methods must be approved by Teklab, Inc. Batch QC is required.
Samples collected from an IL site.

Contact: Shelly Hennessy Email: shennessy@TekLabInc.com
Requested Due Date: Standard TAT Billing/PO: 36235 Phone: (618) 344-1004 ext. 36

PLEASE NOTE:

NELAP accreditation is required on the requested analytes and must be documented as such on the final report. If your laboratory does not currently hold a NELAP accreditation for the requested method and/or analytes, please contact Teklab immediately. If your laboratory loses accreditation or is suspended for any analyte/method during the life of the contract, you must contact Teklab immediately.

Lab Use	Sample ID	Sample Date/Time	Preservative	Matrix	Radium 226/228											
							cpm				pH					
	24050429-001	5/3/24 0830	Unpres	Groundwater	✔		32.40				1.1					
			Unpres	Aqueous												
			Other	Aqueous												
			Other	Aqueous												
			Other	Aqueous												
			Other	Aqueous												
			Other	Aqueous												
			Other	Aqueous												
			Other	Aqueous												
			Other	Aqueous												
			Other	Aqueous												

*Relinquished By	Date/Time	Received By	Date/Time
Amber DiCello	5/6/24 1200		5/9/24, 1140

Teklab maintains a strict policy of client confidentiality and as such does not provide client/sampler information without proper authorization. and proprietary rights, Teklab, Inc. protects clients' confidential information as directed by local, state or federal laws. (Teklab QAM Section 9.1, TNI V1 M2 Section 4.1.5 c)

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC
Analytical Laboratories

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Sample Log-In Check List

Client Name: TEK-IL-62234-A Work Order Number: 24050786 RcptNo: 1

Logged by:	Tegan A. Richards	5/9/2024 11:40:00 AM	Tegan Richards
Completed By:	Tegan A. Richards	5/10/2024 12:21:48 PM	Tegan Richards
Reviewed By:	Jennifer Woolf	5/10/2024 2:48:57 PM	Jennifer Woolf

Chain of Custody

1. Is Chain of Custody complete? Yes ☐ No ☑ Not Present ☐
2. How was the sample delivered? FedEx

Log In

3. Coolers are present? Yes ☑ No ☐ NA ☐
4. Shipping container/cooler in good condition? Yes ☑ No ☐
   Custody seals intact on shipping container/cooler? Yes ☐ No ☐ Not Present ☑
   No. Seal Date: Signed By:
5. Was an attempt made to cool the samples? Yes ☐ No ☑ NA ☐
6. Were all samples received at a temperature of >0° C to 6.0°C Yes ☐ No ☑ NA ☐
   Not required
7. Sample(s) in proper container(s)? Yes ☑ No ☐
8. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
9. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
10. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
11. Is the headspace in the VOA vials less than 1/4 inch or 6 mm? Yes ☐ No ☐ No VOA Vials ☑
12. Were any sample containers received broken? Yes ☐ No ☑
13. Does paperwork match bottle labels? Yes ☑ No ☐
    (Note discrepancies on chain of custody)
14. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
15. Is it clear what analyses were requested? Yes ☑ No ☐
16. Were all holding times able to be met? Yes ☑ No ☐
    (If no, notify customer for authorization.)

Special Handling (if applicable)

17. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:
By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:
Client Instructions:

18. Additional remarks:

Containers are preserved, CoC states unpreserved

Cooler Information

Cooler No	Temp ºC	Condition	Seal Intact	Seal No	Seal Date	Signed By

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