Luminant

Illinois Power Generating Company
1500 Eastport Plaza Drive
Collinsville, IL 62234

June 12, 2024

Illinois Environmental Protection Agency
DWPC – Permits MC #15
Attn: Part 845 Coal Combustion Residual Rule Submittal
1021 N. Grand Avenue East
Springfield, IL 62794-9276

Re: Illinois Power Generating Company - Coffeen Power Plant Ash Pond No. 1 (ID No. W1350150004-01)

Illinois Power Generating Company (IPGC) is hereby submitting this assessment of groundwater corrective measures for Coffeen Power Plant Ash Pond No. 1 to satisfy the following provisions:

- 35 I.A.C. 845.660 (Assessment of Corrective Measures), and
- 35 I.A.C. 845.650(d) (Characterization of Nature and Extent)

Along with this letter, these plans will be posted to Luminant's publicly accessible internet site: www.luminant.com/ccr/illinois-ccr/.

If you have any questions regarding this submittal, please contact Phil Morris at 618-343-7799 or phil.morris@vistracorp.com.

Sincerely,

Dianna Tickner

Dianna Tickner, PE, PMP
Senior Director, Demolition and Decommission

Enclosure

Intended for
Illinois Power Generating Company

Date
June 12, 2024

Project No.
1940103584-002

35 I.A.C. § 845 CORRECTIVE MEASURES ASSESSMENT

ASH POND NO. 1
COFFEEN POWER PLANT
COFFEEN, ILLINOIS
IEPA ID: W135015004-01

RAMBOLL Bright ideas. Sustainable change.

35 I.A.C. § 845 CORRECTIVE MEASURES ASSESSMENT
COFFEEN POWER PLANT ASH POND NO. 1

Project name	**Coffeen Power Plant Ash Pond No. 1**
Project no.	**1940103584-002**
Recipient	**Illinois Power Generating Company**
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CONTENTS

TABLES

FIGURES

ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

35 I.A.C.	Title 35 of the Illinois Administrative Code
AP1	Ash Pond No. 1
AP2	Ash Pond No. 2
ASD	alternative source demonstration
CAAA	Corrective Action Alternatives Analysis
CAP	Corrective Action Plan
CCR	coal combustion residuals
CMA	Corrective Measures Assessment
cm/s	centimeters per second
CPP	Coffeen Power Plant
CSM	conceptual site model
DA	deep aquifer
DCU	deep confining unit
EPRI	Electric Power Research Institute
E001	Event 1
E002	Event 2
E003	Event 3
GMF	Gypsum Management Facility
GMF GSP	GMF Gypsum Stack Pond
GMF RP	GMF Recycle Pond
GMP	Groundwater Monitoring Plan
GWPS	groundwater protection standard(s)
HCR	Hydrogeologic Site Characterization Report
ID	identification
IDNR	Illinois Department of Natural Resources
IEPA	Illinois Environmental Protection Agency
IPGC	Illinois Power Generating Company
ITRC	National Research Council, Interstate Technology & Regulatory Council
IX	ion exchange
LCU	lower confining unit
NID	National Inventory of Dams
No.	number
NPDES	National Pollutant Discharge Elimination System
NRT/OBG	Natural Resource Technology, an OBG Company
PMP	potential migration pathway
PRB	Permeable Reactive Barrier
Ramboll	Ramboll Americas Engineering Solutions, Inc.
SI	surface impoundment
Site	Coffeen Power Plant
TDS	total dissolved solids
UA	uppermost aquifer
UCU	upper confining unit

USEPA	United States Environmental Protection Agency
ZVI	zero-valent iron

1. INTRODUCTION

Ramboll Americas Engineering Solutions, Inc. (Ramboll) has developed this assessment of groundwater corrective measures on behalf of Illinois Power Generating Company (IPGC) to assist in the compliance with the requirements of Title 35 of the Illinois Administrative Code (35 I.A.C.) § 845 Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments. This assessment applies specifically to the coal combustion residuals (CCR) unit referred to as the Ash Pond Number (No.) 1 (AP1) at the Coffeen Power Plant (CPP), also referred to as CCR Unit identification (ID) No. 101, Illinois Environmental Protection Agency (IEPA) ID No. W1350150004-01, and National Inventory of Dams (NID) No. IL50722. This report addresses content requirements specific to 35 I.A.C. § 845.660 (Assessment of Corrective Measures) for exceedances of boron, sulfate, and total dissolved solids (TDS) at AP1.

1.1 Source Control and Residual Plume Management

IPGC intends to initiate significant source and residual plume management efforts as part of AP1 closure, as documented in the Final Closure Plan and Construction Permit Application that were submitted to IEPA in July of 2022 (Golder Associates USA, Inc., 2022). The proposed closure exceeds the minimum Closure Performance Standards listed in 35 I.A.C § 845.750. The closure will include removing free liquids in accordance with the performance standard in 35 I.A.C § 845 and maintaining that condition during the closure construction period. The closure will reduce the hydraulic head that can force leachate into subsurface soils and is the mechanism that can drive risk to groundwater (United States Environmental Protection Agency [USEPA], 2015a, p. 21342):

> *EPA's risk assessment shows that the highest risks are associated with CCR surface impoundments due to the hydraulic head imposed by impounded water. Dewatered CCR surface impoundments will no longer be subjected to hydraulic head so the risk of releases, including the risk that the unit will leach into the groundwater, would be no greater than those from CCR landfills.*

AP1 will be closed using a hybrid closure-by-removal and consolidate-and-cap approach that was developed to reduce the waste footprint at closure and to achieve 10 feet of vertical separation between the top of the uppermost aquifer (UA) and the CCR material. All CCR in the eastern portion of AP1 will be removed and relocated to the western portion of the SI, which will be closed in accordance with 35 I.A.C § 845.750. Under this hybrid approach, approximately 58 percent of the current CCR footprint within the surface impoundment (SI) will be removed. The final cover system will consist of a geomembrane final cover system having performance that exceeds the 35 I.A.C § 845.750(c)(2) minimum final cover requirements. The closure has been designed to minimize the post-closure infiltration of liquids into the waste and will physically isolate the CCR in AP1 from contact with surface water and the atmosphere and minimize the potential for release of CCR. The proposed source control is predicted to reduce water flux into and out of AP1 by 99.99 percent and allow the groundwater protection standards (GWPS) to be achieved within approximately 15 to 18 years, with the exception of G301, after the completion of closure (Ramboll, 2022). These source control activities will serve as the primary groundwater corrective measure at AP1. The potentially feasible corrective measures presented herein are intended to be supplementary to the primary groundwater corrective measure (*i.e.,* source control) and are intended to serve as management measures to address any residual plume(s) that remain after completion of source control.

Attachment A includes select figures from the Construction Permit Application that show the proposed final source control and primary corrective action.

1.2 Adaptive Site Management

Adaptive site management strategies will be employed as an integral part of ongoing corrective action at AP1. The adaptive site management approach will allow timely incorporation of new site information over the closure and post-closure life cycle of AP1 to ensure the achievement of the GWPS. The adaptive site management approach is proposed to expedite progress toward meeting the GWPS while acknowledging uncertainties, such as the persistence of current groundwater flow directions and flux quantities and potential related changes in geochemical conditions. A structured decision-making process and explicitly planned iterations between the implemented corrective measures and monitoring results will ensure that remediation is occurring. System performance and the condition of the residual plume will be monitored as the corrective measure(s) selected through the 35 I.A.C. § 845.710 Corrective Action Plan (CAP) process are implemented to supplement the source control measures described above. If the groundwater concentrations do not decrease consistent with the modeling predictions, the adaptive site management approach will facilitate timely modifications or enhancements to the corrective measure(s), as needed in accordance with 35 I.A.C. § 845.680(b). This approach will be employed in response to new site information and/or the performance of the selected corrective measure(s).

The planned adaptive site management strategies are generally consistent with National Research Council, Interstate Technology & Regulatory Council (ITRC) and USEPA methodologies developed to address sites with long remediation times and high levels of uncertainty regarding the remedial actions necessary to achieve final and protective remediation goals (USEPA, 2022). The elements of the proposed adaptive site management strategy at AP1 will be responsive to the changing conditions associated with pond closure and performance of the selected corrective measure(s) and will include the following:

1. Implementing the groundwater corrective measure(s) selected as part of the CAP for the current conditions at AP1. The selected corrective measures may include a combination of the technologies presented in this Corrective Measures Assessment (CMA).

2. Establishing both the absolute remedial objective and functional (interim) goals to monitor progress toward the remedial objective. Achieving the GWPS for 35 I.A.C. § 845.600 constituents at the downgradient waste boundary is the remedial objective for AP1. Specific functional goals will be developed as part of the CAP process. The functional goals will be measurable thresholds for future action and may include short-term or technology-specific objectives and triggers. Functional goals may vary for different locations, CCR constituents or other site-specific considerations (ITRC, 2017) and will serve as benchmarks for comparison to ongoing groundwater monitoring at AP1.

3. Ongoing groundwater monitoring at AP1 will continue throughout the implementation of source control and residual plume management activities. Post-closure monitoring will continue for a period of at least 30 years, in accordance with 35 I.A.C. § 845.780(c). A comprehensive groundwater monitoring plan (GMP) will be developed as part of the CAP process in accordance with 35 I.A.C. § 845.670 and 35 I.A.C. § 845.220(c)(4). The GMP will include the functional goals and proposed action levels.

4. Groundwater monitoring information will be used to guide decisions regarding whether progress toward the remedial goal is advancing as expected and/or whether additional actions may be needed to achieve the remedial objective, in conjunction with IEPA, as required by 35 I.A.C. § 845.680(b).

2. SITE INFORMATION

The CPP is located in Montgomery County in central Illinois, approximately two miles south of the city of Coffeen and about eight miles southeast of the city of Hillsboro. AP1 is located in Section 11, Township 7 North and Range 7 East. AP1 is located south of the power plant and situated in a predominantly agricultural area (**Figure 2-1**). AP1 is located between the two lobes of Coffeen Lake (identified as "Coffeen Lake" and "Unnamed Tributary" on **Figures 2-1** and **2-2**) to the west, east, and south, and is bordered by agricultural land to the north. **Figure 2-2** is a site map showing the location of AP1 (35 I.A.C. § 845 regulated CCR SI and subject of this CMA), Ash Pond No. 2 (AP2), the Gypsum Management Facility (GMF) Gypsum Stack Pond (GMF GSP), GMF Recycle Pond (GMF RP), and the Landfill. The area near AP1 will hereinafter be referred to as the Site.

The CPP was a coal-fired electrical generating plant that began operation in 1964. The plant initially burned bituminous coal from Illinois and CCR from the coal fired units was disposed of in AP1. AP2 was also utilized in the early 1970's and AP1 was reconstructed in 1978. Both of these units were used until the mid-1980's. Beginning in 2010, CCR material was placed in the Landfill, GMF GSP, and GMF RP. Placement of CCR in AP1 ceased prior to November 4, 2019.

2.1 Conceptual Site Model

Significant site investigation has been completed at the CPP to characterize the geology, hydrogeology, and groundwater quality. Based on extensive investigation and monitoring, AP1 has been well characterized and detailed in the Hydrogeologic Site Characterization Report (HCR; Ramboll, 2021), which was prepared to comply with the requirements specified in 35 I.A.C. § 845.620 and expands upon the Hydrogeologic Monitoring Plan (Natural Resource Technology/O'Brien & Gere Engineers, Inc. [NRT/OBG], 2017). The conceptual site model (CSM) is presented below.

In addition to the CCR present at AP1, there are five principal layers of unlithified material present above the bedrock, which are categorized into hydrostratigraphic units below (from surface downward) based on stratigraphic relationships and common hydrogeologic characteristics.

- **Upper Confining Unit (UCU):** Composed of the Roxana and Peoria Silts (Loess Unit) and the upper clayey portion of the Hagarstown member which are classified as silts to clayey silts and gravelly clay below the surficial soil. Loess Unit thickness ranges from 0 feet (absent) to 16 feet and the clayey portion of the Hagarstown member is up to 6 feet thick. The UCU has been eroded east of AP1, near the Unnamed Tributary.
- **Uppermost Aquifer (UA):** The UA is the Hagarstown Member which is classified as primarily sandy to gravelly silts and clays with thin beds of sands. Where present, the sandy portion of the Hagarstown is generally 2 to 4 feet thick. Similar to the Loess Unit, the Hagarstown is absent in some locations near the Unnamed Tributary. Hydraulic conductivities near AP1 ranged from 2.6×10^{-4} to 9.1×10^{-3} centimeters per second (cm/s) (geometric mean of 2.0×10^{-3} cm/s).
- **Lower Confining Unit (LCU):** Comprised of the Vandalia Member, Mulberry Grove Member, and Smithboro Member. These units include a sandy to silty till with thin, discontinuous sand lenses, a discontinuous and limited extent sandy silt which has infilled prior erosional features,

and silty to clayey diamicton, respectively. The Vandalia Member typically ranged in thickness from 11.7 feet in the northern portion of the CPP, to 31.0 feet between the GMF GSP and the GMF RP; the Mulberry Grove Member is represented by pockets (generally less than 2 feet thick); and the Smithboro Member ranges in thickness from 6.7 to 21.2 feet northwest of the landfill. This LCU has been identified as a potential migration pathway (PMP) because downward vertical gradients indicate that there is the potential for impacts to migrate within this unit. Hydraulic conductivities ranged from 1.2×10^{-4} to 2.3×10^{-3} cm/s (geometric mean of 5.0×10^{-4} cm/s).

- **Deep Aquifer (DA):** Sand and sandy silt/clay units of the Yarmouth Soil, which include accretionary deposits of fine sediment and organic materials, typically less than five feet thick and discontinuous across the CPP. Where present, the DA has been identified as a potential PMP due to presence of downward gradients in the overlying LCU and the relatively greater hydraulic conductivities measured in the DA. Hydraulic conductivity in the DA ranged from 1.3×10^{-4} to 1.7×10^{-3} cm/s (geometric mean of 4.4×10^{-4} cm/s).
- **Deep Confining Unit (DCU):** Comprised of the Banner Formation, and generally consists of clays, silts, and sands. The Lierle Clay Member is the upper layer of the Banner Formation which was encountered at the Site. No monitoring wells are screened only within the DCU, and no field hydraulic conductivity tests were conducted for the DCU.

In the UA, groundwater generally migrates from central portions of the CPP to Coffeen Lake or the Unnamed Tributary. The LCU and DA underlying the UA have been identified as PMPs. Groundwater elevations are primarily controlled by surface topography, geologic unit topography, and water levels within Coffeen Lake and the Unnamed Tributary. Groundwater generally flows from the center of the CPP west towards Coffeen Lake, and east towards the Unnamed Tributary, the eastern lobe of Coffeen Lake, and a discharge flume present along the northern perimeter of AP1, resulting in a groundwater divide (high) running through the middle of the CPP. Groundwater elevations and contours for the quarter 2, 2023 groundwater monitoring event (Event 1 [E001]) are presented in **Figure 2-3**.

2.2 Groundwater Quality

Groundwater monitoring in accordance with the proposed GMP and sampling methodologies provided in the operating permit application for AP1 began in the second quarter of 2023. The 35 I.A.C § 845 groundwater monitoring system is displayed on **Figure 2-4** and consists of 12 wells screened in the UA (two background and 10 compliance), three wells screened in the LCU, one well screened in the DA, one temporary water level only CCR staff gage, and two temporary water level only surface water staff gages. The groundwater samples collected from the 16 wells are used to monitor and evaluate groundwater quality and demonstrate compliance with the groundwater quality standards listed in 35 I.A.C. § 845.600(a). The proposed monitoring wells yield groundwater samples that represent the quality of downgradient groundwater at the CCR boundary (as required in 35 I.A.C. § 845.630(a)(2)).

The E001 groundwater monitoring event was completed on June 8, 2023. In accordance with 35 I.A.C. § 845.610(b)(3)(C), statistically derived values were compared with the GWPSs summarized in 35 I.A.C. § 845.600 to determine exceedances of the GWPS. The statistical determination identified the following GWPS exceedances at compliance groundwater monitoring wells (Ramboll, 2023):

- Boron in UA well G313
- Sulfate in UA wells G301, G303, G305, G307, G308, G310, G312, and G313; in LCU wells G307D, G314, and G316; and in DA well G314D
- TDS in UA wells G303, G305, G308, G312, G313, and G315; in LCU wells G314 and G316; and in DA well G314D

Subsequent compliance sampling events for Quarter 3 and Quarter 4 2023 (Event 2 [E002] and Event 3 [E003], respectively) were completed in August and November 2023 and groundwater samples were evaluated for exceedances of the GWPS as described in 35 I.A.C. § 845.600 (Ramboll, 2024a; Ramboll, 2024b). The following additional exceedances were identified during the E002 and E003 monitoring events:

- TDS in UA well G310

The boron, sulfate, and TDS exceedances are addressed in this CMA, in accordance with 35 I.A.C. § 845.660.

3. CORRECTIVE MEASURES ASSESSMENT METHODOLOGY

This section describes the CMA methodology initiated in response to the identification of exceedances of the GWPSs for 35 I.A.C. § 845.600 constituents at the downgradient waste boundary of AP1 during the E001 groundwater monitoring event (Ramboll, 2023). The CMA was initiated on January 14, 2024, within 90 days after the detection of exceedance(s) of GWPS. Under 35 I.A.C. § 845, owners and operators of existing CCR SIs must initiate the assessment of corrective measures in accordance with 35 I.A.C. § 845.660 if one or more constituents are detected, and confirmed by an immediate resample, to be in exceedance of a GWPS in 35 I.A.C. § 845.600, and the owner or operator has not demonstrated that: a source other than the CCR SI caused the exceedance, or; that the exceedance of the GWPS resulted from error in sampling, analysis, statistical evaluation, natural variation in groundwater quality or a change in the potentiometric surface and groundwater flow direction (*i.e.,* an alternative source demonstration [ASD]).

The CMA is the first step in developing a long-term CAP to address the GWPS exceedances at CCR SIs. The process provides a systematic, rational method for evaluating potential corrective measures by first identifying potentially viable technologies and assessing them using qualitative information to eliminate from consideration infeasible or otherwise unacceptable remedial technologies (*i.e.,* the 35 I.A.C. § 845.660). The remaining technologies will be evaluated individually, or assembled into combined alternatives, and further evaluated under the CAP process per 35 I.A.C. § 845.670.

This CMA identified applicable corrective measure technologies and evaluated them for viability, given the site-specific conditions and considerations at AP1, by addressing the following 35 I.A.C § 845.660 evaluation criteria:

- Performance, reliability, ease of implementation and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to any residual contamination;
- Time required to begin and complete the CAP; and
- Institutional requirements, such as State or local permit requirements or other environmental or public health requirements that may substantially affect implementation of the CAP.

The evaluation included qualitative and/or semi-quantitative screening of the potential corrective measures (technologies) relative to their general performance, reliability, and ease of implementation characteristics and their potential impacts, timeframes, and institutional requirements to assess the viability of each technology to address the GWPS exceedances at AP1. This approach provided a reasoned set of corrective measures that could be used, either individually or in combination, to supplement the primary source control measures described in **Section 1.1**. This set of corrective measures will be further evaluated in the Corrective Action Alternatives Assessment (CAAA).

4. DESCRIPTION OF POTENTIAL CORRECTIVE MEASURE TECHNOLOGIES

The potential groundwater corrective measures summarized below are applicable to AP1 and were included in the CMA development and analysis. Site-specific considerations provided in **Section 2** were used to evaluate potential groundwater corrective measures. Each of the corrective measures evaluated may be capable of satisfying the requirements and objectives, listed in **Section 3**, to varying degrees of effectiveness. The corrective measure review process was intended to yield a set of applicable corrective measures that could be used to supplement the primary corrective action, which will be the source control activities described in **Section 1.1** (hybrid consolidate-and-cap approach with a geomembrane final cover system). The source control is expected to reduce downgradient concentrations in the UA to less than the GWPS via naturally occurring physical and chemical processes over an approximately 20-year timeframe. Ongoing monitoring will be an integral part of all corrective measures to verify and document the remedial process. The corrective measures ultimately advanced to the CAAA and selected in the CAP will be used to enhance the effectiveness of the source control and may be used independently or combined into specific remedial alternatives to leverage the advantages of multiple corrective measures to attain GWPSs.

Source control measures will be initiated for AP1, as described in **Section 1.1**; all of the evaluated additional corrective measure technologies are proposed to be supplemental and complementary to source control activities. The following potential corrective measures, commonly used to mitigate groundwater impacts, were considered as a part of the CMA process:

- Source Control with Groundwater Polishing;
- Source Control with Groundwater Extraction (groundwater pumping wells or collection trenches);
- Source Control with a Cutoff Wall; and
- Source Control with In-Situ Treatment (Permeable Reactive Barrier [PRB] or In-Situ Chemical Treatment).

4.1 Source Control with Groundwater Polishing

Both federal and state regulators have long recognized that natural geochemical processes can be an acceptable component of a remedial action when it can achieve remedial action objectives in a reasonable timeframe. In 1999, USEPA published a final policy directive (USEPA, 1999) for groundwater remediation and described the process as follows:

- *"The reliance on natural attenuation processes (within the context of a carefully controlled and monitored site cleanup approach) to achieve site-specific remediation objectives within a time frame that is reasonable compared to that offered by other more active methods. The 'natural attenuation processes' that are at work in such a remediation approach include a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil or groundwater. These in-situ processes include biodegradation; dispersion; dilution; sorption; volatilization; radioactive decay; and chemical or biological stabilization, transformation, or destruction of contaminants."*

The USEPA has stated that source control is the most effective means of ensuring the timely attainment of remediation objectives (USEPA, 1999). Natural geochemical processes may be appropriate as a "finishing step" after effective source control implementation (*i.e.*, groundwater polishing), to reduce the residual mass remaining in the groundwater after closure, if there are no risks to receptors and/or the contaminant plume is not expanding. Thus, groundwater polishing would be used in conjunction with the significant planned source control effort at the site, which will consist of a hybrid consolidate-and-cap approach with a final cover system described in **Section 1.1**.

In 2015, USEPA addressed remediation of inorganic compounds in groundwater and noted that the use of natural geochemical processes to address inorganic contaminants: (1) is not intended to constitute a treatment process for inorganic contaminants; (2) when appropriately implemented, can help to restore an aquifer to beneficial uses by immobilizing contaminants onto aquifer solids and providing the primary means for attenuation of contaminants in groundwater; and (3) is not intended to be a "do nothing" response (USEPA, 2015b). Rather, documenting the applicability of natural geochemical processes for groundwater remediation should be thoroughly and adequately supported with site-specific characterization data and analysis (USEPA, 1999; USEPA, 2007; USEPA, 2015b).

Both physical and chemical processes can contribute to the reduction of the small amount of residual mass remaining after closure of AP1, and the toxicity, mobility, volume, or concentration of contaminants in groundwater. Physical processes applicable to CCR constituents in groundwater include dilution, dispersion, and flushing. Chemical processes applicable to CCR constituents in groundwater include precipitation and coprecipitation (*e.g.,* incorporation into sulfide minerals), sorption (*e.g.,* to iron, manganese, aluminum; to other metal oxides or oxyhydroxides; or to sulfide minerals or organic matter), and ion exchange (IX).

All inorganic compounds are subject to physical processes and under typical environmental conditions, physical mechanisms most often exert the dominant control on the CCR constituents of interest, such as sulfate and chloride, and lithium to a more variable degree. Chemical mechanisms are also likely to be active, though not often dominant, such as adsorption, ion exchange, and organic complexation. In combination with source control, these natural controls can provide an effective means to polish residual loading and achieve the GWPS in a reasonable timeframe. Additional data collection and analysis may be required to support the USEPA's evaluation framework (USEPA, 2015b) and obtain regulatory approval.

4.2 Source Control with Groundwater Extraction

Groundwater extraction is one of the most widely used groundwater corrective technologies and has a long history of performance. This corrective measure includes installation of one or more groundwater pumping wells or trenches to control and extract impacted groundwater. Groundwater extraction captures and contains impacted groundwater and can limit plume expansion and/or off-site migration. Construction of a groundwater extraction system typically includes, but is not limited to, the following primary components:

- Designing and constructing a groundwater extraction system consisting of one or more extraction wells and operating at a rate to allow capture of CCR impacted groundwater within the UA and/or the LCU and DA.

- Deepening the discharge flume along the northern perimeter of AP1 to construct an extraction trench in combination with a groundwater pumping system.
- Management of extracted groundwater, which may include modification to the existing National Pollutant Discharge Elimination System (NPDES) permit.
- Ongoing inspection and maintenance of the groundwater extraction system.

Remediation of inorganics by groundwater extraction can be effective, but systems do not always perform as expected. A combination of factors, including geologic heterogeneities, difficulty in flushing low-permeability zones, and rates of contaminant desorption from aquifer solids can limit effectiveness. Groundwater extraction systems require ongoing operation and maintenance to address issues such as iron bacteria and well fouling and to ensure optimal performance. The extracted groundwater must be managed, either by ex-situ treatment or disposal.

Groundwater extraction may reduce the timeframe to achieve GWPS and limit the off-site migration of constituents that exceed the GWPS. Extraction could be accomplished using a groundwater pumping well system or an extraction trench.

4.3 Source Control with a Cutoff Wall

Since the late 1970s and early 1980s, vertical cutoff walls have been used to control and/or isolate impacted groundwater. Low-permeability cutoff walls can be used to prevent horizontal off-site migration of potentially impacted groundwater. Cutoff walls act as barriers to lateral transport of impacted groundwater and can isolate soils that have been impacted by CCR to prevent mixing with unimpacted groundwater. Cutoff walls are often used in conjunction with an interior pumping system to establish an inward gradient within the cutoff wall. The gradient imparted by the pumping system maintains an inward flow through the wall, keeping it from acting as a groundwater dam and controlling potential end-around or breakout flow of contaminated groundwater. Constructing the cutoff wall such that it intersects a low-permeability material at its base, referred to as "keying", greatly increases its effectiveness.

A commonly used cutoff wall construction technology is the slurry trench method, which consists of excavating a trench and backfilling it with a soil-bentonite mixture, often created with the excavated soils, or, for deeper walls, a cement-bentonite mixture that is produced at an onsite batch plant. The trench is temporarily supported with bentonite slurry pumped into the trench during excavation (D'Appolonia & Ryan, 1979). Cutoff wall excavation uses conventional hydraulic excavators, hydraulic excavators equipped with specialized booms to extend their reach (*i.e.,* long-stick excavators), clamshells, or more specialized equipment such as hydromills or secant-pile drill rigs, depending upon trench depth, material excavated, and type of material that the wall is keyed into.

Cutoff walls are a widely accepted technology for containing impacted groundwater. Combining groundwater polishing with a limited cutoff wall and groundwater extraction in specific areas may provide advantages over independent use of these potential corrective technologies. Cutoff walls can be used in combination with groundwater extraction or as part of a PRB system (as the "funnel" in a funnel-and-gate system; **Section 4.4**).

4.4 Source Control with In-Situ Chemical Treatment

The use of in-situ treatment, either by injection or PRBs is a widely used technology for treating impacted groundwater. However, in-situ treatment techniques for boron, sulfate and TDS are not well established, therefore performance is unknown.

Chemical treatment could consist of injection of reactive materials into the subsurface to treat contaminants at specific, targeted locations. Alternately, treatment could be accomplished via PRB, where reactive materials are placed in the subsurface at locations designed to direct the contaminant plume along a flow path through the reactive media. In either system, the contaminants are transformed or otherwise rendered into environmentally acceptable forms to attain remediation concentration goals downgradient of the barrier (Electric Power Research Institute [EPRI], 2006).

As groundwater passes through the PRB under natural gradients, dissolved constituents in the groundwater react with the media and are transformed or immobilized. A variety of media have been used or proposed for use in PRBs. Zero-valent iron (ZVI) has been shown to effectively immobilize some CCR constituents, including arsenic, chromium, cobalt, molybdenum, selenium, and sulfate. Use of a combination media consisting of ZVI and a boron-selective ion exchange resin to treat boron has been documented in a pilot-scale test (EPRI, 2006).

System configurations include continuous PRBs, in which the reactive media extends across the entire path of the contaminant plume; and funnel-and-gate systems, where low-permeability barriers are installed to control groundwater flow through a permeable gate containing the reactive media. Continuous PRBs intersect the entire contaminant plume and do not materially impact the groundwater flow system. Design may or may not include keying the PRB into a low-permeability unit at depth. Funnel-and-gate systems utilize a system of barriers to groundwater flow (funnels) to direct the contaminant plume through the reactive gate. The barriers, typically some form of cutoff wall, are keyed into a low-permeability unit at depth to prevent short circuiting of the plume. Funnel-and-gate design must consider the residence time to allow chemical reactions to occur. Directing the contaminant plume through the reactive gate can significantly increase the flow velocity, thus reducing residence time.

Design of in-situ treatment systems requires rigorous site investigation to characterize the site hydrogeology and to delineate the contaminant plume. A thorough understanding of the geochemical and redox characteristics of the plume is critical to assess the feasibility of the process and select appropriate reactive media. Laboratory studies, including batch studies and column studies using samples of site groundwater, are needed to determine the effectiveness of the selected reactive media at the site (EPRI, 2006). The main considerations in selecting reactive media are as follows (Gavaskar et al., 1998; cited by EPRI, 2006):

- Reactivity – The media should be of adequate reactivity to immobilize a contaminant within the residence time of the design.
- Hydraulic performance – The media should provide adequate flow through the PRB, meaning a greater particle size than the surrounding aquifer materials. Alternatively, gravel beds have been placed in front of barriers to direct flow through the barrier.
- Stability – The media should remain reactive for an amount of time that makes its use economically advantageous over other technologies.

- Environmentally compatible by-products – Any by-products of media reaction should be environmentally acceptable. For example, iron released by ZVI corrosion should not occur at levels exceeding regulatory acceptance levels.
- Availability and price – The media should be easy to obtain in large quantities at a price that does not negate the economic feasibility of using a PRB.

5. ASSESSMENT OF CORRECTIVE MEASURE TECHNOLOGIES

This CMA was initiated to address exceedances of the 35 I.A.C. § 845.600 GWPS for boron, sulfate, and TDS at the downgradient waste boundary of AP1 identified during the E001 groundwater monitoring event (**Section 2.2**).

5.1 Requirements

The potential groundwater corrective technologies described in the previous section were evaluated relative to the requirements presented in **Section 3** and reiterated below:

- Performance, reliability, ease of implementation and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to any residual contamination:
- Time required to begin and complete the CAP; and
- Institutional requirements, such as State or local permit requirement or other environmental or public health requirements that may substantially affect implementation of the CAP.

Table 5-1 presents the qualitative CMA evaluation of each corrective technology relative to these requirements, as well as their ability to address GWPS exceedances of boron, sulfate, and TDS. The following sections provide a summary of these evaluations and a discussion of the potential groundwater corrective measure technologies that may be viable, either independently or in combination, to address GWPS exceedances. This section also provides a summary of corrective measure technologies that have been retained and advanced for evaluation as part of the CAAA process for selecting the final remedy for AP1 per 35 I.A.C. § 845.670.

5.2 Groundwater Corrective Technology Assessment

Source control, consisting of hybrid closure-by-removal and consolidate-and-cap with a final cover system, will be the primary groundwater corrective measure for AP1. Closure is expected to be completed by April 2026 and each of the potential groundwater corrective measure technologies would supplement the positive impact of the closure activities. The following sections evaluate groundwater corrective measure technologies that, when combined with site closure, may be viable to address the boron, sulfate, and TDS GWPS exceedances. Technologies that are not viable for addressing the GWPS at AP1 will be eliminated from further evaluation and viable technologies will be advanced for further evaluation as part of the CAAA process per 35 I.A.C. § 845.600.

5.2.1 Source Control with Groundwater Polishing

Source control corrective measures (**Section 1.1**) will reduce the mass loading to the groundwater system and the groundwater polishing process could decrease the timeframe for attainment of GWPS in the UA. Groundwater flow and fate and transport modeling incorporating only physical processes indicate that source control would meet GWPS in less than the 15 to 18 years post-closure at all locations except G301, where the groundwater model indicates attainment of the GWPS will take 59 years. Physical processes are expected to perform well in the sandier portions of the UA, as discussed below.

Groundwater polishing by natural geochemical processes is a widely accepted component of groundwater remediation and is routinely approved by the IEPA when paired with source control. The performance of groundwater polishing as a groundwater corrective measure varies based on site-specific conditions and additional data collection may be needed to support the design and regulatory approval. The sandier portions of the UA suggest good performance by physical processes in addressing the boron, sulfate, and TDS in AP1. The chemical processes in the fine-grained UCU require further evaluation.

Naturally occurring geochemical processes are ongoing at AP1 and will continue to affect groundwater constituent concentrations during and after AP1 closure. Ongoing monitoring of groundwater conditions is needed to better understand the mechanisms and efficacy of the groundwater polishing process and to confirm the effectiveness over time. Thus, additional groundwater sample collection and analyses would be required to characterize potential mechanisms, as discussed above, and to provide long term monitoring of the remedial progress. Enhancements to the groundwater monitoring system may be required to ensure that groundwater polishing is occurring as predicted by the groundwater and consistent with the adaptive site management approach. The reliability of groundwater polishing as a groundwater corrective measure is high because operation and maintenance requirements are limited. However, the reliability can also vary based on site-specific hydrogeologic and geochemical conditions.

Following characterization and approval of the CAP, monitoring of the groundwater polishing processes and comparison to functional goals established to monitor progress toward the remedial objective could begin prior to, or concurrently with, site closure activities. Installing additional monitoring wells could begin as quickly as within a few months of CAP approval. The time required could be reduced if existing groundwater monitoring well systems could be utilized for monitoring.

No potential safety impacts or exposure to human health or environmental receptors are expected to result from the groundwater polishing processes. Timeframes to achieve GWPS are dependent on site-specific conditions, which require detailed technical analysis which are ongoing and will be evaluated in connection with the CAAA. Selecting groundwater polishing as a corrective measure for AP1 will require approval of the closure and CAP permits by the IEPA.

Monitoring the groundwater polishing to track progress toward achievement of the GWPS, in conjunction with source control at AP1, would require long-term maintenance and monitoring of the groundwater monitoring system to confirm source control and verify the effectiveness in reducing groundwater concentrations to levels below the GWPS. System design could begin immediately after approval of the CAP permit. Additional investigations to characterize site conditions and installation of the final monitoring system could be performed concurrently with the source control (unit closure) activities, which are currently expected to be completed in 2026.

Groundwater polishing processes will continue before and after source control implementation and may be a viable corrective measure for the boron, sulfate, and TDS exceedances at AP1. Therefore, these processes are being advanced to the CAAA for further evaluation.

5.2.2 Source Control with Groundwater Extraction

Source control will reduce the mass loading to the groundwater system and implementing a groundwater extraction system may reduce the time required to attain the GWPS in the UA.

However, the groundwater impacts already present in the low permeability PMP may limit the reduction in time to attain the GWPS that can be achieved by a groundwater extraction system.

Groundwater extraction is a widely accepted corrective measure with a long track record of performance and reliability. It is routinely approved by the IEPA. For a corrective measure using groundwater extraction to effectively control groundwater flow and/or to remove potentially contaminated groundwater, horizontal and vertical capture zone(s) must be created. However, the heterogeneous, varied nature of the UA may result in variable performance of pumping wells. Additionally, the groundwater flow direction and location of the discharge flume under consideration for AP2 may complicate design and may affect performance of a pumping well system. An alternative method for controlling groundwater flow and removing potentially contaminated groundwater could include constructing a discharge trench by lowering the normal water level in the discharge flume located north of AP1 (*i.e.,* dewatering). This option is being considered as part of the corrective measures assessment for AP2 and could passively increase the hydraulic gradient and corresponding groundwater flow velocities between AP1 and the discharge flume, without the need for groundwater collection or active pumping. Cutoff walls (**Section 4.3**) could also be used in conjunction with a pumping system to control potential groundwater movement from the flume.

Implementation of a groundwater extraction system presents design challenges due to the heterogeneous, varied nature of the UA and proximity to the discharge flume. An extraction system in the UA would have to consider the potential for extracting water from the discharge flume. Extracted groundwater would require management, possibly including treatment, which may require specialized equipment and/or contractors. Construction of an extraction system to intercept the natural groundwater flow to the north, or conversion of the flume into an extraction trench, would introduce challenges related to construction access and relocating compliance wells so that they are not affected by other site features.

There could be some impacts associated with constructing and operating a groundwater extraction system, including altering of the groundwater flow system and some limited exposure to extracted groundwater. Additional data collection and analyses would be required to design an extraction system. Construction could be completed within 1 year following completion of a final design. Time of implementation is approximately 3 to 4 years after approval of the CAP permit, including characterization, design, permitting, and construction. Timeframes to achieve GWPS are dependent on site-specific conditions. An extraction system may reduce the time to attain GWPS in the UA relative to the post-closure timeframe predicted by the groundwater modeling. However, accelerated attainment of the GWPS may be limited by the heterogeneity of the UA.

Implementing a groundwater extraction system at AP1 would require IEPA approval of the CAP permit, and discharge of extracted groundwater may require a modification to the NPDES permit, as well as possibly permitting and construction of a new outfall. Depending upon the location of the extraction system, an Illinois Department of Natural Resources (IDNR) dam safety modification permit may also be required to construct an extraction system. The potential for wetlands impacts would require evaluation, depending upon the location of the extraction system.

Groundwater extraction could be viable corrective measure for the boron, sulfate, and TDS exceedances at AP1. Therefore, implementation of groundwater extraction by constructing a groundwater extraction trench is being advanced to the CAAA for further evaluation.

5.2.3 Source Control with Groundwater Cutoff Wall

Source control will reduce the mass loading to the groundwater system and implementing additional groundwater corrective measures may reduce the time required to attain the GWPS in the UA. Groundwater cutoff walls are a widely accepted corrective measure used to control and/or isolate impacted groundwater and are routinely approved by the IEPA. Cutoff walls have a long history of reliable performance as hydraulic barriers, provided they are properly designed and constructed. However, if not coupled with a groundwater extraction system, a cutoff wall will provide directional groundwater control only and may result in redistribution of contaminants and potentially GWPS exceedances at new locations.

Cutoff walls are designed to act as hydraulic barriers; as a result, cutoff walls inherently alter the existing groundwater flow system. Changes to the existing groundwater flow system may need to be controlled to maximize the effectiveness of the remedy by, for example, combining a cutoff wall with groundwater extraction to control build-up of hydraulic head upgradient and around the cutoff walls. The effectiveness of a cutoff wall as a hydraulic barrier also relies on the contrast between the hydraulic conductivity of the aquifer and the cutoff wall. The most effective barriers have hydraulic conductivity values that are several orders of magnitude lower than the geologic materials they are in contact with. A cutoff wall designed with hydraulic conductivity of 1×10^{-7} cm/sec would two to four orders of magnitude lower than the UA, which has hydraulic conductivities from 1.7×10^{-5} to 9.1×10^{-3} cm/s (Ramboll, 2021), and would be an effective containment method in the UA and could improve the performance of a UA extraction system.

Constructing a cutoff wall could result in structural impacts to the AP1 and AP2 embankment dikes, depending on the location of the wall. Specialized construction contractor(s) may be required, which could delay implementation.

Additional data collection and analyses would be required to design a cutoff wall. The time to implement a cutoff wall is approximately 4 to 5 years, including characterization, design, permitting, and construction. Construction could possibly be accelerated by combining with site closure activities. To attain GWPS, cutoff walls require a separate groundwater corrective measure to operate in concert with the cutoff wall(s). Cutoff walls are commonly coupled with groundwater polishing and/or groundwater extraction as groundwater corrective measures. The time to attain GWPS is dependent on the selected groundwater corrective measure or measures that are coupled with the cutoff walls.

Constructing a cutoff wall at AP1 would require IEPA approval of the CAP permit and, depending on the location, an IDNR dam safety modification permit may be required. The potential for wetlands impacts would require evaluation, depending upon the location of the cutoff wall.

Due to the uncertain performance, reliability, and requirement that a cutoff wall be coupled with other groundwater corrective measures, a cutoff wall is not a viable corrective measure for the boron, sulfate, and TDS exceedances at AP1. Therefore, it is not being advanced to the CAAA for further evaluation.

5.2.4 Source Control with In-Situ Treatment

Source control will reduce the mass loading to the groundwater system and implementing additional groundwater corrective measures may reduce the time required to attain the GWPS in the UA. Use of in-situ treatment, either through targeted injection of reactive media or in PRB systems, to transform contaminants into environmentally acceptable forms to attain the GWPS was considered.

In-situ treatment using IX to address boron, sulfate, and TDS exceedances in groundwater is not an established or widely accepted groundwater corrective measure; therefore, its performance and reliability are unknown. Regulatory acceptance of this innovative approach to achieving the GWPS is uncertain.

In-situ treatment presents design and construction challenges, including targeted reactive media delivery via injection to the low permeability PMP and to the heterogeneous and discontinuous UA. Depending upon the location of the PRB system, construction may affect AP1 embankment and/or final cover system and periodic change-outs of IX resin media may be required.

Additional data collection and analyses would be required to design an in-situ treatment system and bench scale and/or pilot scale testing may be required to demonstrate performance and reliability. Time of implementation is approximately 4 to 6 years after approval of the CAP permit, including characterization, design, permitting, and construction. Timeframes to achieve GWPS are dependent on demonstrations of performance and reliability and on ultimate regulatory acceptance. It is not known whether in-situ treatment would reduce the time to attain GWPS in the UA relative to the post-closure timeframe predicted by the groundwater modeling.

Due to the uncertain performance, reliability, and potential for regulatory acceptance, in-situ chemical treatment is not a viable corrective measure for the boron, sulfate, and TDS exceedances at AP1 and is not being advanced to the CAAA for further evaluation.

5.3 Technologies Advanced to CAAA

Based on the evaluations presented above, the following potential corrective technologies are being advanced to the CAAA, individually or in combination, for more detailed evaluations:

- Source control with groundwater polishing; and,
- Source control and with groundwater extraction.

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TABLES

Table 5-1.
CORRECTIVE MEASURES ASSESSMENT MATRIX
ASH POND NO. 1
COFFEEN POWER PLANT
COFFEEN, ILLINOIS
June 12, 2024

Remedy	Evaluation Factors						
	Performance	**Reliability**	**Ease of Implementation**	**Potential Impacts of Remedy (safety impacts, cross-media impacts, control of exposure to any residual contamination)**	**Time Required to Begin and Implement Remedy[1]**	**Time to Attain Groundwater Protection Standards**	**Institutional Requirements (state/local permit requirements, environmental/public health requirements that affect implementation of remedy)**
Source Control with Groundwater Polishing	Performs best paired with source control, which is expected to be completed prior to 2026. Site conditions are favorable for physical processes, while chemical processes may limited under normal aquifer conditions.	Ongoing analysis will evaluate if the attenuation mechanism has low reversibility, the aquifer has sufficient capacity, and the hydrogeology is favorable for dilution/dispersion.	Long-term monitoring would be required. Implementing would not require extensive specialized equipment or contractors	None identified.	Approximately 90 days after CAP permit approval.	Less than the 15 to 18 years post-closure predicted by the groundwater model at all locations except G301, where the model indicates attainment of the GWPS will take 59 years.	IEPA approval of the closure and CAP permits is required.
Source Control with Groundwater Extraction	Widely accepted and routinely approved technology; variable performance anticipated due to the heterogeneous, varied nature of Uppermost Aquifer and possibly due to proximity of CPP discharge flume (extraction system may capture water from the flume). Deepening the flume to construct an extraction trench under consideration for AP2 may also contribute to performance.	Reliable if properly designed, constructed and maintained. The heterogeneous, varied nature of Uppermost Aquifer may present reliability challenges for pumping wells; a trench may be more reliable.	Design challenges due to heterogeneous, varied nature of Uppermost Aquifer. Specialized contractors unlikely to be necessary. Extracted groundwater would require management, possibly including treatment, which may require specialized equipment/contractors. Construction of an extraction system to intercept the natural groundwater flow to the north would introduce challenges related to construction access and relocating compliance wells so that they are not affected by other site features.	Alters groundwater flow system and there is the some limited potential for contact exposure to extracted groundwater. Groundwater extraction may induce settlement, which could cause structural impacts to the AP1 or AP2 embankments, and/or adjacent structures. The construction of trenches could also cause stability impacts to the AP2 dikes and/or adjacent structures.	Design, permitting and construction is expected to take 3 to 4 years after CAP permit approval. Additional time may be required to permit a trench and a new compliance monitoring well network.	Dependent on site-specific conditions. Accelerated attainment of GWPS will be limited by the low permeability and heterogeneity of the Uppermost Aquifer and may not significantly improve attainment of the GWPS.	IEPA approval of the closure and CAP permits is required. Extracted groundwater could likely be discharged under the NPDES permit. Approval from IEPA for modifications to the compliance monitoring well network proposed in the operating permit would be required. A IDNR dam safety modification permit might also be required, depending on the location of wells and settlement potential and/or extraction trench. If an extraction trench is used, additional permitting related to construction in wetlands and/or Waters of the United States may be required, if they are determined to be present at the stie.
Source Control with Groundwater Cutoff Wall	Widely accepted and routinely approved technology with good performance if properly designed and constructed. If not combined with groundwater extraction, a cutoff wall will provide directional control only, thus redirecting flow to other areas where GWPS may be exceeded.	Reliable for groundwater directional control if properly designed and constructed.	Widely used, established technology. May require specialized contractors depending upon the construction/implementation method.	Alters groundwater flow system but does not provide any treatment. Can result in unintended consequences resulting from redirecting contaminants to areas where they are not currently present. May cause structural impacts to the AP1 or AP2 embankments, depending on the location of the wall.	Design, permitting and construction is expected to take 4 to 5 years after CAP approval. Implementation could be accelerated by combining with closure construction activities.	Provides groundwater directional control only. Combination with other groundwater corrective measure(s), such as groundwater extraction or permeable reactive barrier, would reduce the time required to achieve and attain GWPS.	IEPA approval of the closure and CAP permits is required. An IDNR dam safety permit may also be required depending on the location of the cutoff wall. May also require an evaluation and/or permits related to wetlands, if determined to be present in the area of the proposed remedy.
Source Control with In-Situ Treatment (Permeable Reactive Barrier or In-situ Chemical Treatment)	In-situ treatment using IX resins not well established for sulfate or boron; therefore, performance is unknown.	Unknown reliability for sulfate or boron.	Design challenges related to reactive material delivery due to heterogenous, discontinuous nature of Uppermost Aquifer. Could require periodic change-outs of resin media.	May cause structural impacts to the embankment dikes, depending on the location of the PRB.	May require bench scale and/or pilot scale testing as part of design. Design, permitting and construction is expected to take 4 to 6 years after CAP approval.	There is uncertainty regarding whether a in-situ treatment would reduce sulfate or boron concentrations to achieve the GWPS. Dependent on conditions specific to the reactive media used and the site. Treatment technology is not well understood.	IEPA approval of the CAP permit is required. IEPA approval of this innovative and relatively unproved solution may be challenging. An IDNR dam safety permit may also be required depending on the location of wells/PRB. May also require an evaluation and/or permits related to wetlands, if determined to be present in the area of the proposed remedy.

Notes:
[1] Time required to begin and implement remedy includes design, permitting, and construction.
GWPS - groundwater protection standard
AP1 - Ash Pond No. 1
AP2 - Ash Pond No. 2
CAP - Corrective Action Plan
CPP - Coffeen Power Plant
IDNR - Illinois Department of Natural Resources
IEPA - Illinois Environmental Protection Agency
IX - Ion Exchange
PRB - Permeable Reactive Barrier

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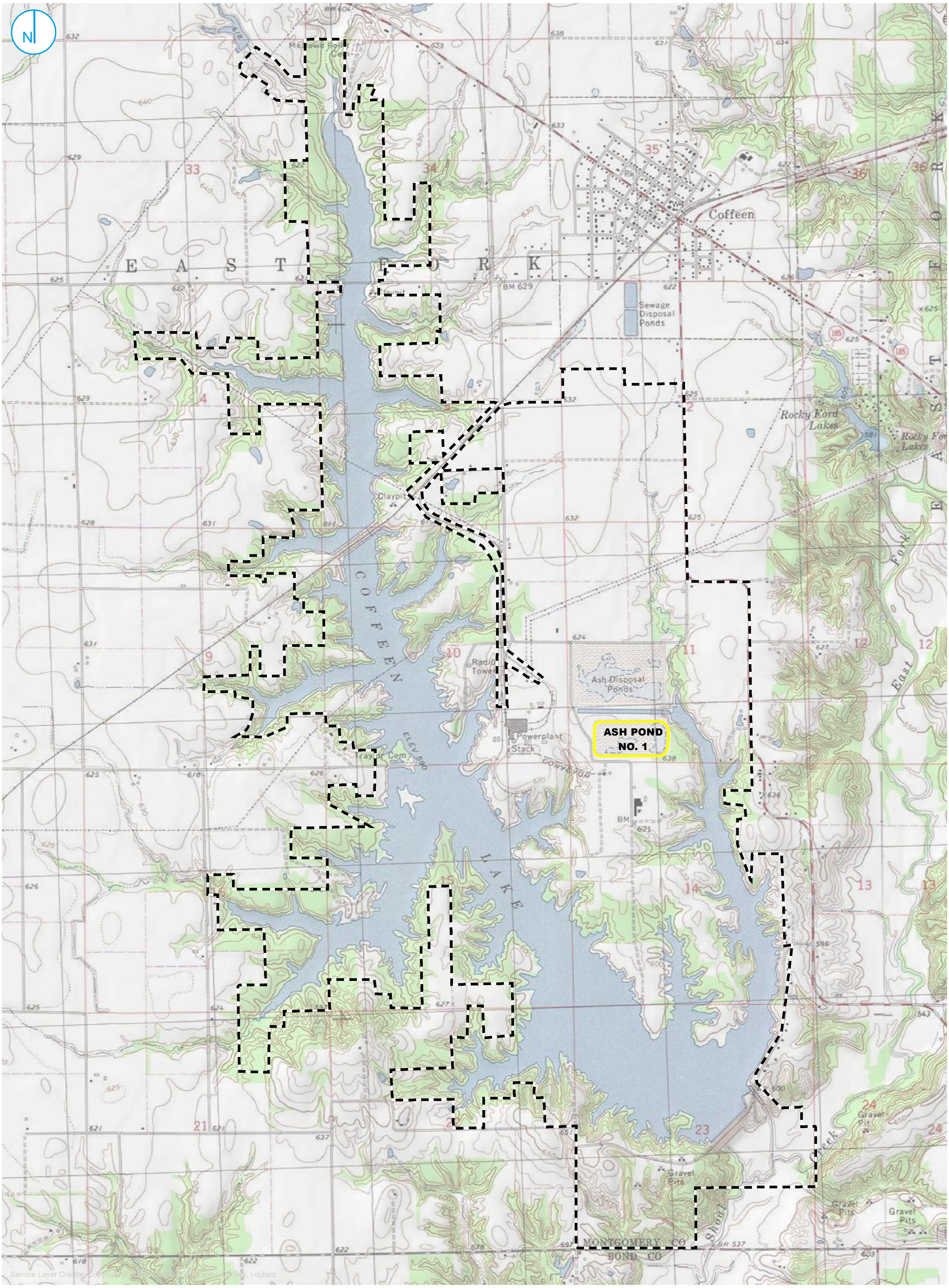
FIGURES

PROJECT: 169000XXXX | DATED: 10/13/2021 | DESIGNER: STOLZSD

Y:\Mapping\Projects\22\2285\MXD\845_Operating_Permit\Coffeen\AP1\GMP\Figure 1-1_Site Location Map AP1.mxd



REGULATED UNIT (SUBJECT UNIT)

PROPERTY BOUNDARY

0 1,000 2,000 Feet

SITE LOCATION MAP

FIGURE 2-1

35 I.A.C. § 845 CORRECTIVE MEASURES ASSESSMENT
ASH POND NO.1
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

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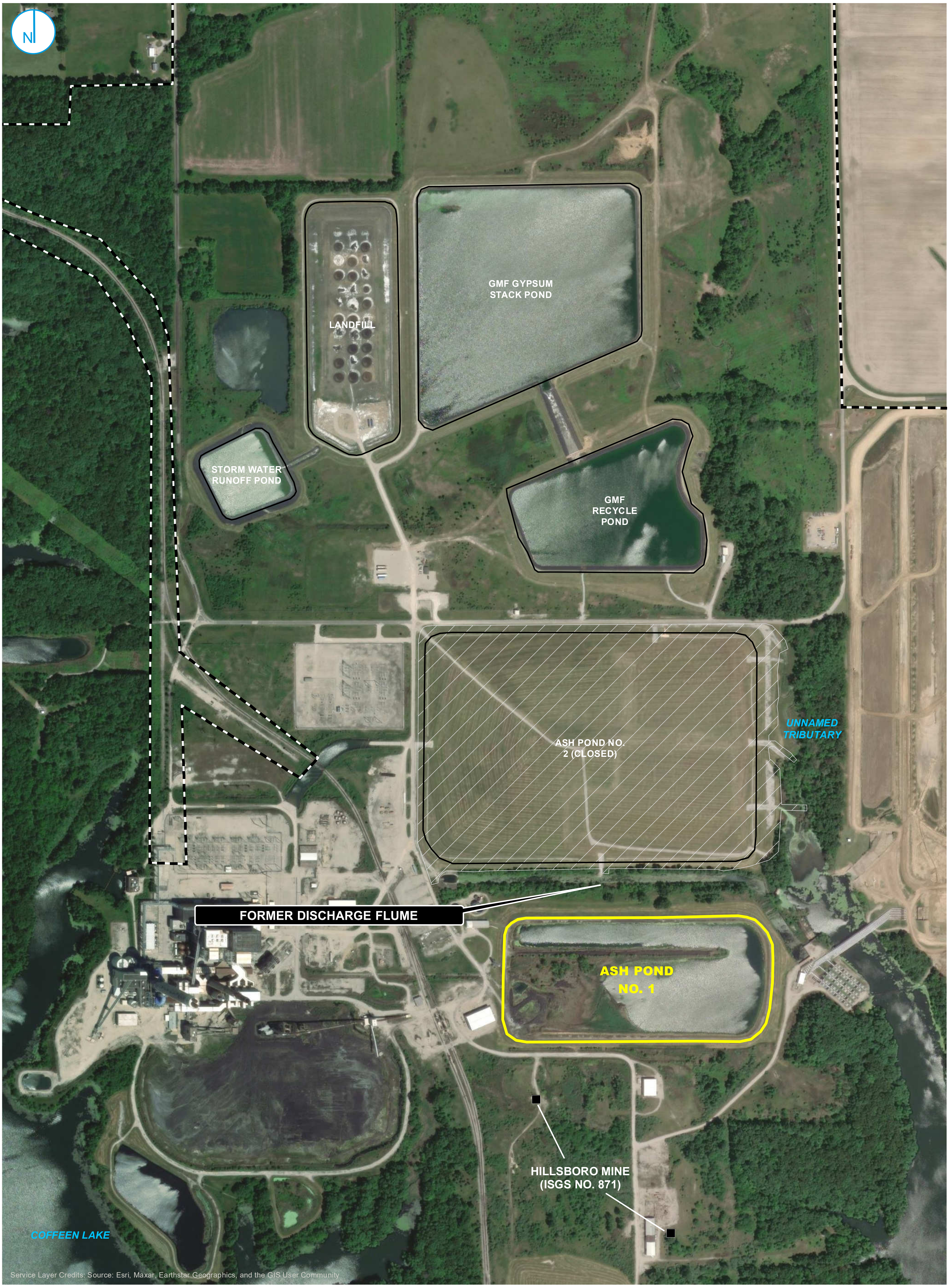

COAL MINE SHAFT
REGULATED UNIT (SUBJECT UNIT)
SITE FEATURE
LIMITS OF FINAL COVER
PROPERTY BOUNDARY

0 275 550
Feet

SITE MAP

FIGURE 2-2

35 I.A.C. § 845 CORRECTIVE MEASURES ASSESSMENT
ASH POND NO.1
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

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COMPLIANCE MONITORING WELL
BACKGROUND MONITORING WELL
MONITORING WELL
SOURCE SAMPLE LOCATION
LEACHATE WELL
STAFF GAGE, CCR UNIT
STAFF GAGE, RIVER

GROUNDWATER ELEVATION CONTOUR (2-FT CONTOUR INTERVAL, NAVD88)
INFERRED GROUNDWATER ELEVATION CONTOUR
GROUNDWATER FLOW DIRECTION
REGULATED UNIT (SUBJECT UNIT)
SITE FEATURE
LIMITS OF FINAL COVER
PROPERTY BOUNDARY

0 325 650 Feet

NOTES:
1. ELEVATIONS IN PARENTHESES WERE NOT USED FOR CONTOURING.
2. ELEVATION CONTOURS SHOWN IN FEET, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

POTENTIOMETRIC SURFACE MAP APRIL 30, 2023

FIGURE 2-3

2023 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ASH POND NO. 1
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

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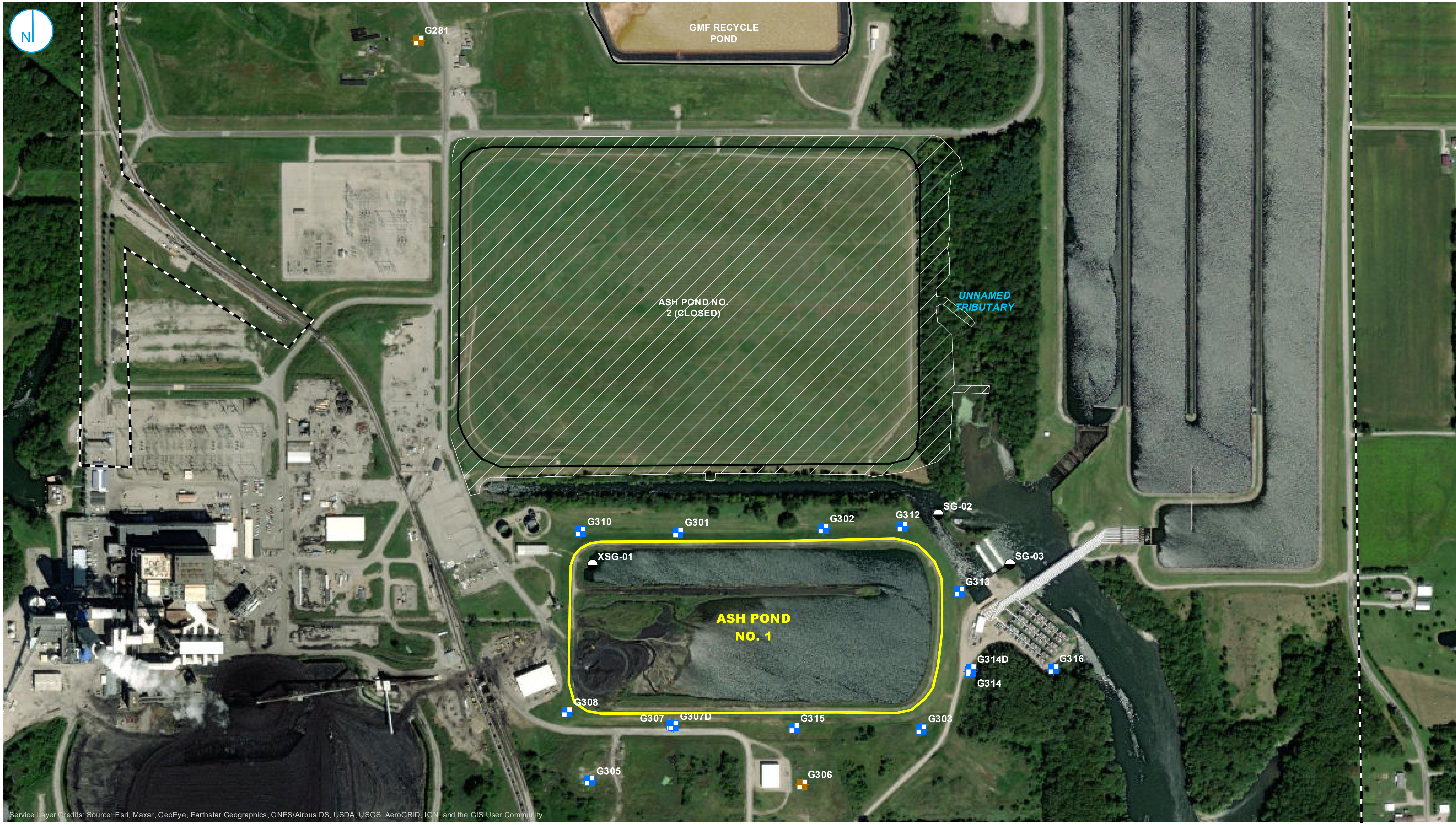

PROJECT: 169000XXXX | DATED: 10/12/2021 | DESIGNER: HOTCALD

Y:\Mapping\Projects\22\2285\MXD\845_Operating_Permit\Coffeen\AP1\GMP\Figure 2-1_Proposed Monitoring Well Network.mxd

COMPLIANCE WELL
BACKGROUND WELL
STAFF GAGE
REGULATED UNIT (SUBJECT UNIT) SITE
FEATURE
LIMITS OF FINAL COVER
PROPERTY BOUNDARY

0 200 400 Feet

MONITORING WELL LOCATION MAP

35 I.A.C. § 845 CORRECTIVE MEASURES ASSESSMENT
ASH POND NO.1
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

FIGURE 2-4

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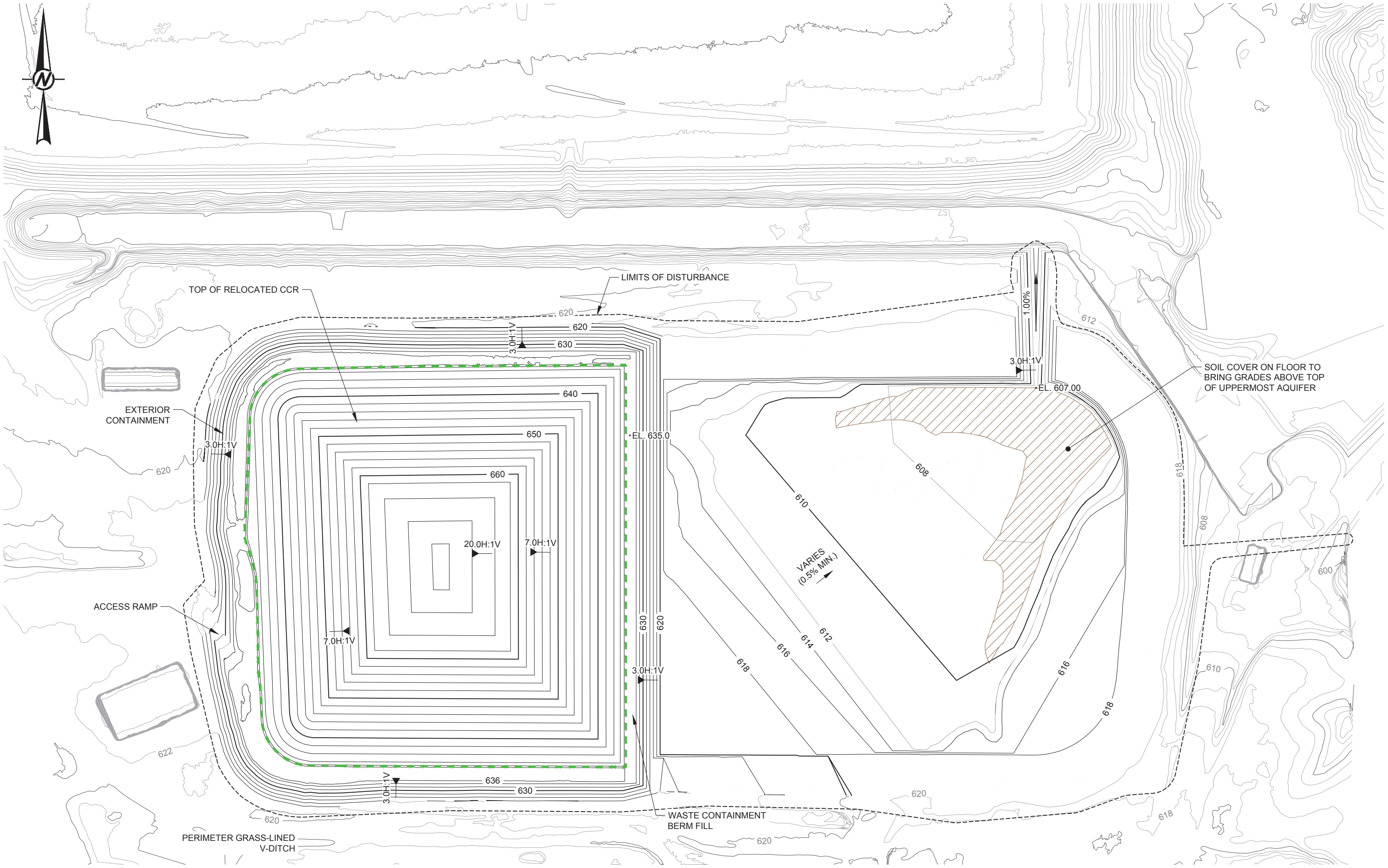
ATTACHMENTS

ATTACHMENT A
Selected Construction Permit Application Plans



LEGEND

600 (solid line)	AP1 CLOSURE IN PLACE GRADES (SEE NOTES 1 AND 2)
600 (grey line)	EXISTING GROUND CONTOURS (SEE NOTE 3)
green dashed line	LIMITS OF RELOCATED CCR WASTE
arrow line	PROPOSED STORMWATER FLOW PATH
dashed line	LIMITS OF DISTURBANCE

NOTE(S)

1. THE CLOSURE-IN-PLACE CONCEPT FOR ASH POND NO. 1 (AP1) INVOLVES REMOVAL OF PONDED WATER, CONSTRUCTION OF A CCR WASTE CONTAINMENT BERM, REMOVAL AND RELOCATION OF CCR WASTE AND 1 FT (MAX.) OF SUBSOIL EAST OF THE BERM TO WITHIN THE CONSOLIDATED FOOTPRINT, PLACEMENT OF SOIL COVER ON PORTIONS OF THE AP1 FLOOR EAST OF THE BERM, AND FINAL COVER CONSTRUCTION OVER THE CONSOLIDATED FOOTPRINT.
2. AP1 CLOSURE IN PLACE GRADES INCLUDE RELOCATED CCR WASTE, WASTE CONTAINMENT BERM, SOIL COVER OVER THE TOP OF THE UPPERMOST AQUIFER, AND PERIMETER GRADING AROUND AP1 EXTERIOR SIDE SLOPES.
3. EXISTING CONTOURS ARE A COMPOSITE OF AN AERIAL SURVEY COMPLETED BY DRAGONFLY AEROSOLUTIONS DATED 12/3/2020 AND TOPOGRAPHIC/BATHYMETRIC SURVEYS COMPLETED BY INGENAE DATED 12/3/2020 & 12/4/2020.

0 100 200
1" = 100' FEET

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
A	2022-07-28	ISSUED FOR PERMIT APPLICATION	ETF	ETF	MWD	MNH

SEAL

LICENSED PROFESSIONAL ENGINEER
MARK N. HADDOCK
062-058223
7/28/22
STATE OF ILLINOIS

CLIENT
ILLINOIS POWER RESOURCES GENERATING, LLC
COFEEN POWER PLANT

CONSULTANT
WSP GOLDER

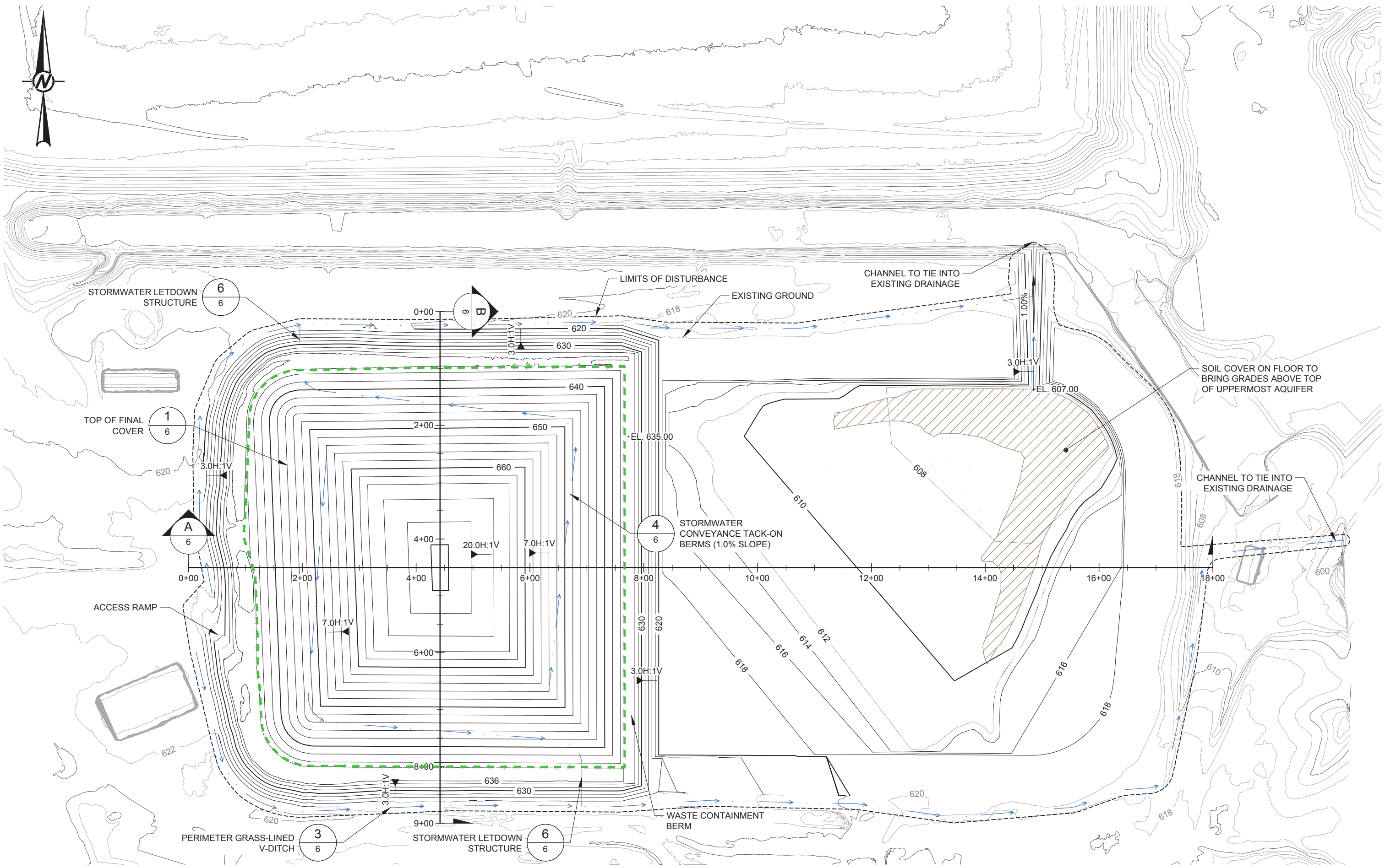
GOLDER ASSOCIATES USA INC.
701 EMERSON ROAD
SUITE 250
CREVE COEUR, MO 63141
[+1] (314) 984 8800

PROJECT
ASH POND NO. 1 CONSTRUCTION PERMIT APPLICATION

TITLE
ASH REGRADING AND CONTAINMENT PLAN

PROJECT NO.	REV.		DRAWING
21465046	A	3 of 6	3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D



LEGEND

- 600 — FINAL CLOSURE IN PLACE GRADES (SEE NOTES 1 AND 2)
- 600 — EXISTING GROUND CONTOURS (SEE NOTE 3)
- LIMIT OF RELOCATED CCR WASTE
- PROPOSED STORMWATER FLOW PATH
- LIMITS OF DISTURBANCE

NOTE(S)

1. THE CLOSURE-IN-PLACE CONCEPT FOR ASH POND NO. 1 (AP1) INVOLVES REMOVAL OF PONDED WATER, CONSTRUCTION OF A CCR STRUCTURAL WASTE CONTAINMENT BERM, REMOVAL AND RELOCATION OF ASH AND 1 FT (MAX.) OF SUBSOIL EAST OF THE BERM TO WITHIN THE CONSOLIDATED FOOTPRINT, PLACEMENT OF SOIL COVER ON PORTIONS OF AP1 FLOOR EAST OF THE BERM, AND FINAL COVER CONSTRUCTION.
2. FINAL GRADES INCLUDE FINAL COVER, WASTE CONTAINMENT BERM, SOIL COVER OVER TOP OF UPPERMOST AQUIFER, AND PERIMETER GRADING AROUND AP1 EXTERIOR SIDE SLOPES.
3. EXISTING CONTOURS ARE A COMPOSITE OF AN AERIAL SURVEY COMPLETED BY DRAGONFLY AEROSOLUTIONS DATED 12/3/2020, TOPOGRAPHIC/BATHYMETRIC SURVEYS COMPLETED BY INGENAE DATED 12/3/2020 & 12/4/2020.
4. THE PROPOSED STORMWATER DRAINAGE CONCEPT IS TO SHED WATER INTO EXISTING DRAINAGE CHANNELS NORTH AND EAST OF THE FACILITY. STORMWATER COLLECTED WITHIN AP1 WILL BE DIRECTED INTO AN OPEN CHANNEL THAT BREACHES THE CONSTRUCTED BERM TO CONNECT TO THE EXISTING DRAINAGE.

0 100 200
1" = 100' FEET

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
A	2022-07-28	ISSUED FOR PERMIT APPLICATION	ETF	ETF	MWD	MNH

SEAL

LICENSED PROFESSIONAL ENGINEER
MARK N. HADDOCK
062-058223
7/28/22
STATE OF ILLINOIS

CLIENT
ILLINOIS POWER RESOURCES GENERATING, LLC
COFFEEN POWER PLANT

CONSULTANT
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GOLDER ASSOCIATES USA INC.
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PROJECT
ASH POND NO. 1 CONSTRUCTION PERMIT APPLICATION

TITLE
FINAL COVER AND STORMWATER PLAN

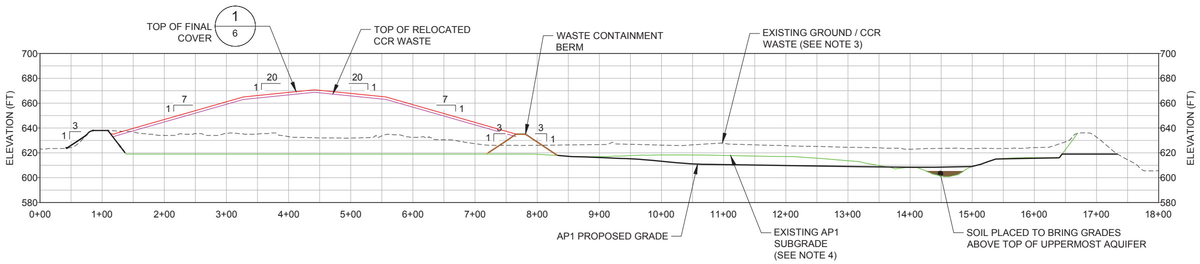
PROJECT NO.	REV.		DRAWING
21465046	A	4 of 6	4

Path: C:\Users\EVForney\Golder Associates\21465046 Vistra Coffeen Part 845 Apps IL - 5 Technical Work\DRAFTING\PRODUCTION\ | File Name: CE-PROD-AP1-COVER-GRAD.dwg | Last Edited By: evforney Date: 2022-07-11 Time:12:00:41 PM | Printed By: EVForney Date: 2022-07-12 Time:9:24:12 AM

0 1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

NOTE(S)

1. THE CLOSURE-IN-PLACE CONCEPT FOR ASH POND NO.1 (AP1) INVOLVES REMOVAL OF PONDED WATER, CONSTRUCTION OF A WASTE CONTAINMENT BERM, REMOVAL AND RELOCATION OF CCR WASTE AND 1 FT (MAX.) OF SUBSOIL EAST OF THE BERM TO WITHIN THE CONSOLIDATED FOOTPRINT, PLACEMENT OF SOIL COVER ON PORTIONS OF AP1 FLOOR EAST OF THE BERM, AND FINAL COVER CONSTRUCTION OVER THE CONSOLIDATED FOOTPRINT.
2. AP1 BASE OF ASH GRADES WERE DEVELOPED FROM THE 1963 EARTHWORK AND GRADING PLANS.
3. EXISTING CONTOURS ARE A COMPOSITE OF AN AERIAL SURVEY COMPLETED BY DRAGONFLY AEROSOLUTIONS DATED 12/3/2020 AND TOPOGRAPHIC/BATHYMETRIC SURVEYS COMPLETED BY INGENAE DATED 12/3/2020 & 12/4/2020.



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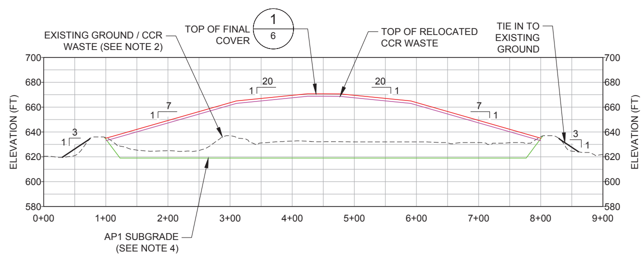
VERT. SCALE X2
A
6
SECTION A



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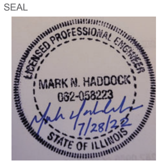
VERT. SCALE X2
B
6
SECTION B

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
A	2022-07-28	ISSUED FOR PERMIT APPLICATION	ETF	ETF	MWD	MNH

SEAL



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PROJECT
ASH POND NO. 1 CONSTRUCTION PERMIT APPLICATION

TITLE
CROSS SECTIONS

PROJECT NO.	REV.		DRAWING
21465046	A	5 of 6	5

Intended for
Illinois Power Generating Company
134 CIPS Lane
Coffeen, IL 62017
Montgomery County

Date
June 12, 2024

Project No.
1940103584-002

NATURE AND EXTENT REPORT

COFFEEN POWER PLANT, ASH POND NO. 1, IEPA ID NO. W1350150004-01

Bright ideas. Sustainable change.

NATURE AND EXTENT REPORT
COFFEEN POWER PLANT, ASH POND NO. 1, IEPA ID NO. W1350150004-01

Project name	**Coffeen Power Plant Ash Pond No. 1**
Project no.	**1940103584-002**
Recipient	**Illinois Power Generating Company**
Document type	**Nature and Extent Report**
Revision	**Final**
Date	**June 12, 2024**
Prepared by	**Alison O'Connor, PhD and Nathaniel Keller**
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CONTENTS

TABLES (ATTACHED)

FIGURES (ATTACHED)

APPENDICES

ACRONYMS AND ABBREVIATIONS

35 I.A.C.	Title 35 of the Illinois Administrative Code
40 C.F.R.	Title 40 of the Code of Federal Regulations
AP1	Ash Pond No. 1
AP2	Ash Pond No. 2
bgs	below ground surface
CCR	coal combustion residuals
cm/s	centimeters per second
CMA	Corrective Measures Assessment
CPP	Coffeen Power Plant
CSM	conceptual site model
DA	deep aquifer
E001	Event 1
E002	Event 2
E003	Event 3
ft/ft	feet per foot
GCSM	geochemical conceptual site model
GMF	Gypsum Management Facility
GSP	Gypsum Stack Pond
GWPS	groundwater protection standard
HCR	Hydrogeologic Site Characterization Report
HDPE	high-density polyethylene
IEPA	Illinois Environmental Protection Agency
IPGC	Illinois Power Generating Company
LCL	lower confidence limit
LCU	lower confining unit
LF	Landfill
mg/L	milligrams per liter
NAVD88	North American Vertical Datum of 1988
No.	number
PMP	potential migration pathway
Ramboll	Ramboll Americas Engineering Solutions, Inc.
RP	Recycle Pond
SI	surface impoundment
TDS	total dissolved solids
UA	uppermost aquifer
UCU	upper confining unit
USGS	United States Geological Survey
WPCP	Water Pollution Control Permit

EXECUTIVE SUMMARY

Groundwater samples collected at the Coffeen Power Plant (CPP) Ash Pond Number (No.) 1 (AP1) during June 2023 for the Quarter 2, 2023 compliance sampling event (Event 1 [E001]) were evaluated for exceedances of the groundwater protection standards (GWPS) described in Title 35 of the Illinois Administrative Code (35 I.A.C.) § 845.600. Exceedances were identified in the following hydrostratigraphic units and wells:

- Uppermost aquifer (UA) Exceedances:
  - Boron at G313
  - Sulfate at G301, G303, G305, G307, G308, G310, G312, and G313
  - Total dissolved solids (TDS) at G303, G305, G308, G312, G313, and G315
- Lower Confining Unit (LCU) (potential migration pathway [PMP]) Exceedances:
  - Sulfate at G307D, G314, and G316
  - TDS at G314 and G316
- Deep Aquifer (DA) (PMP) Exceedances:
  - Sulfate at G314D
  - TDS at G314D

As a result of the identified E001 exceedances, a Corrective Measures Assessment (CMA) was initiated on January 14, 2024 in accordance with 35 I.A.C. § 845.660 and submitted on June 12, 2024 [1]. The subsequent compliance sampling events for the Quarter 3 and Quarter 4, 2023 sampling events (Event 2 [E002] and Event 3 [E003]) were completed in August and November 2023 and groundwater samples were evaluated for exceedances of the GWPS as described in 35 I.A.C. § 845.600. Exceedances identified during the E002 event were consistent with those listed above. In addition to the exceedances listed above, the following exceedance was identified in the UA during the E003 Event:

- TDS at G310

Pursuant to 35 I.A.C. § 845.650(e), potential alternative sources for the GWPS exceedances were evaluated, but were not conclusive in demonstrating an alternative source for the GWPS exceedances.

As required by 35 I.A.C. § 845.650(d)(1), this report characterizes the nature and extent of boron, sulfate, and TDS, and relevant site conditions to determine how they may affect the corrective measures ultimately selected for AP1 and documents the additional measures taken in accordance with 35 I.A.C. § 845.650(d).

A boron statistical exceedance of the GWPS was encountered only within the UA at G313. The lateral extent of boron statistical exceedances is defined by existing monitoring wells and surface water samples collected from the former discharge flume and Coffeen Lake. Vertically, the extent of boron statistical exceedances of the GWPS is limited by the presence of low permeability tills, as evidenced by the lack of boron exceedances in the underlying LCU and DA monitoring wells. The boron concentrations are attenuated via surface complexation reactions and by interactions with clay minerals, which are present in solids across the UA, LCU, and DA. The boron concentrations in Coffeen Lake were evaluated and they do not present unacceptable risk [2].

Sulfate and TDS statistical exceedances of the GWPS were encountered within the three hydrostratigraphic units: the UA, LCU, the DA. In the UA, the extent of sulfate and TDS statistical exceedances of the GWPS are laterally defined to the north and east of AP1 by surface water samples collected from the former discharge flume and Coffeen Lake, while the extent of impacts in the LCU and DA are defined by groundwater flow directions and the results from Coffeen Lake. Delineation of sulfate and TDS statistical exceedances in the UA to the west of the north/south trending groundwater divide is not well defined because of the absence of compliance wells west of G305 and G308. However, westerly groundwater flow at these locations is likely toward a nearby historical drainage and eventually toward Coffeen Lake; the low concentrations of sulfate and TDS in Coffeen Lake surface water samples provides delineation to the west of AP1. The sulfate (and therefore TDS) concentrations are attenuated via surface complexation reactions. Batch attenuation testing with solids from the site indicate that chemical attenuation of sulfate could be limited. Sulfate and TDS concentrations in Coffeen Lake were evaluated and they do not present unacceptable risk [2].

1. INTRODUCTION

35 I.A.C. § 845.650(d)(1) requires the owner or operator of a coal combustion residuals (CCR) surface impoundment (SI) to characterize the nature and extent of a release and relevant site conditions that may affect the remedy ultimately selected for a CCR SI if any constituent regulated under 35 I.A.C. § 845 is found to exceed the GWPS. This report documents the nature and extent of constituents detected above the GWPS that are attributable to the CPP AP1.

The groundwater data and analysis in this report includes results from historical sampling (initiated in 2015) through E003, which was completed on November 21, 2023. Results of the E001, E002, and E003 events were submitted and placed in the facility's operating record by October 16, 2023; January 20, 2024; and March 10, 2024, respectively, as required by 35 I.A.C. § 845.800(d)(15), within 60 days of receiving final laboratory analytical data [3, 4, 5]. The statistical determination presented in the reports identified the following exceedances of the GWPS at compliance groundwater wells in the following hydrostratigraphic units:

- Detected UA Exceedances:
  - Boron at G313
  - Sulfate at G301, G303, G305, G307, G308, G310, G312, and G313
  - TDS at G303, G305, G308, G310, G312, G313, and G315
- Detected LCU Exceedances:
  - Sulfate at G307D, G314, and G316
  - TDS at G314 and G316
- Detected DA Exceedances:
  - Sulfate at G314D
  - TDS at G314D

Pursuant to 35 I.A.C. § 845.650(e), the following were evaluated as potential alternative sources for each GWPS exceedance:

- Sources other than the CCR SI
- Error in sampling and analysis protocol
- Error in statistical analysis
- Natural variation in groundwater quality
- Change in the potentiometric surface and groundwater flow direction.

These evaluations were not conclusive in demonstrating an alternative source for the GWPS exceedances. This Nature and Extent Report discusses in detail the extent of the boron, sulfate, and TDS exceedances as well as a geochemical conceptual site model (GCSM) describing the nature of these exceedances.

2. UNIT BACKGROUND

2.1 Site Location and Description

The CPP is located in Montgomery County in central Illinois, approximately two miles south of the City of Coffeen and about eight miles southeast of the City of Hillsboro (**Figure 2-1**). The CPP was a coal-fired power plant with five CCR units present: AP1 (35 I.A.C. § 845 regulated CCR Unit and subject of this report), Ash Pond No. 2 (AP2), the Gypsum Management Facility (GMF) Gypsum Stack Pond (GSP), GMF Recycle Pond (RP), and Landfill (LF). AP1 is located in Section 11, Township 7 North and Range 3 West. AP1 is located east of the CPP and situated in a predominantly agricultural area (**Figure 2-2**). AP1 is located between two lobes of Coffeen Lake (the western lobe is identified as “Coffeen Lake” and the upper reaches of the eastern lobe are fed by a stream labeled as “Unnamed Tributary” on **Figure 2-2**). The northern edge of AP1 is adjacent to the former discharge flume for the closed generating plant. AP1 is bordered by Coffeen Lake to the east, former plant operations to the west and vacant forested land to the south.

2.2 Description of CCR Unit

The CPP was a coal-fired electrical generating plant that began operation in 1964. The plant initially burned bituminous coal from Illinois and CCR from the coal fired units was disposed of in AP1. AP2 was utilized for CCR disposal beginning in the early 1970’s and AP1 was reconstructed in 1978. Both of these units were used until the mid-1980’s, beginning in 2010 CCR material was placed in the LF and GMF Units.

- **AP1:** This SI (also known as the Bottom Ash/Recycle Pond) is a reclaimed ash pond that was reconstructed utilizing the existing earthen berms with reinforcement, as provided by Water Pollution Control Permit (WPCP) 1978-EA-389 issued by the Illinois Environmental Protection Agency (IEPA) on May 26, 1978. AP1 (existing unlined SI) covers an area of approximately 23 acres, has berms up to 41 feet above the surrounding land surface, and a volume of 300 acre-feet. It primarily received bottom ash and low volume wastes from floor drains in the main power block building. Several years ago, air heater wash and boiler chemical cleaning wastes were directed to AP1, but this practice was discontinued. The bottom ash was periodically removed for beneficial uses by a third-party contractor. Sluicing of waste to AP1 ceased prior to November 4, 2019. Review of historical aerial imagery of AP1 (observations summarized in **Figure 2-3**) illustrate the extent of CCR deposition through time as well as potential CCR variability (based on observed differences in color). Characterization of the CCR material, including total metals analysis of two samples of materials within AP1, and completion of monitoring wells screened within the CCR was completed in areas of AP1 that were safely accessible in 2021 to meet the requirements of 35 I.A.C. § 845 (**Figure 2-4**) (Hydrogeologic Site Characterization Report [HCR] [6]).

  Water that may come into contact with CCR within the footprint of AP1 becomes CCR source water. CCR source water samples, collected from the porewater monitoring wells (XPW01, XPW02) screened within the CCR materials at AP1, were used to provide information for groundwater transport modeling[1]. The base of CCR at AP1 is shown in **Figure 2-5**.

- **AP2:** AP2 is a closed (IEPA-approved) SI with a surface area of approximately 60 acres and berms 47 feet higher than the surrounding land surface. AP2 was originally removed from service and capped in the mid 1980's. A clay and soil cap was placed on the surface of the pond with contouring and drainage provided to direct storm water to four engineered revetment down drain structures. Prior to capping, this pond was identified as Outfall 004 in the facility National Pollutant Discharge Elimination System operating permit, IL0000108. Additional closure activities include the construction of a geomembrane cover system that began in July 2019 and was completed on November 17, 2020. Construction was completed in accordance with the Closure and Post Closure Care Plan approved by the IEPA on January 30, 2018 [7].
- **GMF GSP:** The 37-acre GMF GSP received blowdown from the air emission scrubbers and was put into operation in 2010. Construction of the GMF GSP was in accordance with WPCP 2008-EA-4661 and features a composite 60-mil high-density polyethylene (HDPE) liner with 3 feet of recompacted soil with a hydraulic conductivity of 1 x 10^{-7} centimeters per second (cm/s) with internal piping and drains to collect contact water. Construction of the unit required excavation to an elevation of approximately 603 feet[2] and installation of a groundwater underdrain system to eliminate inward pressure on the liner prior to placement of CCR. The GMF GSP underdrain was actively pumped during construction but is no longer actively pumped. Illinois Power Generating Company (IPGC) ceased placement of waste to the GMF GSP prior to April 11, 2021.
- **GMF RP:** The 17-acre GMF RP received blowdown from the air emission scrubbers and was put into operation in 2010. Construction of the GMF RP was in accordance with WPCP 2008-EA-4661 and features a composite 60-mil HDPE liner with 3 feet of recompacted soil with a hydraulic conductivity of 1 x 10^{-7} cm/s with internal piping and drains to collect contact water. Construction of the unit required excavation to an elevation of approximately 601 feet and installation of a groundwater underdrain system to eliminate inward pressure on the liner prior to placement of CCR. The GMF RP underdrain is a passive, gravity drained system. IPGC ceased placement of waste to the GMF RP prior to April 11, 2021.
- **LF:** Fly ash was managed in a permitted composite lined landfill constructed in 2010. The LF has an active groundwater underdrain system that is currently being operated. Additionally, the ash landfill leachate collection system is restricted by rule to no more than one foot of leachate on the composite liner. An IEPA groundwater monitoring program is in effect for the GMF (under Bureau of Water) and Ash Landfill (under Bureau of Land).

[1] Per Federal Register 80 (21302), which promulgated the final Title 40 of the Code of Federal Regulations (40 C.F.R.) § 257 rule, porewater concentrations should be used to characterize potential leaching from impoundments. As discussed further in USEPA's risk assessment of CCR SIs [17], porewater is "collected from the interstitial water between waste particles in surface impoundments as it occurs in the field," and concentrations within the porewater are "the most representative data available for impoundments because these data are field-measured concentrations of leachate." Therefore, CCR source water collected from porewater wells screened near the base of ash within the unit represents the CCR source term.

[2] All elevations in this report are referenced to North American Vertical Datum of 1988 (NAVD88) unless otherwise noted.

2.3 Geology and Hydrogeology

Significant site investigation has been completed at the CPP to characterize the geology, hydrogeology, and groundwater quality. Based on extensive investigation and monitoring, AP1 has been well characterized and detailed in the HCR [6].

2.3.1 Hydrostratigraphic Units

In addition to the CCR, five hydrostratigraphic units have been identified at the CPP based on stratigraphic relationships and common hydrogeologic characteristics, and are summarized as follows:

- **Upper Confining Unit (UCU)**: Consists of the Loess Unit and the upper clayey portion of the Hagarstown Member which has generally lower vertical permeability and generally greater than 60 percent fines. This Unit was encountered across most of the CPP, with the exception of the eastern edges of the SIs near the Unnamed Tributary where the unit was eroded following deposition or locations where it has been excavated for construction.
- **Upper Aquifer (UA)**: This unit consists primarily of sand and sandy silts and clays at the base of the Hagarstown Member and, in some locations, the uppermost weathered sandy clay portion of the Vandalia Member. This unit is absent in several locations due to weathering and in others due to excavation during construction of the CCR Unit. The hydraulic characteristics of the Hagarstown Member are variable due to the different material compositions, but generally indicate the unit has a moderate hydraulic conductivity.
- **Lower Confining Unit (LCU)**: This unit is composed of the sandy clay till of the Vandalia Member, the silt of the Mulberry Grove Formation, and the compacted clay till of the Smithboro Member. The unit underlies the UA and was encountered in all boring locations on the CPP. Results from laboratory tests completed for vertical hydraulic conductivity indicate the Vandalia Member has a very low vertical hydraulic conductivity.
- **Deep Aquifer (DA)**: This unit consists primarily of sandy silt and sands of the Yarmouth Soil, which are thin (less than 5 feet) and discontinuous across the CPP.
- **Deep Confining Unit (DCU)**: This unit underlies the DA and is composed of the Banner Formation, of which the thick Lierle Clay is the first encountered unit. No boring penetrated the full thickness of this formation.

2.3.2 Uppermost Aquifer

The UA has been identified as the base of the Hagarstown Member and, in some locations, the uppermost weathered sandy clay portion of the Vandalia Member. This unit is continuous across the site, but hydraulic characteristics are variable as a result of the unit composition. The UA is absent in several locations due to weathering and in other locations due to excavation during construction of the CCR Unit. The UA exhibits a moderate hydraulic conductivity and is the most likely unit to indicate potential impacts from AP1. Based on the geologic information, the top of the aquifer is highest in elevation along the south-southwest side of AP1, with an elevation of approximately 608 feet. Except in areas where the UCU and UA have been eroded, the top of the UA is typically separated from overlying CCR material by several feet of the low permeability UCU, which consists of the Loess Unit and the upper clayey portion of the Hagarstown Member (**Figures 2-6** and **2-7**). The base of the UA is the top of the LCU, which contains the low permeability Vandalia Member, Mulberry Grove Member, and Smithboro Till.

2.3.3 Potential Migration Pathways

PMPs were interpreted using the lithologic composition and hydrogeologic properties (hydraulic conductivity, hydraulic position with respect to the unit) of the screened materials. In addition to the physical properties, the analytical results from the baseline groundwater monitoring performed in wells screened in the confining units and DA were used to identify PMPs. The UA is the first occurrence of groundwater and therefore the PMPs identified are in geologic units located below the UA. Monitoring wells G307D, G311D, G314, and G316 are considered LCU PMP monitoring locations and G314D is considered a DA PMP monitoring location. Wells G307D, G311D, G314, and G316 evaluate the potential for migration of impacts through the LCU where the UA is absent and potentially into the DA, where monitored.

2.3.4 Regional Bedrock Geology

Bedrock has not been investigated at the site due to the depth to bedrock and presence of two low permeability confining units underlying the UA and above the bedrock, and the intermittent coal beds found within the bedrock. There are no known monitoring wells or production wells screened within the bedrock at CPP. Bedrock has not been encountered at any borings on-site. A literature review was completed to supplement the site geology.

Detailed descriptions of the Pennsylvanian strata of Illinois were published by Willman et al. [8] and Kolata [9]. The Bond Formation includes all strata from the base of the Shoal Creek Limestone Member or the LaSalle Limestone Member to the top of the Millersville Limestone Member or the Livingstone Limestone Member. It is overlain by the Mattoon Formation and underlain by the Modesto Formation. It varies from less than 150 feet thick in eastern Illinois to over 300 feet thick in southeastern Illinois, averaging about 250 feet. The Bond Formation is characterized by a high percentage of limestone and calcareous clays and shales. The Bond and Modesto Formations of the McLeansboro Group also contain multiple thin (typically less than 2 feet) intermittent coal beds. The upper formation of the Kewanee Group is the Carbondale Formation which contains multiple coal beds, including the Herrin (No. 6) Coal, of varying thicknesses (up to 7 feet) [10]. It is bound by thick limestone members (up to 50 feet), the thickest and purest limestones in the Pennsylvanian System of Illinois. Gray shales constitute the greatest part of the formation, although thick channel sandstones are developed locally.

Two mines were operated historically in the vicinity of the site. The Hillsboro Mine located east/southeast of the GSP was operated by the Truax-Traer Coal Company from 1964-1970 and by the Consolidation Coal Company from 1971 through 1983. The mine targeted the Herrin Coal at a depth of 500 to 510 feet below ground surface (bgs), and geological reports included roof problems and slight floor heaving. The Clover Leaf No. 4 Mine located north of the GSP was operated by the Clover Leaf Coal Mining company and the Coffeen Coal Mining Company from 1906 through 1924. The mine targeted the Herrin Coal at a depth of 510 to 544 feet bgs. Geologic reports indicate a massive black shale roof, and unmined areas which could be related to water-bearing sandstones above the roof [11].

2.3.5 Water Table Elevation and Groundwater Flow Direction

Porewater (*i.e.,* CCR source water) elevations within AP1 (as observed in XPW01, XPW02, and XSG-01) are greater than the surrounding areas. The phreatic surface within AP1 in 2023 averaged approximately 629.5 feet, ranging from approximately 628.3 to 630.8 feet in XPW01 and XWP02, respectively (**Table 2-1**). As indicated in **Section 2.3.2**, the groundwater in the UA is separated from overlying CCR material by a minimum thickness of 10 feet of the low permeability soils of the UCU, except along the eastern edge of AP1 where an incised stream gully was backfilled with native materials and CCR (**Figure 2-5**).

Overall groundwater flow within the UA is divided towards the two lobes of Coffeen Lake. The groundwater divide runs approximately through the center of the CPP, with groundwater east of the divide flowing east to southeast towards the Unnamed Tributary or the eastern lobe of Coffeen Lake and groundwater west of the divide flowing west to southwest towards the western lobe of Coffeen Lake. Groundwater flows north to northeast across AP1 (**Figure 2-8** and **Table 2-1**) toward the former discharge flume and Unnamed Tributary. Based on the elevations of the tributary and groundwater elevations measured east of the tributary (**Appendix A** and **Table 2-1**), the Unnamed Tributary is a hydraulic barrier and prevents groundwater migration east of the Unnamed Tributary. A minor component of flow is present to the southwest, likely toward a historical drainage present prior to AP1 construction and site development (**Appendix B**). During 2023, groundwater elevations in the UA in the vicinity of AP1 ranged from approximately 605 to 624 feet, with the exception of G307, which is the potentiometric high indicating the presence of the groundwater divide and was typically at or above 624 feet (**Figure 2-8**). Although elevations vary seasonally, the groundwater flow direction in the UA is consistent and likely controlled by the proximity and hydraulic connection to both the eastern and western lobes of Coffeen Lake.

LCU (PMP) groundwater elevations are slightly lower than those in the UA and exhibit similar variability in seasonal groundwater elevation as the UA. Groundwater elevation within the LCU ranged from about 590 to 623 feet in 2023 (**Figure 2-8** and **Appendix A**). LCU monitoring wells G307D, G311D, G314, and G316 are nearest AP1 and typically have groundwater elevations ranging from about 590 to 623 feet.

DA (PMP) groundwater elevations are generally lower than those in the UA and LCU (PMP) and ranged from approximately 576 to 618 feet in 2023 (**Figure 2-8** and **Appendix A**). DA monitoring well G314D is adjacent to the eastern boundary of AP1 and typically had groundwater elevations ranging from about 596 to 607 feet during 2023. A groundwater contour map was generated for the DA for the E002 event and groundwater flow within the DA generally follows subsurface topography for the unit (**Figure 2-9**).

No monitoring wells were installed in the UCU during 2021 investigation activities and no wells have historically been installed across solely the UCU because it is not present or is unsaturated where present at the CPP. Groundwater elevations within the DCU and bedrock unit are unknown because no wells are screened within these low hydraulic conductivity units.

2.3.5.1 Vertical Hydraulic Gradients

Vertical hydraulic gradients were calculated using available groundwater elevation data from February 2017 to November 2023 at nested well locations within the UA, LCU (upper and lower), and DA. Vertical hydraulic gradients for AP1 are presented in **Table 2-2** and well locations are shown on **Figure 2-8**. The results of the vertical hydraulic gradient calculations between hydrostratigraphic units are summarized below:

- UA to Upper LCU (Vandalia Member):
  - Vertical gradients at well nest G405/T408, located north of AP2, vary between upward and downward with an average (downward) vertical gradient of 0.02 feet per foot (ft/ft).

  - Vertical gradients at well nest G406/T409, located south of AP2 /northwest of AP1, vary between upward and downward with an average (upward) vertical gradient of -0.06 ft/ft. Since 2021, the vertical gradient observed at this well nest has been consistently upward, with the exception of August 2022.

- UA to Lower LCU (Smithboro Member)
  - Well nest G307/G307D, located south of AP1, has consistently downward vertical gradients with an average vertical gradient of 0.13 ft/ft.
  - In well nest G311/G311D gradients are consistently strongly downward, with an average vertical gradient of 0.71 ft/ft.
- Upper LCU (Vandalia Member) to Lower LCU (Smithboro Member)
  - Well nest T408/G45D, located north of AP2, has consistently downward vertical gradients with an average vertical gradient of 0.98 ft/ft. Beginning in 2020, vertical gradients observed at this well nest have become less strongly downward.
  - Vertical gradients at well nest G406/T409, located south of AP2/northwest of AP1, are consistently downward, with the exception of August 2022, with an average vertical gradient of 0.64 ft/ft. Beginning in 2020, vertical gradients observed at this well nest have become less strongly downward.
- LCU to DA
  - Vertical gradients at well nest G314/G314D, located east of AP1, are consistently downward, with an average vertical gradient of 0.69 ft/ft. Beginning in 2022, vertical gradients observed at this well nest have become progressively less strongly downward and the vertical gradient was observed to be upward (-0.01 ft/ft) during December 2023.

Vertical hydraulic gradients indicate there is consistently downward migration of groundwater in most areas of the CPP, with the exception being northwest of AP1, where consistent upward gradients were measured between the UA and upper LCU. However, overall, there has been a decrease in magnitude of downward gradients since approximately 2020, which is likely a result of plant shutdown and placement of a geomembrane on AP2.

2.3.5.2 Impact of Surface Water Bodies on Groundwater Flow

Surface water elevations were measured from various locations along the Unnamed Tributary from March 2021 to December 2023 (**Figure 2-8**). Elevations at SG-04 (near CIPS Trail and determined to be destroyed in October 2023) ranged from 591.94 to 593.38 feet. Surface water elevations near the former discharge flume located between AP1 and AP2 were measured at SG-02 and ranged from 598.34 to 598.75 feet. Surface water elevations from Coffeen Lake at SG-03 (near the outfall east of AP1) ranged from 585.09 to 589.97 feet.

Groundwater contour maps prepared from elevation data measured in monitoring wells indicate groundwater elevations are variable, but flow directions are generally consistent in the UA. Groundwater generally flows from the center of the CPP west towards Coffeen Lake and east towards the Unnamed Tributary and the eastern lobe of Coffeen Lake resulting from a groundwater divide (high) running through the middle of the CPP. This flow pattern is typical for a peninsula of land bordered by a lake. Groundwater flows locally towards the former discharge flume between AP1 and AP2 and to Unnamed Tributary, which flows south to Coffeen Lake.

Groundwater near AP1 discharges locally to the Unnamed Tributary to the east and the former discharge plume to the south, which flow south and east, respectively, into the eastern lobe of Coffeen Lake. The Unnamed Tributary is a local groundwater receiving body that may prevent or reduce groundwater migration east of the Unnamed Tributary.

Construction of the LF, GMF GSP, and GMF RP required removal of the Hagarstown Member, in effect removing the aquifer beneath the footprint of these units [12]. It is uncertain whether these constructed units significantly limit lateral groundwater flow, either by creating no flow zones or by capturing groundwater via their dewatering [13].

2.3.6 Hydraulic Conductivities

2.3.6.1 Field Hydraulic Conductivities

Field hydraulic conductivity tests were performed by Hanson in 2021 as part of characterization efforts to complete 35 I.A.C. § 845 requirements. Individual field hydraulic conductivity test results conducted at AP1 are summarized in **Table 2-3** [6], and tested well locations are included on **Figure 2-8**. The results of the tests are summarized as follows:

- **UA:** Hydraulic conductivities near AP1 ranged from 2.6 x 10^{-4} to 9.1 x 10^{-3} cm/s. Tests had a geometric mean of 2.0 x 10^{-3} cm/s. This is generally consistent with, although higher than, tests conducted prior to 2017 as part of CCR Rule characterization efforts that indicated hydraulic conductivities varied from 1.7 x 10^{-5} to 2.1 x 10^{-3} cm/s, with a geometric mean of 2.9 x 10^{-4} cm/s.
- **LCU:** Hydraulic conductivities ranged from 1.2 x 10^{-4} to 2.3 x 10^{-3} cm/s. Tests had a geometric mean of 5.0 x 10^{-4} cm/s. Monitoring wells with the highest hydraulic conductivities were located near the GMF RP and wells with the lowest hydraulic conductivities were located near AP1. Prior to 2017, field hydraulic conductivity tests completed in the LCU for monitoring well and temporary piezometers (G45D, G46D, T408, and T409) indicate horizontal conductivities from 4.0 x 10^{-8} to 3.4 x 10^{-5} cm/s. The elevated hydraulic conductivity values (10^{-4} to 10^{-3} cm/s) in LCU wells are likely not representative of the primary LCU lithology, but instead reflect the isolated and discontinuous sandy lenses in which the wells are screened.
- **DA:** Geometric mean hydraulic conductivity at DA well G314D, near AP1, was 8.7 x 10^{-5} cm/s and was slightly lower than tests completed in the northern portion of the CPP in 2009 that resulted in hydraulic conductivity values ranging from 1.3 x 10^{-4} to 1.7 x 10^{-3} cm/s, with a geometric mean of 4.4 x 10^{-4} cm/s.
- **DCU:** No monitoring wells are screened only within the DCU, and no field hydraulic conductivity tests have been conducted for the DCU.

2.3.6.2 Laboratory Hydraulic Conductivities

Falling head permeability tests (ASTM D5084 Method F) were performed in the laboratory on samples collected during the 2021 investigations [6] and historically [13]. The results are summarized in **Table 2-4** and discussed below.

- **CCR:** One geotechnical sample of CCR (ash) was collected at XPW02 and the vertical hydraulic conductivity is 8.8 x 10^{-5} cm/s.

- **UCU:**
  - Vertical hydraulic conductivities of samples collected from G307D and G311D near AP1 are 4.8×10^{-8} and 2.9×10^{-8} cm/s, respectively. These values are consistent with historically reported values.
  - Geotechnical tests conducted prior to 2017 indicated UCU vertical hydraulic conductivity values ranging from 1.3×10^{-8} to 5.0×10^{-7} cm/s, with a geometric mean of 1.0×10^{-7} cm/s.
- **UA:** One geotechnical sample of UA material was collected from G275D, near the GMF RP, with a vertical hydraulic conductivity of 1.6×10^{-4} cm/s. No UA samples collected near AP1 were analyzed for vertical hydraulic conductivity.
- **LCU:**
  - Three samples collected from G307D, G311D, and G314D, near AP1, have vertical hydraulic conductivities ranging from 5.5×10^{-8} to 3.7×10^{-7} cm/s, with a geometric mean of 1.8×10^{-7} cm/s. Vertical hydraulic conductivities from 2021 are consistent with those observed historically.
  - Intermittently present within the LCU is the Mulberry Grove Member. Historical vertical hydraulic conductivities of the Mulberry Grove Member were measured as 1.6×10^{-6} and 1.9×10^{-6} cm/s.
  - Historical laboratory tests reported LCU vertical hydraulic conductivity values ranging from 6.8×10^{-9} to 4.5×10^{-6} cm/s, with a geometric mean of 3.0×10^{-8} cm/s.
- **DA:** No laboratory vertical hydraulic conductivity tests were completed on DA materials.
- **DCU**: No laboratory vertical hydraulic conductivity tests were completed during 2021 on DCU materials. Historical vertical hydraulic conductivity tests were performed on samples collected north and west of the GMF GSP. Vertical hydraulic conductivities of 6.8×10^{-9} and 4.5×10^{-6} cm/s were reported.
- **Bedrock**: No bedrock samples were analyzed for vertical hydraulic conductivity.

2.4 Groundwater Monitoring

The monitoring system for AP1 is shown on **Figure 2-2** and consists of two background monitoring wells (G281 and G306), 14 compliance monitoring wells (G301, G302, G303, G305, G307, G307D, G308, G310, G312, G313, G314, G314D, G315, and G316), and three temporary water level only surface water staff gages (SG-02, SG-03, and XSG-01) to monitor potential impacts from AP1 [14]. These monitoring wells are screened within the UA (G281, G301, G302, G303, G305, G306, G307, G308, G310, G312, G313, and G315), LCU (G307D, G314, and G316), and DA (G314D) along the perimeter of AP1. Porewater samples are collected from locations XPW01 on the western side of AP1 and XPW02 on the northern side of AP1 (**Figure 2-2**).

2.5 Hydrogeologic Conceptual Site Model

The HCR [6] and information provided above forms the foundation of the AP1 hydrogeological setting. AP1 overlies a potential recharge area for the underlying transmissive geologic media, which are composed of unlithified deposits. Recharge migrates downward into and through the UCU into the UA.

Groundwater flow in the UA at the CPP is divided towards the two lobes of Coffeen Lake. The loess of the UCU and sands of the UA are hydraulically connected. Groundwater flow in the silts and clays of the UCU and LCU is expected to be primarily vertical. The majority of horizontal groundwater migration is expected to be within the lower Hagarstown member (*i.e.,* UA).The geologic conceptual model for the site used for groundwater modeling [15] consists of the following layers:

- Hagarstown Loess Unit (*i.e.*, UCU) – Loess Unit and the upper clayey portion of the Hagarstown Member.
- Hagarstown Member (*i.e.*, UA) – sand and sandy silts and clays at the base of the Hagarstown Member and, in some locations, the uppermost weathered sandy clay portion of the Vandalia Member.
- Vandalia Member/Mulberry Grove Member (*i.e.*, LCU) – unweathered sandy clay till and discontinuous silts.
- Smithboro Till (*i.e.*, LCU) – compacted clay till of the Smithboro Member.
- The Yarmouth Soil (*i.e.,* DA) and Lierle Clay (*i.e.,* DCU) were not included in the model, for consistency with the original model [16].

The United States Geological Survey (USGS) National Map places the CPP within the East Fork Shoal Creek watershed subbasin (Hydrologic Unit Code 071402030303). The CPP conceptual site model (CSM) extent is bounded by a hydrological catchment (watershed) divide to the east based on watershed data from USGS. Along the north, south, and east, the model boundary was placed along known waterbodies as much as possible. As such, it is assumed groundwater inflow from adjacent watersheds is negligible through both the UA and LCU. The Coffeen Lake water levels are managed at an average elevation of 591.0 feet. Coffeen Lake, the Unnamed Tributary, and the former discharge flume are the receiving surface water bodies in the area encompassed by the CSM.

Precipitation infiltrates and recharges the groundwater table throughout the site and upgradient of the site. Groundwater in the UCU migrates downward into the sandy material of the lower Hagarstown Formation or weathered Vandalia Till, which is considered the UA. The sands of the UA are separated from the base of CCR in AP1 by the laterally continuous low permeability UCU in the western portion of AP1. Erosion caused by incised streams has occurred along the northeast corner of AP1 which likely results in localized ash contact with the UA. Water that percolates downward from layers overlying the UA is most likely to travel laterally from the site within the UA due to the relatively high permeability (as compared to the underlying LCU) and horizontal gradients present within the UA as described above. Groundwater and surface water elevations indicate groundwater flows towards Coffeen Lake, which is a local receiving body for the UA. Further downward migration is also limited by the relatively thick and low permeability LCU. In portions where the UA isn't present (*i.e.,* G314) groundwater migrates vertically as there is no permeable UA for lateral migration. The Vandalia Till in this location also has lower density and higher porosity (**Table 2-4**) indicating vertical migration may potentially be more prevalent in this area of the site. The lack of UA at this location could indicate that this area experienced more weathering, and the resulting Vandalia Till at this location may have slightly higher permeability.

Based on the geology and hydrogeology, monitoring wells at AP1 can be separated into three distinct groupings that exhibit similar geologic and hydraulic characteristics. Compliance monitoring well groupings are summarized as follows:

- UA wells: shallow wells (generally less than 20 feet bgs) screened in moderate permeability materials (generally about 10^{-3} cm/s) including G301, G302, G305, G307, G308, G310, G312, G313, and G315.
- LCU wells: shallow wells (approximately 20 feet bgs) east of AP1 where the UCU and UA have been eroded (G314 and G316) and a deep well (approximately 60 feet bgs) where the UCU and UA overlie the LCU (G307D). LCU wells are screened in moderate permeability (generally about 10^{-4} cm/s) sand lenses within the low permeability till.
- DA wells: deep well (approximately 50 feet bgs) screened in low to moderate permeability materials (generally about 10^{-5} cm/s) located east of AP1 where the UCU and UA have been eroded (G314D).

3. OCCURRENCE AND DISTRIBUTION OF GROUNDWATER EXCEEDANCES (EXTENT)

Results from groundwater samples collected from AP1 during E001, E002, and E003 were received on August 17, 2023; November 21, 2023; and January 10, 2024, respectively. In accordance with 35 I.A.C. § 845.610(b)(3)(C), comparison of statistically derived values with the GWPSs described in 35 I.A.C. § 845.600 to determine exceedances of the GWPS was completed [3, 4, 5]. Exceedances for which an Alternative Source Demonstration was not completed include the following parameters and wells by hydrostratigraphic unit:

- UA (**Figure 3-1**):
  - Boron at G313
  - Sulfate at G301, G303, G305, G307, G308, G310, G312, and G313
  - TDS at G303, G305, G308, G310, G312, G313, and G315
- LCU (PMP; **Figure 3-2**):
  - Sulfate at G307D, G314, and G316
  - TDS at G314 and G316
- DA (PMP; **Figure 3-3**):
  - Sulfate at G314D
  - TDS at G314D

The extents of exceedances discussed below were defined using existing monitoring wells, including wells present on-site (**Table 3-1**), that may not be included in the 35 I.A.C. § 845 monitoring program.

3.1 Additional Investigation to Define Nature and Extent

Following initial sampling in 2021, potential exceedances of the GWPS were identified for the parameters and locations identified above [3, 4, 5]. Solid phase data were collected and evaluated from 10 locations during monitoring well installation at AP1 to assess potential geological sources of exceedance parameters and to inform the GCSM (discussed further in **Section 4**). Solid samples were collected from XPW01 and XPW02 for CCR source material characterization; from the UA at monitoring wells G306, G307D, G311, G311D, G313, and G316; from the UCU at monitoring wells G307D, G311D, and G314D; from the LCU at monitoring wells G314, G307D, G311D, and G314D; and from the DA at monitoring well G314. Solids samples were collected and analyzed for the following:

- EPA 6010B for Total Metals (iron, aluminum, arsenic, manganese, lead, lithium, molybdenum, cobalt, calcium, beryllium, selenium, and chromium);
- Bulk Mineralogy by Reitveld x-ray diffraction Analysis;
- Bulk elemental composition by x-ray fluorescence;
- Sulfur contents;
- Cation Exchange Capacity Analysis; and,

- Total Organic Carbon Analysis and Loss on Ignition.

Six surface water samples were collected later in 2021 to characterize the water quality in Coffeen Lake to supplement previous samples collected in 2016 (**Appendix C**) [2]. Surface water samples were analyzed for 35 I.A.C. § 845.600 parameters (total and dissolved), ferrous and ferric iron, major ions, and monitored natural attenuation parameters. Data from solids phase and surface water sampling has been incorporated into this report where applicable.

3.2 Extent in the Uppermost Aquifer

Groundwater samples are evaluated quarterly and exceedances are identified following comparison of lower confidence limits (LCLs) to the GWPSs described in 35 I.A.C. § 845.600. The LCLs vary as the dataset is updated to include additional quarterly events (**Table 3-2**). The discussion below includes ranges of concentrations measured in wells with exceedances, because there is no single value for LCLs.

3.2.1 Boron

Boron GWPS (3.2 milligrams per liter [mg/L]) statistical exceedances in the UA are limited to G313. Monitoring well G313 is located on the east berm of the unit, between AP1 and east lobe of Coffeen Lake. Concentrations of boron in G313 range from 3.2 to 5.23 mg/L (**Table 3-3**). The extents of statistical exceedances greater than the GWPS are defined laterally in the UA to the north by monitoring well G312, to the south by monitoring well G303, and to the west by monitoring wells G310 and G308 (**Figure 3-1**). The boring log from G314 and historical topographic maps indicates that the UA has been eroded south and east of G313, and statistical exceedances are not expected to extend a significant distance in these directions due to observed groundwater flow directions and the absence of UA materials observed at G314. Due to the proximity of monitoring well G313 to Coffeen Lake, additional wells cannot be installed to laterally define the eastern extent of boron greater than the GWPS; however, the eastern lobe of Coffeen Lake is located approximately 250 feet downgradient of G313 and comparison of water elevations indicates that groundwater migrates toward Coffeen Lake. The extent of boron statistical exceedances is defined downgradient by surface water sample CL-2 collected near G313, which indicates the boron concentration is 0.086 mg/L, and similar to boron concentrations measured in a Coffeen Lake background sample (BKG-1; 0.086 mg/L) (**Appendix C**).

G314 is screened in the LCU and in close proximity to G313, does not contain statistical exceedances of boron greater than the GWPS and defines the vertical extent of boron GWPS statistical exceedances. Downward migration of boron in the UA at G313 is inhibited by the underlying Vandalia Till, Mulberry Grove Member, and Smithboro Till which are, on average, greater than 15 feet thick at the site. Vertical hydraulic conductivity tests completed on samples of the LCU beneath the UA indicate hydraulic conductivities from 5.5×10^{-8} to 3.7×10^{-7} cm/s. This is very low relative to the horizontal hydraulic conductivity measured within the UA (geometric mean of 2.0×10^{-3} cm/s). The significant contrast in permeability (greater than two orders of magnitude) indicates groundwater at the downgradient edges of AP1 containing elevated concentrations of boron will preferentially migrate horizontally toward the former discharge flume in northeast or to the east toward Coffeen Lake where the UA is present and vertically downward in limited areas (*i.e.*, where the UA is not present and Vandalia Till may be slightly more permeable) into underlying hydrostratigraphic units.

3.2.2 Sulfate

Sulfate statistical exceedances in the UA are located in monitoring wells north of AP1 (G301 and G310), southwest of AP1 (G305, G307, and G308), and east of AP1 (G303, G312, and G313). G313 also contained the boron statistical exceedance discussed above. Concentrations of sulfate in UA wells with GWPS (400 mg/L) statistical exceedances range from 420 to 2,400 mg/L (**Table 3-3**). Coal was historically stored near the southwest corner of AP1 and represents a potential external sulfate source to groundwater. Sulfate has also been identified within solids of the UCU and LCU at concentrations up to 220 milligrams per kilogram [6]. The ability to define the lateral extents of sulfate GWPS exceedances in the UA upgradient of AP1 is limited by the complex groundwater flow patterns influenced by the ash ponds proximity to the groundwater flow divide that runs north-south through the CPP, historical drainage features, and surface water receiving bodies to the north (former discharge flume), east and west (Coffeen Lake east and west lobes), and to a limited extent to the south (Coffeen Lake at southern end of CPP site) (**Figure 3-1**).

The extent of sulfate statistical exceedances is defined downgradient by surface water samples which indicate the sulfate concentrations are between 31 and 110 mg/L (**Appendix C**). The highest sulfate concentrations in surface water samples were located in the former discharge flume (D-1 and D-2; 110 mg/L and 69 mg/L, respectively) between AP1 and AP2. Surface water samples collected from Coffeen Lake (CL-1, CL-2, and CL-3; 33 mg/L, 31 mg/L, and 32 mg/L, respectively) are lower in sulfate than samples concentrations measured in the former discharge flume and are comparable to a Coffeen Lake background sample (BKG-1; 36 mg/L). These results are generally consistent with historical samples collected from Coffeen Lake in 2016 which reported concentrations ranging from 54 - 56 mg/L (**Appendix C**).

Downward migration of sulfate in the UA is inhibited by the underlying Vandalia Till, Mulberry Grove Member, and Smithboro Till which are, on average, greater than 15 feet thick at the site. Vertical hydraulic conductivity tests completed on samples of the LCU beneath the UA indicate hydraulic conductivities from 5.5×10^{-8} to 3.7×10^{-7} cm/s. This is very low relative to the horizontal hydraulic conductivity measured within the UA (geometric mean of 2.0×10^{-3} cm/s). The significant contrast in permeability (greater than two orders of magnitude) indicates groundwater at the downgradient edges of AP1 containing elevated concentrations of sulfate will preferentially migrate horizontally toward the northeast to the former discharge flume or to the east to Coffeen Lake. Vertical downward groundwater movement into underlying hydrostratigraphic units only occurs in limited areas where the UA is not present and the Vandalia is potentially more permeable.

3.2.3 Total Dissolved Solids

TDS results indicate the mass of dissolved material in groundwater is a representation of multiple constituents present in the groundwater. Typically, major ions (such as sulfate) represent the primary contributors to TDS. TDS statistical exceedances in the UA are coincident with many of the sulfate statistical exceedances and are located north of AP1 (G310), southwest of AP1 (G305 and G308), south of AP1 (G315), and east of AP1 (G303, G312, and G313). Concentrations of TDS in UA wells with GWPS statistical exceedances range from 362 to 2,010 mg/L (**Table 3-3**). Similar to sulfate, TDS statistical exceedances are not defined laterally upgradient within the UA around AP1 (**Figure 3-1**) due to complex flow patterns. The extent of TDS statistical exceedances is defined downgradient by surface water samples which indicate the TDS concentrations are between 120 and 240 mg/L (**Appendix C**). The highest TDS concentrations were located in the former discharge flume (D-1 and D-2; 240 mg/L and 240 mg/L, respectively) between AP1 and AP2. Samples collected from Coffeen Lake (CL-1, CL-2, and CL-3;120 mg/L, 160 mg/L, and 150 mg/L, respectively) are lower in TDS than sample concentrations measured in the former discharge flume and to background surface water measurements collected from Coffeen Lake (BKG-1; 72 mg/L).

Downward migration of TDS in the UA is inhibited by the underlying Vandalia Till, Mulberry Grove Member, and Smithboro Till which are, on average, greater than 15 feet thick at the site. Vertical hydraulic conductivity tests completed on samples of the LCU beneath the UA indicate hydraulic conductivities from 5.5×10^{-8} to 3.7×10^{-7} cm/s. This is very low relative to the horizontal hydraulic conductivity measured within the UA (geometric mean of 2.0×10^{-3} cm/s). The significant contrast in permeability (greater than two orders of magnitude) indicates groundwater at the downgradient edges of AP1 containing elevated concentrations of TDS will preferentially migrate horizontally toward the northeast to the former discharge flume or to the east to Coffeen Lake. Vertical downward groundwater movement into underlying hydrostratigraphic units only occurs in limited areas where the UA is not present and the Vandalia is potentially more permeable.

3.3 Extents in Lower Confining Unit / Potential Migration Pathway

3.3.1 Sulfate

Statistical exceedances of sulfate greater than the GWPS (400 mg/L) were identified at LCU wells G307D, near the southwest corner of AP1, and at G314 and G316, between AP1 and Coffeen Lake. Concentrations of sulfate at these locations (**Figure 3-2**) range from 330 to 2,400 mg/L (**Table 3-3**). Similar to groundwater flow patterns in UA, the ability to define the lateral extents of sulfate GWPS statistical exceedances in the LCU upgradient of AP1 is also limited by the complex groundwater flow patterns influenced by the ash ponds proximity to surface water receiving bodies. Because LCU groundwater flow is expected to be primarily vertical except in areas where the overlying deposits are absent, the lateral extent of sulfate is defined downgradient (east of G314 and G316; west of G307D) by surface water samples. The highest sulfate concentrations in surface water samples were located in the former discharge flume (D-1 and D-2; 110 mg/L and 69 mg/L, respectively) between AP1 and AP2. Surface water samples collected from Coffeen Lake (CL-1, CL-2, and CL-3; 33 mg/L, 31 mg/L, and 32 mg/L, respectively) are lower in sulfate than sample concentrations measured in the former discharge flume and are comparable to a Coffeen Lake background sample (BKG-1; 36 mg/L) (**Appendix C**).

3.3.2 Total Dissolved Solids

TDS results indicate the mass of dissolved material in the groundwater and is a representation of multiple constituents present in the groundwater. Typically, major ions (such as sulfate) represent the primary contributors to TDS. Statistical exceedances of TDS greater than the GWPS (1,200 mg/L) were identified at G314 and G316 (**Figure 3-2**), with concentrations ranging from 1,100 to 4,000 mg/L (**Table 3-3**) at these locations. Sulfate statistical exceedances were also determined at these wells.

TDS GWPS statistical exceedances within the LCU are defined to the west by G307D. To the east and south, LCU exceedances can be defined downgradient by TDS concentrations in Coffeen Lake. Samples collected from Coffeen Lake (CL-1, CL-2, and CL-3) have TDS concentrations from

120 to 160 mg/L and are slightly higher than TDS samples collected from a Coffeen Lake background sample (BKG-1; 72 mg/L). TDS exceedances are defined to the north by former discharge flume samples (D-1 and D-2), which were both 240 mg/L (**Appendix C**).

3.4 Extents in Deep Aquifer / Potential Migration Pathway

3.4.1 Sulfate

Sulfate GWPS (400 mg/L) statistical exceedances were identified at G314D. Sulfate concentrations at this location range from 670 to 1,100 mg/L (**Table 3-3**). Sulfate statistical exceedances are not defined laterally by monitoring wells within the DA around AP1 (**Figure 3-3**) but are expected to be limited to the areas where the UA is not present and by flow directions (**Figure 2-9**) which indicate flow toward Coffeen Lake. Delineation within the DA may be complicated by a secondary source of sulfate in the solid phase at certain locations including G314D (Appendix D).

3.4.2 Total Dissolved Solids

TDS results indicate the mass of dissolved material in the groundwater and is a representation of multiple constituents present in the groundwater. Typically, major ions (such as sulfate) represent the primary contributors to TDS. TDS GWPS (1,200 mg/L) statistical exceedances were also identified at G314D. Concentrations of TDS at this location range from 1,600 to 2,420 mg/L (**Table 3-3**). TDS statistical exceedances are not defined laterally within the DA around AP1 (**Figure 3-3**), but, like sulfate, are expected to be limited to the areas where the UA is not present and by flow directions (**Figure 2-9**) which indicate flow toward Coffeen Lake.

4. GEOCHEMICAL CONCEPTUAL SITE MODEL (NATURE)

A GCSM was developed to describe the conditions of the groundwater in the vicinity of CPP AP1 and is summarized here (full analysis presented in **Appendix D**). The GCSM describes the geochemical processes that contribute to the mobilization, distribution, and attenuation of chemicals in the environment. Only parameters that have exceeded the GWPS in AP1 groundwater and will be addressed in the Corrective Action Plan are included in the GCSM. As discussed in previous sections, the exceedances observed at AP1 include boron, sulfate, and TDS.

CCR porewater is water "collected from the interstitial water between waste particles in surface impoundments as it occurs in the field" [17] and represents the material potentially leached from impoundments. CCR materials are the primary source of constituent loading to CCR porewater (*i.e.*, CCR source water). Over an extended period (*e.g.*, months to years), CCR porewater (*i.e.*, water contained within the interstitial pore spaces of CCR that can be sampled by low-flow groundwater sampling methods) reaches equilibrium with the CCR materials. The porewater is therefore representative of the mobile phase constituents capable of migrating into underlying materials and potentially downgradient in groundwater. AP1 CCR source water is therefore the primary indicator of constituents *available* to groundwater and is considered as the primary source term for environmental investigation and fate and transport modeling. AP1 appears to be the primary source of boron and sulfate to downgradient groundwater. However, the poor correlation between boron and sulfate in groundwater and higher concentrations of sulfate in the LCU and DA than in AP1 suggest the potential for a secondary source. TDS is a measure of inorganic and organic substances in solution. TDS trends are generally consistent with those of sulfate in the GMF RP groundwater system.

Conditions within UA, LCU, and DA groundwater are predicted to favor amorphous iron oxide stability at some locations, and the presence of iron oxides in some site solids indicates a portion of the boron and sulfate in the groundwater system may be attenuated via surface complexation reactions. Boron may be further attenuated via interactions with clay minerals, which are present in solids across the UA, LCU, and DA. Batch attenuation testing with solids from the site indicate that chemical attenuation of boron is possible, while chemical attenuation of sulfate could be minimal.

5. COMBINED GEOCHEMICAL AND HYDROGEOLOGIC CONCEPTUAL SITE MODELS

5.1 Boron Conceptual Site Model

The CSM describing current conditions at AP1 combining the hydrogeologic and geochemical CSMs for boron is as follows. Water that may come into contact with CCR in AP1 becomes porewater within the unlined CCR unit. Porewater containing elevated concentrations of boron is capable of migrating into and mixing with groundwater of the UA. Groundwater within the higher hydraulic conductivity zones of the UA in the vicinity of AP1 travels horizontally outward from AP1. The horizontal migration of groundwater outward from AP1 is influenced by groundwater flow gradients towards adjacent receiving water bodies including the former discharge flume, Unnamed Tributary, and ultimately into the east and west lobes of Coffeen Lake.

Conditions within the UA are predicted to favor amorphous iron oxide stability at many locations and the presence of iron oxides in some site solids indicates a portion of the boron in the groundwater system may be attenuated via surface complexation reactions. Boron may be further attenuated via interactions with clay minerals, which are present in solids across the UA. Batch attenuation testing with solids from the site indicate that chemical attenuation of boron is possible. These differences in geochemical conditions in the UA, in combination with the heterogeneities of the sand, sandy silts, and clays within the UA, may contribute to GWPS exceedances of boron in only one compliance well location downgradient of the CCR unit.

5.2 Sulfate and TDS Conceptual Site Model

The CSM describing current conditions at AP1 combining the hydrogeologic and geochemical CSMs for sulfate and TDS is as follows. Water that may come into contact with CCR in AP1 becomes porewater within the unlined CCR unit. Porewater containing elevated concentrations of sulfate and TDS is capable of migrating into and mixing with groundwater of the UA. Groundwater within the UA and in the higher hydraulic conductivity transmissive zones of the LCU in the vicinity of AP1 travels horizontally outward from AP1. The horizontal migration of groundwater outward from AP1 is influenced by groundwater flow gradients towards adjacent receiving water bodies including the former discharge flume, Unnamed Tributary, and ultimately into the east and west lobes of Coffeen Lake. Although downward vertical migration of sulfate and TDS in groundwater is limited by low hydraulic conductivities of the LCU clay, the consistent vertical hydraulic gradients measured at well nest G314, lower densities and higher porosity measured in the till, and the presence of thin, sandy transmissive zones and vertical fractures present in the LCU may provide a pathway for sulfate and TDS to migrate into the DA at the eastern edge (G314D) of AP1.

Conditions within the UA, LCU, and DA are predicted to favor amorphous iron oxide stability at many locations and the presence of iron oxides in some site solids indicates a portion of the sulfate in the groundwater system may be attenuated via surface complexation reactions. Sulfate may be further attenuated via interactions with clay minerals, which are present in solids across the UA and LCU. Batch attenuation testing with solids from the site indicate that chemical attenuation of sulfate could be minimal. These differences in geochemical conditions in the UA, LCU, and DA aquifer, heterogeneities of the hydrostratigraphic units surrounding and below AP1, and relatively higher concentrations of sulfate and TDS, may contribute to GWPS exceedances of sulfate and TDS in locations absent of boron GWPS exceedances.

A screening level risk human health and ecological risk assessment [2] was performed to characterize potential risks to human and ecological receptors that may be exposed to CCR constituents present in Coffeen Lake that may have originated from AP1. The risk assessment evaluation considered contaminants of interest if the maximum detected constituent concentration in groundwater exceeded a human health-based benchmark or a maximum detected constituent concentrations in groundwater exceeded an ecological surface water benchmark protective of aquatic life. Based on the evaluation presented in the risk assessment, no unacceptable risks to human or ecological receptors in Coffeen Lake resulting from CCR exposures associated with AP1 were identified. This means that the risks from the site, in particular the migration of constituents in groundwater to Coffeen Lake that are attributable to AP1, are likely indistinguishable from normal background risks.

6. CONCLUSIONS AND FUTURE ACTIVITIES

In accordance with 35 I.A.C. § 845.650(d)(1), the nature and extent of GWPS statistical exceedances of boron, sulfate, and TDS have been described in sufficient detail to support a complete and accurate assessment of the corrective measures necessary to effectively clean up all releases from AP1.

The lateral extents of statistical exceedances in the UA are illustrated in **Figure 3-1**. As discussed in **Sections 3.2.1, 3.2.2,** and **3.3.3**, boron, sulfate, and TDS statistical exceedances are defined downgradient by Coffeen Lake surface water samples collected in 2021. Boron extent is further defined downgradient of G313 by monitoring wells G314 and G316. Sulfate and TDS statistical exceedances are not expected to extend a significant distance to the south or west due to the north-south groundwater divide, the presence of a former drainage feature, and observed groundwater flow direction within the UA around AP1. Boron, sulfate, and TDS statistical exceedances are constrained vertically by the underlying Vandalia Till.

The lateral extents of statistical exceedances in the LCU are illustrated in **Figure 3-2**. As discussed in **Sections 3.3.1** and **3.3.2**, sulfate and TDS statistical exceedances are defined downgradient by Coffeen Lake surface water samples collected in 2021. Sulfate and TDS statistical exceedances are not expected to extend a significant distance to the south or west due to the north-south groundwater divide, the presence of a former drainage feature, and observed groundwater flow direction within the UA and LCU around AP1.

The lateral extents of statistical exceedances in the DA are illustrated in **Figure 3-3**. As discussed in **Sections 3.4.1** and **3.4.2**, sulfate and TDS are expected to be limited to the areas where the higher permeability UA is not present above the DA and are constrained by the discontinuous occurrence of the lithologic unit and the presence of low hydraulic conductivity clay that separates AP1 from the DA. Sulfate statistical exceedances are also expected to be limited by flow direction within the DA toward Coffeen Lake.

Sulfate was selected for modeling source control presented in the Final Closure Plan and was identified as a surrogate for boron and TDS, as described in the Groundwater Modeling Report [15]. For modeling purposes, it was assumed that sulfate would not significantly sorb or chemically react with aquifer solids (soil adsorption coefficient [Kd] was set to 0 milliliters per gram), which is a conservative estimate for predicting contaminant transport times in the model.

7. REFERENCES

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TABLES

Table 2-1. Summary of Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G281	Background	05/30/2023	6.64	619.71
G301	Compliance	06/06/2023	[7.49]	[615.16]
G302	Compliance	05/30/2023	11.04	608.99
G303	Compliance	05/30/2023	5.92	616.09
G305	Compliance	05/30/2023	7.63	618.03
G306	Background	05/30/2023	8.13	617.77
G307	Compliance	06/05/2023	[0.07]	[624.53]
G307D	Compliance	05/30/2023	2.48	622.39
G308	Compliance	05/30/2023	5.56	619.02
G310	Compliance	05/30/2023	9.57	613.29
G312	Compliance	05/30/2023	12.42	607.35
G313	Compliance	06/06/2023	[3.03]	[611.27]
G314	Compliance	05/30/2023	4.81	609.06
G314D	Compliance	05/30/2023	6.69	607.00
G315	Compliance	06/07/2023	[3.60]	[619.92]
G316	Compliance	05/30/2023	12.28	590.31
XSG-01	Water Level	05/30/2023	5.45	630.07
SG-02	Water Level	05/30/2023	7.47	598.40
SG-03	Water Level	05/30/2023	9.85	585.09

Notes:
BMP = below measuring point
Bracketing [ ] indicates that the measurement was obtained outside of the 24-hour period from initiation of depth to groundwater measurements.
NAVD88 = North American Vertical Datum of 1988

Table 2-1. Summary of Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G281	Background	08/08/2023	6.39	619.97
G301	Compliance	08/08/2023	8.11	614.54
G302	Compliance	08/08/2023	12.68	607.36
G303	Compliance	08/08/2023	8.40	613.62
G305	Compliance	08/08/2023	9.19	616.48
G306	Background	08/08/2023	9.70	616.21
G307	Compliance	08/08/2023	0.70	623.90
G307D	Compliance	08/08/2023	7.89	616.99
G308	Compliance	08/08/2023	5.09	619.50
G310	Compliance	08/08/2023	10.30	612.57
G312	Compliance	08/08/2023	14.00	605.78
G313	Compliance	08/08/2023	3.01	611.29
G314	Compliance	08/08/2023	4.88	609.00
G314D	Compliance	08/08/2023	7.78	605.92
G315	Compliance	08/08/2023	3.50	620.02
G316	Compliance	08/08/2023	11.70	590.89
XSG-01	Water Level	08/08/2023	6.25	629.27
SG-03	Water Level	08/08/2023	9.65	585.29

Notes:
Only wells with groundwater elevations measured are included.
BMP = below measuring point
NAVD88 = North American Vertical Datum of 1988

Table 2-1. Summary of Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G281	Background	11/13/2023	8.59	617.77
G301	Compliance	11/13/2023	8.43	614.22
G302	Compliance	11/13/2023	13.16	606.88
G303	Compliance	11/13/2023	9.32	612.70
G305	Compliance	11/13/2023	8.50	617.17
G306	Background	11/13/2023	10.13	615.78
G307	Compliance	11/13/2023	1.96	622.64
G307D	Compliance	11/13/2023	12.36	612.52
G308	Compliance	11/13/2023	6.00	618.59
G310	Compliance	11/13/2023	10.56	612.31
G312	Compliance	11/13/2023	Dry	
G313	Compliance	11/13/2023	3.36	610.94
G314	Compliance	11/13/2023	5.67	608.21
G314D	Compliance	11/13/2023	7.97	605.73
G315	Compliance	11/13/2023	4.11	619.41
G316	Compliance	11/13/2023	12.46	590.13
XSG-01	Water Level	11/13/2023	10.38	625.14
SG-02	Water Level	11/13/2023	7.36	598.51
SG-03	Water Level	11/13/2023	9.71	585.23

Notes:
Only wells with groundwater elevations measured are included.
BMP = below measuring point
NAVD88 = North American Vertical Datum of 1988

Table 2-2. Vertical Hydraulic Gradients
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Date	G405 Groundwater Elevation (ft NAVD88)	T408 Groundwater Elevation (ft NAVD88)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
	UA	LCU (upper)				
2/4/2017	618.47	619.46	-0.99	12.00	-0.08	up
5/13/2017	618.74	619.00	-0.26	12.00	-0.02	up
7/8/2017	618.54	619.12	-0.58	12.00	-0.05	up
10/21/2017	614.47	614.81	-0.34	12.00	-0.03	up
5/8/2018	618.94	615.82	3.12	12.00	0.26	down
8/2/2018	617.55	614.45	3.10	12.00	0.26	down
10/23/2018	616.40	616.30	0.10	12.00	0.01	down
1/15/2019	616.81	617.01	-0.20	12.00	-0.02	up
8/5/2019	617.72	617.15	0.57	12.00	0.05	down
1/20/2020	619.28	619.13	0.15	12.00	0.01	down
8/10/2020	617.62	617.38	0.24	12.00	0.02	down
1/20/2021	617.12	616.85	0.27	12.00	0.02	down
4/20/2021	617.13	616.65	0.48	12.00	0.04	down
7/26/2021	617.37	617.21	0.16	12.00	0.01	down
8/16/2021	617.28	617.22	0.06	12.00	0.00	down
10/25/2021	618.12	615.50	2.62	12.00	0.22	down
2/7/2022	617.28	616.88	0.40	12.00	0.03	down
5/9/2022	617.91	617.78	0.13	12.00	0.01	down
8/23/2022	616.85	616.99	-0.14	12.00	-0.01	up
2/13/2023	617.50	617.16	0.34	12.00	0.03	down
5/30/2023	616.79	616.66	0.13	12.00	0.01	down
8/8/2023	616.78	616.62	0.16	12.00	0.01	down
10/24/2023	615.79	615.97	-0.18	12.00	-0.02	up
11/13/2023	615.90	616.06	-0.16	12.00	-0.01	up
			Middle of screen elevation G405D			610.0
			Middle of screen elevation T408			598.0

Table 2-2. Vertical Hydraulic Gradients

Nature and Extent Report

Coffeen Power Plant

Ash Pond No. 1

Coffeen, IL

Date	G406 Groundwater Elevation (ft NAVD88)	T409 Groundwater Elevation (ft NAVD88)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
	UA	LCU (upper)				
2/4/2017	617.52	615.93	1.59	8.23	0.19	down
5/13/2017	616.20	616.75	-0.55	8.23	-0.07	up
7/8/2017	616.29	617.05	-0.76	8.23	-0.09	up
10/21/2017	611.27	612.16	-0.89	8.23	-0.11	up
5/8/2018	615.47	616.02	-0.55	8.23	-0.07	up
8/2/2018	615.75	615.25	0.50	8.23	0.06	down
10/23/2018	614.11	613.96	0.15	8.23	0.02	down
1/15/2019	615.36	614.78	0.58	8.23	0.07	down
8/5/2019	616.50	615.10	1.40	8.23	0.17	down
1/20/2020	617.48	617.16	0.32	8.23	0.04	down
8/10/2020	615.54	615.43	0.11	8.23	0.01	down
1/20/2021	612.97	614.41	-1.44	8.23	-0.17	up
4/20/2021	613.78	615.33	-1.55	8.23	-0.19	up
7/26/2021	614.20	615.72	-1.52	8.23	-0.18	up
8/16/2021	613.82	615.42	-1.60	8.23	-0.19	up
10/25/2021	614.93	616.43	-1.50	8.23	-0.18	up
2/7/2022	613.55	614.97	-1.42	8.23	-0.17	up
5/9/2022	615.36	616.81	-1.45	8.23	-0.18	up
8/23/2022	613.47	610.73	2.74	8.23	0.33	down
2/13/2023	614.11	615.65	-1.54	8.23	-0.19	up
5/30/2023	612.29	613.74	-1.45	8.23	-0.18	up
8/8/2023	613.87	615.02	-1.15	8.23	-0.14	up
10/24/2023	611.28	612.55	-1.27	8.23	-0.15	up
11/13/2023	611.53	613.01	-1.48	8.23	-0.18	up
			Middle of screen elevation G406			605.9
			Middle of screen elevation T409			597.7

Table 2-2. Vertical Hydraulic Gradients

Nature and Extent Report

Coffeen Power Plant

Ash Pond No. 1

Coffeen, IL

Date	T408 Groundwater Elevation (ft NAVD88)	G45D Groundwater Elevation (ft NAVD88)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
	LCU (upper)	LCU (lower)				
2/4/2017	619.46	587.71	31.75	13.78	2.30	down
5/13/2017	619.00	586.19	32.81	13.78	2.38	down
7/8/2017	619.12	586.29	32.83	13.78	2.38	down
10/21/2017	614.81	584.69	30.12	13.78	2.19	down
5/8/2018	615.82	587.56	28.26	13.78	2.05	down
8/2/2018	614.45	585.81	28.64	13.78	2.08	down
10/23/2018	616.30	584.60	31.70	13.78	2.30	down
1/15/2019	617.01	586.96	30.05	13.78	2.18	down
8/5/2019	617.15	588.04	29.11	13.78	2.11	down
8/10/2020	617.38	614.21	3.17	13.78	0.23	down
1/20/2021	616.85	614.60	2.25	13.78	0.16	down
4/20/2021	616.65	614.32	2.33	13.78	0.17	down
7/26/2021	617.21	613.58	3.63	13.78	0.26	down
8/16/2021	617.22	613.83	3.39	13.78	0.25	down
10/25/2021	615.50	614.51	0.99	13.78	0.07	down
2/7/2022	616.88	615.01	1.87	13.78	0.14	down
5/9/2022	617.78	614.95	2.83	13.78	0.21	down
8/23/2022	616.99	614.58	2.41	13.78	0.17	down
2/13/2023	617.16	614.69	2.47	13.78	0.18	down
5/30/2023	616.66	613.99	2.67	13.78	0.19	down
8/8/2023	616.62	613.47	3.15	13.78	0.23	down
10/24/2023	615.97	613.40	2.57	13.78	0.19	down
11/13/2023	616.06	613.55	2.51	13.78	0.18	down
			Middle of screen elevation T408			598.0
			Middle of screen elevation G45D			584.2

Table 2-2. Vertical Hydraulic Gradients

Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Date	T409 Groundwater Elevation (ft NAVD88)	G46D Groundwater Elevation (ft NAVD88)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
	LCU (upper)	LCU (lower)				
2/4/2017	615.93	586.06	29.87	22.19	1.35	down
5/13/2017	616.75	584.87	31.88	22.19	1.44	down
7/8/2017	617.05	585.22	31.83	22.19	1.43	down
5/8/2018	616.02	585.86	30.16	22.19	1.36	down
8/2/2018	615.25	583.95	31.30	22.19	1.41	down
10/23/2018	613.96	582.05	31.91	22.19	1.44	down
1/15/2019	614.78	583.17	31.61	22.19	1.42	down
8/5/2019	615.10	583.68	31.42	22.19	1.42	down
8/10/2020	615.43	609.00	6.43	22.19	0.29	down
1/20/2021	614.41	610.49	3.92	22.19	0.18	down
4/20/2021	615.33	611.06	4.27	22.19	0.19	down
7/26/2021	615.72	607.21	8.51	22.19	0.38	down
8/16/2021	615.42	608.17	7.25	22.19	0.33	down
10/25/2021	616.43	609.87	6.56	22.19	0.30	down
2/7/2022	614.97	610.71	4.26	22.19	0.19	down
5/9/2022	616.81	611.34	5.47	22.19	0.25	down
8/23/2022	610.73	615.13	-4.40	22.19	-0.20	up
2/13/2023	615.65	610.39	5.26	22.19	0.24	down
5/30/2023	613.74	610.70	3.04	22.19	0.14	down
8/8/2023	615.02	610.14	4.88	22.19	0.22	down
10/24/2023	612.55	609.65	2.90	22.19	0.13	down
11/13/2023	613.01	609.70	3.31	22.19	0.15	down
			Middle of screen elevation T409			597.7
			Middle of screen elevation G46D			575.5

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Table 2-2. Vertical Hydraulic Gradients
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Date	G307 Groundwater Elevation (ft NAVD88)	G307D Groundwater Elevation (ft NAVD88)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
	UA	LCU (lower)				
4/20/2021	624.50	622.48	2.02	38.06	0.05	down
5/17/2021	624.45	622.44	2.01	38.06	0.05	down
7/12/2021	624.45	622.59	1.86	38.06	0.05	down
8/16/2021	624.46	621.49	2.97	38.06	0.08	down
2/7/2022	624.60	622.32	2.28	38.06	0.06	down
5/9/2022	624.60	616.31	8.29	38.06	0.22	down
8/23/2022	624.60	615.09	9.51	38.06	0.25	down
2/13/2023	624.60	622.13	2.47	38.06	0.06	down
8/8/2023	623.90	616.99	6.91	38.06	0.18	down
11/13/2023	622.64	612.52	10.12	38.06	0.27	down
			Middle of screen elevation G307			606.7
			Middle of screen elevation G307D			568.6

Date	G311 Groundwater Elevation (ft NAVD88)	G311D Groundwater Elevation (ft NAVD88)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
	UA	LCU (lower)				
3/29/2021	616.54	575.42	41.12	43.41	0.95	down
4/22/2021	613.68	575.74	37.94	43.41	0.87	down
5/3/2021	614.01	573.09	40.92	43.41	0.94	down
5/17/2021	613.86	572.40	41.46	43.41	0.96	down
6/9/2021	613.13	573.85	39.28	43.41	0.90	down
6/15/2021	612.78	575.25	37.53	43.41	0.86	down
6/23/2021	612.45	571.74	40.71	43.41	0.94	down
7/12/2021	613.75	571.63	42.12	43.41	0.97	down
7/26/2021	613.05	569.74	43.31	43.41	1.00	down
8/16/2021	613.30	570.34	42.96	43.41	0.99	down
10/25/2021	615.13	583.70	31.43	43.41	0.72	down
2/7/2022	614.28	593.14	21.14	43.41	0.49	down
5/9/2022	615.74	596.43	19.31	43.41	0.44	down
8/23/2022	613.19	597.46	15.73	43.41	0.36	down
5/30/2023	612.78	597.98	14.80	43.41	0.34	down
8/8/2023	611.96	597.72	14.24	43.41	0.33	down
10/24/2023	611.75	597.73	14.02	43.41	0.32	down
11/13/2023	611.66	597.09	14.57	43.41	0.34	down
			Middle of screen elevation G311			606.7
			Middle of screen elevation G311D			563.3

RAMBOLL

Table 2-2. Vertical Hydraulic Gradients

Nature and Extent Report

Coffeen Power Plant

Ash Pond No. 1

Coffeen, IL

Date	G314 Groundwater Elevation (ft NAVD88)	G314D Groundwater Elevation (ft NAVD88)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
	LCU (upper)	DA (PMP)				
3/29/2021	596.40	572.75	23.65	29.76	0.79	down
4/20/2021	603.16	571.76	31.40	27.40	1.15	down
5/3/2021	604.66	568.77	35.89	27.40	1.31	down
5/17/2021	605.61	566.84	38.77	27.40	1.42	down
6/9/2021	607.54	567.45	40.09	27.40	1.46	down
6/14/2021	608.16	568.60	39.56	27.40	1.44	down
6/23/2021	605.19	566.77	38.42	27.40	1.40	down
7/12/2021	605.32	566.88	38.44	27.40	1.40	down
7/26/2021	606.66	566.65	40.01	27.40	1.46	down
8/16/2021	608.60	567.28	41.32	27.40	1.51	down
10/25/2021	610.36	581.05	29.31	27.40	1.07	down
2/7/2022	607.85	590.46	17.39	27.40	0.63	down
5/9/2022	609.11	594.81	14.30	27.40	0.52	down
8/23/2022	610.58	595.70	14.88	27.40	0.54	down
2/13/2023	607.74	597.30	10.44	27.40	0.38	down
3/30/2023	604.91	603.71	1.20	27.40	0.04	down
4/30/2023	608.34	606.21	2.13	27.40	0.08	down
5/30/2023	609.06	607.00	2.06	27.40	0.08	down
6/8/2023	604.44	601.90	2.54	27.40	0.09	down
7/8/2023	608.20	606.45	1.75	27.40	0.06	down
8/8/2023	609.00	605.92	3.08	27.40	0.11	down
9/25/2023	608.92	605.20	3.72	27.40	0.14	down
10/24/2023	608.58	605.14	3.44	27.40	0.13	down
11/13/2023	608.21	605.73	2.48	27.40	0.09	down
12/18/2023	606.49	606.66	-0.17	27.40	-0.01	up
			Middle of screen elevation G314			594.0
			Middle of screen elevation G314D			566.6

[O: KLT 6/4/21, C:YMD 6/7/21; U:KLT 8/25/21, C:EDP 8/31/21]
[KLT 5/3/24, C: SSW 5/7/24]

Notes:

[1] Distance change was calculated using the midpoint of the piezometer screen and water table surface. If the water table surface was above the top of the monitoring well screen, then distance change was calculated using the midpoint of both screens.

[2] Vertical gradients between ±0.0015 are considered flat, and typically have less than 0.02 foot difference in groundwater elevation between wells.

DA = deep aquifer
dh = head change
dl = distance change
ft = foot/feet
LCU (lower) = lower confining unit (Smithboro)
LCU (upper) = lower confining unit (Vandalia)
NAVD88 = North American Vertical Datum of 1988
PMP = potential migration pathway
UA = uppermost aquifer

RAMBOLL

Table 2-3. Field Hydraulic Conductivities
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Gradient Position	Bottom of Screen Elevation (ft NAVD88)	Screen Length [1] (ft)	Field Identified Screened Material	Slug Type	Analysis Method	Falling Head (Slug In) Hydraulic Conductivity (cm/s)	Rising Head (Slug Out) Hydraulic Conductivity (cm/s)	Minimum Hydraulic Conductivity (cm/s)	Maximum Hydraulic Conductivity (cm/s)	Hydraulic Conductivity Geometric Mean (cm/s)
Uppermost Aquifer											
G301	D	604.31	4.65	(ML)s	solid	Kansas Geological Survey	1.1E-03	1.2E-03	2.6E-04	9.1E-03	2.0E-03
G303	D	599.07	10	CL	solid	Kansas Geological Survey	2.8E-04	2.6E-04			
G308	D	606.70	4.79	s(ML), s(CL), (CL)s	solid	Kansas Geological Survey	5.5E-03	1.6E-03			
G309	D	605.02	4.78	SP, s(CL), (ML)s	solid	Kansas Geological Survey	9.1E-03	8.8E-04			
G310	D	604.86	4.79	SM, s(ML)	solid	Kansas Geological Survey	7.5E-03	5.9E-03			
G311	D	604.28	4.77	s(ML), s(CL)	solid	Bouwer-Rice	1.5E-03	- -			
G312	D	602.34	4.79	s(ML), s(CL)	solid	Kansas Geological Survey	1.1E-03	1.1E-03			
G313	D	600.40	4.81	SP, s(ML), (CL)s	solid	Kansas Geological Survey	2.7E-03	3.5E-03			
G315	D	606.46	4.79	s(CL)	solid	Kansas Geological Survey	6.6E-03	5.8E-03			
Lower Confining Unit											
G307D	D	563.76	9.77	(CL)s	solid	Kansas Geological Survey	3.2E-04	1.2E-04	1.2E-04	2.3E-03	5.0E-04
G311D	D	558.29	9.94	CL	solid	Kansas Geological Survey	3.8E-04	2.1E-04			
G316	D	584.82	4.80	SP, s(ML), (CL)s	solid	Kansas Geological Survey	2.3E-03	2.3E-03			
Deep Aquifer (PMP)											
G314D	D	561.76	9.77	SP, s(CL)	solid	Bouwer-Rice	3.3E-04	2.3E-05	2.3E-05	3.3E-04	8.7E-05

[O: KLT 07/09/21; C:EDP 8/31/21]

Notes:
1. All wells are constructed from 2 inch PVC with 0.01 inch slotted screens.
- - = Test not analyzed/performed
cm/s = centimeters per second
D = downgradient
ft = foot/feet
NAVD88 = North American Vertical Datum of 1988
PMP= potential migration pathway
PVC = polyvinyl chloride

USCS = Unified Soil Classification System
CL = Lean Clay
s(CL) = Sandy Lean Clay
(CL)s = Lean Clay with Sand
s(ML) = Sandy Silt
(ML)s = Silt with Sand
SM = Silty Sand
SP = Poorly-Graded Sand

Table 2-4. Geotechnical Data Summary
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Sample ID	Field Location ID	Top of Sample (ft bgs)	Bottom of Sample (ft bgs)	Moisture Content (%)	Dry Density (pcf)	Specific Gravity	Calculated Porosity [1] (%)	Vertical Hydraulic Conductivity (cm/s)	LL	PL	PI	USCS	Gravel (%)	Sand (%)	Fines (%)
Loess Unit															
G307D/Comp 1	G307D	4	12.8	19.4	107.5	2.59	33.5	--	33	16	17	CL	0	33	67
G307D, ST5	G307D	8	10	21.6	105.0	--	--	4.8E-08	--	--	--	CL/CH	--	--	--
G311D/Comp 1	G311D	4	22 **	16.5	115.7	2.64	29.8	--	31	13	18	CL	0	35	65
G311D, ST4	G311D	6	8	19.0	107.5	--	--	2.9E-08	--	--	--	CL	--	--	--
G314D/Comp 1	G314D	4.2	17	16.5	113.6	2.61	30.2	--	29	14	15	CL	0	34	66
Hagarstown Member															
G307D/Comp 2	G307D	12.8	14	19.2	--	2.59	--	--	NP	NP	NP	SW	14	79	7
G311D/Comp 2	G311D	12	14	11.4	126.8	2.68	24.2	--	18	13	5	SM	0	65	35
G314D/Comp 2	G314D	17.3	21.6	12.2	123.4	2.64	25.1	--	29	14	15	CL	0	28	72
Vandalia Member															
G307D/Comp 3	G307D	18	34.9	8.7	131.6	2.60	18.9	--	19	13	6	SP-SM	0	44	56
G311D/Comp 3	G311D	18 **	42	11.4	124.8	2.61	23.4	--	30	15	15	CL	0	28	72
G311D, ST14	G311D	28	30	16.2	116.7	--	--	5.5E-08	--	--	--	CL	--	--	--
G314D/Comp 3	G314D	21.8	45.5	14.6	115.7	2.56	27.6	--	31	15	16	CL	0	26	74
Smithboro Member															
G307D/Comp 4	G307D	40	54	15.6	115.7	2.61	29.0	--	30	15	15	CL	0	28	72
G307D, ST22	G307D	42	44	15.0	118.8	--	--	3.7E-07	--	--	--	CL	--	--	--
G311D/Comp 4	G311D	44	52	15.5	114.2	2.56	28.5	--	30	16	14	CL	0	26	74
G314D, ST18	G314D	37	39	16.6	115.0	--	--	3.0E-07	--	--	--	CL	--	--	--
Yarmouth Soil															
G314D/Comp 4	G314D	46	47	14.9	--	2.61	--	--	--	--	--	SP-SM	0	84	16
Lierle Clay															
G307D/Comp 5	G307D	54	60	8.7	134.6	2.67	19.2	--	47	18	29	CL	0	20	80
G311D/Comp 5	G311D	52	60	18.9	108.0	2.59	33.2	--	37	17	20	CL	0	19	81
G314D/Comp 5	G314D	47.8	52	17.5	109.6	2.58	31.9	--	43	18	25	CL	0	24	76
G314D/Comp 6	G314D	52.2	62.9	13.6	120.2	2.64	27.0	--	37	18	19	CL	0	19	81
Banner Formation															
G314D/Comp 7	G314D	73.9	82.5	14.0	120.3	2.64	27.0	--	29	19	10	CL	0	16	84
G314D/Comp 8	G314D	93.5	100.3	8.5	123.6	2.73	27.4	--	35	19	16	CL	0	16	84

Table 2-4. Geotechnical Data Summary
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Sample ID	Field Location ID	Top of Sample (ft bgs)	Bottom of Sample (ft bgs)	Moisture Content (%)	Dry Density (pcf)	Specific Gravity	Calculated Porosity [1] (%)	Vertical Hydraulic Conductivity (cm/s)	LL	PL	PI	USCS	Gravel (%)	Sand (%)	Fines (%)
CCR															
XPW02 Bulk	XPW02	0	17.7	12.5	110.8	2.60	31.7	8.8E-05	--	--	--	Bottom Ash	0	90	10

[O:KLT, QC: FPO][U: FPO, QC:KLT 8/9/21][U:KLT 8/13/21, C:EDP 8/30/21]

Notes:
[1] Porosity calculated as relationship of bulk density (p_b) to particle density (p_d) ($n = 100[1- (p_b/p_d)]$)
-- = not analyzed
% = Percent
** = not all sampled in the noted interval were included in this composite sample
bgs = below ground surface
cm/s = centimeters per second
ft = foot/feet
LL = Liquid limit
NP = Non Plastic
pcf = pounds per cubic foot
PI = Plasticity Index
PL = Plastic Limit

USCS = Unified Soil Classification System
CH = Fat Clay
CL = Lean Clay
ML = Silt
SC = Clayey Sand
SM = Silty Sand
SP-SM = Poorly Graded-Sand with Silt
SW = Well-Graded Sand

Table 3-1. Monitoring Well Construction Details
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Location	HSU	Date Constructed	Top of PVC Elevation (ft)	Measuring Point Elevation (ft)	Measuring Point Description	Ground Elevation (ft)	Screen Top Depth (ft bgs)	Screen Bottom Depth (ft bgs)	Screen Top Elevation (ft)	Screen Bottom Elevation (ft)	Well Depth (ft bgs)	Bottom of Boring Elevation (ft)	Screen Length (ft)	Screen Diameter (inches)	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)
G281	UA	09/08/2015	--	626.43	Top of Disk	623.82	15.51	20.16	608.31	603.66	20.3	603.50	4.7	2	39.0654052	-89.3993221
G301	UA	09/04/2015	--	622.56	Top of Disk	620.88	11.31	15.96	608.96	604.31	16.21	604.10	4.7	2	39.05951	-89.395415
G302	UA	09/04/2015	--	619.95	Top of Disk	618.52	13.21	17.86	604.74	600.09	18.39	599.60	4.7	2	39.059544	-89.393192
G303	UA	08/26/2010	--	621.93	Top of Disk	619.33	10	20	609.07	599.07	20.4	598.70	10	2	39.057144	-89.391721
G305	UA	05/03/2016	625.67	625.84	Top of PVC	623.23	13.44	18.27	609.10	604.27	18.5	604.10	4.8	2	39.056558	-89.396798
G306	UA	05/03/2016	625.91	626.08	Top of PVC	623.57	13.07	17.68	609.77	605.16	17.9	604.80	4.6	2	39.056494	-89.393556
G307	UA	07/27/2016	624.60	624.60	Top of PVC	624.73	12.96	17.8	609.12	604.28	18.22	603.90	4.8	2	39.057214	-89.395545
G307D	LCU	01/19/2021	624.88	625.05	Top of PVC	622.51	48.98	58.75	573.53	563.76	59.6	562.50	9.8	2	39.05721	-89.39552
G308	UA	01/18/2021	624.59	624.76	Top of PVC	621.59	10.1	14.89	611.49	606.70	15.24	605.80	4.8	2	39.057379	-89.397134
G310	UA	02/09/2021	622.87	622.88	Top of PVC	619.89	10.24	15.03	609.65	604.86	15.38	604.00	4.8	2	39.059532	-89.396907
G312	UA	01/15/2021	619.78	619.95	Top of PVC	616.92	9.79	14.58	607.13	602.34	14.93	601.70	4.8	2	39.059558	-89.391983
G313	UA	02/05/2021	614.30	614.30	Top of PVC	611.51	6.3	11.11	605.21	600.40	11.46	599.50	4.8	2	39.058773	-89.391124
G314	LCU	02/05/2021	613.88	614.05	Top of PVC	611.11	14.56	19.58	596.55	591.53	20.02	591.10	5	2	39.05782	-89.390964
G314D	DA	02/04/2021	613.70	613.71	Top of PVC	610.87	39.34	49.11	571.53	561.76	49.47	510.60	9.8	2	39.057852	-89.390958
G315	UA	01/14/2021	623.52	623.69	Top of PVC	620.94	9.69	14.48	611.25	606.46	14.85	605.00	4.8	2	39.057165	-89.393667
G316	LCU	02/26/2021	602.59	602.59	Top of PVC	599.64	10.02	14.82	589.62	584.82	15.16	583.90	4.8	2	39.057847	-89.389698
XPW01	CCR	01/14/2021	634.57	634.36	Top of PVC	631.85	8.21	12.98	623.64	618.87	13.36	617.90	4.8	2	39.057878	-89.396196
XPW02	CCR	02/08/2021	639.69	639.86	Top of PVC	636.64	8.05	17.85	628.59	618.79	18.2	618.40	9.8	2	39.058828	-89.395267

Notes:
All elevation data are presented relative to the North American Vertical Datum of 1988 (NAVD88), GEOID 12A
-- = not measured/recorded
bgs = below ground surface
CCR = Coal Combustion Residuals
DA = Deep Aquifer
ft = foot or feet
HSU = Hydrostratigraphic Unit
LCU = Lower Confining Unit
PVC = polyvinyl chloride
UA = Uppermost Aquifer

Table 3-2. Exceedance Parameter Statistical Results
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Location	Parameter	Unit	Groundwater Protection Standard	2023 Q2 LCL	2023 Q3 LCL	2023 Q4 LCL
G313	Boron, total	mg/L	3.20	3.28	3.29	3.30
G301	Sulfate, total	mg/L	400	664	652	644
G303	Sulfate, total	mg/L	400	708	708	611
G305	Sulfate, total	mg/L	400	787	801	808
G307	Sulfate, total	mg/L	400	513	--	456
G307D	Sulfate, total	mg/L	400	622	602	516
G308	Sulfate, total	mg/L	400	1,030	1,020	871
G310	Sulfate, total	mg/L	400	553	-6,390a	-5,310a
G312	Sulfate, total	mg/L	400	696	721	--
G313	Sulfate, total	mg/L	400	491	-517a	-487a
G314	Sulfate, total	mg/L	400	2,000	2,000	2,000
G314D	Sulfate, total	mg/L	400	674	735	780
G316	Sulfate, total	mg/L	400	660	660	660
G303	Total Dissolved Solids	mg/L	1,200	1,510	1,510	1,510
G305	Total Dissolved Solids	mg/L	1,200	1,280	1,320	1,350
G308	Total Dissolved Solids	mg/L	1,200	1,810	1,800	1,600
G310	Total Dissolved Solids	mg/L	1,200	1,100	1,100	1,240
G312	Total Dissolved Solids	mg/L	1,200	1,460	1,420	--
G313	Total Dissolved Solids	mg/L	1,200	1,600	1,520	1,510
G314	Total Dissolved Solids	mg/L	1,200	3,400	3,400	3,400
G314D	Total Dissolved Solids	mg/L	1,200	1,640	1,760	1,600
G315	Total Dissolved Solids	mg/L	1,200	1,320	1,290	1,100
G316	Total Dissolved Solids	mg/L	1,200	1,600	1,600	1,600

Notes:
-- = data not available (well reported dry or inaccessible during compliance sampling event)
LCL = Lower Confidence Level
mg/L = milligrams per liter
a: Negative LCL values are the result of downward trends in the data. The confidence interval around a trend line, particularly a non-parametric estimation, may be wide at the most recent sample point due to lack of data density.

Table 3-3. Summary of Groundwater Data
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

HSU	Location	Parameter	Unit	Sample Count	Non-Detect Result Count	Percent Non-Detect Results	First Sample	Last Sample	Minimum	Median	Mean	Maximum
CCR	XPW01	Boron, total	mg/L	6	0	0	03/30/2021	08/10/2023	2.40	2.50	2.78	3.97
CCR	XPW01	Sulfate, total	mg/L	10	0	0	03/30/2021	11/17/2023	480	750	743	860
CCR	XPW01	Total Dissolved Solids	mg/L	10	0	0	03/30/2021	11/17/2023	1,020	1,200	1,210	1,400
CCR	XPW02	Boron, total	mg/L	6	0	0	03/30/2021	08/10/2023	1.92	2.40	2.29	2.40
CCR	XPW02	Sulfate, total	mg/L	10	0	0	03/30/2021	11/17/2023	175	575	488	650
CCR	XPW02	Total Dissolved Solids	mg/L	10	0	0	03/30/2021	11/17/2023	522	1,000	896	1,100
DA	G314D	Boron, total	mg/L	9	0	0	03/30/2021	11/20/2023	0.130	0.180	0.175	0.236
DA	G314D	Sulfate, total	mg/L	8	0	0	03/30/2021	11/20/2023	670	1,040	959	1,100
DA	G314D	Total Dissolved Solids	mg/L	8	0	0	03/30/2021	11/20/2023	1,600	2,390	2,188	2,420
LCU	G307D	Boron, total	mg/L	9	0	0	03/29/2021	11/17/2023	1.01	1.40	1.51	2.54
LCU	G307D	Sulfate, total	mg/L	8	0	0	03/29/2021	11/17/2023	537	725	712	850
LCU	G307D	Total Dissolved Solids	mg/L	8	0	0	03/29/2021	11/17/2023	1,040	1,250	1,252	1,500
LCU	G314	Boron, total	mg/L	12	0	0	03/30/2021	11/20/2023	0.120	0.175	0.196	0.420
LCU	G314	Sulfate, total	mg/L	12	0	0	03/30/2021	11/20/2023	830	2,035	1,991	2,400
LCU	G314	Total Dissolved Solids	mg/L	12	0	0	03/30/2021	11/20/2023	1,900	3,700	3,569	4,000
LCU	G316	Boron, total	mg/L	12	0	0	03/30/2021	11/20/2023	0.330	0.430	0.433	0.550
LCU	G316	Sulfate, total	mg/L	12	0	0	03/30/2021	11/20/2023	330	740	697	840
LCU	G316	Total Dissolved Solids	mg/L	12	0	0	03/30/2021	11/20/2023	1,100	1,610	1,608	1,800
UA	G281	Boron, total	mg/L	35	19	54	11/20/2015	11/20/2023	<0.0071	0.0100	0.0170	0.110
UA	G281	Sulfate, total	mg/L	35	0	0	11/20/2015	11/20/2023	140	280	287	380
UA	G281	Total Dissolved Solids	mg/L	35	0	0	11/20/2015	11/20/2023	700	870	866	1,000
UA	G301	Boron, total	mg/L	23	0	0	11/20/2015	11/20/2023	1.90	2.20	2.28	2.90
UA	G301	Sulfate, total	mg/L	23	0	0	11/20/2015	11/20/2023	513	710	700	860
UA	G301	Total Dissolved Solids	mg/L	23	0	0	11/20/2015	11/20/2023	900	1,100	1,155	1,500
UA	G302	Boron, total	mg/L	23	0	0	11/20/2015	11/20/2023	1.10	1.90	1.86	2.96
UA	G302	Sulfate, total	mg/L	23	0	0	11/20/2015	11/20/2023	260	430	412	530
UA	G302	Total Dissolved Solids	mg/L	23	0	0	11/20/2015	11/20/2023	780	1,100	1,046	1,400
UA	G303	Boron, total	mg/L	23	0	0	11/20/2015	11/21/2023	1.40	1.80	1.96	2.98
UA	G303	Sulfate, total	mg/L	23	0	0	11/20/2015	11/21/2023	590	740	749	870
UA	G303	Total Dissolved Solids	mg/L	23	0	0	11/20/2015	11/21/2023	1,200	1,600	1,610	1,900
UA	G305	Boron, total	mg/L	9	0	0	05/19/2016	11/17/2023	1.80	2.44	2.33	2.70
UA	G305	Sulfate, total	mg/L	9	0	0	05/19/2016	11/17/2023	710	890	880	980
UA	G305	Total Dissolved Solids	mg/L	9	0	0	05/19/2016	11/17/2023	1,300	1,500	1,490	1,800
UA	G306	Boron, total	mg/L	31	0	0	05/19/2016	11/17/2023	2.22	2.70	2.73	3.50
UA	G306	Sulfate, total	mg/L	31	0	0	05/19/2016	11/17/2023	5.90	250	258	700
UA	G306	Total Dissolved Solids	mg/L	31	0	0	05/19/2016	11/17/2023	455	700	700	900
UA	G307	Boron, total	mg/L	19	0	0	08/16/2016	11/21/2023	1.80	2.10	2.07	2.35
UA	G307	Sulfate, total	mg/L	19	0	0	08/16/2016	11/21/2023	490	980	908	1,300
UA	G307	Total Dissolved Solids	mg/L	19	0	0	08/16/2016	11/21/2023	915	1,400	1,352	1,600

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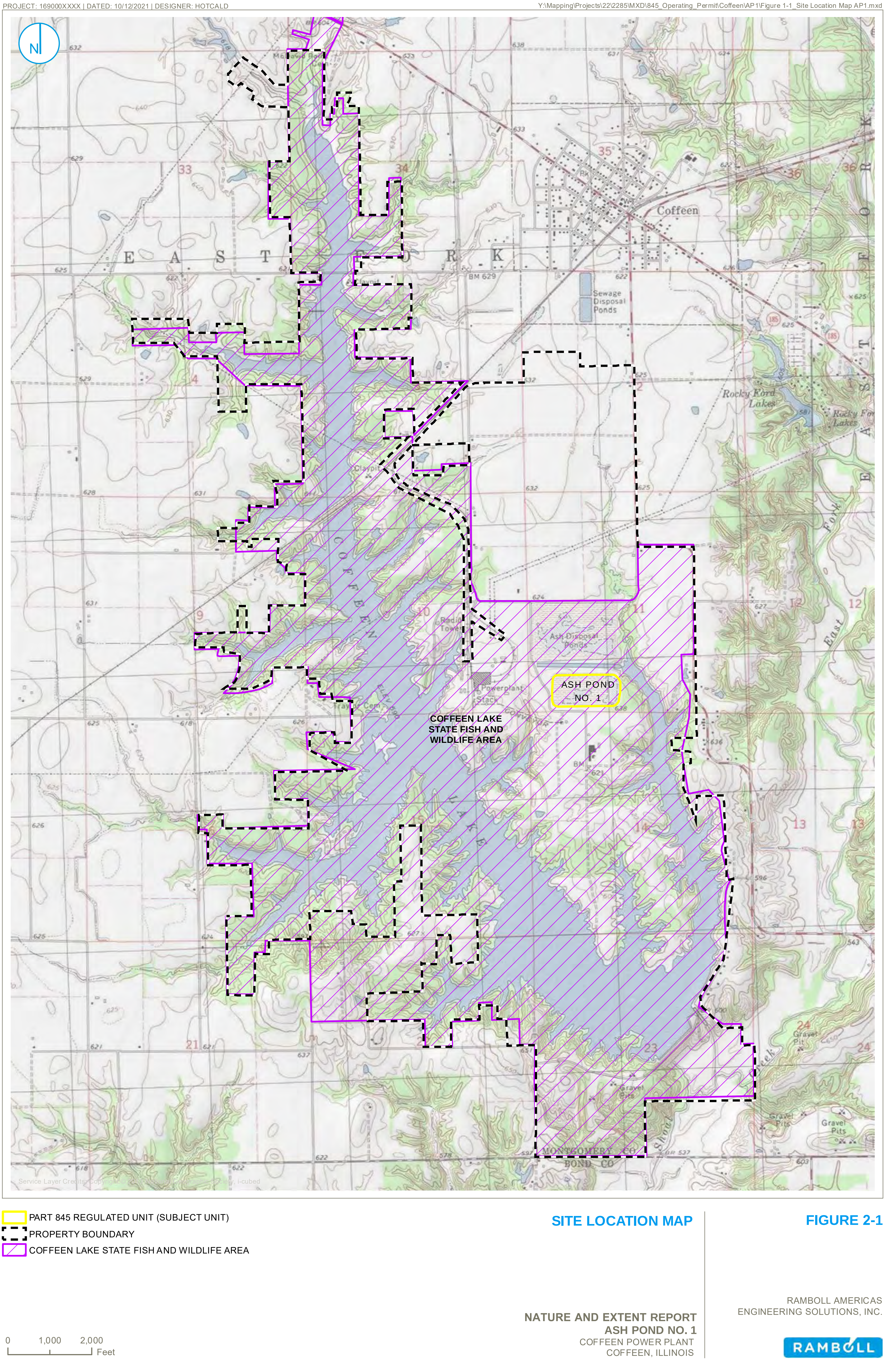
Table 3-3. Summary of Groundwater Data
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

HSU	Location	Parameter	Unit	Sample Count	Non-Detect Result Count	Percent Non-Detect Results	First Sample	Last Sample	Minimum	Median	Mean	Maximum
UA	G308	Boron, total	mg/L	12	0	0	03/29/2021	11/17/2023	2.40	2.55	2.58	2.88
UA	G308	Sulfate, total	mg/L	12	0	0	03/29/2021	11/17/2023	936	1,100	1,074	1,200
UA	G308	Total Dissolved Solids	mg/L	12	0	0	03/29/2021	11/17/2023	1,640	1,850	1,842	2,000
UA	G310	Boron, total	mg/L	12	0	0	03/29/2021	11/20/2023	1.60	1.80	1.82	2.08
UA	G310	Sulfate, total	mg/L	12	0	0	03/29/2021	11/20/2023	420	840	861	2,300
UA	G310	Total Dissolved Solids	mg/L	12	0	0	03/29/2021	11/20/2023	1,100	1,500	1,398	1,600
UA	G312	Boron, total	mg/L	10	0	0	03/30/2021	08/09/2023	1.30	1.65	2.01	3.51
UA	G312	Sulfate, total	mg/L	10	0	0	03/30/2021	08/09/2023	600	905	842	1,000
UA	G312	Total Dissolved Solids	mg/L	10	0	0	03/30/2021	08/09/2023	1,300	1,700	1,681	2,010
UA	G313	Boron, total	mg/L	12	0	0	03/30/2021	11/20/2023	3.20	3.40	3.55	5.23
UA	G313	Sulfate, total	mg/L	12	0	0	03/30/2021	11/20/2023	667	735	747	970
UA	G313	Total Dissolved Solids	mg/L	12	0	0	03/30/2021	11/20/2023	1,400	1,600	1,588	1,800
UA	G315	Boron, total	mg/L	12	0	0	03/30/2021	11/21/2023	1.20	1.30	1.34	1.90
UA	G315	Sulfate, total	mg/L	12	0	0	03/30/2021	11/21/2023	588	865	811	1,100
UA	G315	Total Dissolved Solids	mg/L	12	0	0	03/30/2021	11/21/2023	362	1,500	1,354	1,700

Notes:
< = less than the method detection limit
CCR = Coal Combustion Residuals
DA = Deep Aquifer
HSU = Hydrostratigraphic Unit
LCU = Lower Confining Unit
mg/L = milligrams per liter
UA = Uppermost Aquifer

FIGURES

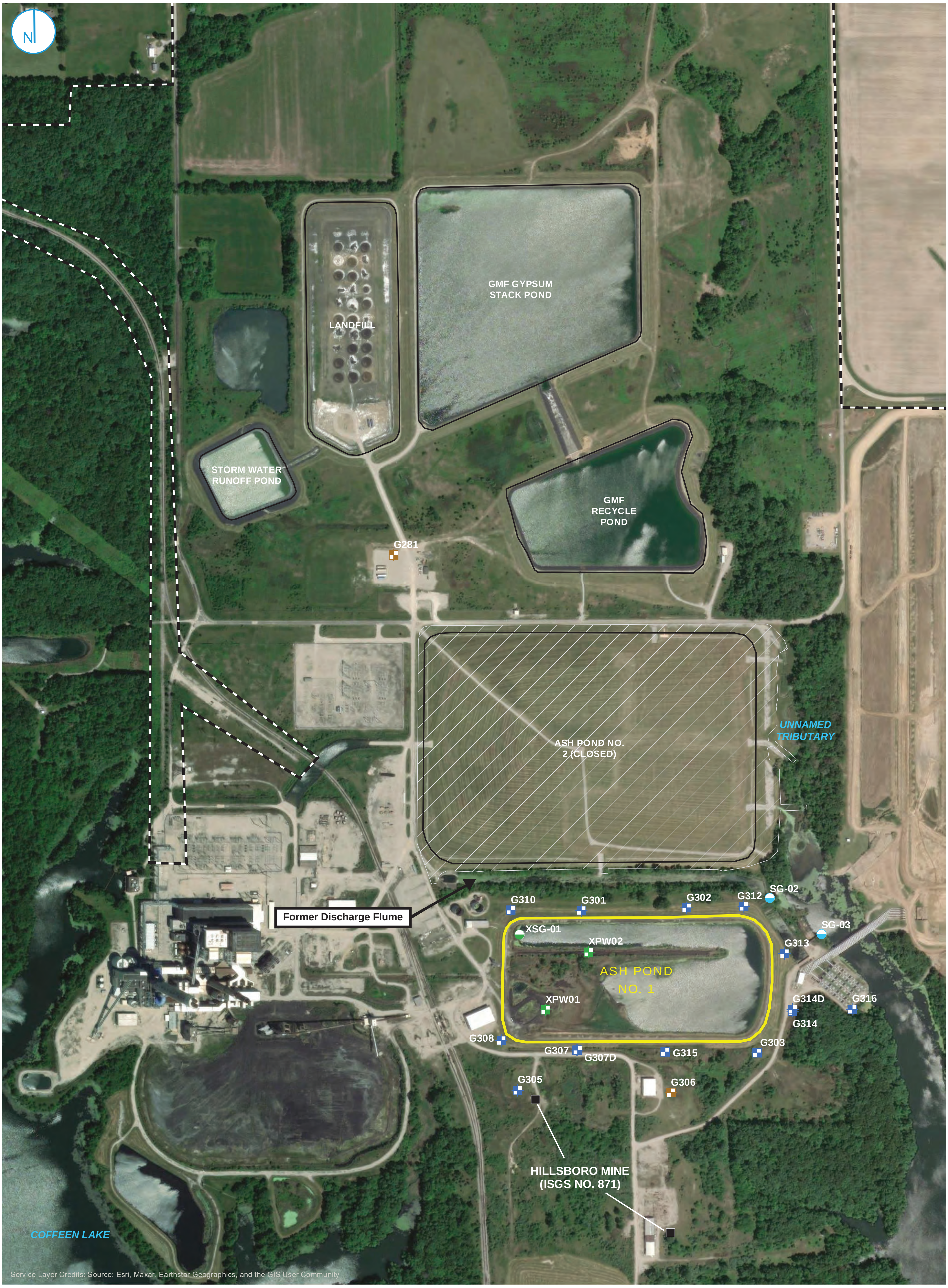


SITE LOCATION MAP

FIGURE 2-1

NATURE AND EXTENT REPORT
ASH POND NO. 1
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.



COMPLIANCE MONITORING WELL
BACKGROUND MONITORING WELL
PORE WATER WELL
STAFF GAGE, CCR UNIT
STAFF GAGE, RIVER
COAL MINE SHAFT

REGULATED UNIT (SUBJECT UNIT)
SITE FEATURE
LIMITS OF FINAL COVER
PROPERTY BOUNDARY

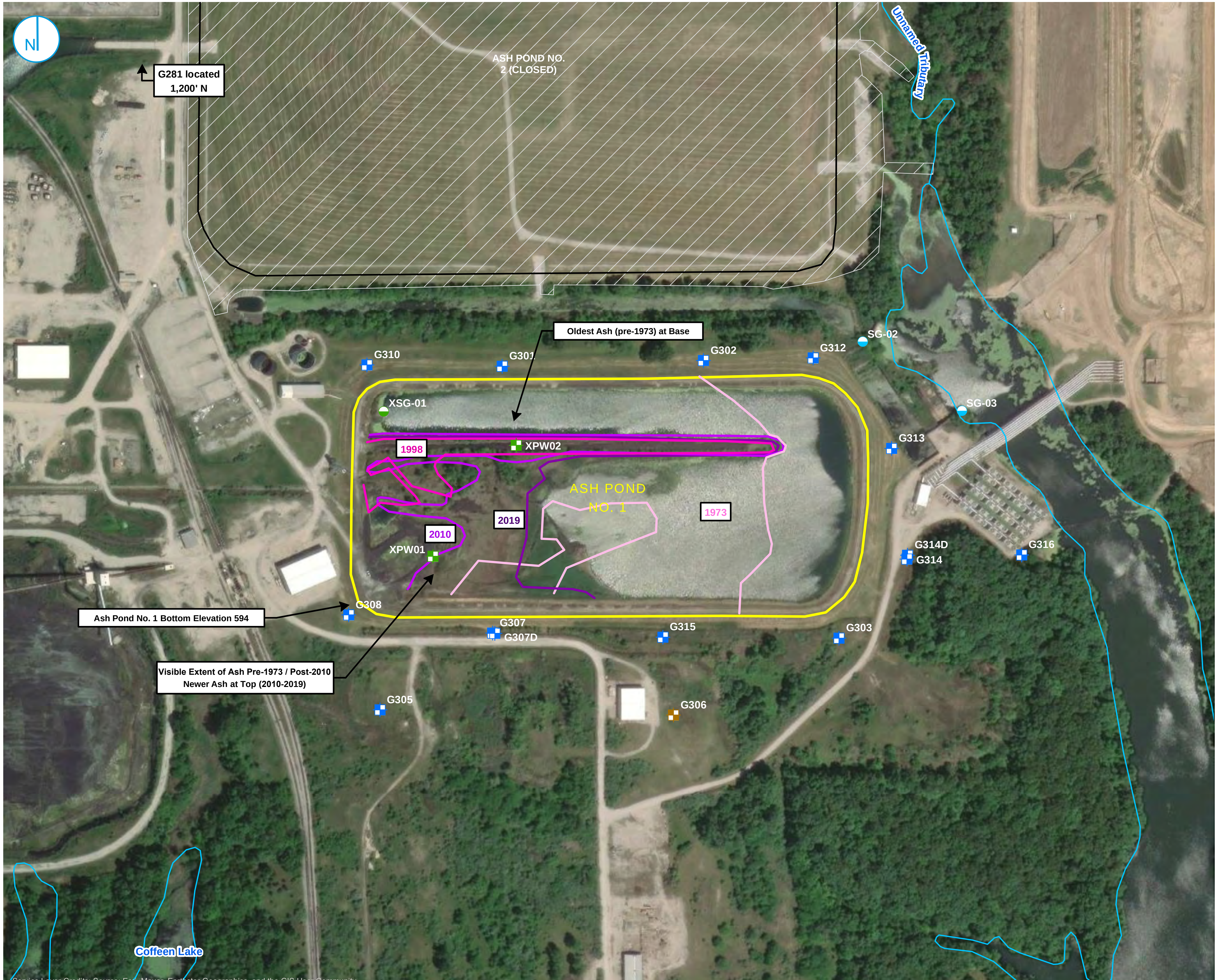
0 275 550
Feet

MONITORING WELL LOCATION MAP

NATURE AND EXTENT REPORT
ASH POND NO. 1
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

FIGURE 2-2

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.



COMPLIANCE MONITORING WELL
BACKGROUND MONITORING WELL
PORE WATER WELL
STAFF GAGE, RIVER
STAFF GAGE, CCR UNIT
APPROXIMATE LIMITS OF ASH BASED ON 1973 AERIAL
APPROXIMATE LIMITS OF ASH BASED ON 1998 AERIAL
APPROXIMATE LIMITS OF ASH BASED ON 2010 AERIAL
APPROXIMATE LIMITS OF ASH BASED ON 2019 AERIAL
SURFACE WATER FEATURE
REGULATED UNIT (SUBJECT UNIT)
SITE FEATURE
LIMITS OF FINAL COVER

0 150 300 Feet

CCR OBSERVATIONS

NATURE AND EXTENT REPORT
ASH POND NO. 1
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

FIGURE 2-3

RAMBOLL AMERICAS ENGINEERING SOLUTIONS INC.

PROJECT: 169000XXXX | DATED: 5/3/2024 | DESIGNER: GALARNMC

Y:\Mapping\Projects\22\2285\MXD\Nature_and_Extent\COF\Nature_and_Extent_Report\101\Figure 2-3_CCR Observations.mxd

PORE WATER WELL
STAFF GAGE, CCR UNIT
630 ELEVATION CONTOUR
ELEVATION BELOW 630
REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

0 75 150 Feet

CCR ACCESS SUMMARY

NATURE AND EXTENT REPORT
ASH POND NO. 1
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

FIGURE 2-4

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

PROJECT: 169000XXXX | DATED: 5/3/2024 | DESIGNER: GALARNMC

Y:\Mapping\Projects\22\2285\MXD\Nature_and_Extent\COF\Nature_and_Extent_Report\101\Figure 2-4. CCR Access Summary.mxd

Y:\Mapping\Projects\22\2285\MXD\Nature_and_Extent\COF\Nature_and_Extent_Report\101\Figure 2-5. Base of CCR.mxd

PROJECT: 169000XXXX | DATED: 5/3/2024 | DESIGNER: GALARNMC

5-FT BOTTOM OF ASH ELEVATION
1-FT BOTTOM OF ASH ELEVATION
REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

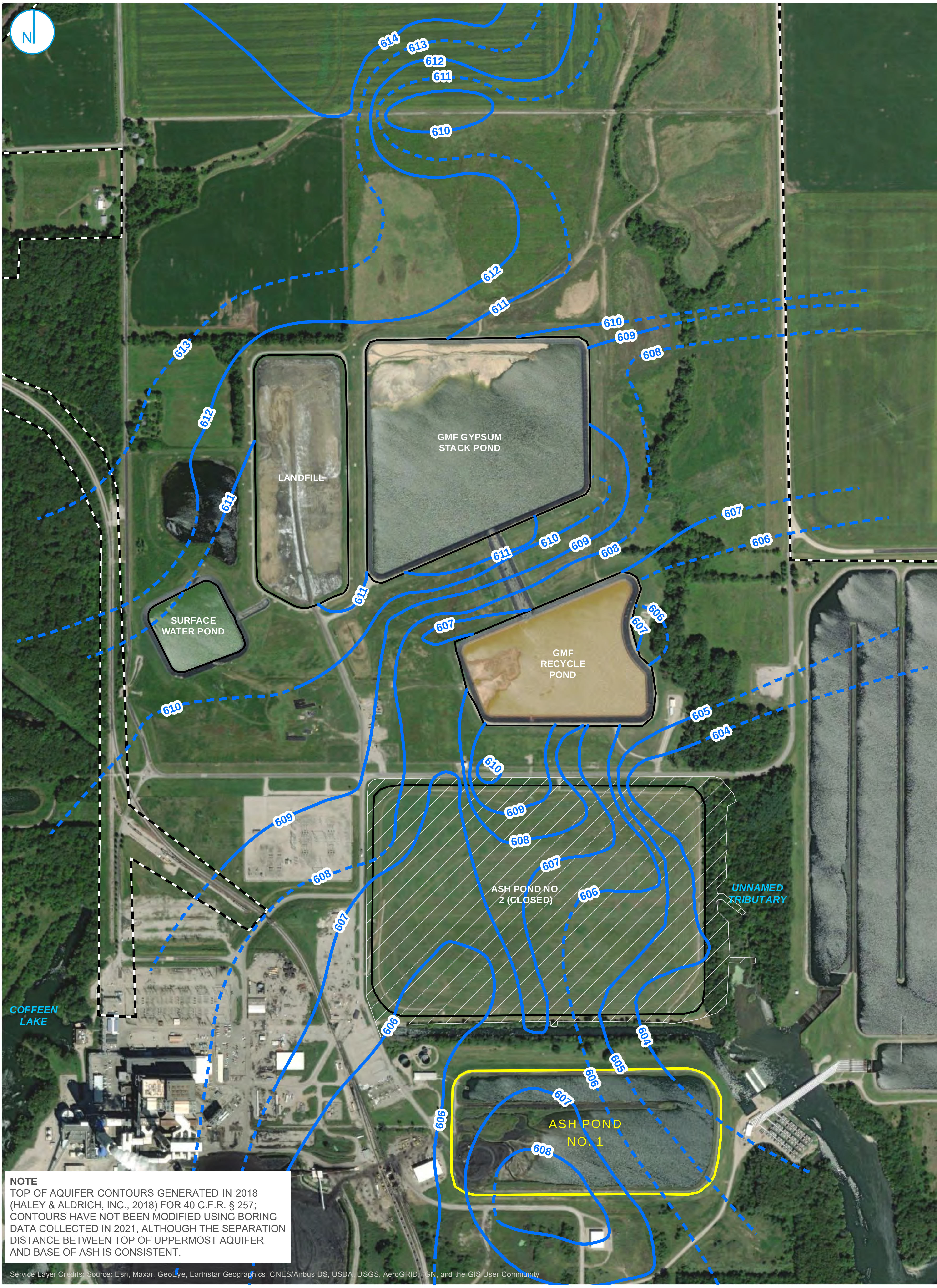
0 75 150 Feet

BASE OF CCR

NATURE AND EXTENT REPORT
ASH POND NO. 1
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

FIGURE 2-5

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.



NOTE
TOP OF AQUIFER CONTOURS GENERATED IN 2018 (HALEY & ALDRICH, INC., 2018) FOR 40 C.F.R. § 257; CONTOURS HAVE NOT BEEN MODIFIED USING BORING DATA COLLECTED IN 2021, ALTHOUGH THE SEPARATION DISTANCE BETWEEN TOP OF UPPERMOST AQUIFER AND BASE OF ASH IS CONSISTENT.

HAGARSTOWN MEMBER ELEVATION CONTOUR (1-FT INTERVAL, NAVD88)
INFERRED HAGARSTOWN MEMBER ELEVATION CONTOUR
PART 845 REGULATED UNIT (SUBJECT UNIT)
SITE FEATURE
LIMITS OF FINAL COVER
PROPERTY BOUNDARY

0 275 550 Feet

TOP OF UPPERMOST AQUIFER

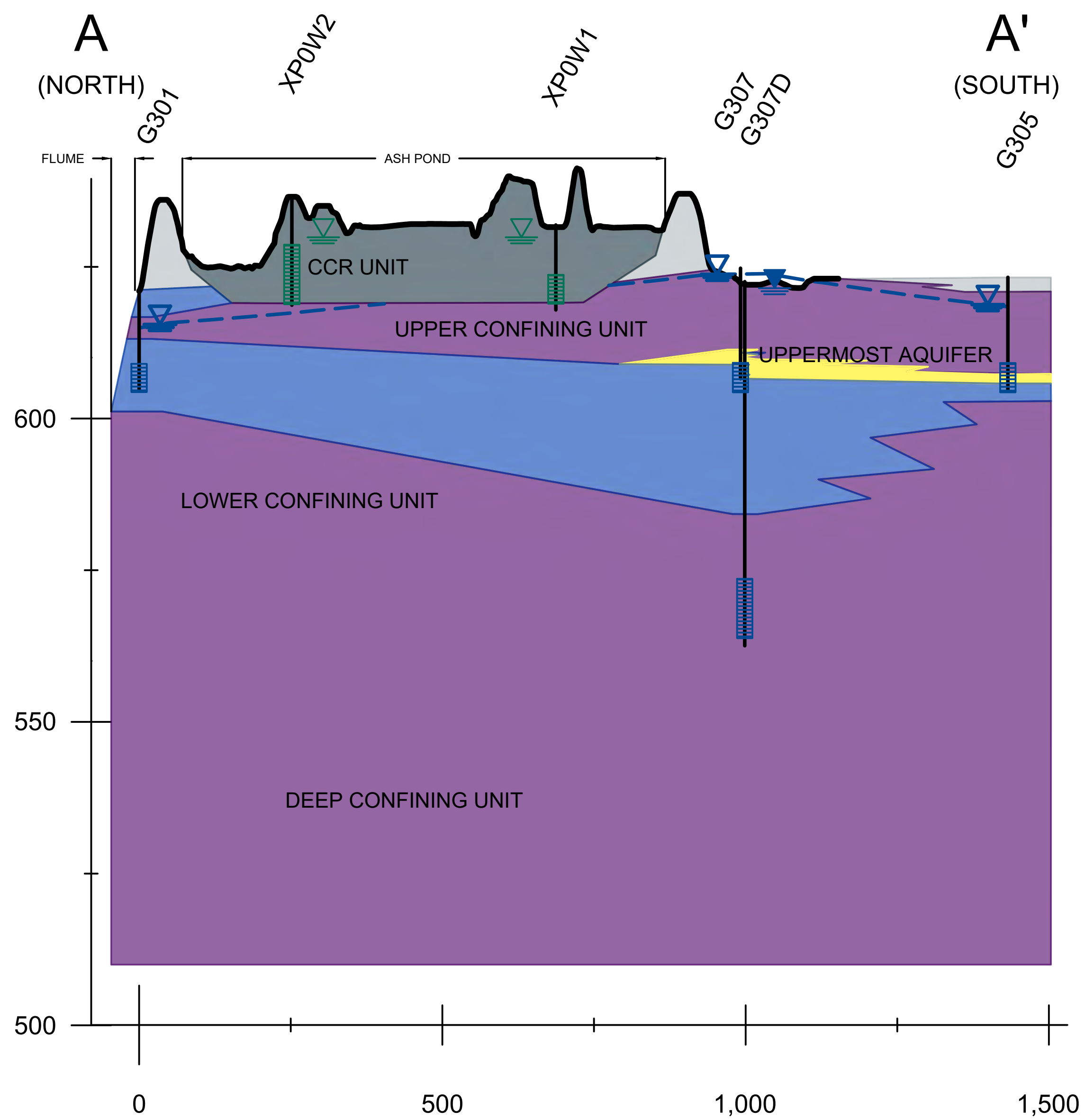
FIGURE 2-6

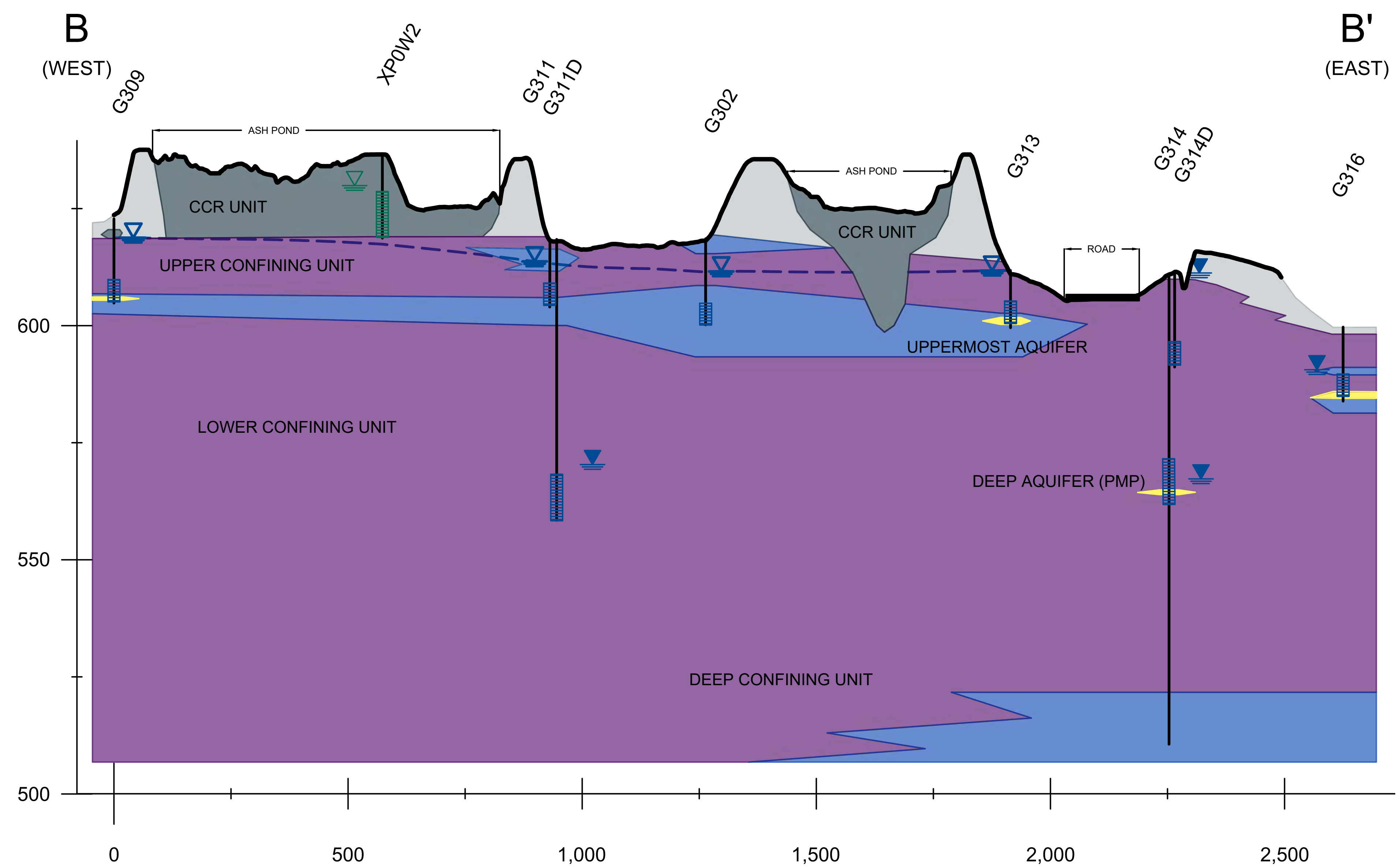
NATURE AND EXTENT REPORT
ASH POND NO. 1
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

NOTES
1. This profile was developed by interpolation between widely spaced boreholes. Only at the borehole location should it be considered as an approximately accurate representation and then only to the degree implied by the notes on the borehole logs.
2. Scale is approximate.
3. Vertical scale is exaggerated 10X.
4. Groundwater elevations measured on July 26, 2021.





LEGEND
- COAL COMBUSTION RESIDUALS (CCR)
- FILL
- CLAY (CL/CH)
- SILT (ML)
- SAND (SP/SM/SW)
- WELL SCREEN INTERVAL
- UPPERMOST AQUIFER POTENTIOMETRIC SURFACE
- UPPERMOST AQUIFER GROUNDWATER ELEVATION
- POREWATER ELEVATION
- BEDROCK GROUNDWATER / OTHER GROUNDWATER / SURFACE WATER ELEVATION(S)

30'
0
300'

GEOLOGIC CROSS SECTIONS
A-A' & B-B'

NATURE AND EXTENT REPORT
ASH POND NO. 1
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

FIGURE 2-7

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

- COMPLIANCE MONITORING WELL
- BACKGROUND MONITORING WELL
- PORE WATER WELL
- LEACHATE WELL
- MONITORING WELL
- STAFF GAGE, CCR UNIT
- STAFF GAGE, RIVER
- GROUNDWATER ELEVATION CONTOUR (2-FT CONTOUR INTERVAL, NAVD88)
- INFERRED GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- REGULATED UNIT (SUBJECT UNIT)
- LIMITS OF FINAL COVER
- PROPERTY BOUNDARY
- SITE FEATURE

0 325 650 Feet

NOTES:
1. ELEVATIONS IN PARENTHESES WERE NOT USED FOR CONTOURING.
2. ELEVATION CONTOURS SHOWN IN FEET, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

UPPERMOST AQUIFER POTENTIOMETRIC SURFACE MAP MAY 30, 2023 (E001)

FIGURE 2-8

NATURE AND EXTENT REPORT
ASH POND NO. 1
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

RAMBOLL

MONITORING WELL
GROUNDWATER ELEVATION CONTOUR (2-FT CONTOUR INTERVAL, NAVD88)
INFERRED GROUNDWATER ELEVATION CONTOUR
GROUNDWATER FLOW DIRECTION
REGULATED UNIT (SUBJECT UNIT)
SITE FEATURE
LIMITS OF FINAL COVER
PROPERTY BOUNDARY

0 325 650
Feet

**DEEP AQUIFER
POTENTIOMETRIC SURFACE MAP
AUGUST 8, 2023 (E002)**

FIGURE 2-9

NATURE AND EXTENT REPORT
ASH POND NO. 1
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

TOTAL BORON EXCEEDANCE
TOTAL SULFATE EXCEEDANCE
TOTAL DISSOLVED SOLIDS EXCEEDANCE
COMPLIANCE WELL WITHOUT EXCEEDANCE
REGULATED UNIT (SUBJECT UNIT)
SITE FEATURE
LIMITS OF FINAL COVER
PROPERTY BOUNDARY

0 275 550 Feet

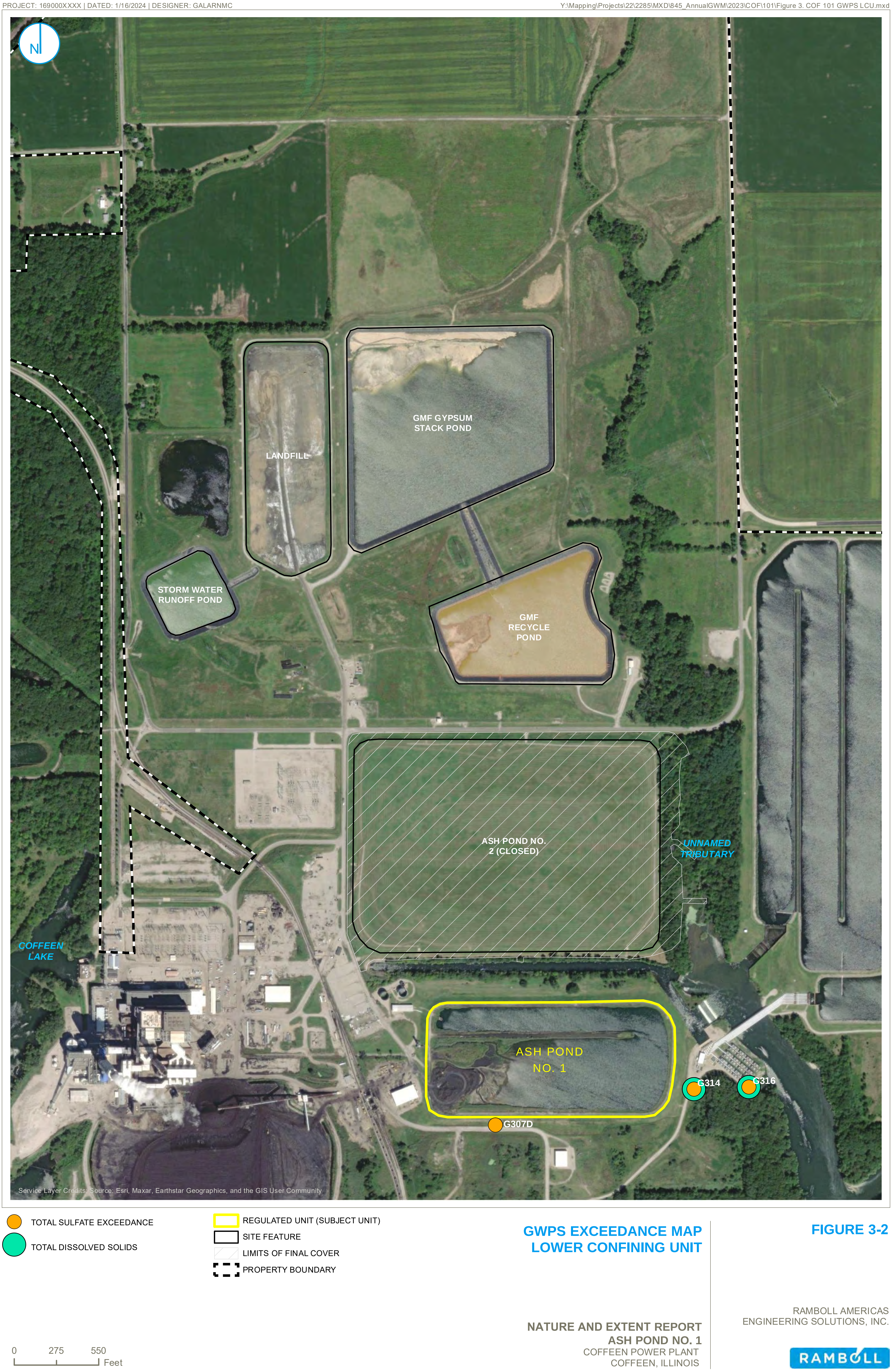
GWPS EXCEEDANCE MAP
UPPERMOST AQUIFER

FIGURE 3-1

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

NATURE AND EXTENT REPORT
ASH POND NO. 1
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

RAMBOLL



GWPS EXCEEDANCE MAP
LOWER CONFINING UNIT

FIGURE 3-2

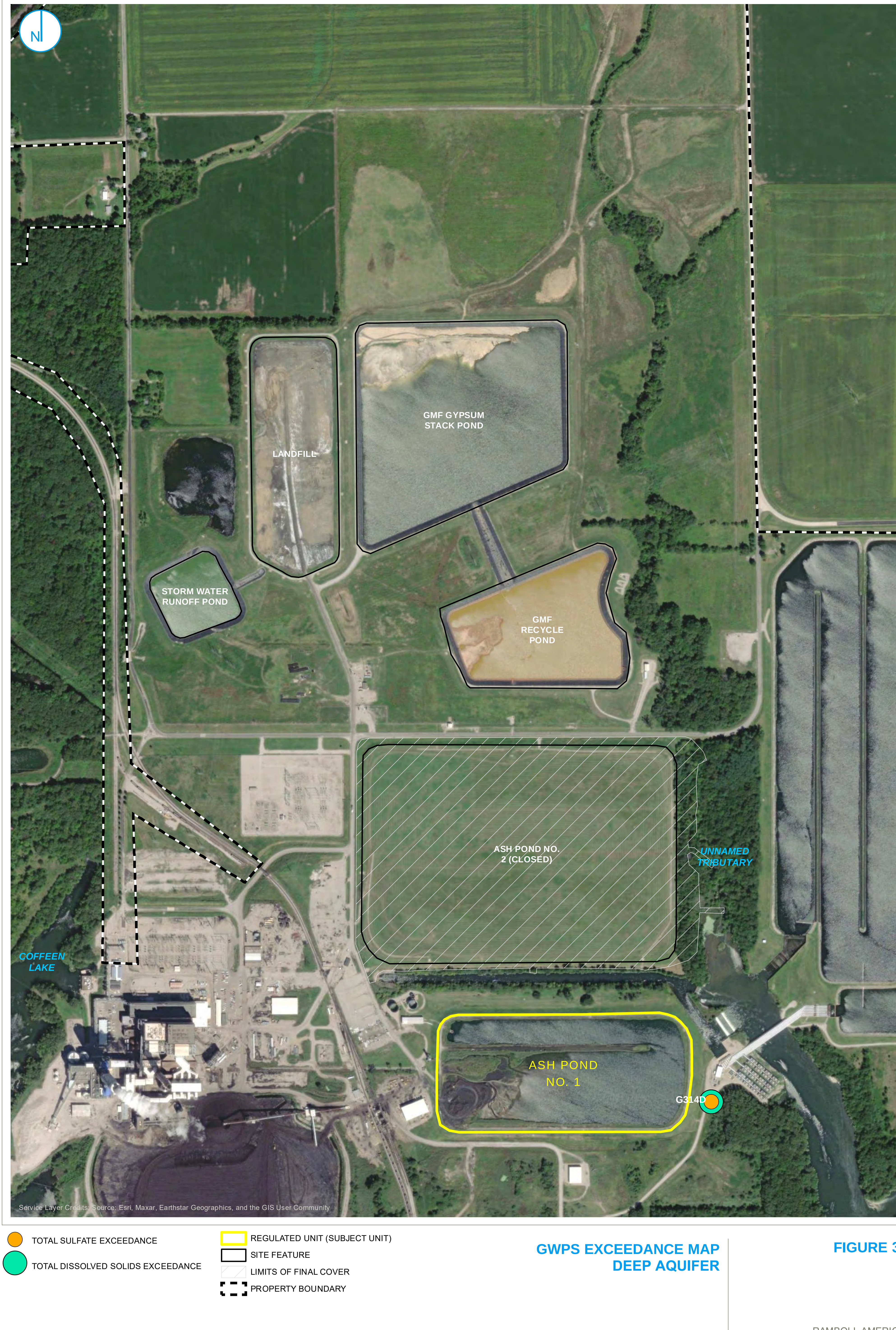
NATURE AND EXTENT REPORT
ASH POND NO. 1
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

RAMBOLL

PROJECT: 169000XXXX | DATED: 1/16/2024 | DESIGNER: GALARNMC

Y:\Mapping\Projects\22\2285\MXD\845_AnnualGWM\2023\COF\101\Figure 4. COF 101 GWPS DA.mxd



TOTAL SULFATE EXCEEDANCE

TOTAL DISSOLVED SOLIDS EXCEEDANCE

REGULATED UNIT (SUBJECT UNIT)

SITE FEATURE

LIMITS OF FINAL COVER

PROPERTY BOUNDARY

0 275 550 Feet

GWPS EXCEEDANCE MAP
DEEP AQUIFER

FIGURE 3-3

NATURE AND EXTENT REPORT
ASH POND NO. 1

COFFEEN POWER PLANT
COFFEEN, ILLINOIS

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

APPENDICES

APPENDIX A
Site-Wide Groundwater Elevations

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G045D	Water Level	LCU	02/13/2023	9.12	614.69
G045D	Water Level	LCU	05/30/2023	9.82	613.99
G045D	Water Level	LCU	08/08/2023	10.34	613.47
G045D	Water Level	LCU	10/24/2023	10.41	613.40
G045D	Water Level	LCU	11/13/2023	10.26	613.55
G046D	Water Level	LCU	02/13/2023	14.85	610.39
G046D	Water Level	LCU	05/30/2023	14.54	610.70
G046D	Water Level	LCU	08/08/2023	15.10	610.14
G046D	Water Level	LCU	10/24/2023	15.59	609.65
G046D	Water Level	LCU	11/13/2023	15.54	609.70
G1001	Water Level	LCU	02/13/2023	6.12	591.49
G1001	Water Level	LCU	03/30/2023	6.09	591.51
G1001	Water Level	LCU	04/30/2023	6.53	591.07
G1001	Water Level	LCU	05/30/2023	6.61	590.99
G1001	Water Level	LCU	08/08/2023	6.32	591.29
G1001	Water Level	LCU	09/25/2023	6.14	591.46
G1001	Water Level	LCU	10/24/2023	6.20	591.41
G1001	Water Level	LCU	11/13/2023	6.49	591.12
G1001	Water Level	LCU	12/18/2023	5.88	591.73
G1003	Water Level	LCU	02/13/2023	Dry	Dry
G1003	Water Level	LCU	05/30/2023	Dry	Dry
G1003	Water Level	LCU	08/08/2023	Dry	Dry
G1003	Water Level	LCU	10/24/2023	Dry	Dry
G1003	Water Level	LCU	11/13/2023	Dry	Dry
G101	Water Level	UA	02/13/2023	4.71	622.89
G101	Water Level	UA	05/30/2023	6.53	621.07
G101	Water Level	UA	08/08/2023	11.16	616.44
G101	Water Level	UA	10/25/2023	14.15	613.45
G101	Water Level	UA	11/13/2023	13.95	613.65
G102	Water Level	UA	02/13/2023	4.80	624.24
G102	Water Level	UA	08/08/2023	10.34	618.70
G102	Water Level	UA	10/24/2023	12.60	616.44
G102	Water Level	UA	11/13/2023	12.84	616.20
G102	Water Level	UA	12/18/2023	12.82	616.22

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G103	Water Level	UA	02/13/2023	9.59	624.21
G103	Water Level	UA	03/30/2023	7.94	625.85
G103	Water Level	UA	04/30/2023	9.58	624.21
G103	Water Level	UA	05/30/2023	10.49	623.31
G103	Water Level	UA	06/08/2023	11.00	622.80
G103	Water Level	UA	07/08/2023	12.05	621.74
G103	Water Level	UA	08/08/2023	13.53	620.27
G103	Water Level	UA	09/25/2023	14.74	619.06
G103	Water Level	UA	10/25/2023	15.66	618.14
G103	Water Level	UA	11/13/2023	16.00	617.80
G103	Water Level	UA	12/18/2023	16.24	617.56
G105	Water Level	UA	02/13/2023	8.24	623.84
G105	Water Level	UA	08/08/2023	10.84	621.24
G105	Water Level	UA	09/25/2023	15.74	616.34
G105	Water Level	UA	10/25/2023	12.90	619.18
G105	Water Level	UA	11/13/2023	13.46	618.62
G105	Water Level	UA	12/18/2023	13.63	618.45
G106	Water Level	UA	02/13/2023	8.44	622.71
G106	Water Level	UA	03/30/2023	7.82	623.32
G106	Water Level	UA	04/30/2023	9.16	621.98
G106	Water Level	UA	05/30/2023	9.81	621.33
G106	Water Level	UA	06/08/2023	10.39	620.76
G106	Water Level	UA	07/08/2023	10.50	620.65
G106	Water Level	UA	08/08/2023	12.17	618.98
G106	Water Level	UA	09/25/2023	12.97	618.18
G106	Water Level	UA	10/25/2023	14.01	617.14
G106	Water Level	UA	11/13/2023	14.21	616.94
G106	Water Level	UA	12/18/2023	13.87	617.28
G107	Water Level	UA	02/13/2023	9.07	621.15
G107	Water Level	UA	05/30/2023	10.85	619.37
G107	Water Level	UA	08/08/2023	12.76	617.46
G107	Water Level	UA	10/25/2023	14.31	615.91
G107	Water Level	UA	11/13/2023	14.40	615.82
G108	Water Level	UA	02/13/2023	9.67	620.55

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Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G108	Water Level	UA	05/30/2023	11.65	618.57
G108	Water Level	UA	08/08/2023	13.24	616.98
G108	Water Level	UA	10/25/2023	14.89	615.33
G108	Water Level	UA	11/13/2023	14.96	615.26
G109	Water Level	UA	02/13/2023	9.81	619.95
G109	Water Level	UA	05/30/2023	11.89	617.87
G109	Water Level	UA	08/08/2023	13.64	616.12
G109	Water Level	UA	10/25/2023	14.89	614.87
G109	Water Level	UA	11/13/2023	15.09	614.67
G110	Water Level	UA	02/13/2023	10.80	618.85
G110	Water Level	UA	05/30/2023	12.70	616.95
G110	Water Level	UA	08/08/2023	14.16	615.49
G110	Water Level	UA	10/25/2023	15.31	614.34
G110	Water Level	UA	11/13/2023	15.43	614.22
G111	Water Level	UA	02/13/2023	12.91	616.99
G111	Water Level	UA	05/30/2023	13.70	616.20
G111	Water Level	UA	08/08/2023	14.95	614.95
G111	Water Level	UA	10/25/2023	16.00	613.90
G111	Water Level	UA	11/13/2023	16.09	613.81
G119	Water Level	UA	02/13/2023	14.64	616.91
G119	Water Level	UA	05/30/2023	15.08	616.47
G119	Water Level	UA	08/08/2023	15.65	615.90
G119	Water Level	UA	10/25/2023	16.40	615.15
G119	Water Level	UA	11/13/2023	16.25	615.30
G120	Water Level	UA	02/13/2023	14.43	617.44
G120	Water Level	UA	05/30/2023	14.86	617.01
G120	Water Level	UA	08/08/2023	16.31	615.56
G120	Water Level	UA	10/25/2023	17.18	614.69
G120	Water Level	UA	11/13/2023	17.08	614.79
G121	Water Level	UA	02/13/2023	14.72	618.11
G121	Water Level	UA	05/30/2023	15.38	617.45
G121	Water Level	UA	08/08/2023	18.40	614.43
G121	Water Level	UA	10/25/2023	19.45	613.38
G121	Water Level	UA	11/13/2023	18.96	613.87

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G122	Water Level	UA	02/13/2023	13.89	618.80
G122	Water Level	UA	05/30/2023	14.00	618.69
G122	Water Level	UA	08/08/2023	19.54	613.15
G122	Water Level	UA	10/25/2023	21.21	611.48
G122	Water Level	UA	11/13/2023	20.40	612.29
G123	Water Level	UA	02/13/2023	11.80	621.16
G123	Water Level	UA	05/30/2023	12.68	620.28
G123	Water Level	UA	08/08/2023	18.57	614.39
G123	Water Level	UA	10/25/2023	20.09	612.87
G123	Water Level	UA	11/13/2023	19.94	613.02
G124	Water Level	UA	02/13/2023	12.14	621.25
G124	Water Level	UA	05/30/2023	13.43	619.96
G124	Water Level	UA	08/08/2023	18.49	614.90
G124	Water Level	UA	10/25/2023	21.05	612.34
G124	Water Level	UA	11/13/2023	Dry	Dry
G125	Water Level	UA	02/13/2023	11.99	621.52
G125	Water Level	UA	05/30/2023	13.54	619.97
G125	Water Level	UA	08/08/2023	18.53	614.98
G125	Water Level	UA	10/25/2023	21.21	612.30
G125	Water Level	UA	11/13/2023	Dry	Dry
G126	Water Level	UA	02/13/2023	8.92	616.47
G126	Water Level	UA	05/30/2023	10.04	615.35
G126	Water Level	UA	08/08/2023	10.93	614.46
G126	Water Level	UA	10/25/2023	11.85	613.54
G126	Water Level	UA	11/13/2023	11.91	613.48
G151	Water Level	UA	02/13/2023	10.88	615.05
G151	Water Level	UA	05/30/2023	11.58	614.35
G151	Water Level	UA	08/08/2023	12.22	613.71
G151	Water Level	UA	10/25/2023	12.99	612.94
G151	Water Level	UA	11/13/2023	12.97	612.96
G152	Water Level	UA	02/13/2023	10.25	616.27
G152	Water Level	UA	05/30/2023	11.11	615.41
G152	Water Level	UA	08/08/2023	12.40	614.12
G152	Water Level	UA	10/25/2023	13.42	613.10

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G152	Water Level	UA	11/13/2023	13.07	613.45
G153	Water Level	UA	02/13/2023	12.24	614.16
G153	Water Level	UA	05/30/2023	11.40	615.00
G153	Water Level	UA	08/08/2023	13.08	613.32
G153	Water Level	UA	10/25/2023	14.81	611.59
G153	Water Level	UA	11/13/2023	14.90	611.50
G154	Water Level	UA	02/13/2023	10.91	615.44
G154	Water Level	UA	05/30/2023	13.15	613.20
G154	Water Level	UA	08/08/2023	14.60	611.75
G154	Water Level	UA	10/25/2023	15.90	610.45
G154	Water Level	UA	11/13/2023	15.76	610.59
G155	Water Level	UA	02/13/2023	11.56	614.30
G155	Water Level	UA	05/30/2023	12.44	613.42
G155	Water Level	UA	08/08/2023	13.21	612.65
G155	Water Level	UA	10/25/2023	14.01	611.85
G155	Water Level	UA	11/13/2023	13.92	611.94
G200	Water Level	UA	02/13/2023	2.91	623.03
G200	Water Level	UA	03/30/2023	3.01	622.92
G200	Water Level	UA	04/30/2023	4.51	621.42
G200	Water Level	UA	05/30/2023	5.89	620.04
G200	Water Level	UA	06/08/2023	6.44	619.49
G200	Water Level	UA	08/08/2023	9.21	616.73
G200	Water Level	UA	09/25/2023	10.61	615.33
G200	Water Level	UA	10/25/2023	11.51	614.43
G200	Water Level	UA	11/13/2023	11.88	614.06
G200	Water Level	UA	12/18/2023	11.48	614.46
G206	Water Level	UA	02/13/2023	9.20	623.62
G206	Water Level	UA	03/30/2023	9.12	623.69
G206	Water Level	UA	04/30/2023	10.27	622.54
G206	Water Level	UA	05/30/2023	11.17	621.64
G206	Water Level	UA	07/08/2023	12.13	620.69
G206	Water Level	UA	08/08/2023	13.89	618.93
G206	Water Level	UA	09/25/2023	14.74	618.08
G206	Water Level	UA	10/25/2023	15.71	617.11

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G206	Water Level	UA	11/13/2023	16.16	616.66
G206	Water Level	UA	12/18/2023	15.85	616.97
G206D	Water Level	DA	02/13/2023	9.92	624.22
G206D	Water Level	DA	02/16/2023	[29.69]	[604.16]
G206D	Water Level	DA	03/30/2023	32.14	601.99
G206D	Water Level	DA	04/30/2023	30.53	603.60
G206D	Water Level	DA	05/30/2023	30.22	603.91
G206D	Water Level	DA	07/08/2023	30.10	604.04
G206D	Water Level	DA	08/08/2023	30.04	604.10
G206D	Water Level	DA	09/25/2023	30.08	604.06
G206D	Water Level	DA	10/25/2023	30.34	603.80
G206D	Water Level	DA	11/13/2023	30.40	603.74
G206D	Water Level	DA	12/18/2023	30.32	603.82
G207	Water Level	UA	02/13/2023	10.25	622.96
G207	Water Level	UA	03/30/2023	9.67	623.53
G207	Water Level	UA	04/30/2023	10.55	622.65
G207	Water Level	UA	05/30/2023	11.47	621.73
G207	Water Level	UA	07/08/2023	12.45	620.76
G207	Water Level	UA	08/08/2023	14.20	619.01
G207	Water Level	UA	09/25/2023	15.27	617.94
G207	Water Level	UA	10/25/2023	16.24	616.97
G207	Water Level	UA	11/13/2023	16.67	616.54
G207	Water Level	UA	12/18/2023	16.31	616.90
G208	Water Level	UA	02/13/2023	10.28	622.88
G208	Water Level	UA	03/30/2023	9.65	623.50
G208	Water Level	UA	04/30/2023	10.30	622.85
G208	Water Level	UA	05/30/2023	11.10	622.05
G208	Water Level	UA	06/08/2023	12.38	620.78
G208	Water Level	UA	07/08/2023	12.32	620.83
G208	Water Level	UA	08/08/2023	14.08	619.08
G208	Water Level	UA	09/25/2023	15.31	617.84
G208	Water Level	UA	10/25/2023	16.25	616.91
G208	Water Level	UA	11/13/2023	16.66	616.50
G208	Water Level	UA	12/18/2023	16.24	616.92

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G209	Water Level	UA	02/13/2023	10.01	622.90
G209	Water Level	UA	03/30/2023	9.63	623.27
G209	Water Level	UA	04/30/2023	10.25	622.65
G209	Water Level	UA	05/30/2023	11.07	621.83
G209	Water Level	UA	07/08/2023	11.82	621.08
G209	Water Level	UA	08/08/2023	13.79	619.12
G209	Water Level	UA	09/25/2023	14.78	618.13
G209	Water Level	UA	10/25/2023	15.60	617.31
G209	Water Level	UA	11/13/2023	16.24	616.67
G209	Water Level	UA	12/18/2023	16.04	616.87
G210	Water Level	UA	02/13/2023	10.49	622.50
G210	Water Level	UA	03/30/2023	9.73	623.25
G210	Water Level	UA	04/30/2023	10.36	622.62
G210	Water Level	UA	05/30/2023	11.09	621.89
G210	Water Level	UA	06/08/2023	11.76	621.23
G210	Water Level	UA	07/08/2023	12.29	620.70
G210	Water Level	UA	08/08/2023	13.75	619.24
G210	Water Level	UA	09/25/2023	14.67	618.32
G210	Water Level	UA	10/25/2023	15.52	617.47
G210	Water Level	UA	11/13/2023	15.82	617.17
G210	Water Level	UA	12/18/2023	15.99	617.00
G211	Water Level	UA	02/13/2023	9.90	622.74
G211	Water Level	UA	03/30/2023	9.18	623.45
G211	Water Level	UA	04/30/2023	9.99	622.64
G211	Water Level	UA	05/30/2023	10.54	622.09
G211	Water Level	UA	06/08/2023	11.76	620.88
G211	Water Level	UA	07/08/2023	12.43	620.21
G211	Water Level	UA	08/08/2023	13.44	619.20
G211	Water Level	UA	09/25/2023	14.74	617.90
G211	Water Level	UA	10/25/2023	15.15	617.49
G211	Water Level	UA	11/13/2023	15.61	617.03
G211	Water Level	UA	12/18/2023	15.93	616.71
G212	Water Level	UA	02/13/2023	10.38	622.51
G212	Water Level	UA	03/30/2023	9.77	623.11

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G212	Water Level	UA	04/30/2023	10.89	621.99
G212	Water Level	UA	05/30/2023	11.64	621.24
G212	Water Level	UA	06/08/2023	12.80	620.08
G212	Water Level	UA	07/08/2023	13.48	619.41
G212	Water Level	UA	08/08/2023	14.61	618.28
G212	Water Level	UA	09/25/2023	15.97	616.92
G212	Water Level	UA	10/25/2023	16.46	616.43
G212	Water Level	UA	11/13/2023	16.92	615.97
G212	Water Level	UA	12/18/2023	17.00	615.89
G213	Water Level	UA	02/13/2023	10.83	621.98
G213	Water Level	UA	03/30/2023	10.15	622.65
G213	Water Level	UA	04/30/2023	11.04	621.76
G213	Water Level	UA	05/30/2023	11.96	620.84
G213	Water Level	UA	06/08/2023	12.80	620.00
G213	Water Level	UA	07/08/2023	13.50	619.31
G213	Water Level	UA	08/08/2023	15.05	617.76
G213	Water Level	UA	09/25/2023	15.90	616.91
G213	Water Level	UA	10/25/2023	16.81	616.00
G213	Water Level	UA	11/13/2023	17.41	615.40
G213	Water Level	UA	12/18/2023	17.34	615.47
G214	Water Level	UA	02/13/2023	14.53	618.32
G214	Water Level	UA	03/30/2023	13.04	619.80
G214	Water Level	UA	04/30/2023	13.98	618.86
G214	Water Level	UA	05/30/2023	14.73	618.11
G214	Water Level	UA	06/08/2023	15.56	617.29
G214	Water Level	UA	07/08/2023	16.44	616.41
G214	Water Level	UA	08/08/2023	17.64	615.21
G214	Water Level	UA	09/25/2023	18.42	614.43
G214	Water Level	UA	10/25/2023	19.14	613.71
G214	Water Level	UA	11/13/2023	19.35	613.50
G214	Water Level	UA	12/18/2023	19.23	613.62
G215	Water Level	UA	02/13/2023	14.38	618.68
G215	Water Level	UA	03/30/2023	13.16	619.89
G215	Water Level	UA	04/30/2023	14.03	619.02

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G215	Water Level	UA	05/30/2023	14.76	618.29
G215	Water Level	UA	06/08/2023	15.46	617.59
G215	Water Level	UA	07/08/2023	16.06	616.99
G215	Water Level	UA	08/08/2023	17.22	615.84
G215	Water Level	UA	09/25/2023	18.06	614.99
G215	Water Level	UA	10/25/2023	18.41	614.65
G215	Water Level	UA	11/13/2023	19.03	614.03
G215	Water Level	UA	12/18/2023	18.75	614.31
G216	Water Level	UA	02/13/2023	13.54	619.22
G216	Water Level	UA	03/30/2023	12.27	620.48
G216	Water Level	UA	04/30/2023	12.94	619.81
G216	Water Level	UA	05/30/2023	13.63	619.12
G216	Water Level	UA	06/08/2023	14.99	617.77
G216	Water Level	UA	07/08/2023	15.42	617.33
G216	Water Level	UA	08/08/2023	16.51	616.25
G216	Water Level	UA	09/25/2023	17.38	615.38
G216	Water Level	UA	10/25/2023	17.86	614.90
G216	Water Level	UA	11/13/2023	18.21	614.55
G216	Water Level	UA	12/18/2023	18.00	614.76
G217	Water Level	UA	02/13/2023	14.72	618.38
G217	Water Level	UA	08/08/2023	18.29	614.81
G217	Water Level	UA	10/25/2023	19.51	613.59
G217	Water Level	UA	11/13/2023	19.68	613.42
G217	Water Level	UA	12/18/2023	19.33	613.77
G218	Water Level	UA	02/13/2023	13.71	619.40
G218	Water Level	UA	03/30/2023	12.50	620.60
G218	Water Level	UA	04/30/2023	12.98	620.12
G218	Water Level	UA	05/30/2023	13.72	619.38
G218	Water Level	UA	06/08/2023	15.11	618.00
G218	Water Level	UA	07/08/2023	15.80	617.31
G218	Water Level	UA	08/08/2023	16.98	616.13
G218	Water Level	UA	09/25/2023	17.95	615.16
G218	Water Level	UA	10/25/2023	18.48	614.63
G218	Water Level	UA	11/13/2023	18.67	614.44

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G218	Water Level	UA	12/18/2023	18.38	614.73
G270	Water Level	UA	02/13/2023	2.53	623.33
G270	Water Level	UA	03/30/2023	2.41	623.44
G270	Water Level	UA	04/30/2023	2.83	623.02
G270	Water Level	UA	05/30/2023	5.06	620.79
G270	Water Level	UA	08/14/2023	[8.52]	[617.34]
G270	Water Level	UA	10/25/2023	10.92	614.94
G270	Water Level	UA	11/13/2023	10.90	614.96
G270	Water Level	UA	12/18/2023	9.84	616.02
G271	Water Level	UA	02/13/2023	8.93	616.64
G271	Water Level	UA	03/30/2023	7.12	618.44
G271	Water Level	UA	04/30/2023	8.97	616.59
G271	Water Level	UA	05/30/2023	9.28	616.28
G271	Water Level	UA	06/08/2023	9.57	615.99
G271	Water Level	UA	07/08/2023	9.83	615.73
G271	Water Level	UA	08/08/2023	11.20	614.37
G271	Water Level	UA	09/25/2023	12.44	613.13
G271	Water Level	UA	10/25/2023	12.95	612.62
G271	Water Level	UA	11/13/2023	13.00	612.57
G271	Water Level	UA	12/18/2023	12.79	612.78
G272	Water Level	UA	02/13/2023	8.55	615.26
G272	Water Level	UA	03/30/2023	6.96	616.84
G272	Water Level	UA	04/30/2023	9.20	614.60
G272	Water Level	UA	05/30/2023	9.48	614.32
G272	Water Level	UA	08/08/2023	10.55	613.26
G272	Water Level	UA	09/25/2023	11.63	612.18
G272	Water Level	UA	10/25/2023	12.03	611.78
G272	Water Level	UA	11/13/2023	12.01	611.80
G272	Water Level	UA	12/18/2023	11.81	612.00
G273	Water Level	UA	02/13/2023	8.95	614.07
G273	Water Level	UA	03/30/2023	7.80	615.21
G273	Water Level	UA	04/30/2023	10.09	612.92
G273	Water Level	UA	05/30/2023	10.41	612.60
G273	Water Level	UA	08/08/2023	11.56	611.46

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G273	Water Level	UA	09/25/2023	12.39	610.63
G273	Water Level	UA	10/25/2023	12.78	610.24
G273	Water Level	UA	11/13/2023	12.71	610.31
G273	Water Level	UA	12/18/2023	12.40	610.62
G274	Water Level	UA	02/13/2023	13.22	610.82
G274	Water Level	UA	03/30/2023	11.96	612.07
G274	Water Level	UA	04/30/2023	13.85	610.18
G274	Water Level	UA	05/30/2023	14.16	609.87
G274	Water Level	UA	06/08/2023	14.41	609.63
G274	Water Level	UA	07/08/2023	14.33	609.70
G274	Water Level	UA	08/08/2023	14.99	609.05
G274	Water Level	UA	09/25/2023	15.46	608.57
G274	Water Level	UA	10/25/2023	Dry	Dry
G274	Water Level	UA	11/13/2023	15.77	608.27
G274	Water Level	UA	12/18/2023	15.53	608.51
G275	Water Level	UA	02/13/2023	13.02	605.24
G275	Water Level	UA	05/30/2023	13.38	604.88
G275	Water Level	UA	08/08/2023	Dry	Dry
G275	Water Level	UA	11/13/2023	Dry	Dry
G275D	Water Level	DA	02/13/2023	39.49	580.82
G275D	Water Level	DA	08/08/2023	31.27	589.04
G275D	Water Level	DA	09/25/2023	42.29	578.02
G275D	Water Level	DA	10/25/2023	39.74	580.57
G275D	Water Level	DA	12/18/2023	43.46	576.85
G276	Water Level	UA	02/13/2023	27.37	604.63
G276	Water Level	UA	03/30/2023	25.78	606.21
G276	Water Level	UA	04/30/2023	26.04	605.95
G276	Water Level	UA	05/30/2023	26.60	605.39
G276	Water Level	UA	06/08/2023	26.84	605.16
G276	Water Level	UA	07/08/2023	27.27	604.73
G276	Water Level	UA	08/08/2023	27.75	604.25
G276	Water Level	UA	10/25/2023	28.49	603.51
G276	Water Level	UA	11/13/2023	28.59	603.41
G276	Water Level	UA	12/18/2023	28.71	603.29

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Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G277	Water Level	UA	02/13/2023	19.67	603.41
G277	Water Level	UA	05/30/2023	18.21	604.87
G277	Water Level	UA	08/08/2023	19.76	603.32
G277	Water Level	UA	11/13/2023	Dry	Dry
G278	Water Level	UA	02/13/2023	19.95	611.22
G278	Water Level	UA	05/30/2023	21.75	609.42
G278	Water Level	UA	08/08/2023	20.98	610.19
G278	Water Level	UA	10/25/2023	23.48	607.69
G278	Water Level	UA	11/13/2023	24.23	606.94
G279	Water Level	UA	02/13/2023	20.83	611.21
G279	Water Level	UA	05/30/2023	22.73	609.31
G279	Water Level	UA	08/08/2023	23.69	608.35
G279	Water Level	UA	10/25/2023	24.56	607.48
G279	Water Level	UA	11/13/2023	23.39	608.65
G280	Water Level	UA	02/13/2023	3.01	622.34
G280	Water Level	UA	03/30/2023	2.74	622.60
G280	Water Level	UA	04/30/2023	3.52	621.82
G280	Water Level	UA	05/30/2023	3.96	621.38
G280	Water Level	UA	08/08/2023	5.80	619.55
G280	Water Level	UA	09/25/2023	7.42	617.92
G280	Water Level	UA	10/25/2023	8.56	616.79
G280	Water Level	UA	11/13/2023	8.91	616.44
G280	Water Level	UA	12/18/2023	9.04	616.31
G281	Water Level	UA	02/13/2023	4.63	621.73
G281	Water Level	UA	03/30/2023	3.94	622.41
G281	Water Level	UA	04/30/2023	6.44	619.91
G281	Water Level	UA	05/30/2023	6.64	619.71
G281	Water Level	UA	08/08/2023	6.39	619.97
G281	Water Level	UA	10/24/2023	8.64	617.72
G281	Water Level	UA	11/13/2023	8.59	617.77
G281	Water Level	UA	12/18/2023	6.83	619.53
G283	Water Level	LCU	02/13/2023	4.61	606.14
G283	Water Level	LCU	03/30/2023	3.55	607.19
G283	Water Level	LCU	04/30/2023	4.71	606.03

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G283	Water Level	LCU	05/30/2023	5.60	605.14
G283	Water Level	LCU	08/14/2023	[7.45]	[603.30]
G283	Water Level	LCU	10/24/2023	7.79	602.96
G283	Water Level	LCU	11/13/2023	7.22	603.53
G283	Water Level	LCU	12/18/2023	6.49	604.26
G284	Water Level	UA	02/13/2023	9.72	608.70
G284	Water Level	UA	03/30/2023	8.65	609.76
G284	Water Level	UA	04/30/2023	11.62	606.79
G284	Water Level	UA	05/30/2023	12.43	605.98
G284	Water Level	UA	08/14/2023	[12.28]	[606.14]
G284	Water Level	UA	10/24/2023	Dry	Dry
G284	Water Level	UA	11/13/2023	Dry	Dry
G284	Water Level	UA	12/18/2023	12.91	605.51
G285	Water Level	LCU	02/13/2023	6.12	607.40
G285	Water Level	LCU	03/30/2023	4.18	609.33
G285	Water Level	LCU	04/30/2023	5.80	607.71
G285	Water Level	LCU	05/30/2023	6.71	606.80
G285	Water Level	LCU	07/08/2023	8.14	605.37
G285	Water Level	LCU	08/08/2023	8.25	605.26
G285	Water Level	LCU	08/14/2023	[8.44]	[605.08]
G285	Water Level	LCU	09/25/2023	8.47	605.05
G285	Water Level	LCU	10/24/2023	8.96	604.56
G285	Water Level	LCU	11/13/2023	9.38	604.14
G285	Water Level	LCU	12/18/2023	8.03	605.49
G286	Water Level	UA	02/13/2023	6.18	606.95
G286	Water Level	UA	08/10/2023	[Dry]	[Dry]
G286	Water Level	UA	10/24/2023	Dry	Dry
G286	Water Level	UA	11/13/2023	Dry	Dry
G286	Water Level	UA	12/18/2023	Dry	Dry
G287	Water Level	UA	02/13/2023	5.75	611.70
G288	Water Level	UA	02/13/2023	9.78	610.29
G288	Water Level	UA	03/30/2023	4.70	615.37
G288	Water Level	UA	04/30/2023	6.66	613.41
G288	Water Level	UA	05/30/2023	7.40	612.67

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G288	Water Level	UA	06/08/2023	8.05	612.02
G288	Water Level	UA	07/08/2023	7.65	612.42
G288	Water Level	UA	08/08/2023	8.62	611.45
G288	Water Level	UA	08/11/2023	[8.70]	[611.37]
G288	Water Level	UA	09/25/2023	9.57	610.50
G288	Water Level	UA	10/24/2023	9.95	610.12
G288	Water Level	UA	11/13/2023	9.84	610.23
G288	Water Level	UA	12/18/2023	8.56	611.51
G301	Water Level	UA	02/13/2023	5.30	617.35
G301	Water Level	UA	06/08/2023	7.70	614.94
G301	Water Level	UA	07/08/2023	7.82	614.82
G301	Water Level	UA	08/08/2023	8.11	614.54
G301	Water Level	UA	10/24/2023	8.51	614.14
G301	Water Level	UA	11/13/2023	8.43	614.22
G301	Water Level	UA	12/18/2023	8.00	614.65
G302	Water Level	UA	02/13/2023	7.16	612.88
G302	Water Level	UA	03/30/2023	4.68	615.35
G302	Water Level	UA	04/30/2023	9.10	610.93
G302	Water Level	UA	05/30/2023	11.04	608.99
G302	Water Level	UA	06/08/2023	11.57	608.46
G302	Water Level	UA	07/08/2023	12.07	607.96
G302	Water Level	UA	08/08/2023	12.68	607.36
G302	Water Level	UA	09/25/2023	13.12	606.92
G302	Water Level	UA	11/13/2023	13.16	606.88
G302	Water Level	UA	12/18/2023	12.47	607.57
G303	Water Level	UA	02/13/2023	4.20	617.82
G303	Water Level	UA	03/30/2023	3.62	618.39
G303	Water Level	UA	04/30/2023	4.62	617.39
G303	Water Level	UA	05/30/2023	5.92	616.09
G303	Water Level	UA	08/08/2023	8.40	613.62
G303	Water Level	UA	09/25/2023	9.18	612.83
G303	Water Level	UA	10/24/2023	9.71	612.31
G303	Water Level	UA	11/13/2023	9.32	612.70
G303	Water Level	UA	12/18/2023	8.22	613.80

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G305	Water Level	UA	02/13/2023	6.08	619.59
G305	Water Level	UA	03/30/2023	5.81	619.85
G305	Water Level	UA	04/30/2023	6.59	619.07
G305	Water Level	UA	05/30/2023	7.63	618.03
G305	Water Level	UA	06/08/2023	8.35	617.31
G305	Water Level	UA	07/08/2023	8.23	617.43
G305	Water Level	UA	08/08/2023	9.19	616.48
G305	Water Level	UA	10/24/2023	9.95	615.72
G305	Water Level	UA	11/13/2023	8.50	617.17
G305	Water Level	UA	12/18/2023	8.24	617.43
G306	Water Level	UA	02/13/2023	5.80	620.11
G306	Water Level	UA	03/30/2023	5.41	620.49
G306	Water Level	UA	04/30/2023	6.64	619.26
G306	Water Level	UA	05/30/2023	8.13	617.77
G306	Water Level	UA	06/08/2023	9.18	616.72
G306	Water Level	UA	07/08/2023	8.60	617.30
G306	Water Level	UA	08/08/2023	9.70	616.21
G306	Water Level	UA	10/24/2023	10.81	615.10
G306	Water Level	UA	11/13/2023	10.13	615.78
G306	Water Level	UA	12/18/2023	7.56	618.35
G307	Water Level	UA	02/13/2023	Above Top of Casing	Above Top of Casing
G307	Water Level	UA	08/08/2023	0.70	623.90
G307	Water Level	UA	11/13/2023	1.96	622.64
G307D	Water Level	LCU	02/13/2023	2.75	622.13
G307D	Water Level	LCU	03/30/2023	2.32	622.55
G307D	Water Level	LCU	04/30/2023	2.41	622.46
G307D	Water Level	LCU	05/30/2023	2.48	622.39
G307D	Water Level	LCU	08/08/2023	7.89	616.99
G307D	Water Level	LCU	10/24/2023	11.33	613.55
G307D	Water Level	LCU	11/13/2023	12.36	612.52
G307D	Water Level	LCU	12/18/2023	7.55	617.33
G308	Water Level	UA	02/13/2023	3.88	620.71
G308	Water Level	UA	03/30/2023	3.79	620.79
G308	Water Level	UA	04/30/2023	4.84	619.74

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G308	Water Level	UA	05/30/2023	5.56	619.02
G308	Water Level	UA	06/08/2023	5.93	618.66
G308	Water Level	UA	07/08/2023	5.37	619.22
G308	Water Level	UA	08/08/2023	5.09	619.50
G308	Water Level	UA	09/25/2023	6.16	618.42
G308	Water Level	UA	10/24/2023	6.19	618.40
G308	Water Level	UA	11/13/2023	6.00	618.59
G308	Water Level	UA	12/18/2023	4.71	619.88
G309	Water Level	UA	02/13/2023	9.64	616.24
G309	Water Level	UA	08/08/2023	8.04	617.84
G309	Water Level	UA	09/25/2023	8.24	617.64
G309	Water Level	UA	10/24/2023	8.69	617.19
G309	Water Level	UA	11/13/2023	8.32	617.56
G309	Water Level	UA	12/18/2023	7.60	618.28
G310	Water Level	UA	02/13/2023	7.09	615.78
G310	Water Level	UA	03/30/2023	6.42	616.44
G310	Water Level	UA	04/30/2023	8.94	613.92
G310	Water Level	UA	05/30/2023	9.57	613.29
G310	Water Level	UA	06/08/2023	9.96	612.90
G310	Water Level	UA	08/08/2023	10.30	612.57
G310	Water Level	UA	09/25/2023	10.73	612.14
G310	Water Level	UA	10/24/2023	10.82	612.05
G310	Water Level	UA	11/13/2023	10.56	612.31
G310	Water Level	UA	12/18/2023	9.95	612.92
G311	Water Level	UA	05/30/2023	8.26	612.78
G311	Water Level	UA	08/08/2023	9.08	611.96
G311	Water Level	UA	10/24/2023	9.29	611.75
G311	Water Level	UA	11/13/2023	9.38	611.66
G311D	Water Level	LCU	02/13/2023	23.66	597.58
G311D	Water Level	LCU	05/30/2023	23.26	597.98
G311D	Water Level	LCU	08/08/2023	23.52	597.72
G311D	Water Level	LCU	10/24/2023	23.51	597.73
G311D	Water Level	LCU	11/13/2023	24.15	597.09
G312	Water Level	UA	03/30/2023	8.28	611.49

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G312	Water Level	UA	04/30/2023	10.81	608.96
G312	Water Level	UA	05/30/2023	12.42	607.35
G312	Water Level	UA	06/08/2023	12.87	606.91
G312	Water Level	UA	07/08/2023	13.42	606.36
G312	Water Level	UA	08/08/2023	14.00	605.78
G312	Water Level	UA	10/24/2023	Dry	Dry
G312	Water Level	UA	11/13/2023	Dry	Dry
G312	Water Level	UA	12/18/2023	14.45	605.33
G313	Water Level	UA	02/13/2023	3.24	611.06
G313	Water Level	UA	08/08/2023	3.01	611.29
G313	Water Level	UA	10/24/2023	3.08	611.22
G313	Water Level	UA	11/13/2023	3.36	610.94
G313	Water Level	UA	12/18/2023	3.48	610.82
G314	Water Level	LCU	02/13/2023	6.14	607.74
G314	Water Level	LCU	03/30/2023	8.96	604.91
G314	Water Level	LCU	04/30/2023	5.53	608.34
G314	Water Level	LCU	05/30/2023	4.81	609.06
G314	Water Level	LCU	06/08/2023	9.43	604.44
G314	Water Level	LCU	07/08/2023	5.67	608.20
G314	Water Level	LCU	08/08/2023	4.88	609.00
G314	Water Level	LCU	09/25/2023	4.96	608.92
G314	Water Level	LCU	10/24/2023	5.30	608.58
G314	Water Level	LCU	11/13/2023	5.67	608.21
G314	Water Level	LCU	12/18/2023	7.39	606.49
G314D	Water Level	DA	02/13/2023	16.40	597.30
G314D	Water Level	DA	03/30/2023	9.98	603.71
G314D	Water Level	DA	04/30/2023	7.48	606.21
G314D	Water Level	DA	05/30/2023	6.69	607.00
G314D	Water Level	DA	06/08/2023	11.80	601.90
G314D	Water Level	DA	07/08/2023	7.25	606.45
G314D	Water Level	DA	08/08/2023	7.78	605.92
G314D	Water Level	DA	09/25/2023	8.50	605.20
G314D	Water Level	DA	10/24/2023	8.56	605.14
G314D	Water Level	DA	11/13/2023	7.97	605.73

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G314D	Water Level	DA	12/18/2023	7.04	606.66
G315	Water Level	UA	02/13/2023	2.08	621.44
G315	Water Level	UA	08/08/2023	3.50	620.02
G315	Water Level	UA	10/24/2023	4.04	619.48
G315	Water Level	UA	11/13/2023	4.11	619.41
G315	Water Level	UA	12/18/2023	2.55	620.97
G316	Water Level	LCU	02/13/2023	11.53	591.06
G316	Water Level	LCU	05/30/2023	12.28	590.31
G316	Water Level	LCU	08/08/2023	11.70	590.89
G316	Water Level	LCU	10/24/2023	12.54	590.05
G316	Water Level	LCU	11/13/2023	12.46	590.13
G317	Water Level	UA	02/13/2023	34.52	607.41
G317	Water Level	UA	08/08/2023	Dry	Dry
G317	Water Level	UA	09/25/2023	37.42	604.51
G317	Water Level	UA	10/24/2023	Dry	Dry
G317	Water Level	UA	11/13/2023	Dry	Dry
G317	Water Level	UA	12/18/2023	38.02	603.91
G401	Water Level	UA	02/13/2023	21.17	604.40
G401	Water Level	UA	05/30/2023	21.72	603.85
G401	Water Level	UA	08/08/2023	21.75	603.82
G401	Water Level	UA	10/24/2023	21.66	603.91
G401	Water Level	UA	11/13/2023	13.63	611.94
G402	Water Level	UA	02/13/2023	8.83	604.54
G402	Water Level	UA	03/30/2023	8.23	605.13
G402	Water Level	UA	04/30/2023	9.59	603.77
G402	Water Level	UA	05/30/2023	10.56	602.80
G402	Water Level	UA	06/08/2023	10.94	602.43
G402	Water Level	UA	07/08/2023	11.08	602.29
G402	Water Level	UA	08/08/2023	11.65	601.72
G402	Water Level	UA	10/24/2023	12.01	601.36
G402	Water Level	UA	11/13/2023	11.71	601.66
G402	Water Level	UA	12/18/2023	11.48	601.89
G403	Water Level	UA	02/13/2023	6.05	620.42
G403	Water Level	UA	03/30/2023	5.81	620.65

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G403	Water Level	UA	04/30/2023	7.09	619.37
G403	Water Level	UA	05/30/2023	8.13	618.33
G403	Water Level	UA	06/08/2023	8.74	617.73
G403	Water Level	UA	07/08/2023	7.21	619.26
G403	Water Level	UA	08/08/2023	7.45	619.02
G403	Water Level	UA	09/25/2023	8.82	617.64
G403	Water Level	UA	10/24/2023	8.62	617.85
G403	Water Level	UA	11/13/2023	8.27	618.20
G403	Water Level	UA	12/18/2023	6.64	619.83
G404	Water Level	UA	02/13/2023	3.46	612.21
G404	Water Level	UA	03/30/2023	3.24	612.42
G404	Water Level	UA	04/30/2023	4.64	611.02
G404	Water Level	UA	05/30/2023	5.42	610.24
G404	Water Level	UA	08/14/2023	[5.62]	[610.05]
G404	Water Level	UA	10/24/2023	7.09	608.58
G404	Water Level	UA	11/13/2023	6.48	609.19
G404	Water Level	UA	12/18/2023	4.70	610.97
G405	Water Level	UA	02/13/2023	6.13	617.50
G405	Water Level	UA	03/30/2023	5.87	617.75
G405	Water Level	UA	04/30/2023	6.53	617.09
G405	Water Level	UA	05/30/2023	6.83	616.79
G405	Water Level	UA	06/08/2023	7.08	616.55
G405	Water Level	UA	07/08/2023	6.59	617.04
G405	Water Level	UA	08/08/2023	6.85	616.78
G405	Water Level	UA	09/25/2023	7.59	616.04
G405	Water Level	UA	10/24/2023	7.84	615.79
G405	Water Level	UA	11/13/2023	7.73	615.90
G405	Water Level	UA	12/18/2023	6.55	617.08
G406	Water Level	UA	02/13/2023	11.25	614.11
G406	Water Level	UA	03/30/2023	9.94	615.41
G406	Water Level	UA	04/30/2023	12.48	612.87
G406	Water Level	UA	05/30/2023	13.06	612.29
G406	Water Level	UA	06/08/2023	13.75	611.61
G406	Water Level	UA	07/08/2023	11.92	613.44

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G406	Water Level	UA	08/08/2023	11.49	613.87
G406	Water Level	UA	09/25/2023	13.95	611.41
G406	Water Level	UA	10/24/2023	14.08	611.28
G406	Water Level	UA	11/13/2023	13.83	611.53
G406	Water Level	UA	12/18/2023	12.03	613.33
G407	Water Level	UA	02/13/2023	5.60	615.72
G407	Water Level	UA	03/30/2023	5.49	615.82
G407	Water Level	UA	04/30/2023	6.91	614.40
G407	Water Level	UA	05/30/2023	7.35	613.96
G407	Water Level	UA	06/08/2023	8.75	612.57
G407	Water Level	UA	07/08/2023	8.22	613.10
G407	Water Level	UA	08/08/2023	8.79	612.53
G407	Water Level	UA	10/24/2023	8.39	612.93
G407	Water Level	UA	11/13/2023	8.31	613.01
G407	Water Level	UA	12/18/2023	6.76	614.56
G410	Water Level	UA	02/13/2023	7.44	612.35
G410	Water Level	UA	05/30/2023	8.99	610.80
G410	Water Level	UA	08/08/2023	9.66	610.13
G410	Water Level	UA	10/24/2023	10.88	608.91
G410	Water Level	UA	11/13/2023	10.68	609.11
G411	Water Level	UA	02/13/2023	6.15	617.10
G411	Water Level	UA	05/30/2023	8.52	614.73
G411	Water Level	UA	08/08/2023	8.69	614.56
G411	Water Level	UA	10/24/2023	11.33	611.92
G411	Water Level	UA	11/13/2023	11.20	612.05
MW03D	Water Level	DA	02/13/2023	30.75	598.26
MW03D	Water Level	DA	03/30/2023	30.43	598.57
MW03D	Water Level	DA	04/30/2023	30.00	599.01
MW03D	Water Level	DA	05/30/2023	30.11	598.90
MW03D	Water Level	DA	06/08/2023	30.17	598.83
MW03D	Water Level	DA	07/08/2023	30.39	598.62
MW03D	Water Level	DA	08/08/2023	30.65	598.36
MW03D	Water Level	DA	09/25/2023	29.29	599.72
MW03D	Water Level	DA	10/25/2023	29.64	599.37

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
MW03D	Water Level	DA	11/13/2023	32.01	597.00
MW03D	Water Level	DA	12/18/2023	32.08	596.93
MW04S	Water Level	UA	02/13/2023	4.30	621.59
MW04S	Water Level	UA	05/30/2023	6.63	619.26
MW04S	Water Level	UA	08/08/2023	9.80	616.09
MW04S	Water Level	UA	11/13/2023	12.20	613.69
MW05S	Water Level	UA	02/13/2023	5.22	620.73
MW05S	Water Level	UA	05/30/2023	7.25	618.70
MW05S	Water Level	UA	08/08/2023	9.35	616.60
MW05D	Water Level	DA	02/13/2023	19.65	606.26
MW05D	Water Level	DA	05/30/2023	18.29	607.62
MW05D	Water Level	DA	08/08/2023	21.12	604.79
MW06S	Water Level	UA	02/13/2023	4.51	621.64
MW06S	Water Level	UA	05/30/2023	6.45	619.70
MW06S	Water Level	UA	08/08/2023	8.72	617.43
MW06S	Water Level	UA	10/24/2023	9.94	616.21
MW06S	Water Level	UA	11/13/2023	8.91	617.24
MW07S	Water Level	UA	02/13/2023	3.15	624.45
MW07S	Water Level	UA	05/30/2023	5.23	622.37
MW07S	Water Level	UA	08/08/2023	7.79	619.81
MW07S	Water Level	UA	10/24/2023	9.37	618.23
MW07S	Water Level	UA	11/13/2023	8.48	619.12
MW09S	Water Level	UA	02/13/2023	3.14	624.48
MW09S	Water Level	UA	05/30/2023	5.45	622.17
MW09S	Water Level	UA	08/08/2023	8.11	619.51
MW09D	Water Level	LCU	05/30/2023	13.91	613.70
MW09D	Water Level	LCU	08/08/2023	14.73	612.88
MW10S	Water Level	UA	05/30/2023	5.44	619.01
MW10S	Water Level	UA	08/08/2023	8.67	615.78
MW10D	Water Level	LCU	02/14/2023	3.41	621.06
MW10D	Water Level	LCU	05/30/2023	15.73	608.74
MW10D	Water Level	LCU	08/08/2023	18.69	605.78
MW11S	Water Level	UA	02/14/2023	3.78	621.49
MW11S	Water Level	UA	08/08/2023	8.00	617.27

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
MW11D	Water Level	LCU	02/14/2023	4.73	620.79
MW11D	Water Level	LCU	03/30/2023	3.97	621.55
MW11D	Water Level	LCU	04/30/2023	4.00	621.51
MW11D	Water Level	LCU	05/30/2023	4.76	620.75
MW11D	Water Level	LCU	06/08/2023	6.52	618.99
MW11D	Water Level	LCU	07/08/2023	7.38	618.14
MW11D	Water Level	LCU	08/08/2023	8.57	616.95
MW12S	Water Level	UA	02/14/2023	5.30	620.01
MW12S	Water Level	UA	05/30/2023	7.36	617.95
MW12S	Water Level	UA	08/08/2023	10.87	614.44
MW12S	Water Level	UA	10/25/2023	12.51	612.80
MW12S	Water Level	UA	11/13/2023	12.80	612.51
MW12D	Water Level	DA	02/14/2023	13.63	611.58
MW12D	Water Level	DA	03/30/2023	13.17	612.04
MW12D	Water Level	DA	04/30/2023	12.69	612.52
MW12D	Water Level	DA	05/30/2023	12.71	612.50
MW12D	Water Level	DA	06/08/2023	12.80	612.41
MW12D	Water Level	DA	07/08/2023	13.31	611.90
MW12D	Water Level	DA	08/08/2023	13.93	611.28
MW12D	Water Level	DA	09/25/2023	14.86	610.35
MW12D	Water Level	DA	10/25/2023	15.32	609.89
MW12D	Water Level	DA	11/13/2023	15.64	609.57
MW12D	Water Level	DA	12/18/2023	16.00	609.21
MW13S	Water Level	UA	02/13/2023	8.55	617.41
MW13S	Water Level	UA	05/30/2023	10.19	615.77
MW13S	Water Level	UA	08/08/2023	11.34	614.62
MW13S	Water Level	UA	10/25/2023	12.79	613.17
MW13S	Water Level	UA	11/13/2023	12.33	613.63
MW13D	Water Level	DA	02/13/2023	1.20	624.66
MW13D	Water Level	DA	05/30/2023	13.52	612.34
MW13D	Water Level	DA	08/08/2023	12.86	613.00
MW13D	Water Level	DA	10/25/2023	12.75	613.11
MW13D	Water Level	DA	11/13/2023	12.45	613.41
MW16S	Water Level	UA	02/14/2023	6.61	622.86

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
MW16S	Water Level	UA	03/30/2023	3.70	625.77
MW16S	Water Level	UA	04/30/2023	5.10	624.37
MW16S	Water Level	UA	05/30/2023	6.89	622.57
MW16S	Water Level	UA	06/08/2023	8.31	621.16
MW16S	Water Level	UA	07/08/2023	9.95	619.52
MW16S	Water Level	UA	08/08/2023	11.63	617.84
MW16D	Water Level	DA	02/14/2023	14.63	614.75
MW16D	Water Level	DA	03/30/2023	13.05	616.33
MW16D	Water Level	DA	04/30/2023	12.09	617.29
MW16D	Water Level	DA	05/30/2023	11.83	617.55
MW16D	Water Level	DA	06/08/2023	11.85	617.53
MW16D	Water Level	DA	07/08/2023	12.34	617.04
MW16D	Water Level	DA	08/08/2023	12.97	616.41
MW17S	Water Level	UA	05/30/2023	6.91	623.65
MW17S	Water Level	UA	08/08/2023	10.81	619.75
MW17D	Water Level	DA	02/14/2023	19.92	610.37
MW17D	Water Level	DA	05/30/2023	13.33	616.96
MW17D	Water Level	DA	08/08/2023	14.58	615.71
MW20S	Water Level	UA	02/13/2023	8.21	614.69
MW20S	Water Level	UA	03/30/2023	6.59	616.31
MW20S	Water Level	UA	04/30/2023	8.97	613.93
MW20S	Water Level	UA	05/30/2023	9.28	613.61
MW20S	Water Level	UA	06/08/2023	9.56	613.33
MW20S	Water Level	UA	07/08/2023	9.63	613.26
MW20S	Water Level	UA	08/08/2023	10.60	612.30
MW20S	Water Level	UA	09/25/2023	11.53	611.37
MW20S	Water Level	UA	10/25/2023	11.74	611.16
MW20S	Water Level	UA	11/13/2023	11.96	610.94
MW20S	Water Level	UA	12/18/2023	11.60	611.30
R104	Water Level	UA	02/14/2023	7.44	625.40
R104	Water Level	UA	03/30/2023	6.14	626.69
R104	Water Level	UA	04/30/2023	7.47	625.36
R104	Water Level	UA	05/30/2023	8.02	624.81
R104	Water Level	UA	06/08/2023	8.41	624.43

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
R104	Water Level	UA	07/08/2023	8.92	623.92
R104	Water Level	UA	08/08/2023	10.45	622.39
R104	Water Level	UA	09/25/2023	11.50	621.34
R104	Water Level	UA	10/25/2023	12.52	620.32
R104	Water Level	UA	11/13/2023	12.91	619.93
R104	Water Level	UA	12/18/2023	12.81	620.03
R201	Water Level	UA	02/14/2023	2.80	623.54
R201	Water Level	UA	03/30/2023	2.56	623.77
R201	Water Level	UA	04/30/2023	3.95	622.38
R201	Water Level	UA	05/30/2023	5.31	621.02
R201	Water Level	UA	06/08/2023	6.13	620.21
R201	Water Level	UA	07/08/2023	6.75	619.59
R201	Water Level	UA	08/08/2023	11.61	614.73
R201	Water Level	UA	09/25/2023	10.12	616.22
R201	Water Level	UA	10/24/2023	11.20	615.14
R201	Water Level	UA	11/13/2023	11.73	614.61
R201	Water Level	UA	12/18/2023	11.37	614.97
R205	Water Level	UA	02/13/2023	7.49	617.03
R205	Water Level	UA	08/08/2023	9.69	614.83
R205	Water Level	UA	10/25/2023	11.16	613.36
R205	Water Level	UA	11/13/2023	11.48	613.04
R205	Water Level	UA	12/18/2023	11.16	613.36
T127	Water Level	UA	02/13/2023	14.15	616.81
T127	Water Level	UA	05/30/2023	14.56	616.40
T127	Water Level	UA	08/08/2023	15.20	615.76
T127	Water Level	UA	10/25/2023	15.99	614.97
T127	Water Level	UA	11/13/2023	15.95	615.01
T128	Water Level	UA	02/13/2023	13.97	616.96
T128	Water Level	UA	05/30/2023	14.26	616.67
T128	Water Level	UA	08/08/2023	14.80	616.13
T128	Water Level	UA	10/25/2023	15.54	615.39
T128	Water Level	UA	11/13/2023	15.50	615.43
T202	Water Level	UA	02/13/2023	5.04	623.59
T202	Water Level	UA	05/30/2023	5.80	622.83

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
T202	Water Level	UA	08/08/2023	9.23	619.40
T202	Water Level	UA	10/24/2023	11.02	617.61
T202	Water Level	UA	11/13/2023	11.66	616.97
T408	Water Level	LCU	02/13/2023	6.92	617.16
T408	Water Level	LCU	05/30/2023	7.42	616.66
T408	Water Level	LCU	08/08/2023	7.46	616.62
T408	Water Level	LCU	10/24/2023	8.11	615.97
T408	Water Level	LCU	11/13/2023	8.02	616.06
T409	Water Level	LCU	02/13/2023	9.36	615.65
T409	Water Level	LCU	05/30/2023	11.27	613.74
T409	Water Level	LCU	08/08/2023	9.99	615.02
T409	Water Level	LCU	10/24/2023	12.46	612.55
T409	Water Level	LCU	11/13/2023	12.00	613.01
TA31	Water Level	UA	02/13/2023	5.00	621.55
TA31	Water Level	UA	05/30/2023	7.06	619.49
TA31	Water Level	UA	08/08/2023	11.98	614.57
TA31	Water Level	UA	10/24/2023	14.65	611.90
TA31	Water Level	UA	11/13/2023	14.31	612.24
TA33	Water Level	UA	02/13/2023	8.04	617.23
TA33	Water Level	UA	05/30/2023	8.42	616.85
TA33	Water Level	UA	08/08/2023	12.10	613.17
TA33	Water Level	UA	10/24/2023	13.86	611.41
TA33	Water Level	UA	11/13/2023	13.98	611.29
TA34	Water Level	UA	02/13/2023	8.03	618.49
TA34	Water Level	UA	05/30/2023	9.48	617.04
TA34	Water Level	UA	08/08/2023	18.31	608.21
TA34	Water Level	UA	10/24/2023	12.98	613.54
TA34	Water Level	UA	11/13/2023	12.60	613.92
TR32	Water Level	UA	02/13/2023	6.11	615.57
TR32	Water Level	UA	05/30/2023	6.18	615.50
TR32	Water Level	UA	10/24/2023	9.02	612.66
TR32	Water Level	UA	11/13/2023	9.67	612.01
X201	Water Level	S	02/14/2023	--	614.71
X201	Water Level	S	03/30/2023	--	614.53

Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

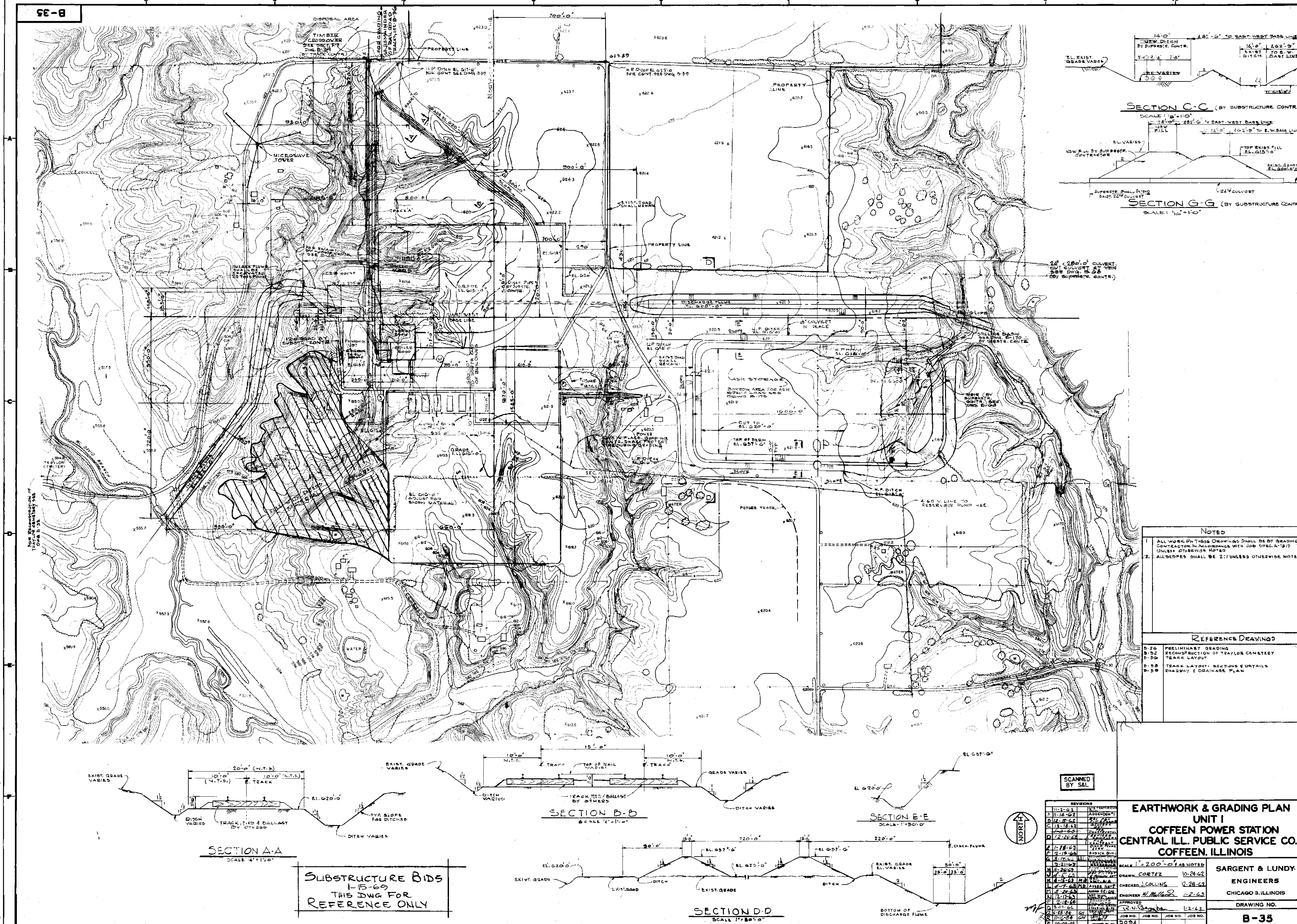
Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
X201	Water Level	S	04/30/2023	--	614.69
X201	Water Level	S	05/30/2023	--	614.93
X201	Water Level	S	08/08/2023	--	615.31
X201	Water Level	S	11/13/2023	[34.00]	[584.47]
X201	Water Level	S	12/12/2023	--	617.10
XPW01	Water Level	CCR	02/13/2023	4.51	630.06
XPW01	Water Level	CCR	03/30/2023	3.99	630.57
XPW01	Water Level	CCR	04/30/2023	4.24	630.32
XPW01	Water Level	CCR	05/30/2023	4.56	630.00
XPW01	Water Level	CCR	08/08/2023	5.29	629.28
XPW01	Water Level	CCR	10/24/2023	6.03	628.54
XPW01	Water Level	CCR	11/13/2023	6.32	628.25
XPW01	Water Level	CCR	12/18/2023	6.11	628.46
XPW02	Water Level	CCR	02/13/2023	9.38	630.31
XPW02	Water Level	CCR	03/30/2023	8.87	630.81
XPW02	Water Level	CCR	04/30/2023	9.11	630.57
XPW02	Water Level	CCR	05/30/2023	9.40	630.28
XPW02	Water Level	CCR	08/08/2023	10.30	629.39
XPW02	Water Level	CCR	09/25/2023	10.71	628.98
XPW02	Water Level	CCR	10/24/2023	10.93	628.76
XPW02	Water Level	CCR	11/13/2023	11.12	628.57
XPW02	Water Level	CCR	12/18/2023	11.02	628.67
NE Riser	Water Level	S	02/14/2023	--	625.24
XSG-01	Water Level	CCR	02/13/2023	5.40	630.12
XSG-01	Water Level	CCR	05/30/2023	5.45	630.07
XSG-01	Water Level	CCR	08/08/2023	6.25	629.27
XSG-01	Water Level	CCR	10/24/2023	7.02	628.50
XSG-01	Water Level	CCR	11/13/2023	10.38	625.14
XSG-01	Water Level	CCR	12/18/2023	7.04	628.48
SG-02	Water Level	SW	02/13/2023	7.25	598.62
SG-02	Water Level	SW	05/30/2023	7.47	598.40
SG-02	Water Level	SW	10/24/2023	7.49	598.38
SG-02	Water Level	SW	11/13/2023	7.36	598.51
SG-02	Water Level	SW	12/18/2023	7.31	598.56

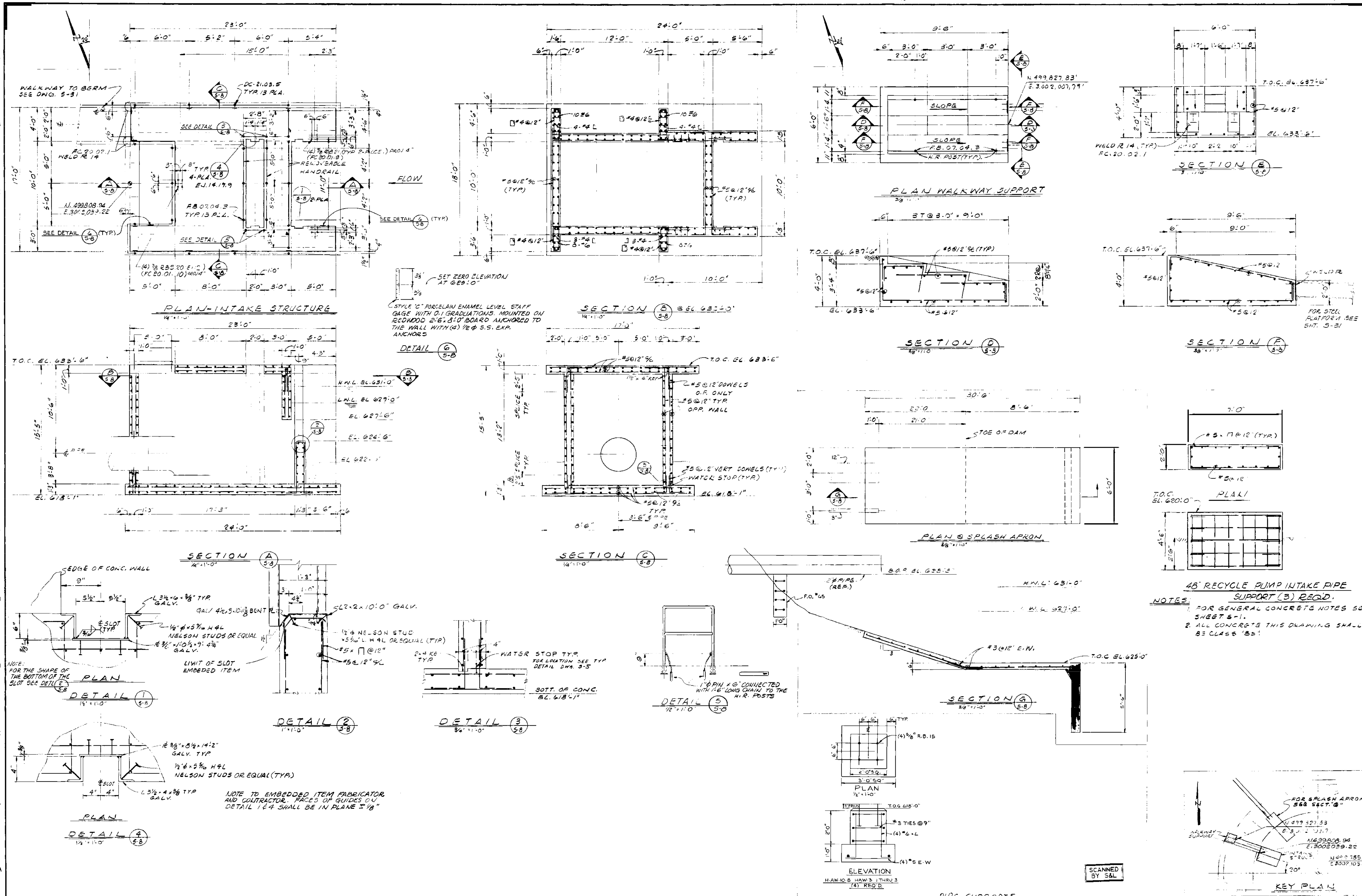
Appendix A. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
SG-03	Water Level	SW	02/13/2023	9.55	585.39
SG-03	Water Level	SW	05/30/2023	9.85	585.09
SG-03	Water Level	SW	08/08/2023	9.65	585.29
SG-03	Water Level	SW	10/24/2023	8.96	585.98
SG-03	Water Level	SW	11/13/2023	9.71	585.23
SG-03	Water Level	SW	12/18/2023	8.92	586.02
SG-04	Water Level	SW	02/13/2023	6.27	593.25
SG-04	Water Level	SW	05/30/2023	6.41	593.11

Notes:
Bracketing [] indicates that the measurement was obtained outside of the 24-hour period from initiaion of depth to groundwater measurements.
BMP = below measuring point
CCR = coal combustion residuals
DA = deep aquifer
LCU = lower confining unit
NAVD88 = North American Vertical Datum of 1988
S = source
SW = surface water
UA = uppermost aquifer

APPENDIX B
Historical Topographic Map and Ash Pond No. 1 Layout and Grading


B-35
SECTION C-C (BY SUBSTRUCTURE CONTR)
SECTION G-G (BY SUBSTRUCTURE CONTR)
SECTION A-A
SCALE 1/4"=1'-0"
SECTION B-B
SECTION E-E
SECTION D-D
SUBSTRUCTURE BIDS
1-15-63
THIS DWG FOR
REFERENCE ONLY
SCANNED BY S&L
NORTH
NOTES
1. ALL WORK ON THESE DRAWINGS SHALL BE BY GRADING CONTRACTOR IN ACCORDANCE WITH JOB SPEC. A-1813 UNLESS OTHERWISE NOTED
2. ALL SLOPES SHALL BE 2:1 UNLESS OTHERWISE NOTED.
REFERENCE DRAWINGS
B-26 PRELIMINARY GRADING
B-32 RECONSTRUCTION OF TRAYLOR CEMETERY
B-36 TRACK LAYOUT
B-38 TRACK LAYOUT - SECTIONS & DETAILS
B-39 ROADWAY & DRAINAGE PLAN
REVISIONS
11-2-62 SITE PREPARATION BIDS
A 11-14-62 ADDENDUM #1
B 12-5-62
C 12-18-62
1-2-63 FOR CONSTRUCTION
D 12-26-62 FOR CONTRACT
E 1-28-63
F 2-14-63
G 3-14-63
3-21-63
H 5-26-63
J 4-8-63
K 4-15-63 M.D.
L 4-19-63 M.D.
M 5-20-63
N 12-17-63
P 2-18-64 REMOVED FILL NOTE
Q 3-17-66
R 6-28-84 GN
R 11-16-84 GN
S 09-08-95 SCANNED BY S&L
EARTHWORK & GRADING PLAN
UNIT I
COFFEEN POWER STATION
CENTRAL ILL. PUBLIC SERVICE CO.
COFFEEN. ILLINOIS
SCALE 1"=200'-0" & AS NOTED
DRAWN CORTEZ 10-24-62
CHECKED J. COLLINS 12-28-62
ENGINEER 1-2-63
APPROVED R.N. 1-2-63
JOB NO. 3094
SARGENT & LUNDY
ENGINEERS
CHICAGO 3, ILLINOIS
DRAWING NO.
B-35



NO.	REVISIONS	DATE	BY	CH'D	APP'D
1	REVISED DET. 1, 2, 3 ADDED DET. 4 REVISED SECT. A B & G.	4/12/78	TOB		
2	REVISED ELEV. ADDED NOTE, DIMS. SECT. CALLOUT REINF. ADDED DETAIL 5 & 6, 48" RECYCLE PUMP INTAKE PIPE	5/31/78	TVT		
3	ADDED R.C. PROJ., EST. EL. REVISED DIMS., PIPE SUPPORTS	9/6/78	TVT		
4	REMOVED PIPE SUPPORTS H-AW-3-1 THRU 8	4/13/79	TVT		
5	FIELD REVISION	6-1-81	JFD		
6	SCANNED BY S&L	2-23-96			

NO.	REFERENCE DRAWINGS
S-31	STEEL MISC. STRUCT. & DETAILS
M-42	YARD PIPING PLOT PLAN
S-45	LAYOUT & GRADING PLAN
M-43	YARD PIPING, SECTIONS & DETAILS

PRINT RECORD					
DATE ISSUED	3/24/78	4/14/78	6/16/78	9/15/78	4/13/79
REVISION NO.	0	1	2	3	4
FOR	BID	BID	AFC	RAFC	RAFC
CUSTOMER	4	4	6	6	9
FIELD	—	—	2	2	2
INTRA CO.	7+15	7+15	AR	AR	AR
0201-200	6	6	8+15	8+15	8+15

ENG. RECORD		
DRAWN	TCB	3-78
CHECKED		6-6-78
MECH. CK.		6-6-78
STRUCT. CK.		6-6-78
ELECT. CK.		6-6-78
PIPING CK.	RAS	6-6-78
APPROVED		6-6-78
APPROVED		

DRAWING STATUS	
ISSUED	DATE
PRELIMINARY	
FOR COMMENTS AND/OR APPROVAL	
APPROVED FOR CONSTRUCTION MEB	6-16-78
REVISED & APPROVED FOR CONSTRUCTION MEB REV. 5	4-13-79

NOT APPROVED FOR CONSTRUCTION UNLESS SIGNED & DATED. DESTROY ALL PRINTS BEARING EARLIER DATE &/OR REVISION NO.

CONCRETE
RECYCLE PUMP HOUSE - INTAKE STRUCTURE
& MISCELLANEOUS FOUNDATIONS

WASTEWATER MANAGEMENT FACILITIES
CENTRAL ILLINOIS PUBLIC SERVICE COMPANY
COFFEEN POWER STATION

SCALE AS NOTED

Stearns-Roger INCORPORATED

ORDER NO. C-20000

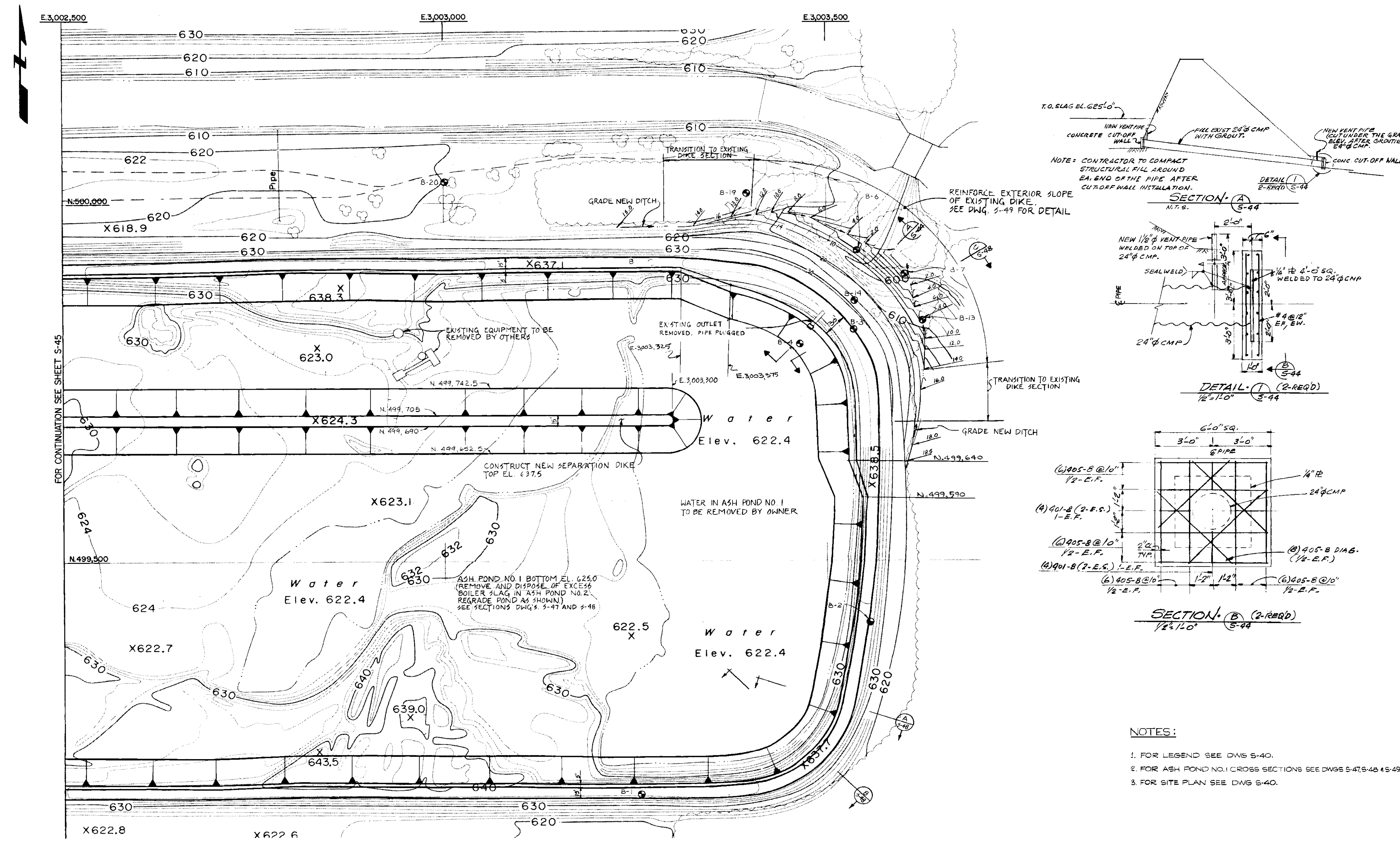
DWG. NO. L-22886

0201

SHEET NO. S-8

REV. 6

STATE OF ILLINOIS VLADIMIR FOITIK 81-3493 STRUCTURAL ENGINEER



NOTES:

1. FOR LEGEND SEE DWG S-40.
2. FOR ASH POND NO. 1 CROSS SECTIONS SEE DWGS S-47, S-48 & S-49.
3. FOR SITE PLAN SEE DWG S-40.

SCANNED BY S&L

S.R NO. Y2-4

STATE OF ILLINOIS — 6-9-78 — VLADIMIR FOJTIK — 81-3493 — STRUCTURAL ENGINEER

NO.	REVISIONS	DATE	BY	CH'D	APP'D
1	GENERAL REVISIONS	4-11-78	WSB		
2	APPROVED FOR CONSTRUCTION	6/6/78	JKS		
3	REVISED NOTE	11/3/78	TVT		
4	ADD'D SECTION "A" & "B" AND DETAIL "1"	6-5-79			
5	RELOCATED N.E. CORNER EMBANKMENT, ASH POND #1	6/4/81	JJD		
6	SCANNED BY S&L	2/23/96			

REFERENCE DRAWINGS

PRINT RECORD					
DATE ISSUED	3/29/78	4/14/78	6/6/78	11/1/78	6/8/79
REVISION NO.	0	1	2	3	4
FOR	BID	BID	CONST	RAFC	RAFC
CUSTOMER	4	4	6	10	10
FIELD	–	–	2	2	2
INTRA CO.	7+1S	7+1S	AR	AR	AR
0201-200	6	6+1S	8+1S	8+1S	8+1S

ENG. RECORD		
DRAWN	WSB	1/31/78
CHECKED	JKS	6/6/78
MECH. CK.		6-8-78
STRUCT. CK.		6-6-78
ELECT. CK.		6-8-78
PIPING CK.	MEB	6/8/78
APPROVED		
APPROVED		

DRAWING STATUS	
ISSUED	DATE
PRELIMINARY	
FOR COMMENTS AND/OR APPROVAL	
APPROVED FOR CONSTRUCTION MEB	6/9/78
REVISED & APPROVED FOR CONSTRUCTION MEB REV. 4	6-8-79

NOT APPROVED FOR CONSTRUCTION UNLESS SIGNED & DATED. DESTROY ALL PRINTS BEARING EARLIER DATE &/OR REVISION NO.

CIVIL
LAYOUT & GRADING PLAN SHEET 4

WASTEWATER MANAGEMENT FACILITIES
CENTRAL ILLINOIS PUBLIC SERVICE COMPANY
COFFEEN POWER STATION

SCALE 1"=50'

Stearns-Roger INCORPORATED

ORDER NO. C-20000

DWG. NO. L-22886

0201

SHEET NO. S-44

REV. 6

APPENDIX C
Surface Water Sampling Locations and Laboratory Analytical Report

GSI Surface Water Sample

Background Surface Water Sample

Figure adapted by Ramboll from Geosyntec-provided figure

Notes:
Locations are approximate

N

0 520 Feet

Surface Water Sampling Locations

134 Cips Lane
Coffeen, Illinois

Geosyntec consultants

St. Louis | July 2021

Figure 3

S:\Company\Projects_post_2014\GLP8005_Coffeen MNA\GIS\Porewater and Sediment Sampling Loactions.mxd 7/22/2021 8:27:18 AM eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Chicago
2417 Bond Street
University Park, IL 60484
Tel: (708)534-5200

Laboratory Job ID: 500-203343-1
Client Project/Site: GLP8029 Coffeen, IL

For:
Geosyntec Consultants, Inc.
2100 Commonwealth Blvd.
Suite 100
Ann Arbor, Michigan 48105

Attn: Brian Ares

Authorized for release by:
8/20/2021 1:48:27 PM

Robin Kintz, Project Manager II
(708)534-5200
Robin.Kintz@Eurofinset.com

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Table of Contents

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Job ID: 500-203343-1

Laboratory: Eurofins TestAmerica, Chicago

Narrative

Job Narrative
500-203343-1

Comments
No additional comments.

Receipt
The samples were received on 8/5/2021 9:45 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 1.1º C and 2.5º C.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Field Service / Mobile Lab
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Methods 300.0, 9056A: Due to the high concentration of Chloride, the matrix spike / matrix spike duplicate (MS/MSD) for analytical batch 500-614638 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

Method 9060A: One of the CCV replicates failed to meet criteria at 89% recovery for DOC. The average was within control; therefore, the data have been reported. The RPD was within control as well. The following samples are affected: D-2-20210803 (500-203343-1), D-1-20210803 (500-203343-2), BKG-1-20210803 (500-203343-3), CL-1-20210803 (500-203343-4), DUP-20210803 (500-203343-5), CL-2-20210803 (500-203343-6), CL-3-20210803 (500-203343-7), (CCB 500-613783/21) and (CCV 500-613783/20).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Geosyntec Consultants, Inc. Job ID: 500-203343-1
Project/Site: GLP8029 Coffeen, IL

Client Sample ID: D-2-20210803 Lab Sample ID: 500-203343-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.30		0.050	0.0056	mg/L	1		6010B	Total/NA
Calcium	45		0.20	0.053	mg/L	1		6010B	Total/NA
Iron	0.24		0.20	0.082	mg/L	1		6010B	Total/NA
Magnesium	13	B	0.10	0.049	mg/L	1		6010B	Total/NA
Manganese	0.20		0.010	0.0023	mg/L	1		6010B	Total/NA
Potassium	3.2	B	0.50	0.066	mg/L	1		6010B	Total/NA
Sodium	13	B	1.0	0.097	mg/L	1		6010B	Total/NA
Boron, Dissolved	0.30		0.050	0.0056	mg/L	1		6010B	Dissolved
Calcium, Dissolved	46		0.20	0.053	mg/L	1		6010B	Dissolved
Iron, Dissolved	0.15	J	0.20	0.082	mg/L	1		6010B	Dissolved
Magnesium, Dissolved	13	B	0.10	0.049	mg/L	1		6010B	Dissolved
Manganese, Dissolved	0.20		0.010	0.0023	mg/L	1		6010B	Dissolved
Potassium, Dissolved	3.2	B	0.50	0.066	mg/L	1		6010B	Dissolved
Sodium, Dissolved	13	B	1.0	0.097	mg/L	1		6010B	Dissolved
Chloride	7.2		0.20	0.17	mg/L	1		9056A	Total/NA
Sulfate	69		4.0	1.9	mg/L	20		9056A	Total/NA
Alkalinity	100		5.0	3.7	mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	240		10	4.3	mg/L	1		SM 2540C	Total/NA
Ferric Iron	0.24		0.20	0.10	mg/L	1		SM 3500	Total/NA
Phosphorus as PO4	0.24		0.15	0.073	mg/L	1		SM 4500 P E	Total/NA
Sulfide	0.25	J	1.0	0.23	mg/L	1		SM 4500 S2 F	Total/NA
Dissolved Organic Carbon - Duplicate	3.6		1.0	0.47	mg/L	1		9060A	Dissolved

Client Sample ID: D-1-20210803 Lab Sample ID: 500-203343-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.33		0.050	0.0056	mg/L	1		6010B	Total/NA
Calcium	53		0.20	0.053	mg/L	1		6010B	Total/NA
Iron	0.23		0.20	0.082	mg/L	1		6010B	Total/NA
Magnesium	16	B	0.10	0.049	mg/L	1		6010B	Total/NA
Manganese	0.030		0.010	0.0023	mg/L	1		6010B	Total/NA
Potassium	2.5	B	0.50	0.066	mg/L	1		6010B	Total/NA
Sodium	19	B	1.0	0.097	mg/L	1		6010B	Total/NA
Boron, Dissolved	0.32		0.050	0.0056	mg/L	1		6010B	Dissolved
Calcium, Dissolved	52		0.20	0.053	mg/L	1		6010B	Dissolved
Iron, Dissolved	0.13	J	0.20	0.082	mg/L	1		6010B	Dissolved
Magnesium, Dissolved	16	B	0.10	0.049	mg/L	1		6010B	Dissolved
Manganese, Dissolved	0.024		0.010	0.0023	mg/L	1		6010B	Dissolved
Potassium, Dissolved	2.5	B	0.50	0.066	mg/L	1		6010B	Dissolved
Sodium, Dissolved	18	B	1.0	0.097	mg/L	1		6010B	Dissolved
Chloride	9.1		0.40	0.34	mg/L	2		9056A	Total/NA
Sulfate	110		5.0	2.4	mg/L	25		9056A	Total/NA
Alkalinity	100		5.0	3.7	mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	240		10	4.3	mg/L	1		SM 2540C	Total/NA
Ferric Iron	0.23		0.20	0.10	mg/L	1		SM 3500	Total/NA
Phosphorus as PO4	0.13	J	0.15	0.073	mg/L	1		SM 4500 P E	Total/NA
Dissolved Organic Carbon - Duplicate	3.3		1.0	0.47	mg/L	1		9060A	Dissolved

Client Sample ID: BKG-1-20210803 Lab Sample ID: 500-203343-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.082		0.050	0.0056	mg/L	1		6010B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 500-203343-1

Client Sample ID: BKG-1-20210803 (Continued)

Lab Sample ID: 500-203343-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	20		0.20	0.053	mg/L	1		6010B	Total/NA
Iron	0.27		0.20	0.082	mg/L	1		6010B	Total/NA
Magnesium	10	B	0.10	0.049	mg/L	1		6010B	Total/NA
Manganese	0.037		0.010	0.0023	mg/L	1		6010B	Total/NA
Potassium	4.9	B	0.50	0.066	mg/L	1		6010B	Total/NA
Sodium	12	B	1.0	0.097	mg/L	1		6010B	Total/NA
Boron, Dissolved	0.079		0.050	0.0056	mg/L	1		6010B	Dissolved
Calcium, Dissolved	20		0.20	0.053	mg/L	1		6010B	Dissolved
Iron, Dissolved	0.19	J	0.20	0.082	mg/L	1		6010B	Dissolved
Magnesium, Dissolved	10	B	0.10	0.049	mg/L	1		6010B	Dissolved
Potassium, Dissolved	4.9	B	0.50	0.066	mg/L	1		6010B	Dissolved
Sodium, Dissolved	12	B	1.0	0.097	mg/L	1		6010B	Dissolved
Chloride	12		2.0	1.7	mg/L	10		9056A	Total/NA
Sulfate	36		2.0	0.95	mg/L	10		9056A	Total/NA
Alkalinity	65		5.0	3.7	mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	72		10	4.3	mg/L	1		SM 2540C	Total/NA
Ferric Iron	0.27		0.20	0.10	mg/L	1		SM 3500	Total/NA
Phosphorus as PO4	0.12	J	0.15	0.073	mg/L	1		SM 4500 P E	Total/NA
Dissolved Organic Carbon - Duplicate	5.0		1.0	0.47	mg/L	1		9060A	Dissolved

Client Sample ID: CL-1-20210803

Lab Sample ID: 500-203343-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.10		0.050	0.0056	mg/L	1		6010B	Total/NA
Calcium	23		0.20	0.053	mg/L	1		6010B	Total/NA
Iron	0.38		0.20	0.082	mg/L	1		6010B	Total/NA
Magnesium	11	B	0.10	0.049	mg/L	1		6010B	Total/NA
Manganese	0.037		0.010	0.0023	mg/L	1		6010B	Total/NA
Potassium	4.5	B	0.50	0.066	mg/L	1		6010B	Total/NA
Sodium	11	B	1.0	0.097	mg/L	1		6010B	Total/NA
Boron, Dissolved	0.12		0.050	0.0056	mg/L	1		6010B	Dissolved
Calcium, Dissolved	26		0.20	0.053	mg/L	1		6010B	Dissolved
Iron, Dissolved	0.68		0.20	0.082	mg/L	1		6010B	Dissolved
Magnesium, Dissolved	11	B	0.10	0.049	mg/L	1		6010B	Dissolved
Manganese, Dissolved	0.062		0.010	0.0023	mg/L	1		6010B	Dissolved
Potassium, Dissolved	4.7	B	0.50	0.066	mg/L	1		6010B	Dissolved
Sodium, Dissolved	12	B	1.0	0.097	mg/L	1		6010B	Dissolved
Chloride	11		0.40	0.34	mg/L	2		9056A	Total/NA
Sulfate	33		2.0	0.95	mg/L	10		9056A	Total/NA
Alkalinity	68		5.0	3.7	mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	120		10	4.3	mg/L	1		SM 2540C	Total/NA
Ferric Iron	0.38		0.20	0.10	mg/L	1		SM 3500	Total/NA
Phosphorus as PO4	0.21		0.15	0.073	mg/L	1		SM 4500 P E	Total/NA
Dissolved Organic Carbon - Duplicate	5.4		1.0	0.47	mg/L	1		9060A	Dissolved

Client Sample ID: DUP-20210803

Lab Sample ID: 500-203343-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.086		0.050	0.0056	mg/L	1		6010B	Total/NA
Calcium	21		0.20	0.053	mg/L	1		6010B	Total/NA
Iron	0.39		0.20	0.082	mg/L	1		6010B	Total/NA
Magnesium	10	B	0.10	0.049	mg/L	1		6010B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: DUP-20210803 (Continued)　　Lab Sample ID: 500-203343-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Manganese	0.052		0.010	0.0023	mg/L	1		6010B	Total/NA
Potassium	4.7	B	0.50	0.066	mg/L	1		6010B	Total/NA
Sodium	11	B	1.0	0.097	mg/L	1		6010B	Total/NA
Boron, Dissolved	0.086		0.050	0.0056	mg/L	1		6010B	Dissolved
Calcium, Dissolved	21		0.20	0.053	mg/L	1		6010B	Dissolved
Iron, Dissolved	0.087	J	0.20	0.082	mg/L	1		6010B	Dissolved
Magnesium, Dissolved	10	B	0.10	0.049	mg/L	1		6010B	Dissolved
Potassium, Dissolved	4.7	B	0.50	0.066	mg/L	1		6010B	Dissolved
Sodium, Dissolved	11	B	1.0	0.097	mg/L	1		6010B	Dissolved
Chloride	11		0.40	0.34	mg/L	2		9056A	Total/NA
Sulfate	33		2.0	0.95	mg/L	10		9056A	Total/NA
Alkalinity	65		5.0	3.7	mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	110		10	4.3	mg/L	1		SM 2540C	Total/NA
Ferric Iron	0.39		0.20	0.10	mg/L	1		SM 3500	Total/NA
Phosphorus as PO4	0.14	J	0.15	0.073	mg/L	1		SM 4500 P E	Total/NA
Dissolved Organic Carbon - Duplicate	4.9		1.0	0.47	mg/L	1		9060A	Dissolved

Client Sample ID: CL-2-20210803　　Lab Sample ID: 500-203343-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.086		0.050	0.0056	mg/L	1		6010B	Total/NA
Calcium	21		0.20	0.053	mg/L	1		6010B	Total/NA
Iron	0.38		0.20	0.082	mg/L	1		6010B	Total/NA
Magnesium	10	B	0.10	0.049	mg/L	1		6010B	Total/NA
Manganese	0.051		0.010	0.0023	mg/L	1		6010B	Total/NA
Potassium	4.7	B	0.50	0.066	mg/L	1		6010B	Total/NA
Sodium	11	B	1.0	0.097	mg/L	1		6010B	Total/NA
Boron, Dissolved	0.087		0.050	0.0056	mg/L	1		6010B	Dissolved
Calcium, Dissolved	22		0.20	0.053	mg/L	1		6010B	Dissolved
Iron, Dissolved	0.13	J	0.20	0.082	mg/L	1		6010B	Dissolved
Magnesium, Dissolved	10	B	0.10	0.049	mg/L	1		6010B	Dissolved
Potassium, Dissolved	4.7	B	0.50	0.066	mg/L	1		6010B	Dissolved
Sodium, Dissolved	11	B	1.0	0.097	mg/L	1		6010B	Dissolved
Chloride	11		0.40	0.34	mg/L	2		9056A	Total/NA
Sulfate	31		2.0	0.95	mg/L	10		9056A	Total/NA
Alkalinity	65		5.0	3.7	mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	160		10	4.3	mg/L	1		SM 2540C	Total/NA
Ferric Iron	0.38		0.20	0.10	mg/L	1		SM 3500	Total/NA
Phosphorus as PO4	0.12	J	0.15	0.073	mg/L	1		SM 4500 P E	Total/NA
Dissolved Organic Carbon - Duplicate	4.9		1.0	0.47	mg/L	1		9060A	Dissolved

Client Sample ID: CL-3-20210803　　Lab Sample ID: 500-203343-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.086		0.050	0.0056	mg/L	1		6010B	Total/NA
Calcium	21		0.20	0.053	mg/L	1		6010B	Total/NA
Iron	0.31		0.20	0.082	mg/L	1		6010B	Total/NA
Magnesium	11	B	0.10	0.049	mg/L	1		6010B	Total/NA
Manganese	0.046		0.010	0.0023	mg/L	1		6010B	Total/NA
Potassium	4.9	B	0.50	0.066	mg/L	1		6010B	Total/NA
Sodium	11	B	1.0	0.097	mg/L	1		6010B	Total/NA
Boron, Dissolved	0.084		0.050	0.0056	mg/L	1		6010B	Dissolved

This Detection Summary does not include radiochemical test results.

Client Sample ID: CL-3-20210803 (Continued) Lab Sample ID: 500-203343-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium, Dissolved	21		0.20	0.053	mg/L	1		6010B	Dissolved
Magnesium, Dissolved	10	B	0.10	0.049	mg/L	1		6010B	Dissolved
Potassium, Dissolved	4.6	B	0.50	0.066	mg/L	1		6010B	Dissolved
Sodium, Dissolved	11	B	1.0	0.097	mg/L	1		6010B	Dissolved
Chloride	11		0.40	0.34	mg/L	2		9056A	Total/NA
Sulfate	32		2.0	0.95	mg/L	10		9056A	Total/NA
Alkalinity	63		5.0	3.7	mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	150		10	4.3	mg/L	1		SM 2540C	Total/NA
Ferric Iron	0.31		0.20	0.10	mg/L	1		SM 3500	Total/NA
Phosphorus as PO4	0.095	J	0.15	0.073	mg/L	1		SM 4500 P E	Total/NA
Dissolved Organic Carbon - Duplicate	4.9		1.0	0.47	mg/L	1		9060A	Dissolved

This Detection Summary does not include radiochemical test results.

Method Summary

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 500-203343-1

Method	Method Description	Protocol	Laboratory
6010B	Metals (ICP)	SW846	TAL CHI
9056A	Anions, Ion Chromatography	SW846	TAL CHI
9060A	Organic Carbon, Dissolved (DOC)	SW846	TAL CHI
SM 2320B	Alkalinity	SM	TAL CHI
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CHI
SM 3500	Iron, Ferric	SM	TAL CHI
SM 3500 Fe B	Iron, Ferrous	SM	TAL CHI
SM 4500 P E	Phosphorus	SM	TAL CHI
SM 4500 S2 F	Sulfide, Total	SM	TAL CHI
3010A	Preparation, Total Metals	SW846	TAL CHI
SM 4500 P B	Phosphorous, Total and Ortho	SM	TAL CHI

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = Eurofins TestAmerica, Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: Geosyntec Consultants, Inc.
Job ID: 500-203343-1
Project/Site: GLP8029 Coffeen, IL

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-203343-1	D-2-20210803	Water	08/03/21 10:15	08/05/21 09:45
500-203343-2	D-1-20210803	Water	08/03/21 10:50	08/05/21 09:45
500-203343-3	BKG-1-20210803	Water	08/03/21 12:45	08/05/21 09:45
500-203343-4	CL-1-20210803	Water	08/03/21 13:20	08/05/21 09:45
500-203343-5	DUP-20210803	Water	08/03/21 13:30	08/05/21 09:45
500-203343-6	CL-2-20210803	Water	08/03/21 13:50	08/05/21 09:45
500-203343-7	CL-3-20210803	Water	08/03/21 14:20	08/05/21 09:45

Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 500-203343-1

Client Sample ID: D-2-20210803

Date Collected: 08/03/21 10:15
Date Received: 08/05/21 09:45

Lab Sample ID: 500-203343-1
Matrix: Water

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.30		0.050	0.0056	mg/L		08/10/21 08:44	08/10/21 23:27	1
Calcium	45		0.20	0.053	mg/L		08/10/21 08:44	08/10/21 23:27	1
Cobalt	<0.0050		0.0050	0.00078	mg/L		08/10/21 08:44	08/10/21 23:27	1
Iron	0.24		0.20	0.082	mg/L		08/10/21 08:44	08/10/21 23:27	1
Lithium	<0.010		0.010	0.0044	mg/L		08/10/21 08:44	08/10/21 23:27	1
Magnesium	13	B	0.10	0.049	mg/L		08/10/21 08:44	08/10/21 23:27	1
Manganese	0.20		0.010	0.0023	mg/L		08/10/21 08:44	08/10/21 23:27	1
Potassium	3.2	B	0.50	0.066	mg/L		08/10/21 08:44	08/10/21 23:27	1
Sodium	13	B	1.0	0.097	mg/L		08/10/21 08:44	08/10/21 23:27	1

Method: 6010B - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron, Dissolved	0.30		0.050	0.0056	mg/L		08/10/21 08:44	08/10/21 23:31	1
Calcium, Dissolved	46		0.20	0.053	mg/L		08/10/21 08:44	08/10/21 23:31	1
Cobalt, Dissolved	<0.0050		0.0050	0.00078	mg/L		08/10/21 08:44	08/10/21 23:31	1
Iron, Dissolved	0.15	J	0.20	0.082	mg/L		08/10/21 08:44	08/10/21 23:31	1
Lithium, Dissolved	<0.010		0.010	0.0044	mg/L		08/10/21 08:44	08/10/21 23:31	1
Magnesium, Dissolved	13	B	0.10	0.049	mg/L		08/10/21 08:44	08/10/21 23:31	1
Manganese, Dissolved	0.20		0.010	0.0023	mg/L		08/10/21 08:44	08/10/21 23:31	1
Potassium, Dissolved	3.2	B	0.50	0.066	mg/L		08/10/21 08:44	08/10/21 23:31	1
Sodium, Dissolved	13	B	1.0	0.097	mg/L		08/10/21 08:44	08/10/21 23:31	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	7.2		0.20	0.17	mg/L			08/17/21 16:12	1
Sulfate	69		4.0	1.9	mg/L			08/18/21 12:53	20
Alkalinity	100		5.0	3.7	mg/L			08/15/21 19:00	1
Total Dissolved Solids	240		10	4.3	mg/L			08/09/21 09:49	1
Ferric Iron	0.24		0.20	0.10	mg/L			08/19/21 14:42	1
Ferrous Iron	<0.050	HF	0.050	0.050	mg/L			08/11/21 04:46	1
Phosphorus as PO4	0.24		0.15	0.073	mg/L		08/15/21 12:30	08/18/21 12:20	1
Sulfide	0.25	J	1.0	0.23	mg/L			08/10/21 00:05	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Duplicate	3.6		1.0	0.47	mg/L			08/09/21 23:09	1

Client: Geosyntec Consultants, Inc. Job ID: 500-203343-1
Project/Site: GLP8029 Coffeen, IL

Client Sample ID: D-1-20210803 Lab Sample ID: 500-203343-2
Date Collected: 08/03/21 10:50 **Matrix: Water**
Date Received: 08/05/21 09:45

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.33		0.050	0.0056	mg/L		08/10/21 08:44	08/10/21 23:34	1
Calcium	53		0.20	0.053	mg/L		08/10/21 08:44	08/10/21 23:34	1
Cobalt	<0.0050		0.0050	0.00078	mg/L		08/10/21 08:44	08/10/21 23:34	1
Iron	0.23		0.20	0.082	mg/L		08/10/21 08:44	08/10/21 23:34	1
Lithium	<0.010		0.010	0.0044	mg/L		08/10/21 08:44	08/10/21 23:34	1
Magnesium	16	B	0.10	0.049	mg/L		08/10/21 08:44	08/10/21 23:34	1
Manganese	0.030		0.010	0.0023	mg/L		08/10/21 08:44	08/10/21 23:34	1
Potassium	2.5	B	0.50	0.066	mg/L		08/10/21 08:44	08/10/21 23:34	1
Sodium	19	B	1.0	0.097	mg/L		08/10/21 08:44	08/10/21 23:34	1

Method: 6010B - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron, Dissolved	0.32		0.050	0.0056	mg/L		08/10/21 08:44	08/10/21 23:38	1
Calcium, Dissolved	52		0.20	0.053	mg/L		08/10/21 08:44	08/10/21 23:38	1
Cobalt, Dissolved	<0.0050		0.0050	0.00078	mg/L		08/10/21 08:44	08/10/21 23:38	1
Iron, Dissolved	0.13	J	0.20	0.082	mg/L		08/10/21 08:44	08/10/21 23:38	1
Lithium, Dissolved	<0.010		0.010	0.0044	mg/L		08/10/21 08:44	08/10/21 23:38	1
Magnesium, Dissolved	16	B	0.10	0.049	mg/L		08/10/21 08:44	08/10/21 23:38	1
Manganese, Dissolved	0.024		0.010	0.0023	mg/L		08/10/21 08:44	08/10/21 23:38	1
Potassium, Dissolved	2.5	B	0.50	0.066	mg/L		08/10/21 08:44	08/10/21 23:38	1
Sodium, Dissolved	18	B	1.0	0.097	mg/L		08/10/21 08:44	08/10/21 23:38	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	9.1		0.40	0.34	mg/L			08/19/21 11:37	2
Sulfate	110		5.0	2.4	mg/L			08/18/21 13:07	25
Alkalinity	100		5.0	3.7	mg/L			08/15/21 19:07	1
Total Dissolved Solids	240		10	4.3	mg/L			08/09/21 09:51	1
Ferric Iron	0.23		0.20	0.10	mg/L			08/19/21 14:42	1
Ferrous Iron	<0.050	HF	0.050	0.050	mg/L			08/11/21 04:55	1
Phosphorus as PO4	0.13	J	0.15	0.073	mg/L		08/15/21 12:30	08/18/21 12:21	1
Sulfide	<1.0		1.0	0.23	mg/L			08/10/21 00:08	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Duplicate	3.3		1.0	0.47	mg/L			08/09/21 23:16	1

Client Sample Results

Client: Geosyntec Consultants, Inc.
Job ID: 500-203343-1
Project/Site: GLP8029 Coffeen, IL

Client Sample ID: BKG-1-20210803
Lab Sample ID: 500-203343-3
Date Collected: 08/03/21 12:45
Matrix: Water
Date Received: 08/05/21 09:45

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.082		0.050	0.0056	mg/L		08/10/21 08:44	08/10/21 23:42	1
Calcium	20		0.20	0.053	mg/L		08/10/21 08:44	08/10/21 23:42	1
Cobalt	<0.0050		0.0050	0.00078	mg/L		08/10/21 08:44	08/10/21 23:42	1
Iron	0.27		0.20	0.082	mg/L		08/10/21 08:44	08/10/21 23:42	1
Lithium	<0.010		0.010	0.0044	mg/L		08/10/21 08:44	08/10/21 23:42	1
Magnesium	10	B	0.10	0.049	mg/L		08/10/21 08:44	08/10/21 23:42	1
Manganese	0.037		0.010	0.0023	mg/L		08/10/21 08:44	08/10/21 23:42	1
Potassium	4.9	B	0.50	0.066	mg/L		08/10/21 08:44	08/10/21 23:42	1
Sodium	12	B	1.0	0.097	mg/L		08/10/21 08:44	08/10/21 23:42	1

Method: 6010B - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron, Dissolved	0.079		0.050	0.0056	mg/L		08/10/21 08:44	08/10/21 23:46	1
Calcium, Dissolved	20		0.20	0.053	mg/L		08/10/21 08:44	08/10/21 23:46	1
Cobalt, Dissolved	<0.0050		0.0050	0.00078	mg/L		08/10/21 08:44	08/10/21 23:46	1
Iron, Dissolved	0.19	J	0.20	0.082	mg/L		08/10/21 08:44	08/10/21 23:46	1
Lithium, Dissolved	<0.010		0.010	0.0044	mg/L		08/10/21 08:44	08/10/21 23:46	1
Magnesium, Dissolved	10	B	0.10	0.049	mg/L		08/10/21 08:44	08/10/21 23:46	1
Manganese, Dissolved	<0.010		0.010	0.0023	mg/L		08/10/21 08:44	08/10/21 23:46	1
Potassium, Dissolved	4.9	B	0.50	0.066	mg/L		08/10/21 08:44	08/10/21 23:46	1
Sodium, Dissolved	12	B	1.0	0.097	mg/L		08/10/21 08:44	08/10/21 23:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	12		2.0	1.7	mg/L			08/17/21 17:48	10
Sulfate	36		2.0	0.95	mg/L			08/18/21 13:48	10
Alkalinity	65		5.0	3.7	mg/L			08/15/21 19:14	1
Total Dissolved Solids	72		10	4.3	mg/L			08/09/21 09:54	1
Ferric Iron	0.27		0.20	0.10	mg/L			08/19/21 14:42	1
Ferrous Iron	<0.050	HF	0.050	0.050	mg/L			08/11/21 04:58	1
Phosphorus as PO4	0.12	J	0.15	0.073	mg/L		08/15/21 12:30	08/18/21 12:22	1
Sulfide	<1.0		1.0	0.23	mg/L			08/10/21 00:12	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Duplicate	5.0		1.0	0.47	mg/L			08/09/21 23:26	1

Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 500-203343-1

Client Sample ID: CL-1-20210803
Date Collected: 08/03/21 13:20
Date Received: 08/05/21 09:45

Lab Sample ID: 500-203343-4
Matrix: Water

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.10		0.050	0.0056	mg/L		08/10/21 08:44	08/10/21 23:50	1
Calcium	23		0.20	0.053	mg/L		08/10/21 08:44	08/10/21 23:50	1
Cobalt	<0.0050		0.0050	0.00078	mg/L		08/10/21 08:44	08/10/21 23:50	1
Iron	0.38		0.20	0.082	mg/L		08/10/21 08:44	08/10/21 23:50	1
Lithium	<0.010		0.010	0.0044	mg/L		08/10/21 08:44	08/10/21 23:50	1
Magnesium	11	B	0.10	0.049	mg/L		08/10/21 08:44	08/10/21 23:50	1
Manganese	0.037		0.010	0.0023	mg/L		08/10/21 08:44	08/10/21 23:50	1
Potassium	4.5	B	0.50	0.066	mg/L		08/10/21 08:44	08/10/21 23:50	1
Sodium	11	B	1.0	0.097	mg/L		08/10/21 08:44	08/10/21 23:50	1

Method: 6010B - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron, Dissolved	0.12		0.050	0.0056	mg/L		08/10/21 08:44	08/10/21 23:54	1
Calcium, Dissolved	26		0.20	0.053	mg/L		08/10/21 08:44	08/10/21 23:54	1
Cobalt, Dissolved	<0.0050		0.0050	0.00078	mg/L		08/10/21 08:44	08/10/21 23:54	1
Iron, Dissolved	0.68		0.20	0.082	mg/L		08/10/21 08:44	08/10/21 23:54	1
Lithium, Dissolved	<0.010		0.010	0.0044	mg/L		08/10/21 08:44	08/10/21 23:54	1
Magnesium, Dissolved	11	B	0.10	0.049	mg/L		08/10/21 08:44	08/10/21 23:54	1
Manganese, Dissolved	0.062		0.010	0.0023	mg/L		08/10/21 08:44	08/10/21 23:54	1
Potassium, Dissolved	4.7	B	0.50	0.066	mg/L		08/10/21 08:44	08/10/21 23:54	1
Sodium, Dissolved	12	B	1.0	0.097	mg/L		08/10/21 08:44	08/10/21 23:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	11		0.40	0.34	mg/L			08/17/21 18:01	2
Sulfate	33		2.0	0.95	mg/L			08/18/21 14:01	10
Alkalinity	68		5.0	3.7	mg/L			08/15/21 19:21	1
Total Dissolved Solids	120		10	4.3	mg/L			08/09/21 09:56	1
Ferric Iron	0.38		0.20	0.10	mg/L			08/19/21 14:42	1
Ferrous Iron	<0.050	HF	0.050	0.050	mg/L			08/11/21 05:00	1
Phosphorus as PO4	0.21		0.15	0.073	mg/L		08/15/21 12:30	08/18/21 12:23	1
Sulfide	<1.0		1.0	0.23	mg/L			08/10/21 00:16	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Duplicate	5.4		1.0	0.47	mg/L			08/09/21 23:33	1

Client Sample ID: DUP-20210803 Lab Sample ID: 500-203343-5

Date Collected: 08/03/21 13:30 **Matrix: Water**
Date Received: 08/05/21 09:45

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.086		0.050	0.0056	mg/L		08/10/21 08:44	08/10/21 23:58	1
Calcium	21		0.20	0.053	mg/L		08/10/21 08:44	08/10/21 23:58	1
Cobalt	<0.0050		0.0050	0.00078	mg/L		08/10/21 08:44	08/10/21 23:58	1
Iron	0.39		0.20	0.082	mg/L		08/10/21 08:44	08/10/21 23:58	1
Lithium	<0.010		0.010	0.0044	mg/L		08/10/21 08:44	08/10/21 23:58	1
Magnesium	10	B	0.10	0.049	mg/L		08/10/21 08:44	08/10/21 23:58	1
Manganese	0.052		0.010	0.0023	mg/L		08/10/21 08:44	08/10/21 23:58	1
Potassium	4.7	B	0.50	0.066	mg/L		08/10/21 08:44	08/10/21 23:58	1
Sodium	11	B	1.0	0.097	mg/L		08/10/21 08:44	08/10/21 23:58	1

Method: 6010B - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron, Dissolved	0.086		0.050	0.0056	mg/L		08/10/21 08:44	08/11/21 00:14	1
Calcium, Dissolved	21		0.20	0.053	mg/L		08/10/21 08:44	08/11/21 00:14	1
Cobalt, Dissolved	<0.0050		0.0050	0.00078	mg/L		08/10/21 08:44	08/11/21 00:14	1
Iron, Dissolved	0.087	J	0.20	0.082	mg/L		08/10/21 08:44	08/11/21 00:14	1
Lithium, Dissolved	<0.010		0.010	0.0044	mg/L		08/10/21 08:44	08/11/21 00:14	1
Magnesium, Dissolved	10	B	0.10	0.049	mg/L		08/10/21 08:44	08/11/21 00:14	1
Manganese, Dissolved	<0.010		0.010	0.0023	mg/L		08/10/21 08:44	08/11/21 00:14	1
Potassium, Dissolved	4.7	B	0.50	0.066	mg/L		08/10/21 08:44	08/11/21 00:14	1
Sodium, Dissolved	11	B	1.0	0.097	mg/L		08/10/21 08:44	08/11/21 00:14	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	11		0.40	0.34	mg/L			08/17/21 18:28	2
Sulfate	33		2.0	0.95	mg/L			08/18/21 14:15	10
Alkalinity	65		5.0	3.7	mg/L			08/15/21 19:28	1
Total Dissolved Solids	110		10	4.3	mg/L			08/09/21 09:59	1
Ferric Iron	0.39		0.20	0.10	mg/L			08/19/21 14:42	1
Ferrous Iron	<0.050	HF	0.050	0.050	mg/L			08/11/21 05:03	1
Phosphorus as PO4	0.14	J	0.15	0.073	mg/L		08/15/21 12:30	08/18/21 12:42	1
Sulfide	<1.0		1.0	0.23	mg/L			08/10/21 00:20	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Duplicate	4.9		1.0	0.47	mg/L			08/09/21 23:40	1

Client Sample ID: CL-2-20210803
Date Collected: 08/03/21 13:50
Date Received: 08/05/21 09:45

Lab Sample ID: 500-203343-6
Matrix: Water

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.086**		0.050	0.0056	mg/L		08/10/21 08:44	08/11/21 00:18	1
Calcium	**21**		0.20	0.053	mg/L		08/10/21 08:44	08/11/21 00:18	1
Cobalt	<0.0050		0.0050	0.00078	mg/L		08/10/21 08:44	08/11/21 00:18	1
Iron	**0.38**		0.20	0.082	mg/L		08/10/21 08:44	08/11/21 00:18	1
Lithium	<0.010		0.010	0.0044	mg/L		08/10/21 08:44	08/11/21 00:18	1
Magnesium	**10**	**B**	0.10	0.049	mg/L		08/10/21 08:44	08/11/21 00:18	1
Manganese	**0.051**		0.010	0.0023	mg/L		08/10/21 08:44	08/11/21 00:18	1
Potassium	**4.7**	**B**	0.50	0.066	mg/L		08/10/21 08:44	08/11/21 00:18	1
Sodium	**11**	**B**	1.0	0.097	mg/L		08/10/21 08:44	08/11/21 00:18	1

Method: 6010B - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron, Dissolved	**0.087**		0.050	0.0056	mg/L		08/10/21 08:44	08/11/21 00:21	1
Calcium, Dissolved	**22**		0.20	0.053	mg/L		08/10/21 08:44	08/11/21 00:21	1
Cobalt, Dissolved	<0.0050		0.0050	0.00078	mg/L		08/10/21 08:44	08/11/21 00:21	1
Iron, Dissolved	**0.13**	**J**	0.20	0.082	mg/L		08/10/21 08:44	08/11/21 00:21	1
Lithium, Dissolved	<0.010		0.010	0.0044	mg/L		08/10/21 08:44	08/11/21 00:21	1
Magnesium, Dissolved	**10**	**B**	0.10	0.049	mg/L		08/10/21 08:44	08/11/21 00:21	1
Manganese, Dissolved	<0.010		0.010	0.0023	mg/L		08/10/21 08:44	08/11/21 00:21	1
Potassium, Dissolved	**4.7**	**B**	0.50	0.066	mg/L		08/10/21 08:44	08/11/21 00:21	1
Sodium, Dissolved	**11**	**B**	1.0	0.097	mg/L		08/10/21 08:44	08/11/21 00:21	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**11**		0.40	0.34	mg/L			08/17/21 18:55	2
Sulfate	**31**		2.0	0.95	mg/L			08/18/21 14:29	10
Alkalinity	**65**		5.0	3.7	mg/L			08/15/21 19:35	1
Total Dissolved Solids	**160**		10	4.3	mg/L			08/09/21 10:02	1
Ferric Iron	**0.38**		0.20	0.10	mg/L			08/19/21 14:42	1
Ferrous Iron	<0.050	HF	0.050	0.050	mg/L			08/11/21 05:06	1
Phosphorus as PO4	**0.12**	**J**	0.15	0.073	mg/L		08/15/21 12:30	08/18/21 12:43	1
Sulfide	<1.0		1.0	0.23	mg/L			08/10/21 00:23	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Duplicate	**4.9**		1.0	0.47	mg/L			08/09/21 23:47	1

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 500-203343-1

Client Sample ID: CL-3-20210803

Date Collected: 08/03/21 14:20
Date Received: 08/05/21 09:45

Lab Sample ID: 500-203343-7
Matrix: Water

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.086		0.050	0.0056	mg/L		08/10/21 08:44	08/11/21 00:25	1
Calcium	21		0.20	0.053	mg/L		08/10/21 08:44	08/11/21 00:25	1
Cobalt	<0.0050		0.0050	0.00078	mg/L		08/10/21 08:44	08/11/21 00:25	1
Iron	0.31		0.20	0.082	mg/L		08/10/21 08:44	08/11/21 00:25	1
Lithium	<0.010		0.010	0.0044	mg/L		08/10/21 08:44	08/11/21 00:25	1
Magnesium	11	B	0.10	0.049	mg/L		08/10/21 08:44	08/11/21 00:25	1
Manganese	0.046		0.010	0.0023	mg/L		08/10/21 08:44	08/11/21 00:25	1
Potassium	4.9	B	0.50	0.066	mg/L		08/10/21 08:44	08/11/21 00:25	1
Sodium	11	B	1.0	0.097	mg/L		08/10/21 08:44	08/11/21 00:25	1

Method: 6010B - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron, Dissolved	0.084		0.050	0.0056	mg/L		08/10/21 08:44	08/11/21 00:29	1
Calcium, Dissolved	21		0.20	0.053	mg/L		08/10/21 08:44	08/11/21 00:29	1
Cobalt, Dissolved	<0.0050		0.0050	0.00078	mg/L		08/10/21 08:44	08/11/21 00:29	1
Iron, Dissolved	<0.20		0.20	0.082	mg/L		08/10/21 08:44	08/11/21 00:29	1
Lithium, Dissolved	<0.010		0.010	0.0044	mg/L		08/10/21 08:44	08/11/21 00:29	1
Magnesium, Dissolved	10	B	0.10	0.049	mg/L		08/10/21 08:44	08/11/21 00:29	1
Manganese, Dissolved	<0.010		0.010	0.0023	mg/L		08/10/21 08:44	08/11/21 00:29	1
Potassium, Dissolved	4.6	B	0.50	0.066	mg/L		08/10/21 08:44	08/11/21 00:29	1
Sodium, Dissolved	11	B	1.0	0.097	mg/L		08/10/21 08:44	08/11/21 00:29	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	11		0.40	0.34	mg/L			08/17/21 19:23	2
Sulfate	32		2.0	0.95	mg/L			08/18/21 14:42	10
Alkalinity	63		5.0	3.7	mg/L			08/15/21 19:41	1
Total Dissolved Solids	150		10	4.3	mg/L			08/09/21 10:04	1
Ferric Iron	0.31		0.20	0.10	mg/L			08/19/21 14:42	1
Ferrous Iron	<0.050	HF	0.050	0.050	mg/L			08/11/21 05:09	1
Phosphorus as PO4	0.095	J	0.15	0.073	mg/L		08/15/21 12:30	08/18/21 12:44	1
Sulfide	<1.0		1.0	0.23	mg/L			08/10/21 00:27	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Duplicate	4.9		1.0	0.47	mg/L			08/09/21 23:55	1

Qualifiers

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 500-203343-1

Metals

Prep Batch: 613499

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-203343-1	D-2-20210803	Dissolved	Water	3010A	
500-203343-1	D-2-20210803	Total/NA	Water	3010A	
500-203343-2	D-1-20210803	Dissolved	Water	3010A	
500-203343-2	D-1-20210803	Total/NA	Water	3010A	
500-203343-3	BKG-1-20210803	Dissolved	Water	3010A	
500-203343-3	BKG-1-20210803	Total/NA	Water	3010A	
500-203343-4	CL-1-20210803	Dissolved	Water	3010A	
500-203343-4	CL-1-20210803	Total/NA	Water	3010A	
500-203343-5	DUP-20210803	Dissolved	Water	3010A	
500-203343-5	DUP-20210803	Total/NA	Water	3010A	
500-203343-6	CL-2-20210803	Dissolved	Water	3010A	
500-203343-6	CL-2-20210803	Total/NA	Water	3010A	
500-203343-7	CL-3-20210803	Dissolved	Water	3010A	
500-203343-7	CL-3-20210803	Total/NA	Water	3010A	
MB 500-613499/1-A	Method Blank	Total/NA	Water	3010A	
LCS 500-613499/2-A	Lab Control Sample	Total/NA	Water	3010A	

Analysis Batch: 613679

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-203343-1	D-2-20210803	Dissolved	Water	6010B	613499
500-203343-1	D-2-20210803	Total/NA	Water	6010B	613499
500-203343-2	D-1-20210803	Dissolved	Water	6010B	613499
500-203343-2	D-1-20210803	Total/NA	Water	6010B	613499
500-203343-3	BKG-1-20210803	Dissolved	Water	6010B	613499
500-203343-3	BKG-1-20210803	Total/NA	Water	6010B	613499
500-203343-4	CL-1-20210803	Dissolved	Water	6010B	613499
500-203343-4	CL-1-20210803	Total/NA	Water	6010B	613499
500-203343-5	DUP-20210803	Dissolved	Water	6010B	613499
500-203343-5	DUP-20210803	Total/NA	Water	6010B	613499
500-203343-6	CL-2-20210803	Dissolved	Water	6010B	613499
500-203343-6	CL-2-20210803	Total/NA	Water	6010B	613499
500-203343-7	CL-3-20210803	Dissolved	Water	6010B	613499
500-203343-7	CL-3-20210803	Total/NA	Water	6010B	613499
MB 500-613499/1-A	Method Blank	Total/NA	Water	6010B	613499
LCS 500-613499/2-A	Lab Control Sample	Total/NA	Water	6010B	613499

General Chemistry

Analysis Batch: 613305

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-203343-1	D-2-20210803	Total/NA	Water	SM 2540C	
500-203343-2	D-1-20210803	Total/NA	Water	SM 2540C	
500-203343-3	BKG-1-20210803	Total/NA	Water	SM 2540C	
500-203343-4	CL-1-20210803	Total/NA	Water	SM 2540C	
500-203343-5	DUP-20210803	Total/NA	Water	SM 2540C	
500-203343-6	CL-2-20210803	Total/NA	Water	SM 2540C	
500-203343-7	CL-3-20210803	Total/NA	Water	SM 2540C	
MB 500-613305/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 500-613305/2	Lab Control Sample	Total/NA	Water	SM 2540C	
500-203340-B-2 MS	Matrix Spike	Total/NA	Water	SM 2540C	
500-203340-B-3 DU	Duplicate	Total/NA	Water	SM 2540C	

General Chemistry

Analysis Batch: 613311

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-203343-1	D-2-20210803	Total/NA	Water	SM 3500 Fe B	
500-203343-2	D-1-20210803	Total/NA	Water	SM 3500 Fe B	
500-203343-3	BKG-1-20210803	Total/NA	Water	SM 3500 Fe B	
500-203343-4	CL-1-20210803	Total/NA	Water	SM 3500 Fe B	
500-203343-5	DUP-20210803	Total/NA	Water	SM 3500 Fe B	
500-203343-6	CL-2-20210803	Total/NA	Water	SM 3500 Fe B	
500-203343-7	CL-3-20210803	Total/NA	Water	SM 3500 Fe B	
MB 500-613311/1	Method Blank	Total/NA	Water	SM 3500 Fe B	
LCS 500-613311/2	Lab Control Sample	Total/NA	Water	SM 3500 Fe B	
500-203343-1 MS	D-2-20210803	Total/NA	Water	SM 3500 Fe B	
500-203343-1 MSD	D-2-20210803	Total/NA	Water	SM 3500 Fe B	

Analysis Batch: 613518

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-203343-1	D-2-20210803	Total/NA	Water	SM 4500 S2 F	
500-203343-2	D-1-20210803	Total/NA	Water	SM 4500 S2 F	
500-203343-3	BKG-1-20210803	Total/NA	Water	SM 4500 S2 F	
500-203343-4	CL-1-20210803	Total/NA	Water	SM 4500 S2 F	
500-203343-5	DUP-20210803	Total/NA	Water	SM 4500 S2 F	
500-203343-6	CL-2-20210803	Total/NA	Water	SM 4500 S2 F	
500-203343-7	CL-3-20210803	Total/NA	Water	SM 4500 S2 F	
MB 500-613518/1	Method Blank	Total/NA	Water	SM 4500 S2 F	
LCS 500-613518/2	Lab Control Sample	Total/NA	Water	SM 4500 S2 F	
180-125221-A-1 MS	Matrix Spike	Total/NA	Water	SM 4500 S2 F	
180-125221-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	SM 4500 S2 F	

Analysis Batch: 613783

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-203343-1	D-2-20210803	Dissolved	Water	9060A	
500-203343-2	D-1-20210803	Dissolved	Water	9060A	
500-203343-3	BKG-1-20210803	Dissolved	Water	9060A	
500-203343-4	CL-1-20210803	Dissolved	Water	9060A	
500-203343-5	DUP-20210803	Dissolved	Water	9060A	
500-203343-6	CL-2-20210803	Dissolved	Water	9060A	
500-203343-7	CL-3-20210803	Dissolved	Water	9060A	
MB 500-613783/9	Method Blank	Dissolved	Water	9060A	
LCS 500-613783/10	Lab Control Sample	Dissolved	Water	9060A	

Prep Batch: 614309

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-203343-1	D-2-20210803	Total/NA	Water	SM 4500 P B	
500-203343-2	D-1-20210803	Total/NA	Water	SM 4500 P B	
500-203343-3	BKG-1-20210803	Total/NA	Water	SM 4500 P B	
500-203343-4	CL-1-20210803	Total/NA	Water	SM 4500 P B	
500-203343-5	DUP-20210803	Total/NA	Water	SM 4500 P B	
500-203343-6	CL-2-20210803	Total/NA	Water	SM 4500 P B	
500-203343-7	CL-3-20210803	Total/NA	Water	SM 4500 P B	
MB 500-614309/1-A	Method Blank	Total/NA	Water	SM 4500 P B	
LCS 500-614309/2-A	Lab Control Sample	Total/NA	Water	SM 4500 P B	

General Chemistry

Analysis Batch: 614414

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-203343-1	D-2-20210803	Total/NA	Water	SM 2320B	
500-203343-2	D-1-20210803	Total/NA	Water	SM 2320B	
500-203343-3	BKG-1-20210803	Total/NA	Water	SM 2320B	
500-203343-4	CL-1-20210803	Total/NA	Water	SM 2320B	
500-203343-5	DUP-20210803	Total/NA	Water	SM 2320B	
500-203343-6	CL-2-20210803	Total/NA	Water	SM 2320B	
500-203343-7	CL-3-20210803	Total/NA	Water	SM 2320B	
MB 500-614414/3	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-614414/4	Lab Control Sample	Total/NA	Water	SM 2320B	
500-203363-E-1 DU	Duplicate	Total/NA	Water	SM 2320B	

Analysis Batch: 614638

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-203343-1	D-2-20210803	Total/NA	Water	9056A	
500-203343-3	BKG-1-20210803	Total/NA	Water	9056A	
500-203343-4	CL-1-20210803	Total/NA	Water	9056A	
500-203343-5	DUP-20210803	Total/NA	Water	9056A	
500-203343-6	CL-2-20210803	Total/NA	Water	9056A	
500-203343-7	CL-3-20210803	Total/NA	Water	9056A	
MB 500-614638/3	Method Blank	Total/NA	Water	9056A	
LCS 500-614638/4	Lab Control Sample	Total/NA	Water	9056A	
500-203337-F-2 MS	Matrix Spike	Total/NA	Water	9056A	
500-203337-F-2 MSD	Matrix Spike Duplicate	Total/NA	Water	9056A	

Analysis Batch: 614916

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-203343-1	D-2-20210803	Total/NA	Water	SM 4500 P E	614309
500-203343-2	D-1-20210803	Total/NA	Water	SM 4500 P E	614309
500-203343-3	BKG-1-20210803	Total/NA	Water	SM 4500 P E	614309
500-203343-4	CL-1-20210803	Total/NA	Water	SM 4500 P E	614309
500-203343-5	DUP-20210803	Total/NA	Water	SM 4500 P E	614309
500-203343-6	CL-2-20210803	Total/NA	Water	SM 4500 P E	614309
500-203343-7	CL-3-20210803	Total/NA	Water	SM 4500 P E	614309
MB 500-614309/1-A	Method Blank	Total/NA	Water	SM 4500 P E	614309
LCS 500-614309/2-A	Lab Control Sample	Total/NA	Water	SM 4500 P E	614309

Analysis Batch: 614951

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-203343-1	D-2-20210803	Total/NA	Water	9056A	
500-203343-2	D-1-20210803	Total/NA	Water	9056A	
500-203343-3	BKG-1-20210803	Total/NA	Water	9056A	
500-203343-4	CL-1-20210803	Total/NA	Water	9056A	
500-203343-5	DUP-20210803	Total/NA	Water	9056A	
500-203343-6	CL-2-20210803	Total/NA	Water	9056A	
500-203343-7	CL-3-20210803	Total/NA	Water	9056A	
MB 500-614951/3	Method Blank	Total/NA	Water	9056A	
LCS 500-614951/4	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 615118

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-203343-2	D-1-20210803	Total/NA	Water	9056A	

General Chemistry (Continued)

Analysis Batch: 615118 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-615118/3	Method Blank	Total/NA	Water	9056A	
LCS 500-615118/4	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 615136

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-203343-1	D-2-20210803	Total/NA	Water	SM 3500	
500-203343-2	D-1-20210803	Total/NA	Water	SM 3500	
500-203343-3	BKG-1-20210803	Total/NA	Water	SM 3500	
500-203343-4	CL-1-20210803	Total/NA	Water	SM 3500	
500-203343-5	DUP-20210803	Total/NA	Water	SM 3500	
500-203343-6	CL-2-20210803	Total/NA	Water	SM 3500	
500-203343-7	CL-3-20210803	Total/NA	Water	SM 3500	

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 500-613499/1-A
Matrix: Water
Analysis Batch: 613679

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 613499

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<0.050		0.050	0.0056	mg/L		08/10/21 08:44	08/10/21 22:21	1
Boron, Dissolved	<0.050		0.050	0.0056	mg/L		08/10/21 08:44	08/10/21 22:21	1
Calcium	<0.20		0.20	0.053	mg/L		08/10/21 08:44	08/10/21 22:21	1
Calcium, Dissolved	<0.20		0.20	0.053	mg/L		08/10/21 08:44	08/10/21 22:21	1
Cobalt	<0.0050		0.0050	0.00078	mg/L		08/10/21 08:44	08/10/21 22:21	1
Cobalt, Dissolved	<0.0050		0.0050	0.00078	mg/L		08/10/21 08:44	08/10/21 22:21	1
Iron	<0.20		0.20	0.082	mg/L		08/10/21 08:44	08/10/21 22:21	1
Iron, Dissolved	<0.20		0.20	0.082	mg/L		08/10/21 08:44	08/10/21 22:21	1
Lithium	<0.010		0.010	0.0044	mg/L		08/10/21 08:44	08/10/21 22:21	1
Lithium, Dissolved	<0.010		0.010	0.0044	mg/L		08/10/21 08:44	08/10/21 22:21	1
Magnesium	0.0812	J	0.10	0.049	mg/L		08/10/21 08:44	08/10/21 22:21	1
Magnesium, Dissolved	0.0812	J	0.10	0.049	mg/L		08/10/21 08:44	08/10/21 22:21	1
Manganese	<0.010		0.010	0.0023	mg/L		08/10/21 08:44	08/10/21 22:21	1
Manganese, Dissolved	<0.010		0.010	0.0023	mg/L		08/10/21 08:44	08/10/21 22:21	1
Potassium	0.185	J	0.50	0.066	mg/L		08/10/21 08:44	08/10/21 22:21	1
Potassium, Dissolved	0.185	J	0.50	0.066	mg/L		08/10/21 08:44	08/10/21 22:21	1
Sodium	0.165	J	1.0	0.097	mg/L		08/10/21 08:44	08/10/21 22:21	1
Sodium, Dissolved	0.165	J	1.0	0.097	mg/L		08/10/21 08:44	08/10/21 22:21	1

Lab Sample ID: LCS 500-613499/2-A
Matrix: Water
Analysis Batch: 613679

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 613499

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	0.822		mg/L		82	80 - 120
Boron, Dissolved	1.00	0.822		mg/L		82	80 - 120
Calcium	10.0	10.7		mg/L		107	80 - 120
Calcium, Dissolved	10.0	10.7		mg/L		107	80 - 120
Cobalt	0.500	0.498		mg/L		100	80 - 120
Cobalt, Dissolved	0.500	0.498		mg/L		100	80 - 120
Iron	1.00	1.15		mg/L		115	80 - 120
Iron, Dissolved	1.00	1.15		mg/L		115	80 - 120
Lithium	0.500	0.525		mg/L		105	80 - 120
Lithium, Dissolved	0.500	0.525		mg/L		105	80 - 120
Magnesium	10.0	10.0		mg/L		100	80 - 120
Magnesium, Dissolved	10.0	10.0		mg/L		100	80 - 120
Manganese	0.500	0.522		mg/L		104	80 - 120
Manganese, Dissolved	0.500	0.522		mg/L		104	80 - 120
Potassium	10.0	10.1		mg/L		101	80 - 120
Potassium, Dissolved	10.0	10.1		mg/L		101	80 - 120
Sodium	10.0	9.94		mg/L		99	80 - 120
Sodium, Dissolved	10.0	9.94		mg/L		99	80 - 120

Client: Geosyntec Consultants, Inc. Job ID: 500-203343-1
Project/Site: GLP8029 Coffeen, IL

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 500-614638/3 **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 614638

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.20		0.20	0.17	mg/L			08/17/21 11:40	1

Lab Sample ID: LCS 500-614638/4 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 614638

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	3.00	2.81		mg/L		94	80 - 120

Lab Sample ID: 500-203337-F-2 MS **Client Sample ID: Matrix Spike**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 614638

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	430		100	487	4	mg/L		60	80 - 120

Lab Sample ID: 500-203337-F-2 MSD **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 614638

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	430		100	491	4	mg/L		64	80 - 120	1	15

Lab Sample ID: MB 500-614951/3 **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 614951

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.20		0.20	0.17	mg/L			08/18/21 11:04	1
Sulfate	<0.20		0.20	0.095	mg/L			08/18/21 11:04	1

Lab Sample ID: LCS 500-614951/4 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 614951

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	3.00	3.27		mg/L		109	80 - 120
Sulfate	5.00	5.30		mg/L		106	80 - 120

Lab Sample ID: MB 500-615118/3 **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 615118

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.20		0.20	0.17	mg/L			08/19/21 11:03	1
Sulfate	<0.20		0.20	0.095	mg/L			08/19/21 11:03	1

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 500-615118/4
Matrix: Water
Analysis Batch: 615118

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	3.00	3.27		mg/L		109	80 - 120
Sulfate	5.00	5.30		mg/L		106	80 - 120

Method: 9060A - Organic Carbon, Dissolved (DOC)

Lab Sample ID: MB 500-613783/9
Matrix: Water
Analysis Batch: 613783

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Duplicate	<1.0		1.0	0.47	mg/L			08/09/21 21:30	1

Lab Sample ID: LCS 500-613783/10
Matrix: Water
Analysis Batch: 613783

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
DOC Result 1	10.0	9.57		mg/L		96	86 - 116
DOC Result 2	10.0	9.57		mg/L		96	86 - 116
Dissolved Organic Carbon - Duplicate	10.0	9.57		mg/L		96	86 - 116

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-614414/3
Matrix: Water
Analysis Batch: 614414

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<5.0		5.0	3.7	mg/L			08/15/21 16:27	1

Lab Sample ID: LCS 500-614414/4
Matrix: Water
Analysis Batch: 614414

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	500	454		mg/L		91	90 - 110

Lab Sample ID: 500-203363-E-1 DU
Matrix: Water
Analysis Batch: 614414

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity	180		181		mg/L		2	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 500-613305/1
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 613305

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<10		10	4.3	mg/L			08/09/21 09:31	1

Lab Sample ID: LCS 500-613305/2
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 613305

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	250	238		mg/L		95	80 - 120

Lab Sample ID: 500-203340-B-2 MS
Client Sample ID: Matrix Spike
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 613305

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	490		250	792		mg/L		120	75 - 125

Lab Sample ID: 500-203340-B-3 DU
Client Sample ID: Duplicate
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 613305

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	480		472		mg/L		2	5

Method: SM 3500 Fe B - Iron, Ferrous

Lab Sample ID: MB 500-613311/1
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 613311

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ferrous Iron	<0.050		0.050	0.050	mg/L			08/11/21 04:41	1

Lab Sample ID: LCS 500-613311/2
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 613311

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ferrous Iron	0.500	0.500		mg/L		100	80 - 120

Lab Sample ID: 500-203343-1 MS
Client Sample ID: D-2-20210803
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 613311

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ferrous Iron	<0.050	HF	0.500	0.500		mg/L		100	75 - 125

Method: SM 3500 Fe B - Iron, Ferrous (Continued)

Lab Sample ID: 500-203343-1 MSD
Client Sample ID: D-2-20210803
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 613311

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ferrous Iron	<0.050	HF	0.500	0.500		mg/L		100	75 - 125	0	20

Method: SM 4500 P E - Phosphorus

Lab Sample ID: MB 500-614309/1-A
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 614916
Prep Batch: 614309

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus as PO4	<0.15		0.15	0.073	mg/L		08/15/21 12:30	08/18/21 11:49	1

Lab Sample ID: LCS 500-614309/2-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 614916
Prep Batch: 614309

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phosphorus as PO4	1.54	1.56		mg/L		101	88 - 123

Method: SM 4500 S2 F - Sulfide, Total

Lab Sample ID: MB 500-613518/1
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 613518

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	<1.0		1.0	0.23	mg/L			08/09/21 23:35	1

Lab Sample ID: LCS 500-613518/2
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 613518

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide	3.84	3.87		mg/L		101	85 - 115

Lab Sample ID: 180-125221-A-1 MS
Client Sample ID: Matrix Spike
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 613518

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide	<1.0		3.84	3.57		mg/L		93	75 - 125

Lab Sample ID: 180-125221-A-1 MSD
Client Sample ID: Matrix Spike Duplicate
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 613518

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfide	<1.0		3.84	3.75		mg/L		98	75 - 125	5	20

Client: Geosyntec Consultants, Inc. Job ID: 500-203343-1
Project/Site: GLP8029 Coffeen, IL

Client Sample ID: D-2-20210803 Lab Sample ID: 500-203343-1
Date Collected: 08/03/21 10:15 **Matrix: Water**
Date Received: 08/05/21 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			613499	08/10/21 08:44	BDE	TAL CHI
Dissolved	Analysis	6010B		1	613679	08/10/21 23:31	EEN	TAL CHI
Total/NA	Prep	3010A			613499	08/10/21 08:44	BDE	TAL CHI
Total/NA	Analysis	6010B		1	613679	08/10/21 23:27	EEN	TAL CHI
Total/NA	Analysis	9056A		1	614638	08/17/21 16:12	EAT	TAL CHI
Total/NA	Analysis	9056A		20	614951	08/18/21 12:53	EAT	TAL CHI
Dissolved	Analysis	9060A		1	613783		TMS	TAL CHI
					(Start)	08/09/21 23:09		
					(End)	08/09/21 23:09		
Total/NA	Analysis	SM 2320B		1	614414	08/15/21 19:00	MS	TAL CHI
Total/NA	Analysis	SM 2540C		1	613305	08/09/21 09:49	CLB	TAL CHI
Total/NA	Analysis	SM 3500		1	615136	08/19/21 14:42	PFK	TAL CHI
Total/NA	Analysis	SM 3500 Fe B		1	613311	08/11/21 04:46	CLB	TAL CHI
Total/NA	Prep	SM 4500 P B			614309	08/15/21 12:30	JMP	TAL CHI
Total/NA	Analysis	SM 4500 P E		1	614916	08/18/21 12:20	JMP	TAL CHI
Total/NA	Analysis	SM 4500 S2 F		1	613518		CLB	TAL CHI
					(Start)	08/10/21 00:05		
					(End)	08/10/21 00:08		

Client Sample ID: D-1-20210803 Lab Sample ID: 500-203343-2
Date Collected: 08/03/21 10:50 **Matrix: Water**
Date Received: 08/05/21 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			613499	08/10/21 08:44	BDE	TAL CHI
Dissolved	Analysis	6010B		1	613679	08/10/21 23:38	EEN	TAL CHI
Total/NA	Prep	3010A			613499	08/10/21 08:44	BDE	TAL CHI
Total/NA	Analysis	6010B		1	613679	08/10/21 23:34	EEN	TAL CHI
Total/NA	Analysis	9056A		25	614951	08/18/21 13:07	EAT	TAL CHI
Total/NA	Analysis	9056A		2	615118	08/19/21 11:37	EAT	TAL CHI
Dissolved	Analysis	9060A		1	613783		TMS	TAL CHI
					(Start)	08/09/21 23:16		
					(End)	08/09/21 23:16		
Total/NA	Analysis	SM 2320B		1	614414	08/15/21 19:07	MS	TAL CHI
Total/NA	Analysis	SM 2540C		1	613305	08/09/21 09:51	CLB	TAL CHI
Total/NA	Analysis	SM 3500		1	615136	08/19/21 14:42	PFK	TAL CHI
Total/NA	Analysis	SM 3500 Fe B		1	613311	08/11/21 04:55	CLB	TAL CHI
Total/NA	Prep	SM 4500 P B			614309	08/15/21 12:30	JMP	TAL CHI
Total/NA	Analysis	SM 4500 P E		1	614916	08/18/21 12:21	JMP	TAL CHI
Total/NA	Analysis	SM 4500 S2 F		1	613518		CLB	TAL CHI
					(Start)	08/10/21 00:08		
					(End)	08/10/21 00:12		

Lab Chronicle

Client: Geosyntec Consultants, Inc. Job ID: 500-203343-1
Project/Site: GLP8029 Coffeen, IL

Client Sample ID: BKG-1-20210803 Lab Sample ID: 500-203343-3

Date Collected: 08/03/21 12:45 **Matrix: Water**
Date Received: 08/05/21 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			613499	08/10/21 08:44	BDE	TAL CHI
Dissolved	Analysis	6010B		1	613679	08/10/21 23:46	EEN	TAL CHI
Total/NA	Prep	3010A			613499	08/10/21 08:44	BDE	TAL CHI
Total/NA	Analysis	6010B		1	613679	08/10/21 23:42	EEN	TAL CHI
Total/NA	Analysis	9056A		10	614638	08/17/21 17:48	EAT	TAL CHI
Total/NA	Analysis	9056A		10	614951	08/18/21 13:48	EAT	TAL CHI
Dissolved	Analysis	9060A		1	613783		TMS	TAL CHI
					(Start)	08/09/21 23:26		
					(End)	08/09/21 23:26		
Total/NA	Analysis	SM 2320B		1	614414	08/15/21 19:14	MS	TAL CHI
Total/NA	Analysis	SM 2540C		1	613305	08/09/21 09:54	CLB	TAL CHI
Total/NA	Analysis	SM 3500		1	615136	08/19/21 14:42	PFK	TAL CHI
Total/NA	Analysis	SM 3500 Fe B		1	613311	08/11/21 04:58	CLB	TAL CHI
Total/NA	Prep	SM 4500 P B			614309	08/15/21 12:30	JMP	TAL CHI
Total/NA	Analysis	SM 4500 P E		1	614916	08/18/21 12:22	JMP	TAL CHI
Total/NA	Analysis	SM 4500 S2 F		1	613518		CLB	TAL CHI
					(Start)	08/10/21 00:12		
					(End)	08/10/21 00:16		

Client Sample ID: CL-1-20210803 Lab Sample ID: 500-203343-4

Date Collected: 08/03/21 13:20 **Matrix: Water**
Date Received: 08/05/21 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			613499	08/10/21 08:44	BDE	TAL CHI
Dissolved	Analysis	6010B		1	613679	08/10/21 23:54	EEN	TAL CHI
Total/NA	Prep	3010A			613499	08/10/21 08:44	BDE	TAL CHI
Total/NA	Analysis	6010B		1	613679	08/10/21 23:50	EEN	TAL CHI
Total/NA	Analysis	9056A		2	614638	08/17/21 18:01	EAT	TAL CHI
Total/NA	Analysis	9056A		10	614951	08/18/21 14:01	EAT	TAL CHI
Dissolved	Analysis	9060A		1	613783		TMS	TAL CHI
					(Start)	08/09/21 23:33		
					(End)	08/09/21 23:33		
Total/NA	Analysis	SM 2320B		1	614414	08/15/21 19:21	MS	TAL CHI
Total/NA	Analysis	SM 2540C		1	613305	08/09/21 09:56	CLB	TAL CHI
Total/NA	Analysis	SM 3500		1	615136	08/19/21 14:42	PFK	TAL CHI
Total/NA	Analysis	SM 3500 Fe B		1	613311	08/11/21 05:00	CLB	TAL CHI
Total/NA	Prep	SM 4500 P B			614309	08/15/21 12:30	JMP	TAL CHI
Total/NA	Analysis	SM 4500 P E		1	614916	08/18/21 12:23	JMP	TAL CHI
Total/NA	Analysis	SM 4500 S2 F		1	613518		CLB	TAL CHI
					(Start)	08/10/21 00:16		
					(End)	08/10/21 00:20		

Lab Chronicle

Client: Geosyntec Consultants, Inc.
Job ID: 500-203343-1
Project/Site: GLP8029 Coffeen, IL

Client Sample ID: DUP-20210803
Lab Sample ID: 500-203343-5
Date Collected: 08/03/21 13:30
Matrix: Water
Date Received: 08/05/21 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			613499	08/10/21 08:44	BDE	TAL CHI
Dissolved	Analysis	6010B		1	613679	08/11/21 00:14	EEN	TAL CHI
Total/NA	Prep	3010A			613499	08/10/21 08:44	BDE	TAL CHI
Total/NA	Analysis	6010B		1	613679	08/10/21 23:58	EEN	TAL CHI
Total/NA	Analysis	9056A		2	614638	08/17/21 18:28	EAT	TAL CHI
Total/NA	Analysis	9056A		10	614951	08/18/21 14:15	EAT	TAL CHI
Dissolved	Analysis	9060A		1	613783		TMS	TAL CHI
					(Start)	08/09/21 23:40		
					(End)	08/09/21 23:40		
Total/NA	Analysis	SM 2320B		1	614414	08/15/21 19:28	MS	TAL CHI
Total/NA	Analysis	SM 2540C		1	613305	08/09/21 09:59	CLB	TAL CHI
Total/NA	Analysis	SM 3500		1	615136	08/19/21 14:42	PFK	TAL CHI
Total/NA	Analysis	SM 3500 Fe B		1	613311	08/11/21 05:03	CLB	TAL CHI
Total/NA	Prep	SM 4500 P B			614309	08/15/21 12:30	JMP	TAL CHI
Total/NA	Analysis	SM 4500 P E		1	614916	08/18/21 12:42	JMP	TAL CHI
Total/NA	Analysis	SM 4500 S2 F		1	613518		CLB	TAL CHI
					(Start)	08/10/21 00:20		
					(End)	08/10/21 00:23		

Client Sample ID: CL-2-20210803
Lab Sample ID: 500-203343-6
Date Collected: 08/03/21 13:50
Matrix: Water
Date Received: 08/05/21 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			613499	08/10/21 08:44	BDE	TAL CHI
Dissolved	Analysis	6010B		1	613679	08/11/21 00:21	EEN	TAL CHI
Total/NA	Prep	3010A			613499	08/10/21 08:44	BDE	TAL CHI
Total/NA	Analysis	6010B		1	613679	08/11/21 00:18	EEN	TAL CHI
Total/NA	Analysis	9056A		2	614638	08/17/21 18:55	EAT	TAL CHI
Total/NA	Analysis	9056A		10	614951	08/18/21 14:29	EAT	TAL CHI
Dissolved	Analysis	9060A		1	613783		TMS	TAL CHI
					(Start)	08/09/21 23:47		
					(End)	08/09/21 23:47		
Total/NA	Analysis	SM 2320B		1	614414	08/15/21 19:35	MS	TAL CHI
Total/NA	Analysis	SM 2540C		1	613305	08/09/21 10:02	CLB	TAL CHI
Total/NA	Analysis	SM 3500		1	615136	08/19/21 14:42	PFK	TAL CHI
Total/NA	Analysis	SM 3500 Fe B		1	613311	08/11/21 05:06	CLB	TAL CHI
Total/NA	Prep	SM 4500 P B			614309	08/15/21 12:30	JMP	TAL CHI
Total/NA	Analysis	SM 4500 P E		1	614916	08/18/21 12:43	JMP	TAL CHI
Total/NA	Analysis	SM 4500 S2 F		1	613518		CLB	TAL CHI
					(Start)	08/10/21 00:23		
					(End)	08/10/21 00:27		

Lab Chronicle

Client: Geosyntec Consultants, Inc.
Job ID: 500-203343-1
Project/Site: GLP8029 Coffeen, IL

Client Sample ID: CL-3-20210803
Lab Sample ID: 500-203343-7
Date Collected: 08/03/21 14:20
Matrix: Water
Date Received: 08/05/21 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			613499	08/10/21 08:44	BDE	TAL CHI
Dissolved	Analysis	6010B		1	613679	08/11/21 00:29	EEN	TAL CHI
Total/NA	Prep	3010A			613499	08/10/21 08:44	BDE	TAL CHI
Total/NA	Analysis	6010B		1	613679	08/11/21 00:25	EEN	TAL CHI
Total/NA	Analysis	9056A		2	614638	08/17/21 19:23	EAT	TAL CHI
Total/NA	Analysis	9056A		10	614951	08/18/21 14:42	EAT	TAL CHI
Dissolved	Analysis	9060A		1	613783		TMS	TAL CHI
					(Start)	08/09/21 23:55		
					(End)	08/09/21 23:55		
Total/NA	Analysis	SM 2320B		1	614414	08/15/21 19:41	MS	TAL CHI
Total/NA	Analysis	SM 2540C		1	613305	08/09/21 10:04	CLB	TAL CHI
Total/NA	Analysis	SM 3500		1	615136	08/19/21 14:42	PFK	TAL CHI
Total/NA	Analysis	SM 3500 Fe B		1	613311	08/11/21 05:09	CLB	TAL CHI
Total/NA	Prep	SM 4500 P B			614309	08/15/21 12:30	JMP	TAL CHI
Total/NA	Analysis	SM 4500 P E		1	614916	08/18/21 12:44	JMP	TAL CHI
Total/NA	Analysis	SM 4500 S2 F		1	613518		CLB	TAL CHI
					(Start)	08/10/21 00:27		
					(End)	08/10/21 00:31		

Laboratory References:

TAL CHI = Eurofins TestAmerica, Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Laboratory: Eurofins TestAmerica, Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	IL00035	04-29-22

Eurofins TestAmerica, Chicago
2417 Bond Street
University Park IL 60484
Phone 708-534-5200 Fax 708-534-5211

Chain of Custody Record

500-203343 COC

eurofins Environment Testing America

Client Information	Sampler: Nick Williams	Lab PM: Kintz Robin M	COC No: 500-93566-41606 1
Client Contact: Brian Ares	Phone: 317 694 9143	E-Mail: Robin Kintz@Eurofinset com	Page: Page 1 of ~~8~~ 1
Company: Geosyntec Consultants Inc	PWSID:	Analysis Requested	Job #: 500-203343
Address: 2100 Commonwealth Blvd Suite 100	Due Date Requested:		
City: Ann Arbor	TAT Requested (days):		
State Zip: MI 48105	Compliance Project Δ Yes Δ No		
Phone: 734-794-1548(Tel)	PO #: Purchase Order not required		
Email: bares@geosyntec com	WO #:		
Project Name: GLP8029 Coffeen IL	Project #: 50019213		
Site:	SSOW#:		

Preservation Codes
A HCL, B NaOH, C Zn Acetate, D Nitric Acid, E NaHSO4, F MeOH, G Amchlor, H Ascorbic Acid, I Ice, J DI Water, K EDTA, L EDA
M Hexane, N None, O AsNaO2, P Na2O4S, Q Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Z other (specify)
Other:

Analyses: Field Filtered Sample (Yes or No); Perform MS/MSD (Yes or No); 9056A - Chloride, Sulfate (N); 6010B - Metals (ICP) - 9 elements (D); 6010B - Dissolved Metals (ICP) - 9 elements (D); 4500_P_E - Phosphorus as PO4 (S); SM4500_S2_F - Sulfide (CB); 9060A_Diss - Organic Carbon Dissolved (DOC) (S); 2320B 2540C 3500_F+2_B_Calc 3500_F+3_B_Calc (N); 9056A - Chloride, Sulfate (Dissolved) (N)

#	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid O=waste/oil, BT=Tissue, A=Air)	Field Filtered	MS/MSD	9056A	6010B	6010B Diss	4500_P_E	SM4500_S2_F	9060A_Diss	2320B...	9056A Diss	Special Instructions/Note
1	D-2-20210803	8/3/21	1015	G	W		N	X	X	X	X	X	X	X	X	Filtered in field for
2	D-1-20210803	↓	1050	G	W		N	X	X	X	X	X	X	X	X	Dissolved Metals, DOC,
3	BKG-1-20210803	↓	1245	G	W		N	X	X	X	X	X	X	X	X	~~and Dissolved Chloride,~~
4	CL-1-20210803	↓	1320	G	W		N	X	X	X	X	X	X	X	X	~~Sulfate~~ NW
5	DUP-20210803	↓	1330	G	W		N	X	X	X	X	X	X	X	X	↓
6	CL-2-20210803	↓	1350	G	W		N	X	X	X	X	X	X	X	X	↓
7	CL-3-20210803	↓	1420	G	W		N	X	X	X	X	X	X	X	X NW	↓

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For ______ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature]	8/4/21 930	GEO	[signature]	8/5/21 0945	ETA

Custody Seals Intact Δ Yes Δ No | Custody Seal No | Cooler Temperature(s) °C and Other Remarks

Login Sample Receipt Checklist

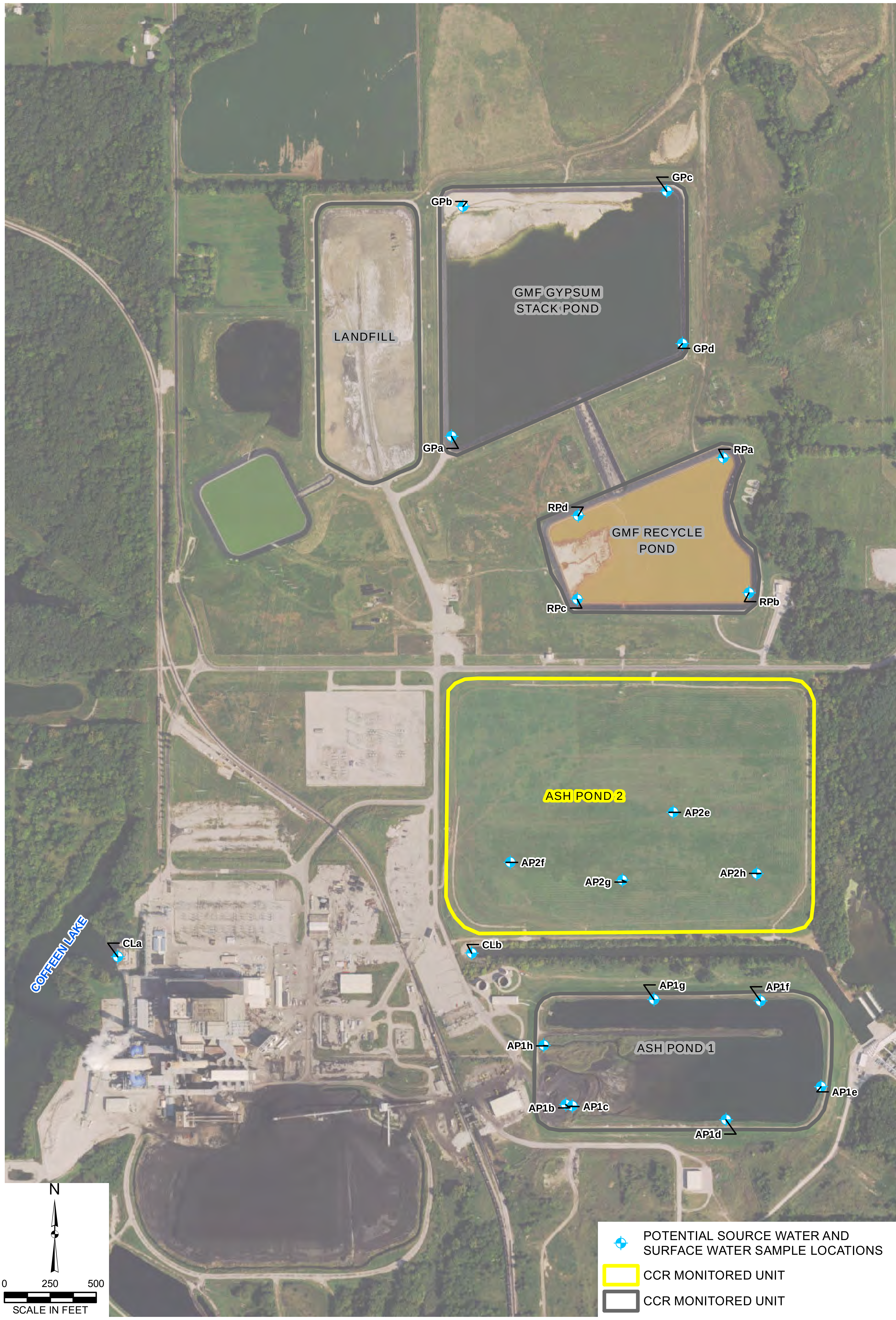
Client: Geosyntec Consultants, Inc.

Job Number: 500-203343-1

Login Number: 203343
List Number: 1
Creator: James, Jeff A

List Source: Eurofins TestAmerica, Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.1, 2.5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Y:\Mapping\Projects\23\2380\MXD\HGCR\Figure 14_Potential Source Water And Surface Water Sample Locations.mxd Author: tcushman; Date/Time: 12/22/2016, 2:59:50 PM

DRAWN BY/DATE:
SDS 12/21/16
REVIEWED BY/DATE:
NRK 12/21/16
APPROVED BY/DATE:
SJC 12/22/16

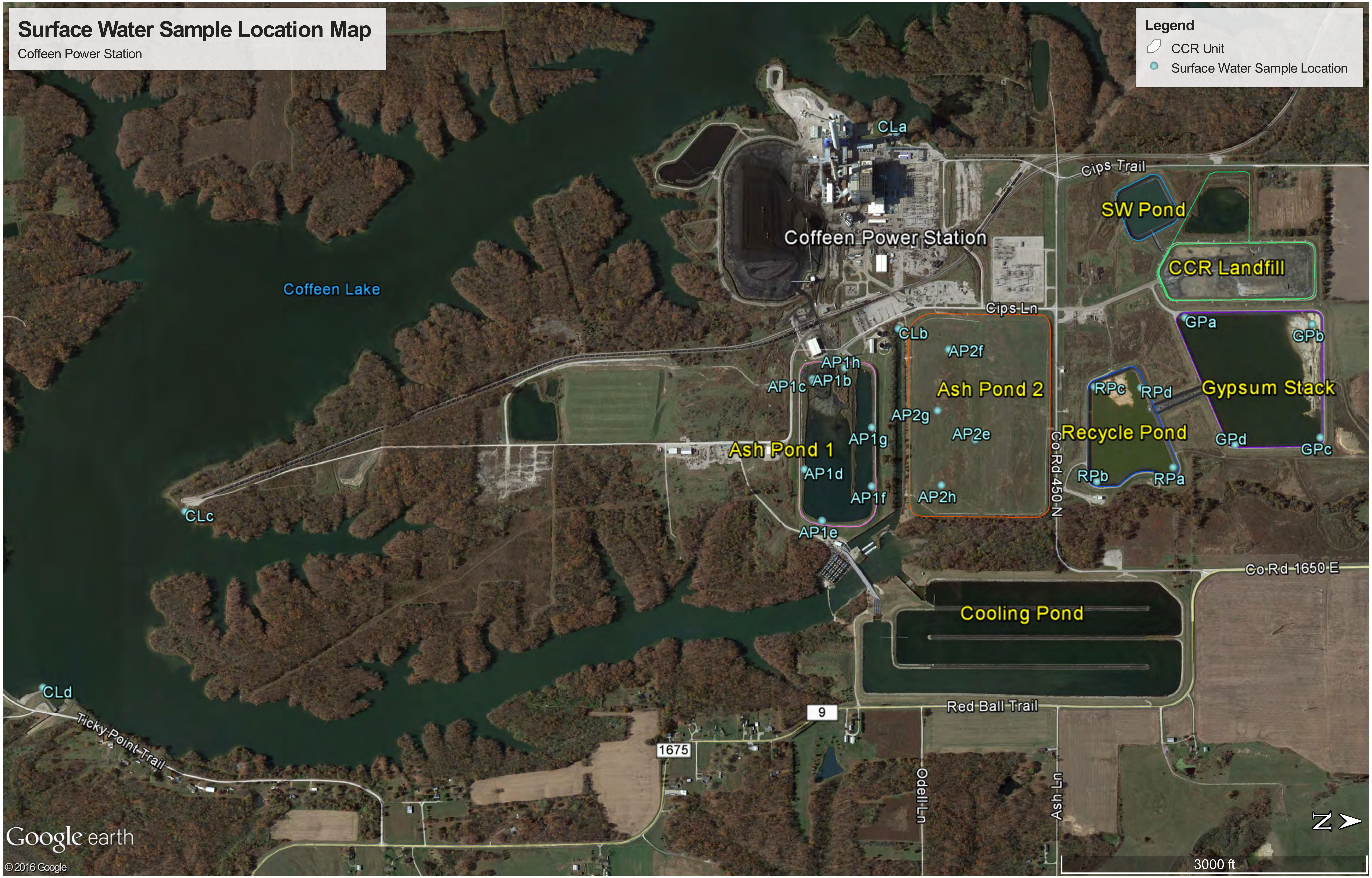
POTENTIAL SOURCE WATER AND SURFACE WATER SAMPLE LOCATIONS

HYDROGEOLOGIC CHARACTERIZATION REPORT
ASH POND 2
COFFEEN POWER STATION
COFFEEN, IL

PROJECT NO: 2380

FIGURE NO: 14

Natural Resource Technology



Surface Water Sample Location Map
Coffeen Power Station
Legend
CCR Unit
Surface Water Sample Location
Coffeen Lake
Coffeen Power Station
CLa
CLb
CLc
CLd
Cips Trail
Cips Ln
SW Pond
CCR Landfill
GPa
GPb
GPc
GPd
Gypsum Stack
RPa
RPb
RPc
RPd
Recycle Pond
Ash Pond 2
AP2e
AP2f
AP2g
AP2h
Ash Pond 1
AP1b
AP1c
AP1d
AP1e
AP1f
AP1g
AP1h
Co Rd 450 N
Co Rd 1650 E
Cooling Pond
Red Ball Trail
9
1675
Ticky Point Trail
Odell Ln
Asy Ln
N
3000 ft
Google earth
© 2016 Google

Table 10

Potential Source Water and Surface Water Sampling Results - October 24, 2016

Hydrogeologic Characterization Report

Coffeen Energy Center

Sample ID	Sample Location	Alkalinity, bicarbonate mg/L	Alkalinity, carbonate mg/L	Antimony, Total ug/L	Arsenic, Total ug/L	Barium, Total ug/L	Beryllium, Total ug/L	Boron, Total ug/L	Cadmium, Total ug/L	Calcium, Total mg/l	Chloride, Total mg/L	Chromium, Total ug/L	Cobalt, Total ug/L	Fluoride, Total mg/L	Lithium, Total ug/L	Magnesium, Total mg/L	Mercury, Total ug/L	Molybdenum, Total ug/L	pH	Potassium, Total mg/L	Selenium, Total ug/L	Sodium, Total mg/l	Solids - total dissolved solids (TDS) mg/L	Sulfate, Total mg/L	Thallium, Total ug/L
AP1a	Ash Pond 1	90	< 2.0	3.1	7.2	130	< 1.0	3800	< 1.0	380	3.2	< 4.0	< 2.0	< 0.250	39	67	< 0.20	47	6.99	7.3	3.0	33	1800	1500	< 1.0
AP1b		120	< 2.0	3.3	17	100	< 1.0	3100	< 1.0	320	13	< 4.0	< 2.0	0.977	47	52	< 0.20	100	7.01	18	6.9	53	1600	1300	< 1.0
AP1c		80	< 2.0	< 3.0	18	130	< 1.0	2900	< 1.0	390	13	< 4.0	< 2.0	0.614	51	49	< 0.20	81	7.05	18	3.1	59	1900	1600	< 1.0
AP1d		90	< 20	< 3.0	2.0	200	< 1.0	2000	< 1.0	210	18	< 4.0	< 2.0	1.08	55	35	< 0.20	31	7.21	26	1.5	83	980	1000	< 1.0
AP1e		80	< 2.0	< 3.0	1.4	160	< 1.0	2100	< 1.0	200	18	< 4.0	< 2.0	1.00	55	34	< 0.20	30	7.12	26	1.2	80	1200	960	< 1.0
AP1f		110	< 20	< 3.0	1.5	150	< 1.0	2100	< 1.0	200	17	< 4.0	< 2.0	1.00	57	35	< 0.20	31	7.20	26	1.2	82	1200	1000	< 1.0
AP1g		75	< 2.0	< 3.0	1.3	140	< 1.0	2100	< 1.0	210	17	< 4.0	< 2.0	1.00	56	32	< 0.20	29	7.21	26	1.4	100	1200	970	< 1.0
AP1h		90	< 20	< 3.0	1.5	180	< 1.0	2200	< 1.0	230	17	< 4.0	< 2.0	0.980	55	30	< 0.20	31	7.41	27	1.2	110	1200	1000	< 1.0
AP2e	Ash Pond 2	55	< 20	< 3.0	23	26	< 1.0	5300	< 1.0	210	< 5.0	< 4.0	< 2.0	0.438	190	40	< 0.20	90	6.49	27	< 1.0	25	1700	1500	< 1.0
AP2f		100	< 20	< 3.0	1.2	22	< 2.0	2000	< 1.0	170	< 5.0	< 4.0	< 2.0	0.398	130	33	< 0.20	3.2	6.42	21	< 1.0	14	1700	1500	< 1.0
AP2g		4.0	< 2.0	< 3.0	5.5	20	< 2.0	4300	4.6	410	< 5.0	< 4.0	< 2.0	0.506	180	51	< 0.20	41	6.46	29	< 1.0	27	2400	2300	< 1.0
AP2h		140	< 2.0	< 3.0	75	23	< 1.0	14000	< 1.0	310	1.7	< 4.0	< 2.0	0.406	120	29	< 0.20	570	7.17	40	< 1.0	39	1500	1300	< 1.0
CLa	Coffeen Lake	80	< 2.0	< 3.0	1.8	54	< 1.0	270	< 1.0	23	23	< 4.0	< 2.0	0.443	< 10	12	< 0.20	5.0	7.22	7.4	< 1.0	19	190	55	< 1.0
CLb		80	< 2.0	< 3.0	1.8	52	< 1.0	280	< 1.0	23	22	< 4.0	< 2.0	0.425	< 10	11	< 0.20	4.9	7.52	7.8	< 1.0	19	180	56	< 1.0
CLc		75	< 2.0	< 3.0	1.8	56	< 1.0	280	< 1.0	23	22	< 4.0	< 2.0	0.426	< 10	12	< 0.20	4.7	7.62	7.4	< 1.0	19	160	54	< 1.0
CLd		80	< 2.0	< 3.0	1.8	54	< 1.0	270	< 1.0	23	23	< 4.0	< 2.0	0.421	< 10	12	< 0.20	4.8	7.30	7.5	< 1.0	20	170	54	< 1.0
GPa	Gypsum Stack Pond	4.0	< 2.0	< 3.0	4.7	120	2.6	59000	40	450	1900	< 4.0	52	42.7	300	1500	< 0.80	130	7.16	210	890	620	17000	17000	< 1.0
GPb		10	< 2.0	8.6	92	1100	< 20	97000	67	1400	2600	150	110	69.4	480	2500	27	140	6.65	360	1500	1000	28000	27000	< 4.0
GPc		5.5	< 2.0	< 6.0	4.4	110	2.6	72000	41	570	1800	< 4.0	54	49.2	300	1500	< 0.80	120	6.73	260	890	650	17000	20000	< 1.0
GPd		6.0	< 2.0	< 3.0	4.2	110	< 20	66000	38	560	1900	< 4.0	52	51.3	300	1500	< 0.80	120	6.73	230	800	660	16000	19000	< 1.0
RPa	Gypsum Recycle Pond	< 2.0	< 2.0	< 3.0	3.3	89	2.3	60000	37	380	1600	< 4.0	44	47.0	310	1200	< 0.20	63	6.70	190	840	450	16000	17000	< 1.0
RPb		< 2.0	< 2.0	< 3.0	2.8	90	2.1	56000	33	380	1800	< 4.0	45	44.4	310	1200	< 0.40	64	6.49	210	780	470	16000	18000	< 1.0
RPc		< 2.0	< 2.0	< 3.0	3.1	88	2.2	59000	37	380	2000	< 4.0	43	45.0	310	1200	< 0.20	64	6.32	200	830	440	16000	20000	< 1.0
RPd		< 2.0	< 2.0	< 3.0	3.4	89	2.4	59000	36	400	1600	< 4.0	45	51.2	310	1300	< 0.20	66	6.32	200	860	460	17000	16000	< 1.0

[O:MDM 12/2016, NRK 12/2016]

PDC Laboratories, Inc.

PROFESSIONAL • DEPENDABLE • COMMITTED

November 08, 2016

Rhonald Hasenyager
Hanson Professional Services, Inc.
1525 South Sixth Street
Springfield, IL 62703-2886

Dear Rhonald Hasenyager:

Please find enclosed the analytical results for the sample(s) the laboratory received on **10/25/16 7:45 am** and logged in under work order **6103663**. All testing is performed according to our current TNI certifications unless otherwise noted. This report cannot be reproduced, except in full, without the written permission of PDC Laboratories, Inc.

If you have any questions regarding your report, please contact your project manager. Quality and timely data is of the utmost importance to us.

PDC Laboratories, Inc. appreciates the opportunity to provide you with analytical expertise. We are always trying to improve our customer service and we welcome you to contact the Vice President, John LaPayne with any feedback you have about your experience with our laboratory.

Sincerely,

Gail g Schindler

Gail Schindler
Project Manager
(309) 692-9688 x1716
gschindler@pdclab.com

PDC Laboratories, Inc.
2231 West Altorfer Drive
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ANALYTICAL RESULTS

Sample: **6103663-01** **Sampled:** 10/24/16 11:52
Name: AP1a **Received:** 10/25/16 07:45
Matrix: Surface Water - Grab

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	3.2	mg/L		10/25/16 11:16	10/25/16 11:16	TAS	EPA 300.0
Fluoride	< 0.250	mg/L		10/25/16 11:16	10/25/16 11:16	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 11:16	10/25/16 11:16	TAS	EPA 300.0
Sulfate	1500	mg/L		10/27/16 13:02	10/27/16 13:02	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	6.99	pH Units		10/24/16 11:52	10/24/16 11:52	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	90	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Solids - total dissolved solids (TDS)	1800	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
Total Metals - PIA							
Antimony	3.1	ug/L		10/26/16 13:38	11/02/16 12:10	JMW	SW 6020
Arsenic	7.2	ug/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Barium	130	ug/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Boron	3800	ug/L		10/26/16 13:38	11/03/16 07:54	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Calcium	380	mg/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Lithium	39	ug/L		10/26/16 13:38	10/27/16 11:24	KJP	SW 6010*
Magnesium	67	mg/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 13:53	JMW	SW 6020
Molybdenum	47	ug/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Potassium	7.3	mg/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Selenium	3.0	ug/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Sodium	33	mg/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:23	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-02** | **Sampled:** 10/24/16 11:56
Name: AP1b | **Received:** 10/25/16 07:45
Matrix: Surface Water - Grab

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	13	mg/L		10/27/16 13:20	10/27/16 13:20	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 12:45	10/25/16 12:45	TAS	EPA 300.0
Sulfate	1300	mg/L		10/27/16 13:38	10/27/16 13:38	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	7.01	pH Units		10/24/16 11:56	10/24/16 11:56	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	120	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	0.977	mg/L		10/27/16 13:26	10/27/16 13:26	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	1600	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
Total Metals - PIA							
Antimony	3.3	ug/L		10/26/16 13:38	11/02/16 12:23	JMW	SW 6020
Arsenic	17	ug/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Barium	100	ug/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Boron	3100	ug/L		10/26/16 13:38	11/03/16 07:59	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Calcium	320	mg/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Lithium	47	ug/L		10/26/16 13:38	10/27/16 11:33	KJP	SW 6010*
Magnesium	52	mg/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:06	JMW	SW 6020
Molybdenum	100	ug/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Potassium	18	mg/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Selenium	6.9	ug/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Sodium	53	mg/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:36	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-03** **Sampled:** 10/24/16 12:10
Name: AP1c **Received:** 10/25/16 07:45
Matrix: Surface Water - Grab

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	13	mg/L		10/27/16 13:55	10/27/16 13:55	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 13:21	10/25/16 13:21	TAS	EPA 300.0
Sulfate	1600	mg/L		10/27/16 14:13	10/27/16 14:13	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	7.05	pH Units		10/24/16 12:10	10/24/16 12:10	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	80	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	0.614	mg/L		10/27/16 13:30	10/27/16 13:30	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	1900	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
Total Metals - PIA							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 12:26	JMW	SW 6020
Arsenic	18	ug/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Barium	130	ug/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Boron	2900	ug/L		10/26/16 13:38	11/03/16 08:01	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Calcium	390	mg/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Lithium	51	ug/L		10/26/16 13:38	10/27/16 11:36	KJP	SW 6010*
Magnesium	49	mg/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:10	JMW	SW 6020
Molybdenum	81	ug/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Potassium	18	mg/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Selenium	3.1	ug/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Sodium	59	mg/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:39	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-04** **Sampled:** 10/24/16 12:15
Name: AP1d **Received:** 10/25/16 07:45
Matrix: Surface Water - Grab

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	18	mg/L		10/27/16 14:31	10/27/16 14:31	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 13:57	10/25/16 13:57	TAS	EPA 300.0
Sulfate	1000	mg/L		10/27/16 14:48	10/27/16 14:48	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	7.21	pH Units		10/24/16 12:15	10/24/16 12:15	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	90	mg/L		10/25/16 09:29	10/25/16 09:29	CJN	SM 2320B*
Alkalinity - carbonate as CaCO3	< 20	mg/L		10/25/16 09:29	10/25/16 09:29	CJN	SM 2320B*
Fluoride	1.08	mg/L		10/27/16 13:43	10/27/16 13:43	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	980	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
Total Metals - PIA							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 12:30	JMW	SW 6020
Arsenic	2.0	ug/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Barium	200	ug/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Boron	2000	ug/L		10/26/16 13:38	11/03/16 08:02	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Calcium	210	mg/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Lithium	55	ug/L		10/26/16 13:38	10/27/16 11:39	KJP	SW 6010*
Magnesium	35	mg/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:13	JMW	SW 6020
Molybdenum	31	ug/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Potassium	26	mg/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Selenium	1.5	ug/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Sodium	83	mg/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:43	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-05** **Sampled:** 10/24/16 12:01
Name: AP1e **Received:** 10/25/16 07:45
Matrix: Surface Water - Grab

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	18	mg/L		10/27/16 18:37	10/27/16 18:37	TAS	EPA 300.0
Fluoride	1.00	mg/L		10/25/16 13:26	10/25/16 13:26	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 13:26	10/25/16 13:26	TAS	EPA 300.0
Sulfate	960	mg/L		10/28/16 11:36	10/28/16 11:36	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	7.12	pH Units		10/24/16 12:01	10/24/16 12:01	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	80	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Solids - total dissolved solids (TDS)	1200	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
Total Metals - PIA							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 12:45	JMW	SW 6020
Arsenic	1.4	ug/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Barium	160	ug/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Boron	2100	ug/L		10/26/16 13:38	11/03/16 08:03	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Calcium	200	mg/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Lithium	55	ug/L		10/26/16 13:38	10/27/16 11:48	KJP	SW 6010*
Magnesium	34	mg/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:17	JMW	SW 6020
Molybdenum	30	ug/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Potassium	26	mg/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Selenium	1.2	ug/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Sodium	80	mg/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:46	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-06** **Sampled:** 10/24/16 12:40
Name: AP1f **Received:** 10/25/16 07:45
Matrix: Surface Water - Grab

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	17	mg/L		10/27/16 15:06	10/27/16 15:06	TAS	EPA 300.0
Fluoride	1.00	mg/L		10/25/16 14:03	10/25/16 14:03	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 14:03	10/25/16 14:03	TAS	EPA 300.0
Sulfate	1000	mg/L		10/27/16 15:23	10/27/16 15:23	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	7.20	pH Units		10/24/16 12:40	10/24/16 12:40	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	110	mg/L		10/25/16 09:29	10/25/16 09:29	CJN	SM 2320B*
Alkalinity - carbonate as CaCO3	< 20	mg/L		10/25/16 09:29	10/25/16 09:29	CJN	SM 2320B*
Solids - total dissolved solids (TDS)	1200	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
Total Metals - PIA							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 12:48	JMW	SW 6020
Arsenic	1.5	ug/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Barium	150	ug/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Boron	2100	ug/L		10/26/16 13:38	11/03/16 08:13	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Calcium	200	mg/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Lithium	57	ug/L		10/26/16 13:38	10/27/16 11:51	KJP	SW 6010*
Magnesium	35	mg/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:21	JMW	SW 6020
Molybdenum	31	ug/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Potassium	26	mg/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Selenium	1.2	ug/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Sodium	82	mg/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 11:50	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-07** | **Sampled:** 10/24/16 12:50
Name: AP1g | **Received:** 10/25/16 07:45
Matrix: Surface Water - Grab

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	17	mg/L		10/27/16 15:41	10/27/16 15:41	TAS	EPA 300.0
Fluoride	1.00	mg/L		10/25/16 15:34	10/25/16 15:34	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 15:34	10/25/16 15:34	TAS	EPA 300.0
Sulfate	970	mg/L		10/28/16 11:54	10/28/16 11:54	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	7.21	pH Units		10/24/16 12:50	10/24/16 12:50	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	75	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Solids - total dissolved solids (TDS)	1200	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
Total Metals - PIA							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 12:52	JMW	SW 6020
Arsenic	1.3	ug/L		10/26/16 13:38	11/01/16 12:09	JMW	SW 6020
Barium	140	ug/L		10/26/16 13:38	11/01/16 14:37	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:09	JMW	SW 6020
Boron	2100	ug/L		10/26/16 13:38	11/03/16 08:16	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:09	JMW	SW 6020
Calcium	210	mg/L		10/26/16 13:38	11/02/16 12:52	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 14:37	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/02/16 12:52	JMW	SW 6020
Lithium	56	ug/L		10/26/16 13:38	10/27/16 11:54	KJP	SW 6010*
Magnesium	32	mg/L		10/26/16 13:38	11/01/16 14:37	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:37	JMW	SW 6020
Molybdenum	29	ug/L		10/26/16 13:38	11/01/16 12:09	JMW	SW 6020
Potassium	26	mg/L		10/26/16 13:38	11/01/16 12:09	JMW	SW 6020
Selenium	1.4	ug/L		10/26/16 13:38	11/01/16 12:09	JMW	SW 6020
Sodium	100	mg/L		10/26/16 13:38	11/02/16 12:52	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:09	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-08**
Name: AP1h
Matrix: Surface Water - Grab

Sampled: 10/24/16 12:55
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	17	mg/L		10/27/16 16:51	10/27/16 16:51	TAS	EPA 300.0
Fluoride	0.980	mg/L		10/25/16 16:11	10/25/16 16:11	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 16:11	10/25/16 16:11	TAS	EPA 300.0
Sulfate	1000	mg/L		10/28/16 12:12	10/28/16 12:12	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	7.41	pH Units		10/24/16 12:55	10/24/16 12:55	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	90	mg/L		10/25/16 09:29	10/25/16 09:29	CJN	SM 2320B*
Alkalinity - carbonate as CaCO3	< 20	mg/L		10/25/16 09:29	10/25/16 09:29	CJN	SM 2320B*
Solids - total dissolved solids (TDS)	1200	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
Total Metals - PIA							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 12:55	JMW	SW 6020
Arsenic	1.5	ug/L		10/26/16 13:38	11/01/16 12:12	JMW	SW 6020
Barium	180	ug/L		10/26/16 13:38	11/01/16 14:40	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:12	JMW	SW 6020
Boron	2200	ug/L		10/26/16 13:38	11/03/16 08:18	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:12	JMW	SW 6020
Calcium	230	mg/L		10/26/16 13:38	11/02/16 12:55	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 14:40	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/02/16 12:55	JMW	SW 6020
Lithium	55	ug/L		10/26/16 13:38	10/27/16 11:57	KJP	SW 6010*
Magnesium	30	mg/L		10/26/16 13:38	11/01/16 14:40	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:40	JMW	SW 6020
Molybdenum	31	ug/L		10/26/16 13:38	11/01/16 12:12	JMW	SW 6020
Potassium	27	mg/L		10/26/16 13:38	11/01/16 12:12	JMW	SW 6020
Selenium	1.2	ug/L		10/26/16 13:38	11/01/16 12:12	JMW	SW 6020
Sodium	110	mg/L		10/26/16 13:38	11/02/16 12:55	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:12	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-09** | **Sampled:** 10/24/16 11:30
Name: AP2e | **Received:** 10/25/16 07:45
Matrix: Surface Water - Grab

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	< 5.0	mg/L		10/27/16 17:27	10/27/16 17:27	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 14:33	10/25/16 14:33	TAS	EPA 300.0
Sulfate	1500	mg/L		10/28/16 12:31	10/28/16 12:31	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	6.49	pH Units		10/24/16 11:30	10/24/16 11:30	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	55	mg/L		10/25/16 09:29	10/25/16 09:29	CJN	SM 2320B*
Alkalinity - carbonate as CaCO3	< 20	mg/L		10/25/16 09:29	10/25/16 09:29	CJN	SM 2320B*
Fluoride	0.438	mg/L		10/27/16 13:58	10/27/16 13:58	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	1700	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
Total Metals - PIA							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 12:59	JMW	SW 6020
Arsenic	23	ug/L		10/26/16 13:38	11/01/16 12:16	JMW	SW 6020
Barium	26	ug/L		10/26/16 13:38	11/01/16 14:44	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/02/16 12:59	JMW	SW 6020
Boron	5300	ug/L		10/26/16 13:38	11/03/16 08:19	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:16	JMW	SW 6020
Calcium	210	mg/L		10/26/16 13:38	11/02/16 12:59	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 14:44	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/02/16 12:59	JMW	SW 6020
Lithium	190	ug/L		10/26/16 13:38	10/27/16 12:00	KJP	SW 6010*
Magnesium	40	mg/L		10/26/16 13:38	11/01/16 14:44	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:44	JMW	SW 6020
Molybdenum	90	ug/L		10/26/16 13:38	11/01/16 12:16	JMW	SW 6020
Potassium	27	mg/L		10/26/16 13:38	11/01/16 12:16	JMW	SW 6020
Selenium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:16	JMW	SW 6020
Sodium	25	mg/L		10/26/16 13:38	11/02/16 12:59	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:16	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-10** | **Sampled:** 10/24/16 11:20
Name: AP2f | **Received:** 10/25/16 07:45
Matrix: Surface Water - Grab

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	< 5.0	mg/L		10/27/16 18:02	10/27/16 18:02	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 15:09	10/25/16 15:09	TAS	EPA 300.0
Sulfate	1500	mg/L		10/28/16 12:49	10/28/16 12:49	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	6.42	pH Units		10/24/16 11:20	10/24/16 11:20	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	100	mg/L		10/25/16 09:29	10/25/16 09:29	CJN	SM 2320B*
Alkalinity - carbonate as CaCO3	< 20	mg/L		10/25/16 09:29	10/25/16 09:29	CJN	SM 2320B*
Fluoride	0.398	mg/L		10/27/16 14:02	10/27/16 14:02	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	1700	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
Total Metals - PIA							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 13:03	JMW	SW 6020
Arsenic	1.2	ug/L		10/26/16 13:38	11/01/16 12:20	JMW	SW 6020
Barium	22	ug/L		10/26/16 13:38	11/01/16 14:47	JMW	SW 6020
Beryllium	< 2.0	ug/L		10/26/16 13:38	11/02/16 13:54	JMW	SW 6020
Boron	2000	ug/L		10/26/16 13:38	11/03/16 08:20	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:20	JMW	SW 6020
Calcium	170	mg/L		10/26/16 13:38	11/02/16 13:54	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 14:47	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/02/16 13:03	JMW	SW 6020
Lithium	130	ug/L		10/26/16 13:38	10/27/16 12:03	KJP	SW 6010*
Magnesium	33	mg/L		10/26/16 13:38	11/01/16 14:47	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:47	JMW	SW 6020
Molybdenum	3.2	ug/L		10/26/16 13:38	11/01/16 12:20	JMW	SW 6020
Potassium	21	mg/L		10/26/16 13:38	11/01/16 12:20	JMW	SW 6020
Selenium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:20	JMW	SW 6020
Sodium	14	mg/L		10/26/16 13:38	11/02/16 13:03	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:20	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-11**
Name: AP2g
Matrix: Surface Water - Grab

Sampled: 10/24/16 11:10
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	< 5.0	mg/L		10/27/16 19:12	10/27/16 19:12	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 16:20	10/25/16 16:20	TAS	EPA 300.0
Sulfate	2300	mg/L		10/28/16 13:07	10/28/16 13:07	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	6.46	pH Units		10/24/16 11:10	10/24/16 11:10	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	4.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	0.506	mg/L		10/27/16 14:07	10/27/16 14:07	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	2400	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
Total Metals - PIA							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 13:06	JMW	SW 6020
Arsenic	5.5	ug/L		10/26/16 13:38	11/01/16 12:23	JMW	SW 6020
Barium	20	ug/L		10/26/16 13:38	11/01/16 14:51	JMW	SW 6020
Beryllium	< 2.0	ug/L		10/26/16 13:38	11/02/16 13:57	JMW	SW 6020
Boron	4300	ug/L		10/26/16 13:38	11/03/16 08:22	JMW	SW 6020
Cadmium	4.6	ug/L		10/26/16 13:38	11/01/16 12:23	JMW	SW 6020
Calcium	410	mg/L		10/26/16 13:38	11/02/16 13:57	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 14:51	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/02/16 13:06	JMW	SW 6020
Lithium	180	ug/L		10/26/16 13:38	10/27/16 12:06	KJP	SW 6010*
Magnesium	51	mg/L		10/26/16 13:38	11/01/16 14:51	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:51	JMW	SW 6020
Molybdenum	41	ug/L		10/26/16 13:38	11/01/16 12:23	JMW	SW 6020
Potassium	29	mg/L		10/26/16 13:38	11/01/16 12:23	JMW	SW 6020
Selenium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:23	JMW	SW 6020
Sodium	27	mg/L		10/26/16 13:38	11/02/16 13:06	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:23	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-12**
Name: AP2h
Matrix: Surface Water - Grab

Sampled: 10/24/16 11:40
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	1.7	mg/L		10/25/16 16:56	10/25/16 16:56	TAS	EPA 300.0
Fluoride	0.406	mg/L		10/25/16 16:56	10/25/16 16:56	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 16:56	10/25/16 16:56	TAS	EPA 300.0
Sulfate	1300	mg/L		10/28/16 14:57	10/28/16 14:57	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	7.17	pH Units		10/24/16 11:40	10/24/16 11:40	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	140	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Solids - total dissolved solids (TDS)	1500	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
Total Metals - PIA							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 13:10	JMW	SW 6020
Arsenic	75	ug/L		10/26/16 13:38	11/01/16 12:27	JMW	SW 6020
Barium	23	ug/L		10/26/16 13:38	11/01/16 14:55	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:27	JMW	SW 6020
Boron	14000	ug/L		10/26/16 13:38	11/03/16 08:23	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:27	JMW	SW 6020
Calcium	310	mg/L		10/26/16 13:38	11/02/16 13:10	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 14:55	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/02/16 13:10	JMW	SW 6020
Lithium	120	ug/L		10/26/16 13:38	10/27/16 12:09	KJP	SW 6010*
Magnesium	29	mg/L		10/26/16 13:38	11/01/16 14:55	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:55	JMW	SW 6020
Molybdenum	570	ug/L		10/26/16 13:38	11/01/16 12:27	JMW	SW 6020
Potassium	40	mg/L		10/26/16 13:38	11/03/16 08:23	JMW	SW 6020
Selenium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:27	JMW	SW 6020
Sodium	39	mg/L		10/26/16 13:38	11/02/16 13:10	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:27	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-13** | **Sampled:** 10/24/16 15:30
Name: CLa | **Received:** 10/25/16 07:45
Matrix: Surface Water - Grab

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	23	mg/L		10/27/16 20:41	10/27/16 20:41	TAS	EPA 300.0
Fluoride	0.443	mg/L		10/25/16 17:32	10/25/16 17:32	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 17:32	10/25/16 17:32	TAS	EPA 300.0
Sulfate	55	mg/L		10/25/16 17:50	10/25/16 17:50	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	7.22	pH Units		10/24/16 15:30	10/24/16 15:30	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	80	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Solids - total dissolved solids (TDS)	190	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
Total Metals - PIA							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 13:14	JMW	SW 6020
Arsenic	1.8	ug/L		10/26/16 13:38	11/01/16 12:30	JMW	SW 6020
Barium	54	ug/L		10/26/16 13:38	11/01/16 14:58	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:30	JMW	SW 6020
Boron	270	ug/L		10/26/16 13:38	11/03/16 08:24	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:30	JMW	SW 6020
Calcium	23	mg/L		10/26/16 13:38	11/02/16 13:14	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 14:58	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/02/16 13:14	JMW	SW 6020
Lithium	< 10	ug/L		10/26/16 13:38	10/27/16 12:12	KJP	SW 6010*
Magnesium	12	mg/L		10/26/16 13:38	11/01/16 14:58	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 14:58	JMW	SW 6020
Molybdenum	5.0	ug/L		10/26/16 13:38	11/01/16 12:30	JMW	SW 6020
Potassium	7.4	mg/L		10/26/16 13:38	11/01/16 12:30	JMW	SW 6020
Selenium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:30	JMW	SW 6020
Sodium	19	mg/L		10/26/16 13:38	11/02/16 13:14	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:30	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-14**
Name: CLb
Matrix: Surface Water - Grab

Sampled: 10/24/16 13:35
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	22	mg/L		10/27/16 20:58	10/27/16 20:58	TAS	EPA 300.0
Fluoride	0.425	mg/L		10/25/16 18:08	10/25/16 18:08	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 18:08	10/25/16 18:08	TAS	EPA 300.0
Sulfate	56	mg/L		10/25/16 18:26	10/25/16 18:26	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	7.52	pH Units		10/24/16 13:35	10/24/16 13:35	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	80	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Solids - total dissolved solids (TDS)	180	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
Total Metals - PIA							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 13:17	JMW	SW 6020
Arsenic	1.8	ug/L		10/26/16 13:38	11/01/16 12:34	JMW	SW 6020
Barium	52	ug/L		10/26/16 13:38	11/01/16 15:02	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:34	JMW	SW 6020
Boron	280	ug/L		10/26/16 13:38	11/03/16 08:26	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:34	JMW	SW 6020
Calcium	23	mg/L		10/26/16 13:38	11/02/16 13:17	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 15:02	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/02/16 13:17	JMW	SW 6020
Lithium	< 10	ug/L		10/26/16 13:38	10/27/16 12:15	KJP	SW 6010*
Magnesium	11	mg/L		10/26/16 13:38	11/01/16 15:02	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 15:02	JMW	SW 6020
Molybdenum	4.9	ug/L		10/26/16 13:38	11/01/16 12:34	JMW	SW 6020
Potassium	7.8	mg/L		10/26/16 13:38	11/01/16 12:34	JMW	SW 6020
Selenium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:34	JMW	SW 6020
Sodium	19	mg/L		10/26/16 13:38	11/02/16 13:17	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:34	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-15**
Name: CLc
Matrix: Surface Water - Grab

Sampled: 10/24/16 13:15
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	22	mg/L		10/27/16 21:16	10/27/16 21:16	TAS	EPA 300.0
Fluoride	0.426	mg/L		10/25/16 18:43	10/25/16 18:43	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 18:43	10/25/16 18:43	TAS	EPA 300.0
Sulfate	54	mg/L		10/25/16 19:01	10/25/16 19:01	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	7.62	pH Units		10/24/16 13:15	10/24/16 13:15	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	75	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Solids - total dissolved solids (TDS)	160	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
Total Metals - PIA							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 13:29	JMW	SW 6020
Arsenic	1.8	ug/L		10/26/16 13:38	11/01/16 12:38	JMW	SW 6020
Barium	56	ug/L		10/26/16 13:38	11/01/16 15:05	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:38	JMW	SW 6020
Boron	280	ug/L		10/26/16 13:38	11/03/16 08:27	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:38	JMW	SW 6020
Calcium	23	mg/L		10/26/16 13:38	11/02/16 13:29	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 15:05	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/02/16 13:29	JMW	SW 6020
Lithium	< 10	ug/L		10/26/16 13:38	10/27/16 12:24	KJP	SW 6010*
Magnesium	12	mg/L		10/26/16 13:38	11/01/16 15:05	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 15:05	JMW	SW 6020
Molybdenum	4.7	ug/L		10/26/16 13:38	11/01/16 12:38	JMW	SW 6020
Potassium	7.4	mg/L		10/26/16 13:38	11/01/16 12:38	JMW	SW 6020
Selenium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:38	JMW	SW 6020
Sodium	19	mg/L		10/26/16 13:38	11/02/16 13:29	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:38	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-16**
Name: CLd
Matrix: Surface Water - Grab

Sampled: 10/24/16 15:55
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	23	mg/L		10/27/16 21:34	10/27/16 21:34	TAS	EPA 300.0
Fluoride	0.421	mg/L		10/25/16 19:55	10/25/16 19:55	TAS	EPA 300.0
Nitrite-N	< 0.15	mg/L		10/25/16 19:55	10/25/16 19:55	TAS	EPA 300.0
Sulfate	54	mg/L		10/25/16 20:13	10/25/16 20:13	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	7.30	pH Units		10/24/16 15:55	10/24/16 15:55	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	80	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Solids - total dissolved solids (TDS)	170	mg/L		10/25/16 14:59	10/25/16 15:33	DMB/ARL	SM 2540C
Total Metals - PIA							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 13:32	JMW	SW 6020
Arsenic	1.8	ug/L		10/26/16 13:38	11/01/16 12:41	JMW	SW 6020
Barium	54	ug/L		10/26/16 13:38	11/01/16 15:09	JMW	SW 6020
Beryllium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:41	JMW	SW 6020
Boron	270	ug/L		10/26/16 13:38	11/03/16 08:41	JMW	SW 6020
Cadmium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:41	JMW	SW 6020
Calcium	23	mg/L		10/26/16 13:38	11/02/16 13:32	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 15:09	JMW	SW 6020
Cobalt	< 2.0	ug/L		10/26/16 13:38	11/02/16 13:32	JMW	SW 6020
Lithium	< 10	ug/L		10/26/16 13:38	10/27/16 12:27	KJP	SW 6010*
Magnesium	12	mg/L		10/26/16 13:38	11/01/16 15:09	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 13:38	11/01/16 15:09	JMW	SW 6020
Molybdenum	4.8	ug/L		10/26/16 13:38	11/01/16 12:41	JMW	SW 6020
Potassium	7.5	mg/L		10/26/16 13:38	11/01/16 12:41	JMW	SW 6020
Selenium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:41	JMW	SW 6020
Sodium	20	mg/L		10/26/16 13:38	11/02/16 13:32	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 12:41	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-17** **Sampled:** 10/24/16 14:00
Name: GPa **Received:** 10/25/16 07:45
Matrix: Surface Water - Grab

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	1900	mg/L		10/27/16 21:51	10/27/16 21:51	TAS	EPA 300.0
Nitrite-N	< 3.0	mg/L		10/26/16 11:42	10/26/16 11:42	TAS	EPA 300.0
Sulfate	17000	mg/L		11/01/16 09:58	11/01/16 09:58	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	7.16	pH Units		10/24/16 14:00	10/24/16 14:00	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	4.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	42.7	mg/L		10/27/16 17:31	10/27/16 17:31	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	17000	mg/L		10/27/16 12:04	10/27/16 12:28	ARL	SM 2540C
Total Metals - PIA							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 13:36	JMW	SW 6020
Arsenic	4.7	ug/L		10/26/16 13:38	11/02/16 15:00	JMW	SW 6020
Barium	120	ug/L		10/26/16 13:38	11/02/16 13:36	JMW	SW 6020
Beryllium	2.6	ug/L		10/26/16 13:38	11/02/16 14:16	JMW	SW 6020
Boron	59000	ug/L		10/26/16 13:38	11/03/16 08:44	JMW	SW 6020
Cadmium	40	ug/L		10/26/16 13:38	11/02/16 15:53	JMW	SW 6020
Calcium	450	mg/L		10/26/16 13:38	11/02/16 14:16	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 15:20	JMW	SW 6020
Cobalt	52	ug/L		10/26/16 13:38	11/02/16 15:00	JMW	SW 6020
Lithium	300	ug/L		10/26/16 13:38	10/27/16 12:30	KJP	SW 6010*
Magnesium	1500	mg/L		10/26/16 13:38	11/02/16 14:16	JMW	SW 6020
Mercury	< 0.80	ug/L		10/26/16 13:38	11/02/16 15:00	JMW	SW 6020
Molybdenum	130	ug/L		10/26/16 13:38	11/02/16 14:16	JMW	SW 6020
Potassium	210	mg/L		10/26/16 13:38	11/03/16 09:03	JMW	SW 6020
Selenium	890	ug/L		10/26/16 13:38	11/02/16 15:00	JMW	SW 6020
Sodium	620	mg/L		10/26/16 13:38	11/02/16 13:36	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 15:20	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-18**
Name: GPb
Matrix: Surface Water - Grab

Sampled: 10/24/16 14:10
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	2600	mg/L		10/27/16 22:26	10/27/16 22:26	TAS	EPA 300.0
Nitrite-N	< 3.0	mg/L		10/26/16 12:00	10/26/16 12:00	TAS	EPA 300.0
Sulfate	27000	mg/L		10/28/16 14:39	10/28/16 14:39	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	6.65	pH Units		10/24/16 14:10	10/24/16 14:10	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	10	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	69.4	mg/L		10/27/16 15:56	10/27/16 15:56	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	28000	mg/L		10/27/16 12:04	10/27/16 12:28	ARL	SM 2540C
Total Metals - PIA							
Antimony	8.6	ug/L		10/26/16 13:38	11/02/16 14:20	JMW	SW 6020
Arsenic	92	ug/L		10/26/16 13:38	11/02/16 15:03	JMW	SW 6020
Barium	1100	ug/L		10/26/16 13:38	11/02/16 14:20	JMW	SW 6020
Beryllium	< 20	ug/L		10/26/16 13:38	11/02/16 14:34	JMW	SW 6020
Boron	97000	ug/L		10/26/16 13:38	11/03/16 08:45	JMW	SW 6020
Cadmium	67	ug/L		10/26/16 13:38	11/02/16 15:55	JMW	SW 6020
Calcium	1400	mg/L		10/26/16 13:38	11/02/16 14:34	JMW	SW 6020
Chromium	150	ug/L		10/26/16 13:38	11/02/16 15:03	JMW	SW 6020
Cobalt	110	ug/L		10/26/16 13:38	11/02/16 15:03	JMW	SW 6020
Lithium	480	ug/L		10/26/16 13:38	10/27/16 12:33	KJP	SW 6010*
Magnesium	2500	mg/L		10/26/16 13:38	11/02/16 14:34	JMW	SW 6020
Mercury	27	ug/L		10/26/16 13:38	11/02/16 15:03	JMW	SW 6020
Molybdenum	140	ug/L		10/26/16 13:38	11/02/16 15:03	JMW	SW 6020
Potassium	360	mg/L		10/26/16 13:38	11/03/16 08:45	JMW	SW 6020
Selenium	1500	ug/L		10/26/16 13:38	11/02/16 15:03	JMW	SW 6020
Sodium	1000	mg/L		10/26/16 13:38	11/02/16 14:34	JMW	SW 6020
Thallium	< 4.0	ug/L		10/26/16 13:38	11/07/16 15:07	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: 6103663-19
Name: GPc
Matrix: Surface Water - Grab

Sampled: 10/24/16 14:20
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	1800	mg/L		10/28/16 01:58	10/28/16 01:58	TAS	EPA 300.0
Nitrite-N	< 3.0	mg/L		10/26/16 12:18	10/26/16 12:18	TAS	EPA 300.0
Sulfate	20000	mg/L		10/28/16 02:16	10/28/16 02:16	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	6.73	pH Units		10/24/16 14:20	10/24/16 14:20	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	5.5	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	49.2	mg/L		10/27/16 17:35	10/27/16 17:35	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	17000	mg/L		10/27/16 12:04	10/27/16 12:28	ARL	SM 2540C
Total Metals - PIA							
Antimony	< 6.0	ug/L		10/26/16 13:38	11/02/16 14:23	JMW	SW 6020
Arsenic	4.4	ug/L		10/26/16 13:38	11/02/16 15:07	JMW	SW 6020
Barium	110	ug/L		10/26/16 13:38	11/02/16 13:43	JMW	SW 6020
Beryllium	2.6	ug/L		10/26/16 13:38	11/02/16 14:23	JMW	SW 6020
Boron	72000	ug/L		10/26/16 13:38	11/03/16 08:46	JMW	SW 6020
Cadmium	41	ug/L		10/26/16 13:38	11/02/16 15:56	JMW	SW 6020
Calcium	570	mg/L		10/26/16 13:38	11/02/16 14:38	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 15:27	JMW	SW 6020
Cobalt	54	ug/L		10/26/16 13:38	11/02/16 15:07	JMW	SW 6020
Lithium	300	ug/L		10/26/16 13:38	10/27/16 12:36	KJP	SW 6010*
Magnesium	1500	mg/L		10/26/16 13:38	11/02/16 14:23	JMW	SW 6020
Mercury	< 0.80	ug/L		10/26/16 13:38	11/02/16 15:07	JMW	SW 6020
Molybdenum	120	ug/L		10/26/16 13:38	11/02/16 14:23	JMW	SW 6020
Potassium	260	mg/L		10/26/16 13:38	11/03/16 08:46	JMW	SW 6020
Selenium	890	ug/L		10/26/16 13:38	11/02/16 15:07	JMW	SW 6020
Sodium	650	mg/L		10/26/16 13:38	11/02/16 13:43	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 15:27	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-20**
Name: GPd
Matrix: Surface Water - Grab

Sampled: 10/24/16 14:30
Received: 10/25/16 07:45

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	1900	mg/L		10/28/16 03:09	10/28/16 03:09	TAS	EPA 300.0
Nitrite-N	< 3.0	mg/L		10/26/16 12:36	10/26/16 12:36	TAS	EPA 300.0
Sulfate	19000	mg/L		10/28/16 03:26	10/28/16 03:26	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	6.73	pH Units		10/24/16 14:30	10/24/16 14:30	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	6.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	51.3	mg/L		10/27/16 17:39	10/27/16 17:39	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	16000	mg/L		10/27/16 12:04	10/27/16 12:28	ARL	SM 2540C
Total Metals - PIA							
Antimony	< 3.0	ug/L		10/26/16 13:38	11/02/16 13:47	JMW	SW 6020
Arsenic	4.2	ug/L		10/26/16 13:38	11/02/16 15:10	JMW	SW 6020
Barium	110	ug/L		10/26/16 13:38	11/02/16 13:47	JMW	SW 6020
Beryllium	< 20	ug/L		10/26/16 13:38	11/02/16 14:41	JMW	SW 6020
Boron	66000	ug/L		10/26/16 13:38	11/03/16 08:48	JMW	SW 6020
Cadmium	38	ug/L		10/26/16 13:38	11/02/16 15:57	JMW	SW 6020
Calcium	560	mg/L		10/26/16 13:38	11/02/16 14:41	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 13:38	11/01/16 15:31	JMW	SW 6020
Cobalt	52	ug/L		10/26/16 13:38	11/02/16 15:10	JMW	SW 6020
Lithium	300	ug/L		10/26/16 13:38	10/27/16 12:39	KJP	SW 6010*
Magnesium	1500	mg/L		10/26/16 13:38	11/02/16 14:27	JMW	SW 6020
Mercury	< 0.80	ug/L		10/26/16 13:38	11/02/16 15:10	JMW	SW 6020
Molybdenum	120	ug/L		10/26/16 13:38	11/02/16 14:27	JMW	SW 6020
Potassium	230	mg/L		10/26/16 13:38	11/03/16 08:48	JMW	SW 6020
Selenium	800	ug/L		10/26/16 13:38	11/01/16 15:31	JMW	SW 6020
Sodium	660	mg/L		10/26/16 13:38	11/02/16 13:47	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 13:38	11/01/16 15:31	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-21** **Sampled:** 10/24/16 14:50
Name: RPb **Received:** 10/25/16 07:45
Matrix: Surface Water - Grab

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	1800	mg/L		10/28/16 03:44	10/28/16 03:44	TAS	EPA 300.0
Nitrite-N	< 3.0	mg/L		10/26/16 12:53	10/26/16 12:53	TAS	EPA 300.0
Sulfate	18000	mg/L		10/28/16 04:01	10/28/16 04:01	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	6.49	pH Units		10/24/16 14:50	10/24/16 14:50	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	44.4	mg/L		10/27/16 17:44	10/27/16 17:44	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	16000	mg/L		10/27/16 12:04	10/27/16 12:28	ARL	SM 2540C
Total Metals - PIA							
Antimony	< 3.0	ug/L		10/26/16 11:03	11/01/16 09:42	JMW	SW 6020
Arsenic	2.8	ug/L		10/26/16 11:03	11/02/16 11:16	JMW	SW 6020
Barium	90	ug/L		10/26/16 11:03	11/01/16 09:42	JMW	SW 6020
Beryllium	2.1	ug/L		10/26/16 11:03	11/01/16 10:30	JMW	SW 6020
Boron	56000	ug/L		10/26/16 11:03	11/02/16 16:34	JMW	SW 6020
Cadmium	33	ug/L		10/26/16 11:03	11/02/16 11:32	JMW	SW 6020
Calcium	380	mg/L		10/26/16 11:03	11/01/16 10:30	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 11:03	11/01/16 09:42	JMW	SW 6020
Cobalt	45	ug/L		10/26/16 11:03	11/01/16 09:42	JMW	SW 6020
Lithium	310	ug/L		10/26/16 11:03	10/27/16 11:01	KJP	SW 6010*
Magnesium	1200	mg/L		10/26/16 11:03	11/01/16 10:30	JMW	SW 6020
Mercury	< 0.40	ug/L		10/26/16 11:03	11/02/16 11:16	JMW	SW 6020
Molybdenum	64	ug/L		10/26/16 11:03	11/01/16 10:30	JMW	SW 6020
Potassium	210	mg/L		10/26/16 11:03	11/02/16 11:32	JMW	SW 6020
Selenium	780	ug/L		10/26/16 11:03	11/02/16 11:16	JMW	SW 6020
Sodium	470	mg/L		10/26/16 11:03	11/01/16 09:42	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 11:03	11/01/16 09:42	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-22** | **Sampled:** 10/24/16 15:00
Name: RPc | **Received:** 10/25/16 07:45
Matrix: Surface Water - Grab

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	2000	mg/L		10/28/16 04:19	10/28/16 04:19	TAS	EPA 300.0
Nitrite-N	< 3.0	mg/L		10/26/16 14:05	10/26/16 14:05	TAS	EPA 300.0
Sulfate	20000	mg/L		10/28/16 04:37	10/28/16 04:37	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	6.32	pH Units		10/24/16 15:00	10/24/16 15:00	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	45.0	mg/L		10/27/16 17:48	10/27/16 17:48	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	16000	mg/L		10/27/16 12:04	10/27/16 12:28	ARL	SM 2540C
Total Metals - PIA							
Antimony	< 3.0	ug/L		10/26/16 11:03	11/01/16 09:46	JMW	SW 6020
Arsenic	3.1	ug/L		10/26/16 11:03	11/02/16 11:20	JMW	SW 6020
Barium	88	ug/L		10/26/16 11:03	11/01/16 09:46	JMW	SW 6020
Beryllium	2.2	ug/L		10/26/16 11:03	11/01/16 10:34	JMW	SW 6020
Boron	59000	ug/L		10/26/16 11:03	11/02/16 16:36	JMW	SW 6020
Cadmium	37	ug/L		10/26/16 11:03	11/02/16 11:36	JMW	SW 6020
Calcium	380	mg/L		10/26/16 11:03	11/01/16 10:34	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 11:03	11/01/16 09:46	JMW	SW 6020
Cobalt	43	ug/L		10/26/16 11:03	11/01/16 09:46	JMW	SW 6020
Lithium	310	ug/L		10/26/16 11:03	10/27/16 11:04	KJP	SW 6010*
Magnesium	1200	mg/L		10/26/16 11:03	11/01/16 10:34	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 11:03	11/02/16 10:36	JMW	SW 6020
Molybdenum	64	ug/L		10/26/16 11:03	11/01/16 10:34	JMW	SW 6020
Potassium	200	mg/L		10/26/16 11:03	11/02/16 11:36	JMW	SW 6020
Selenium	830	ug/L		10/26/16 11:03	11/02/16 11:20	JMW	SW 6020
Sodium	440	mg/L		10/26/16 11:03	11/01/16 09:46	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 11:03	11/01/16 09:46	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-23** **Sampled:** 10/24/16 15:05
Name: RPd **Received:** 10/25/16 07:45
Matrix: Surface Water - Grab

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	1600	mg/L		10/28/16 04:25	10/28/16 04:25	TAS	EPA 300.0
Nitrite-N	< 3.0	mg/L		10/26/16 14:23	10/26/16 14:23	TAS	EPA 300.0
Sulfate	16000	mg/L		10/28/16 04:43	10/28/16 04:43	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	6.32	pH Units		10/24/16 15:05	10/24/16 15:05	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	51.2	mg/L		10/27/16 17:53	10/27/16 17:53	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	17000	mg/L		10/27/16 12:04	10/27/16 12:28	ARL	SM 2540C
Total Metals - PIA							
Antimony	< 3.0	ug/L		10/26/16 11:03	11/01/16 09:49	JMW	SW 6020
Arsenic	3.4	ug/L		10/26/16 11:03	11/02/16 11:23	JMW	SW 6020
Barium	89	ug/L		10/26/16 11:03	11/01/16 09:49	JMW	SW 6020
Beryllium	2.4	ug/L		10/26/16 11:03	11/01/16 10:37	JMW	SW 6020
Boron	59000	ug/L		10/26/16 11:03	11/02/16 16:37	JMW	SW 6020
Cadmium	36	ug/L		10/26/16 11:03	11/02/16 11:40	JMW	SW 6020
Calcium	400	mg/L		10/26/16 11:03	11/01/16 10:37	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 11:03	11/01/16 09:49	JMW	SW 6020
Cobalt	45	ug/L		10/26/16 11:03	11/01/16 09:49	JMW	SW 6020
Lithium	310	ug/L		10/26/16 11:03	10/27/16 11:13	KJP	SW 6010*
Magnesium	1300	mg/L		10/26/16 11:03	11/01/16 10:37	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 11:03	11/02/16 10:39	JMW	SW 6020
Molybdenum	66	ug/L		10/26/16 11:03	11/01/16 10:37	JMW	SW 6020
Potassium	200	mg/L		10/26/16 11:03	11/02/16 11:40	JMW	SW 6020
Selenium	860	ug/L		10/26/16 11:03	11/02/16 11:23	JMW	SW 6020
Sodium	460	mg/L		10/26/16 11:03	11/01/16 09:49	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 11:03	11/01/16 09:49	JMW	SW 6020

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ANALYTICAL RESULTS

Sample: **6103663-24** | **Sampled:** 10/24/16 14:40
Name: RPa | **Received:** 10/25/16 07:45
Matrix: Surface Water - Grab

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
Anions - PIA							
Chloride	1600	mg/L		10/28/16 05:02	10/28/16 05:02	TAS	EPA 300.0
Nitrite-N	< 3.0	mg/L		10/26/16 13:11	10/26/16 13:11	TAS	EPA 300.0
Sulfate	17000	mg/L		10/28/16 05:20	10/28/16 05:20	TAS	EPA 300.0
Field - PIA							
pH, Field Measured	6.70	pH Units		10/24/16 14:40	10/24/16 14:40	FIELD	Field*
General Chemistry - PIA							
Alkalinity - bicarbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Alkalinity - carbonate as CaCO3	< 2.0	mg/L		10/31/16 13:36	10/31/16 13:36	LAM	SM 2320B*
Fluoride	47.0	mg/L		10/27/16 15:52	10/27/16 15:52	TTH	SM 4500-F C
Solids - total dissolved solids (TDS)	16000	mg/L		10/27/16 12:04	10/27/16 12:28	ARL	SM 2540C
Total Metals - PIA							
Antimony	< 3.0	ug/L		10/26/16 11:03	11/01/16 09:53	JMW	SW 6020
Arsenic	3.3	ug/L		10/26/16 11:03	11/02/16 11:27	JMW	SW 6020
Barium	89	ug/L		10/26/16 11:03	11/01/16 09:53	JMW	SW 6020
Beryllium	2.3	ug/L		10/26/16 11:03	11/01/16 10:41	JMW	SW 6020
Boron	60000	ug/L		10/26/16 11:03	11/02/16 16:38	JMW	SW 6020
Cadmium	37	ug/L		10/26/16 11:03	11/02/16 11:43	JMW	SW 6020
Calcium	380	mg/L		10/26/16 11:03	11/01/16 10:41	JMW	SW 6020
Chromium	< 4.0	ug/L		10/26/16 11:03	11/01/16 09:53	JMW	SW 6020
Cobalt	44	ug/L		10/26/16 11:03	11/01/16 09:53	JMW	SW 6020
Lithium	310	ug/L		10/26/16 11:03	10/27/16 11:16	KJP	SW 6010*
Magnesium	1200	mg/L		10/26/16 11:03	11/01/16 10:41	JMW	SW 6020
Mercury	< 0.20	ug/L		10/26/16 11:03	11/02/16 10:43	JMW	SW 6020
Molybdenum	63	ug/L		10/26/16 11:03	11/01/16 10:41	JMW	SW 6020
Potassium	190	mg/L		10/26/16 11:03	11/02/16 11:43	JMW	SW 6020
Selenium	840	ug/L		10/26/16 11:03	11/02/16 11:27	JMW	SW 6020
Sodium	450	mg/L		10/26/16 11:03	11/01/16 09:53	JMW	SW 6020
Thallium	< 1.0	ug/L		10/26/16 11:03	11/01/16 09:53	JMW	SW 6020

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Peoria, IL 61615
(800) 752-6651

NOTES

Specific method revisions used for analysis are available upon request.

Certifications

PIA - Peoria, IL
TNI Accreditation for Drinking Water, Wastewater, Hazardous and Solid Wastes Fields of Testing through IL EPA Lab No. 100230
Illinois Department of Public Health Bacteriological Analysis in Drinking Water Approved Laboratory Registry No. 17553
Missouri Department of Natural Resources Certificate of Approval for Microbiological Laboratory Service No. 870
Drinking Water Certifications: Iowa (240); Kansas (E-10338); Missouri (870)
Wastewater Certifications: Arkansas (88-0677); Iowa (240); Kansas (E-10338)
Hazardous/Solid Waste Certifications: Arkansas (88-0677); Iowa (240); Kansas (E-10338)

SPMO - Springfield, MO
USEPA DMR-QA Program

STL - St. Louis, MO
TNI Accreditation for Wastewater, Hazardous and Solid Wastes Fields of Testing through KS Lab No. E-10389
Illinois Department of Public Health Bacteriological Analysis in Drinking Water Approved Laboratory Registry No. 171050
Drinking Water Certifications: Missouri (1050)
Missouri Department of Natural Resources

* Not a TNI accredited analyte

Gail g Schindler

Certified by: Gail Schindler, Project Manager

PDC LABORATORIES, INC.
2231 WEST ALTORFER DRIVE
PEORIA, IL 61615
6/S 10-26-16

PHONE # 309-692-9688
FAX # 309-692-9689

CHAIN OF CUSTODY RECORD

ALL SHADED AREAS MUST BE COMPLETED BY CLIENT (PLEASE PRINT)

(1) CLIENT: Hanson Professional Services / COFFEEN ENERGY CENTER	PROJECT NUMBER:	P.O. NUMBER:	MEANS SHIPPED:
ADDRESS: 134 CIPS LANE	PHONE NUMBER:	FAX NUMBER:	DATE SHIPPED:
CITY STATE ZIP: COFFEEN IL 62017	SAMPLER (PLEASE PRINT): R. ZINSER		MATRIX TYPES: WW- WASTEWATER, DW- DRINKING WATER, GW- GROUND WATER, WWSL- SLUDGE, NAS- SOLID, OTHER: ______
CONTACT PERSON: JOHN ROMANG	SAMPLER'S SIGNATURE: [signature]		

(3) ANALYSIS REQUESTED 6/S 10-26-16 — Custom list

(FOR LAB USE ONLY)
LOGIN # 6103663-24
LOGGED BY: [initials]
NATURAL RESOURCE TECHNOLOGY
COFFEEN POND LAKE
GAIL J SCHINDLER

(2) SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED	SAMPLE TYPE GRAB	SAMPLE TYPE COMP	MATRIX TYPE	TOTAL # OF CONT	SB,AS,BA,BE,ALKHCO3	B,CD,CA,ALK CO3, CL	CR,~~CR+6~~,CO,~~CU~~,~~CN~~,F	~~FE~~,~~PB~~,LI,MG,~~MN~~,HG,MO	~~NI~~,~~G&O~~,PHENOL,~~P~~,SE,	~~AG~~,NA,SO4,TL,TDS,~~ZN~~	~~TSS~~,NO2,~~NO3~~,~~NH3~~,~~TKN~~	REMARKS
AP1 a	10/24/16	11:52	X		SW	7	Per email				/	/	/	pH 6.99
AP1 b	10/24/16	11:56	X		SW	7	/				/	/	/	pH 7.01
AP1 c	10/24/16	12:10	X		GW	7	/	/	/	/	/	/	/	pH 7.05
AP1 d	10/24/16	12:15	X		GW	7	/	/	/	/	/	/	/	pH 7.21
AP1 e	10/24/16	12:01	X		SW	7	/	/	/	/	/	/	/	pH 7.12
AP1 f	10/24/16	12:40	X		SW	7	/	/	/	/	/	/	/	pH 7.20
AP1 g	10/24/16	12:50	X		SW	7	/	/	/	/	/	/	/	pH 7.21
AP1 h	10/24/16	12:55	X		SW	7	/	/	/	/	/	/	/	pH 7.41
AP2 e	10/24/16	11:30	X		SW	7	/	/	/	/	/	/	/	pH 6.49
AP2 f	10/24/16	11:20	X		SW	7	/	/	/	/	/	/	/	pH 6.42
AP2 g	10/24/16	11:10	X		SW	7	/	/	/	/	/	/	/	pH 6.46

(5) TURNAROUND TIME REQUESTED (PLEASE CIRCLE) NORMAL RUSH
X(RUSH TAT IS SUBJECT TO PDC LABS APPROVAL AND SURCHARGE)
RUSH RESULTS VIA (PLEASE CIRCLE) FAX PHONE
FAX # IF DIFFERENT FROM ABOVE: PHONE # IF DIFFERENT FROM ABOVE:

(6) *The sample temperature will be measured upon receipt at the lab. By initialing this area you request that the lab notify you, before proceeding with analysis, if the sample temperature is outside of the range of 0.1-6.0°C. By not initialing this area you allow the lab to proceed with analytical testing regardless of the sample temperature.*

(7) RELINQUISHED BY: (SIGNATURE) [signature]	DATE 10/25/16 TIME 7:45	RECEIVED BY: (SIGNATURE)	DATE TIME
RELINQUISHED BY: (SIGNATURE)	DATE TIME	RECEIVED AT LAB BY: (SIGNATURE) [signature]	DATE 10/25/16 TIME 7:45

(8) COMMENTS: (FOR LAB USE ONLY)

SAMPLE TEMPERATURE UPON RECEIPT 6 °C
CHILL PROCESS STARTED PRIOR TO RECEIPT Y OR N
SAMPLE(S) RECEIVED ON ICE Y OR N
BOTTLES RECEIVED IN GOOD CONDITION Y OR N
BOTTLES FILLED TO APPROX. THE NECK Y OR N
SAMPLES RECEIVED WITHIN HOLD TIME(S) Y OR N

PDC LABORATORIES, INC.
2231 WEST ALTORFER DRIVE
PEORIA, IL 61615
PHONE # 309-692-9688
FAX # 309-692-9689

GJS 10-26-16

CHAIN OF CUSTODY RECORD

ALL SHADED AREAS MUST BE COMPLETED BY CLIENT (PLEASE PRINT)

(1) CLIENT: Hanson Professional Services
COFFEEN ENERGY CENTER

ADDRESS: 134 CIPS LANE

CITY STATE ZIP: COFFEEN IL 62017

CONTACT PERSON: JOHN ROMANG

PROJECT NUMBER:
P.O. NUMBER:
MEANS SHIPPED:
PHONE NUMBER:
FAX NUMBER:
DATE SHIPPED:

SAMPLER (PLEASE PRINT): R. ZINSER

SAMPLER'S SIGNATURE:

MATRIX TYPES:
WW- WASTEWATER
DW- DRINKING WATER
GW- GROUND WATER
WWSL- SLUDGE
NAS- SOLID
OTHER: ______

(3) ANALYSIS REQUESTED GJS 10-26-16

(FOR LAB USE ONLY)
LOGIN # ______
LOGGED BY: ______

NATURAL RESOURCE TECHNOLOGY
COFFEEN POND LAKE
GAIL J SCHINDLER

(2)

SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED	SAMPLE TYPE GRAB	SAMPLE TYPE COMP	MATRIX TYPE	TOTAL # OF CONT	SB,AS,BA,BE,ALKHCO3	B,CD,CA,ALK CO3, CL	CR,CR+6,CO,CU,CN,F	FE,PB,LI,MG,MN,HG,MO	NI,O&O,PHENOL,P,SE,	AG,NA,SO4,TL,TDS,ZN	TSS,NO2,NO3,NH3,TKN	REMARKS
AP2 h	10/24/16	11:40	X		SW	7	/	/	/	/	/	/	/	pH 7.17
CL a	10/24/16	15:30	X		SW	7	/	/	/	/	/	/	/	pH 7.22
CL b	10/24/16	13:35	X		SW	7	/	/	/	/	/	/	/	pH 7.52
CL c	10/24/16	13:15	X		SW	7	/	/	/	/	/	/	/	pH 7.62
CL d	10/24/16	15:55	X		SW	7	/	/	/	/	/	/	/	pH 7.30
GP a	10/24/16	14:00	X		SW	7	/	/	/	/	/	/	/	pH 7.16
GP b	10/24/16	14:10	X		SW	7	/	/	/	/	/	/	/	pH 6.65
GP c	10/24/16	14:20	X		SW	7	/	/	/	/	/	/	/	pH 6.73
GP d	10/24/16	14:30	X		SW	7	/	/	/	/	/	/	/	pH 6.73
RP b	10/24/16	14:50	X		SW	7	/	/	/	/	/	/	/	pH 6.49
RP c	10/24/16	15:00	X		SW	7	/	/	/	/	/	/	/	pH 6.32

(5) TURNAROUND TIME REQUESTED (PLEASE CIRCLE) NORMAL RUSH
X(RUSH TAT IS SUBJECT TO PDC LABS APPROVAL AND SURCHARGE)
RUSH RESULTS VIA (PLEASE CIRCLE) FAX PHONE
FAX # IF DIFFERENT FROM ABOVE:
PHONE # IF DIFFERENT FROM ABOVE:

(6) *The sample temperature will be measured upon receipt at the lab. By initialing this area you request that the lab notify you, before proceeding with analysis, if the sample temperature is outside of the range of 0.1-6.0°C. By not initialing this area you allow the lab to proceed with analytical testing regardless of the sample temperature.*

(7) RELINQUISHED BY: (SIGNATURE) DATE 10/25/16 TIME 7:45
RECEIVED BY: (SIGNATURE) DATE TIME

RELINQUISHED BY: (SIGNATURE) DATE TIME
RECEIVED AT LAB BY: (SIGNATURE) DATE 10/25/16 TIME 745

(8) COMMENTS: (FOR LAB USE ONLY)

SAMPLE TEMPERATURE UPON RECEIPT 6 °C
CHILL PROCESS STARTED PRIOR TO RECEIPT Y OR N
SAMPLE(S) RECEIVED ON ICE Y OR N
BOTTLES RECEIVED IN GOOD CONDITION Y OR N
BOTTLES FILLED TO APPROX. THE NECK Y OR N
SAMPLES RECEIVED WITHIN HOLD TIME(S) Y OR N

PDC LABORATORIES, INC.
2231 WEST ALTORFER DRIVE
PEORIA, IL 61615

PHONE # 309-692-9688
FAX # 309-692-9689

CHAIN OF CUSTODY RECORD

GJS 10-26-16

ALL SHADED AREAS MUST BE COMPLETED BY CLIENT (PLEASE PRINT)

1 CLIENT: Hanson Professional Services — COFFEEN ENERGY CENTER

ADDRESS: 134 CIPS LANE

CITY STATE ZIP: COFFEEN IL 62017

CONTACT PERSON: JOHN ROMANG

PROJECT NUMBER:

P.O. NUMBER:

MEANS SHIPPED:

PHONE NUMBER:

FAX NUMBER:

DATE SHIPPED:

SAMPLER (PLEASE PRINT): R. Zinser

SAMPLER'S SIGNATURE: [signature]

MATRIX TYPES: WW- WASTEWATER, DW- DRINKING WATER, GW- GROUND WATER, WWSL- SLUDGE, NAS- SOLID, OTHER: ______

3 ANALYSIS REQUESTED GJS 10-26-16

(FOR LAB USE ONLY)
LOGIN # ______
LOGGED BY: ______
NATURAL RESOURCE TECHNOLOGY
COFFEEN POND LAKE
GAIL J SCHINDLER

2

SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED	SAMPLE TYPE GRAB	SAMPLE TYPE COMP	MATRIX TYPE	TOTAL # OF CONT	SB,AS,BA,BE,ALKHCO3	B,CD,CA,ALK CO3, CL	CR,CR+6,CO,CU,CN,F	FE,PB,LI,MG,MN,HG,MO	NI,G&O,PHENOL,P,SE,	AG,NA,SO4,TL,TDS,ZN	TSS,NO2,NO3,NH3,TKN	REMARKS
RPd	10/24/16	15:05	X		SW	7	/	/	/	/	/	/	/	pH 6.32
RPa	10/24/16	14:40	X		SW	7	/	/	/	/	/	/	/	pH 6.70

5 TURNAROUND TIME REQUESTED (PLEASE CIRCLE) NORMAL RUSH
X(RUSH TAT IS SUBJECT TO PDC LABS APPROVAL AND SURCHARGE)
RUSH RESULTS VIA (PLEASE CIRCLE) FAX PHONE
FAX # IF DIFFERENT FROM ABOVE:
PHONE # IF DIFFERENT FROM ABOVE:

6 *The sample temperature will be measured upon receipt at the lab. By initialing this area you request that the lab notify you, before proceeding with analysis, if the sample temperature is outside of the range of 0.1-6.0°C. By not initialing this area you allow the lab to proceed with analytical testing regardless of the sample temperature.*

7

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)	DATE / TIME
[signature]	DATE 10/25/16 TIME 7:45		DATE TIME
RELINQUISHED BY: (SIGNATURE)	DATE TIME	RECEIVED AT LAB BY: (SIGNATURE) [signature]	DATE 10/25/16 TIME 7:45

8 COMMENTS: (FOR LAB USE ONLY)

SAMPLE TEMPERATURE UPON RECEIPT 6 °C
CHILL PROCESS STARTED PRIOR TO RECEIPT Y OR N
SAMPLE(S) RECEIVED ON ICE Y OR N
BOTTLES RECEIVED IN GOOD CONDITION Y OR N
BOTTLES FILLED TO APPROX. THE NECK Y OR N
SAMPLES RECEIVED WITHIN HOLD TIME(S) Y OR N

Chain of Custody Parameters (as totals)

Antimony
Arsenic
Barium
Beryllium
Bicarbonate Alkalinity
Boron
Cadmium
Calcium
Carbonate Alkalinity
Chloride
Chromium
Cobalt
Fluoride
Lithium
Magnesium
Mercury
Molybdenum
Nitrite
pH
Potassium
Selenium
Sodium
Sulfate
Thallium
Total Dissolved Solids (TDS)

APPENDIX D
Geochemical Conceptual Site Model

Geosyntec consultants

engineers | scientists | innovators

Geochemical Conceptual Site Model

Coffeen Power Plant –Ash Pond No. 1

(CCR Unit #101)

Prepared for

Illinois Power Generating Company
1500 Eastport Plaza Drive
Collinsville, Illinois 62234

Prepared by

Geosyntec Consultants, Inc.
134 N. Lasalle Street, Suite 300
Chicago, Illinois 60602

Project Number: GLP8078

June 2024

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

AP1	Ash Pond No. 1
AP2	Ash Pond No. 2
bgs	below ground surface
CEC	cation exchange capacity
CCR	coal combustion residuals
COCs	constituents of concern
CPP	Coffeen Power Plant
DA	deep aquifer
DCU	deep confining unit
GCSM	geochemical conceptual site model
GWPS	groundwater protection standards
HSU	hydrostratigraphic unit
I.A.C.	Illinois Administrative Code
LCU	lower confining unit
LOI	loss on ignition
meq/100 g	milliequivalents per 100 grams
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
N&E	nature and extent
ORP	oxidation-reduction potential
PMP	potential migration pathway
SEP	sequential extraction procedure
SU	standard units
TDS	total dissolved solids
TOC	total organic carbon
UA	uppermost aquifer
UCU	upper confining unit
XRD	X-Ray diffraction
XRF	X-Ray fluorescence

1. EXECUTIVE SUMMARY

A geochemical conceptual site model (GCSM) has been developed to describe subsurface conditions at the Coffeen Power Plant Ash Pond No. 1 (AP1) coal combustion residuals unit (Unit #101). A GCSM describes the geochemical processes that contribute to the mobilization, distribution, and attenuation of constituents of concern (COCs) in the subsurface environment. This report describes the GCSM for parameters that have exceeded the GWPS in AP1 groundwater and which will be addressed in the corrective action plan. The exceedances detected at AP1 were boron, sulfate, and total dissolved solids (TDS). Exceedances of COCs are present in three hydrostratigraphic units at the Site: the uppermost aquifer (UA), comprised predominantly of sandy to gravelly silts with thin sand beds, the lower confining unit (LCU), comprised of primarily of sandy to silty till, with discontinuous sand lenses that have been identified as potential migration pathways, and a deep aquifer (DA), comprised of predominantly sand and sandy silt/clay that is discontinuous beneath AP1.

Coal combustion residual (CCR) materials are the primary source of constituent loading to the CCR contact water (i.e., CCR porewater or source water). Over an extended period (e.g., months to years), the CCR porewater (i.e., water contained within the interstitial pore spaces of the CCR that can be sampled by low-flow groundwater sampling methods) reaches equilibrium with the CCR materials. The porewater is therefore representative of the mobile phase constituents capable of migrating into the underlying materials and potentially downgradient in groundwater. The AP1 CCR contact water is therefore the primary indicator of boron and sulfate available to the groundwater and is considered as the primary source term for environmental investigation and fate and transport modeling. AP1 appears to be the primary source of boron and sulfate to downgradient groundwater. However, the poor correlation between boron and sulfate in groundwater and higher concentrations of sulfate in the LCU and DA than in AP1 indicate the potential for a secondary source of sulfate. TDS is a measure of inorganic and organic substances in solution. TDS trends are generally consistent with those of sulfate in the AP1 groundwater system.

Conditions within UA, LCU, and DA groundwater are predicted to favor amorphous iron oxide stability at some locations, and the presence of iron oxides in some site solids indicates a portion of the boron and sulfate in the groundwater system might be attenuated via surface complexation reactions. Boron may be further attenuated via interactions with clay minerals, which are present in solids across the UA, LCU, and DA. Attenuation of the constituents contributing to TDS, such as sulfate, will reduce TDS concentrations as well. Batch attenuation testing with solids from the Site indicate that chemical attenuation of boron is possible, while chemical attenuation of sulfate is expected to be limited.

2. INTRODUCTION

This report documents the development of a geochemical conceptual site model (GCSM) to describe subsurface conditions at the Coffeen Power Plant (CPP) Ash Pond No. 1 (AP1) coal combustion residuals (CCR) unit (Unit #101). A GCSM describes the environmental media and geochemical processes that contribute to the mobilization, distribution, and attenuation of constituents of concern (COCs) in the environment. The GCSM was prepared in support of an evaluation of the nature and extent of exceedances of COCs above the groundwater protection standards (GWPS) at AP1. The document has been prepared as an appendix to the CPP AP1 Nature and Extent (N&E) Report prepared by Ramboll Americas Engineering Solutions. Inc. (Ramboll).

Constituents with statistical exceedances above the GWPS at Coffeen AP1 for the second, third, and fourth quarters of 2023 (Q2 2023, Q3, 2023, and Q4 2023) monitoring events completed under Title 35 of the Illinois Administrative Code (35 I.A.C.) § Section 845.630 are boron, sulfate and total dissolved solids (TDS). For the 2023 events discussed above, an exceedance of boron was detected at compliance monitoring well G313; exceedances of sulfate were detected at G301, G303, G305, G307, G307D, G308, G310, G312, G313, G314, G314D, and G316; and exceedances of TDS were detected at G303, G305, G308, G310, G312, G313, G314, G314D, and G316. The boron exceedance is only present within the uppermost aquifer (UA), whereas sulfate and TDS exceedances were detected in the UA, lower confining unit (LCU), and deep aquifer (DA).

3. SITE BACKGROUND

3.1 Site Overview

An overview of Site characteristics and hydrogeology is presented in the CPP AP1 N&E Report. A Site layout figure is provided in Attachment A.[1] Briefly, the Coffeen AP1 impoundment is located to the south of the Ash Pond No. 2 (AP2) CCR unit (Unit #102). The CPP property is located approximately two miles south of the city of Coffeen, Illinois, and bordered by two lobes of Coffeen Lake to the west, east, and south, and by agricultural land to the north. AP1 is a 23-acre unlined surface impoundment that received bottom ash and other non-CCR waste streams prior to November 4, 2019, at which time sluicing of waste to AP1 ceased. Closure activities have not been initiated at AP1 to date.

A Hydrogeologic Site Characterization Report (Ramboll 2021a) has previously described the hydrostratigraphic units (HSUs) present in the vicinity of the CPP AP1, which consist of an Upper Confining Unit (UCU), UA, LCU, DA, and Deep Confining Unit (DCU). The UCU consists of the silt or clayey silt of the Loess Unit and the upper clayey portion of the Hagarstown Member. The UA is predominantly sandy to gravelly silts with thin sand beds, with lithology identified as the Hagarstown Member. The LCU, which contains the Vandalia Member, Mulberry Grove Member, and Smithboro Member, is comprised primarily of sandy to silty till, with discontinuous sand lenses that have been identified as potential migration pathways (PMPs). The DA is predominantly sand and sandy silt/clay units of the Yarmouth Soil and is discontinuous beneath the CPP.

Vertical gradients measured near the CPP indicate downward flow from the UA to the LCU and DA. Vertical gradients at the G307/G307D well nest, located south AP1, were consistently downward with an average vertical gradient of 0.13 feet per foot; vertical gradients at the G311/G311D well nest were consistently strongly downward with an average vertical gradient of 0.71 feet per foot (CPP GMF RP N&E Report). Both the DA and the LCU have been identified as PMPs due to the presence of these downward gradients.

3.2 Groundwater Monitoring Network

A groundwater monitoring network was proposed in accordance with 35 I.A.C. Section 845.630 to monitor groundwater quality which passes the waste boundary as part of the Operating Permit application to the Illinois Environmental Protection Agency for AP1. The proposed groundwater monitoring network is described in the Groundwater Monitoring Plan (Ramboll 2021b) and shown in Attachment B.[2] Well construction information is provided in Attachment C.[3]

Overall groundwater flow within the UA is divided towards the two lobes of Coffeen Lake. The groundwater divide runs approximately through the center of the CPP, with groundwater east of

[1] This figure is also provided as Figure 2-1 of the CPP AP1 N&E Report.
[2] This figure is also provided as Figure 2-2 of the CPP AP1 N&E Report.
[3] This table is also provided as Table 3-1 of the CPP AP1 N&E Report

the divide flowing east to southeast towards the Unnamed Tributary or the eastern lobe of Coffeen Lake and groundwater west of the divide flowing west to southwest towards the western lobe of Coffeen Lake. Groundwater flows north to northeast across AP1 toward the former discharge flume and Unnamed Tributary. Groundwater flow directions are generally consistent across seasons. A detailed discussion of the hydrology of the Site is presented in Section 2 of the CPP AP1 N&E Report.

4. GEOCHEMICAL SITE CONDITIONS

The general behavior of the COCs is discussed in Section 4.1. Summaries of Site solids and aqueous conditions within the relevant HSUs is provided in Section 4.2 and 4.3, respectively, with discussion of how groundwater both upgradient and downgradient of AP1 may interact with the Site solids to affect constituent behavior. This includes discussion of potential sorbing or precipitating phases and how the stability of those phases may be affected by variable groundwater pH and redox conditions.

4.1 Constituent Transport and Fate

Boron is primarily present in groundwater as boric acid ($H_3BO_3^o$) or borate ($B[OH]_4^-$) (Bolan et al. 2023). The speciation of boron depends on pH: at pH below 9.2 standard units (SU), H_3BO_3 is the dominant species (NCBI 2024). Boron is not subject to oxidation/reduction reactions (Lemarchand et al. 2015; Bolan et al. 2023). Boron primarily sorbs to positively charged sites on solid metal oxide phases, including iron and aluminum oxides (Goldberg and Glaubig 1985; Bolan et al. 2023). Boron sorbs most extensively to amorphous metal oxides between pH 7 SU and 8 SU (Goldberg and Glaubig, 1985). Boron can also sorbs to organic surfaces such as humic acids or coal under favorable conditions, most extensively between pH 8 and 10 SU (LeMarchand et al. 2015). Clay minerals have been correlated with boron sorption in soils (Goldberg 1997), with this sorption mechanism presenting an additional potential attenuation mechanism for boron under favorable geochemical conditions.

Sulfate is the primary form of oxidized sulfur (S(VI)) in the environment and is a divalent oxyanion at pH values greater than 2 SU (Stumm and Morgan 1996). Sulfate in groundwater may sorb onto positively charged sites on solid metal oxide phases, most commonly iron and manganese oxides (Brown et al. 1999). The extent and strength of sulfate sorption to metal oxide surfaces depends on pH, ionic strength, and oxide surface area available for sorption. Sulfate can also form insoluble complexes such as barite ($BaSO_4$) (NCBI 2024). Sulfate in groundwater may be reduced to elemental sulfur (S(0)) or sulfide (S(-II)) under sufficiently reducing conditions, a process governed by local microbial communities (Stumm and Morgan 1996). Generally, reduced sulfur is less mobile in groundwater than sulfate. Reduced sulfur readily precipitates as insoluble metal sulfides (Stumm and Morgan 1996).

TDS is a measure of the mass of dissolved material in water, rather than a specific chemical constituent. Individual constituent contributions to TDS depends on the concentration of that constituent. Typically, major ions (i.e., calcium, sodium, magnesium, potassium, chloride, sulfate, and carbonate species) represent the primary contributors to TDS. As such, TDS is often positively correlated with electrical conductivity and ionic strength (Rusydi 2018, Ghalib et al. 2020). TDS concentrations can be reduced by the removal from aqueous phases of the individual constituents that contribute to TDS.

4.2 Site Solids Characterization

Solid phase data was collected for the CCR source material within the AP1 unit during the installation of porewater monitoring locations XPW01 and XPW02 and analyzed to understand bulk geochemical characterization. Solids from HSUs across the CPP were characterized to determine the type and abundance of minerals present in the UA, LCU, and DA. Solids were characterized using a variety of analytical techniques to characterize their geochemical properties and to understand their effect on the geochemistry of the groundwater system.[4] The results of these analyses are presented in Tables 1 – 4. Solids were collected from six locations adjacent to the following existing wells in the AP1 monitoring network:

- G306, located upgradient of AP1 to the south and considered representative of background conditions, with solids collected within the UA.
- G307 and G307D, located upgradient of AP1 to the south, with solids collected within five intervals representing the UCU, UA, and LCU. Statistical exceedances of sulfate and TDS were determined at G307 during 2023.
- G311 and G311D, located downgradient of AP1 to the north, with solids collected within four intervals representing the UCU, UA, and LCU.
- G313, located downgradient of AP1 to the east, with solids collected within the UA. Statistical exceedances of sulfate and TDS were determined at G313 during 2023 and a statistical exceedance of boron above the GWPS was determined during the Q4 2023 statistical evaluation (Ramboll 2024).
- G314 and G314D, located downgradient of AP1 to the east, with solids collected within six intervals representing the UCU, UA, LCU, and DA. Statistical exceedances of sulfate and TDS were determined at G314 during the 2023 statistical evaluations.
- G316. Located downgradient of AP1 to the east, with solids collected within two intervals within the UA that were combined for analysis. Statistical exceedances of sulfate and TDS were determined at G316 during the 2023 statistical evaluations.

The monitoring well locations are shown on Attachment B. Boring logs for these locations are provided in Attachment D.

[4] Sequential extraction procedures are chemical extractions used to dissolve metals from specific solid-associated phases. While useful for solid phase characterization, reporting limits are often elevated for sulfate and boron and samples from the vicinity of CPP AP1 were not submitted for analysis via this technique.

Five additional locations across the site were analyzed as part of investigations at CPP AP2 but are representative of conditions within the same HSUs beneath AP1. These solids were collected adjacent to existing wells, specifically:

- G270, located upgradient of AP2 to the northwest. Solids were collected within the UA, and are considered representative of background conditions for AP2.
- G1001, located downgradient of AP2 to the east, with solids collected within the LCU.
- G401, located downgradient of AP2 to the south, with solids collected within the UA.
- G407, located side-gradient of AP2 to the west. Solids were collected within the UA.
- G410, located side-gradient of AP2 to the west, with solids collected within two intervals within the UA.

A map showing these monitoring well location and boring logs for these locations are provided in Attachment D.

4.2.1 Bulk Characterization: Organic Carbon, Loss on Ignition, Cation Exchange Capacity and Sulfur Content

Total organic carbon (TOC) represents only the carbon component of organic matter within a solid material, while loss on ignition (LOI) represents the combustible portions of a solid material and is often used as an approximation of organic matter in a sample. The cation exchange capacity (CEC) of a solid represents the total negative surface charge of that material, which is related to the material's surface potential to sorb cations. Amorphous iron hydroxides, organic matter, and clays at circumneutral pH all tend to possess high negative surface charges and therefore tend to contribute to higher CEC values.

The CEC, TOC, and LOI values for solids are presented in Table 1 and the analytical data is provided in Attachment E. CEC, in the vicinity of AP1 range from 3.32 – 31.02 milliequivalents per 100 g of sample [meq/100g]. TOC abundances range from 0.5 – 1.7 percent by dry weight [% wt] and LOI abundances range from 2.5 – 12.4 % wt. No clear patterns in CEC, TOC or LOI between lithologic units is observed for solids across the Site.

Total sulfur within Site solids was low across all lithologies, with all detections less than 0.15 % wt. Acid volatile sulfide (AVS) represents the portion of sulfide within a solid material that can be liberated to hydrogen sulfide (H_2S) gas after the acidification of the sample. Sulfide was only detected at one location (G1001 within the LCU at 0.05 % wt) and the highest detection of AVS was 0.28 milligrams per kilogram (mg/kg), indicating that sulfides have a limited abundance in the Site solids and sulfur is primarily present within other mineral phases. Sulfate concentrations, as measured in solid leachate after HCl digestion, were higher in solids at G307D (UCU and UA; 170-220 mg/kg) and G314D (UA/LCU, 210 mg/kg) compared to similar lithologic units (e.g.

G311D). Higher sulfate concentrations at these two locations are consistent with the highest sulfur wt % values detected for these intervals (0.09 – 0.14 wt %).

Samples of the CCR solid material within AP1 were collected at two locations (co-located with AP1 porewater wells XPW01 and XPW02), and analyzed for boron, total metals and bulk characterization. Ash material had low CEC values (0.28 to 2.26 meq/100g), consistent with ash particle surfaces that have limited additional capacity to sorb ions. TOC values for ash material were higher than detected in Site solids (3.8 – 4.0% wt), consistent with the coal source nature of the ash material. Sulfate concentrations of ash material ranged between 85 to 450 mg/kg, providing evidence that the ash material is a contributing source of sulfate to the AP1 porewater. Boron was present in the ash material, with concentrations ranging between 70 to 110 mg/kg, consistent with the expectation of boron presence within CCR materials (EPRI 2005) and providing evidence that the ash material is a contributing source of boron to AP1 porewater.

4.2.2 Total Metals and Boron via Bulk Characterization

Total metals were analyzed to determine the major and trace metal content of the solids. The abundance of total aluminum, iron, and manganese can provide insights into the potential presence of adsorbing phases, as oxyhydroxides of these metals can provide sorption capacity. The total metals results are presented in Table 2 and the analytical data is provided in Attachment E.

Total iron concentrations are generally consistent in both UA solids (4,900 milligrams per kilogram [mg/kg] to 22,000 mg/kg) and LCU solids (10,000 to 21,000 mg/kg) sampled from across the Site. Total manganese concentrations do not follow a similar pattern to iron, with a relatively larger concentration range in UA solids (34 mg/kg to 1,200 mg/kg) than in LCU solids (370 to 470 mg/kg). The abundance of iron within the bulk solids matrix of both the UA, and LCU indicates the likely presence of iron-bearing minerals within the system. The presence of iron-bearing minerals was confirmed via X-Ray diffraction (XRD) as discussed in Section 4.2.4. Aluminum concentrations in UA solids vary from 9,600 mg/kg at the AP2 background location G270 to 32,000 mg/kg at the downgradient location G316. Boron concentrations within HSU solids were analyzed in the vicinity of AP1, with concentrations not detected above reporting limits for any samples. Boron was detected in UA and LCU samples collected elsewhere at the CPP, with concentrations ranging from 4 to 6 mg/kg (Table 2).

X-Ray fluorescence (XRF) was conducted for identification of the bulk elemental composition of solids. The XRF data are presented in Table 3 and the analytical data is provided in Attachment F. Solids from across all HSUs at the Site are predominantly composed of silicon (61.7 to 84.6 wt%), followed by calcium (0.5 to 9.1 wt%) and aluminum (4.9 to 8.4 wt%), consistent with the sandy, silty, and clayey lithologies described for these units. Iron is detected in all Site solid samples, ranging from 1.69 to 3.71 wt %, with UA solids having lower wt % iron than LCU and DA solids. Manganese was detected in all Site solid samples with concentrations ranging from 0.03 to 0.13 wt %.

4.2.3 Mineralogical Analysis

X-Ray diffraction (XRD) with Rietveld refinement was conducted for identification of minerals in solid samples. XRD is an analytical technique that provides information about the identity of the crystalline material within a sample but does not provide information about non-crystalline or amorphous phases. XRD results are normalized to 100% of the total weight, meaning that material not characterized by XRD is ignored in the percent calculation.

The XRD data are presented in Table 4 and the analytical data is provided in Attachment G. Solids from all HSUs across the Site were predominantly composed of quartz, ranging from 46.3 to 73.5% of the minerals present. Feldspar minerals including albite (6.1 to 10.4%) and microcline (5.1 to 9.8%), carbonates such as dolomite (0.0 to 15.7 %) and calcite (0.4 to 4.2%) and a variety of clays (1.1 to 12.0% total) were detected as additional primary crystalline mineral phases. Low abundances of magnetite (detected up to 0.2%) were detected in UA, LCU and DA solids, but otherwise crystalline forms of iron oxides were not detected in Site solids. Ankerite, an iron-bearing carbonate mineral, was detected in all Site solids at abundances from 0.5 to 9.4%. Combined with XRF data detections of iron abundances between 1.7 to 3.7 wt %, these results indicate that the total iron within Site solids is largely associated with minerals other than crystalline iron oxides. No crystalline manganese oxide minerals were detected in Site solids. The manganese-bearing mineral kutnohorite (0.1 to 0.5 %) was detected at low abundances, consistent with the presence of dolomite-like carbonates.

Kaolinite, montmorillonite, and illite have been correlated with boron retention in soils (Goldberg 1997). Of those three clay types, illite has the greatest rate of boron adsorption, and was detected in solid samples from the UA, DA and LCU at abundances ranging from 1.7 to 4.0%. Montmorillonite and kaolinite were also present in a subset of solids from these units (1.0 to 3.2% and 0.6 to 1.1%, respectively). Chlorite was also identified at abundances ranging from 1.1 to 3.9%. The presence of clay minerals within solids presents an additional, if limited, potential attenuation mechanism for boron across the Site.

4.3 Aqueous Geochemistry

AP1 porewater and groundwater from wells across the UA, DA, and LCU were analyzed for a range of geochemical parameters and presented in Figures 1a – 9. For clarity in interpretation, the figures present data from the UA and both the LCU and DA well locations separately. UA well locations are shown with circular symbology on the figures, LCU locations are shown with triangular symbology, and DA locations are shown with square symbology. Background locations G281 and G306, both of which are screened in the UA, are shown with hollow symbology. The groundwater data used in the site evaluation is summarized in Attachment H.

CCR porewater is water "collected from the interstitial water between waste particles in surface impoundments as it occurs in the field" (USEPA, 2014) and represents the material potentially leached from impoundments. The CCR materials are the primary source of constituent loading to the CCR porewater. Over an extended period (e.g., months to years), the CCR porewater (i.e., water) reaches equilibrium with the CCR materials. The concentrations within the porewater are "the most representative data available for impoundments because these data are field-measured concentrations of leachate" (USEPA 2014). Porewater is therefore the most appropriate source term for potential flux out of CCR impoundments. Porewater samples collected from locations XPW01 and XPW02 are presented in Figures 1a – 9 and the data is summarized in Attachment H.

4.3.1 Redox/pH Summary

The oxidation-reduction (redox) potential (ORP) and pH in aqueous systems are major controls on the speciation and mobility of reactive constituents such as iron, manganese, and sulfate.

AP1 CCR porewater pH values ranged from 7.0 to 8.5 standard units (SU) (Figures 1a & 1b). In wells across the groundwater monitoring network, pH values generally appear to be stable and circumneutral (Figures 1a & 1b). UA groundwater pH values largely range between 6.5 to 7.5 SU, consistent with the buffering capacity expected from the carbonate minerals present within the geologic units. Groundwater pH at downgradient well G312 is consistently between 6.0 and 6.5, although these levels do not represent a statistical exceedance. Groundwater within UA wells upgradient of AP1 and located to the southwest (G305, G307, G307D, and G308) generally have higher pH values than other compliance wells. LCU and DA groundwater pH values similarly ranged between 6.5 to 7.5 SU. Background well G281 has stable pH values through time between 6.8 to 7.25 SU, while G306 has a wider pH range, between 6.2 to 7.1 SU.

A range of ORP values are reported for groundwater across the Site, with some locations (e.g., G301, G314) observed to fluctuate between relatively more reducing and more oxidizing conditions (Figures 2a & 2b). Upgradient UA background wells G281 and G306 are consistently more oxidizing, while LCU wells G307D and G316 are consistently more reducing, although this trend does not extend to the LCU at G314. Groundwater within AP1 porewaters is relatively more reducing than ORP values detected in the groundwater of the monitoring network (Figures 2a & 2b). Many of the UA wells across the network (G301, G302, G303, and G313) appear to fluctuate seasonally between relatively more oxidizing (winter) and more reducing (summer) conditions, a pattern that is not consistently observed across the monitoring network and appears to have become prevalent after the cessation of material addition to AP1 in 2019.

4.3.2 Exceedance Parameters

Total boron concentrations in AP1 porewaters varied from 1.9 to 4.0 milligrams per liter (mg/L), with concentrations at XPW02 consistently detected below the site-specific GWPS for boron of 3.2 mg/L (Figures 3a and 3b). Total sulfate concentrations within AP1 porewater ranged between 175 to 860 mg/L and are typically above the GWPS of 400 mg/L (Figures 4a and 4b). TDS values within AP1 porewater ranged between 522 to 1,400 mg/L, near or below the GWPS of 1,200 mg/L (Figures 5a and 5b). XPW01 and XPW02 are both located on the western portion of AP1, and heterogeneity in ash composition across the former pond may result in the detection of all three exceedance parameter analytes with lower concentrations in AP1 porewater than downgradient groundwater. The porewater results from XPW01 and XPW02 are consistent with concentrations observed in source water collected from test pits as part of the dewatering evaluation process at the pond between 2016-2017, which had detections of total sulfate from 1,200 to 1,600 mg/L and boron from 1.6 to 3.8 mg/L (data originally presented in the 2017 *Antidegradation Assessment for Management of Coal Combustion Residuals Impoundment Waters, Coffeen Power Station*; Attachment I). These concentrations ranges indicate that downgradient groundwater with COC exceedances may be reflective of past conditions within AP1 porewater.

4.3.2.1 UA

UA background wells G281 and G306 have differing ranges of boron concentrations in groundwater, with G281 boron concentrations below the GWPS (below detection limits to 0.04 mg/L), while G306 boron concentrations ranged between 2.2 to 3.5 mg/L, which has resulted in the GWPS of 3.2 mg/L for the AP1 (Figure 3a). Sulfate concentrations at these background wells are typically below the GWPS (G281: 140 to 380 mg/L; G306: 6 to 700 mg/L), as are TDS concentrations (G281: 700 to 1,000 mg/L; G306: 455 to 900 mg/L) (Figures 4a & 5a). For groundwaters at G306, the variable concentration of boron and depressed sulfate concentrations in relation to AP1 porewater concentrations indicates that AP1 porewaters may not be the sole boron source to AP1 groundwater.

The only well in the monitoring network with an exceedance above the GWPS for boron is G313, a downgradient UA compliance well with concentrations that range from 3.2 to 5.2 mg/L. Other UA compliance wells have boron concentrations between 1.1 to 3.5 mg/L, with this subset of UA compliance wells typically below the boron concentrations detected at the background UA well G306.

While there was only one statistical exceedance of boron, statistical exceedances of sulfate were widely distributed both spatially and within the different HSUs downgradient of AP1. The only UA compliance well without an exceedance for sulfate is G302. Sulfate concentrations at other UA compliance wells are typically greater than those detected at XPW02, with G305 and G308 typically detected above concentrations at XPW01 as well (710 to 1200 mg/L) (Figure 4a). G305 and G308 are both located side gradient of AP1 to the southwest, such that AP1 porewater, as represented by XPW01 and XPW02, may not be the only source of sulfate to the groundwater at these locations.

UA background wells G281 (700 to 1,000 mg/L) and G306 (455 to 900 mg/L) have a lower range of TDS concentrations relative to UA compliance wells (362 to 1,700 mg/L; excluding exceedance wells) (Figure 5a). TDS concentrations at wells with statistically significant exceedances of TDS are elevated (1,100 to 2,010 mg/L) compared to the range of values observed for AP1 porewaters (522 to 1,400 mg/L). Total sulfate concentrations are significantly positively linearly correlated with TDS concentrations across the UA monitoring network ($R^2 = 0.67$; Figure 6a), indicating that sulfate is a major contributor to TDS across the UA AP1 monitoring network.

4.3.2.2 LCU/DA

Boron concentrations in LCU and DA groundwaters are relatively lower than those detected in UA groundwaters, ranging from 0.12 to 2.5 mg/L, consistently below the GWPS at the Site (Figure 3b). Boron concentrations at G314 (0.12 to 0.24 mg/L) and G314D (0.14 to 0.24 mg/L) are equivalent to those detected at the background well G281. Unlike boron, sulfate concentrations in all LCU and DA groundwaters are above the GWPS, with concentrations notably higher in G314 (830 to 2,400 mg/L) (Figure 4b). Unlike the UA wells G305 and G308 that had higher sulfate concentrations and are located sidegradient to the southwest, G314 and G314D are downgradient of AP1 to the east, which indicates groundwater at these locations may be influenced by differing sulfate sources.

G307D is the only LCU or DA well without a statistically significant exceedance of TDS (1,040 to 1,500 mg/L) (Figure 5b). G314, G314D and G306 have higher TDS concentrations (1,100 to 4,000 mg/L), well above what is detected in UA wells or AP1 porewaters. Total sulfate concentrations are positively linearly correlated with TDS concentrations across the LCU and DA monitoring network ($R^2 = 0.95$; Figure 6b), indicating that sulfate is a major contributor to TDS across the LCU and DA AP1 monitoring network.

4.3.3 Pourbaix Diagrams

Eh-pH (Pourbaix) diagrams can be used to illustrate the predicted stability of specific phases at thermodynamic equilibrium under the conditions observed for a groundwater sample. Select crystalline mineral species were suppressed to be representative of anticipated groundwater conditions (e.g. mineral formation not anticipated to be kinetically favored for igneous and metamorphic minerals in the low temperature near-surface environment).

Using conditions detected at well G313 on 6 June 2023 to represent downgradient groundwater within the UA (Table 5), amorphous ferrihydrite is predicted to be stable under groundwater conditions at some locations, while at other locations solid phase iron minerals are not expected to be stable (Figure 7a).[5] However, the higher abundance of total iron at G313, which was used to inform the Eh-pH diagram generation, compared to dissolved iron at G313 (Table 6) may overestimate the stability of solid phase iron species.

Under the evaluated conditions, wells G301, G302, and G303 are all predicted to not favor solid phase iron minerals, while at G310 and G315 amorphous iron hydroxide stability is always favored. G301, G302, and G303 are also wells for which a seasonal fluctuation in ORP is observed, and the same process driving these seasonal fluctuations (possibly meteoric water recharge) may contribute to conditions that do not favor amorphous iron oxide stability. Wells G315 and G303 are located physically adjacent and sidegradient of AP1 to the south, while G310 and G301 are adjacent and downgradient of AP1, which indicates that solid phase iron stability is likely related

[5] Field ORP measurements were converted to Eh by adding +200 millivolts to correct for the Ag/AgCl electrode.

to localized conditions, rather than larger hydrologic forces. Conditions at most UA wells, including background wells G281 and G306, are poised on the redox boundary for solid phase iron stability. Ankerite, which is an analogous iron-bearing carbonate species to siderite, was identified via XRD but not expected to be thermodynamically stable within the UA based upon the detected pH and redox conditions. Dissolution of ankerite or magnetite (where present) may provide a source of iron for the subsequent formation of amorphous iron oxide coatings. Overall, these modeling results indicate that amorphous iron oxides (the formation of which is more kinetically favorable than crystalline iron oxides) might be present, although unstable, at some locations within the UA.

Similar aquifer conditions are predicted at locations within the LCU and DA, as modeled using groundwater conditions from G314 sampled on 1 June 2023 (Table 5; Figure 7b). All locations within the LCU and DA are observed to experience dynamic equilibrium conditions in which chemical reactions between dissolved iron and amorphous iron oxyhydroxides may occur, with the exception of G316, where conditions are not observed to favor iron oxide thermodynamic stability. Crystalline magnetite is expected to be thermodynamically stable at all LCU and DA locations (Figure 7c), which is consistent with the low abundances of magnetite detected via XRD near G314 (Table 4). Ankerite is not expected to be thermodynamically stable within the LCU or DA based upon the detected pH or redox conditions. As in the UA, dissolution of ankerite or magnetite may provide a source of iron for the subsequent formation of amorphous iron oxide coatings. Overall, these modeling results indicate that crystalline and amorphous iron oxides (the formation of which is more kinetically favorable than crystalline iron oxides) might be present at some locations within the LCU and DA.

The Eh-pH diagrams for manganese show that solid phase manganese oxides are not predicted to be stable under conditions within either the UA, LCU, or DA across the site (Figures 8a and 8b, respectively). However, rhodochrosite might be stable.

4.3.4 Total and Dissolved Iron and Manganese Concentrations

The distribution of iron and manganese between total and dissolved phases can provide insights on Site redox conditions and constituent behavior. Paired total and dissolved iron and manganese data are only available across the Site for the Q2 and Q3 2023 sampling events. A comparison of the total and dissolved iron and manganese data for these events is provided in Table 6.

Total iron concentrations ranged from 0.026 mg/L at UA well G310 on 9 August 2023 to 17 mg/L at downgradient LCU well G316 on 31 May 2023. Dissolved iron concentrations ranged from below reporting limits to 17 mg/L at downgradient LCU well G316 on 31 May 2023. Where dissolved iron was detected, the dissolved concentration was typically less than 50% of the total iron value, indicating that aqueous iron is largely associated with suspended particulates across the AP1 monitoring network. G302, G303, G314, G314D, and G316 all have higher fractions of dissolved iron concentrations in at least one monitoring event such that dissolved iron is the majority of total iron, consistent with Eh-pH modeling results for these locations indicating geochemical conditions favoring the stability of dissolved iron. Generally, higher total and dissolved iron concentrations are observed in the LCU and DA.

Total manganese concentrations ranged from 0.078 mg/L at background UA well G306 on 5 June to 9.28 mg/L at downgradient LCU well G316 on 9 August 2023 (Table 6). Dissolved manganese concentrations ranged from 0.006 mg/L at background UA well G306 on 5 June to 9.82 mg/L at downgradient LCU well G316 on 9 August 2023. Dissolved manganese represents the majority of total manganese concentrations at all locations except for G306. This is consistent with the lack of manganese-bearing mineral stability based on the Pourbaix diagrams (Figures 8a and 8b), and the lack of detected crystalline manganese-bearing minerals (like rhodochrosite) across most of the Site (Table 4).

4.3.5 Major Ion Distribution and Groundwater Signatures

A Piper diagram was constructed using data from all HSUs to visualize major ion distributions in groundwater (Figure 9). Piper diagrams are a common tool for assessing geochemical similarities or differences between aqueous samples. The cation composition of AP1 porewater is dominated by calcium, with major anion compositions that span from evenly split between alkalinity-dominated to sulfate-dominated. Background wells G281 and G306 have compositions with lower contributions of sulfate, greater contributions of carbonate alkalinity and are dominated by calcium and magnesium. The higher relative abundance of alkalinity is consistent with the presence of carbonates in the UA solids. Groundwater from the compliance network wells spans the range between the background wells and AP1 porewater, with no clear patterns observed for UA, LCU, and DA groundwaters or spatially. These results provide further evidence for the influence of AP1 source water on compliance wells for the unit.

5. EVALUATION OF PARTITION COEFFICIENT RESULTS

Batch test studies combine soil and groundwater collected from the Site to evaluate the attenuation of chemical constituents. A draft memorandum discussing batch attenuation testing at the CPP AP1 was included as an appendix to the *Groundwater Modeling Report* (Ramboll 2022) and is provided as Attachment J to this document.

5.1 Batch Attenuation Testing

Batch attenuation testing was conducted for boron and sulfate to evaluate the potential for sorption and to attempt to generate site-specific distribution coefficients between the solid and aqueous phase. In 2021, Geosyntec conducted a field investigation at AP1 which included completion of four soil borings ranging in depth from 13 to 18 feet below ground surface. Two groundwater samples (G311 and G313) and three soil samples (SB-306, SB-311, and SB-313) representative of the UA were used for batch attenuation testing at five soil:solution ratios (Table 7), each ran in duplicate. G311 is not within the AP1 network but is located downgradient on the north side of the unit (Attachment A). Each microcosm was amended (i.e., spiked) with sodium sulfate (Na_2SO4), and microcosms with G313 groundwater were also amended with boric acid, to achieve target concentrations of sulfate and boron, respectively (Table 7). The G311 microcosm was not amended with boric acid because potential boron exceedances were not identified in the vicinity of G311. G313 groundwater was combined with aquifer solids both adjacent to downgradient location G311 and background location G306 to understand how partitioning behavior may be affected by position relative to AP1. After the end of the test, the samples were filtered through a 0.45-micron (μm) filter prior to analysis for dissolved concentrations of sulfate and/or boron. Analysis of the dissolved phase is important to adequately measure the partioning of mass between the solid and liquid fractions of the experiment.

5.2 Partition Coefficient Results

The mass of sulfate or boron in the water versus in the solids of each sample was plotted according to three sorption models: linear, Langmuir, and Freundlich (Tables 8a and 8b). Data obtained from the batch attenuation tests was used to calculate attenuation distribution coefficients (K_d) for each sorption model. The calculated linear, Langmuir, and Freundlich distribution coefficients (K_d, K_L, and K_F, respectively) values are shown in Tables 9a and 9b. The linear, Langmuir, and Freundlich isotherms for boron and sulfate are provided in Figures 10a – 10e.

A boron partition coefficient was not calculated for G311, since the microcosm was not amended with boric acid because potential boron exceedances were not identified in the vicinity. Given the negative values for the Langmuir isotherms, the Freundlich isotherm fit the data best for G313/SB-306 and G313/SB-313, yielding K_F values of 0.65 L/kg and 2.03 L/kg, respectively. Though slightly higher at G313/SB-313, these values are comparable to boron partition coefficients reported in the literature, which range from 0.19 to 1.3 L/kg depending on pH conditions and the amount of sorbent present (EPRI, 2005; Strenge & Peterson, 1989).

The G311 partition coefficient for sulfate ranged from -624 L/kg for the Langmuir isotherm to 10.11 L/kg for the linear isotherm, but the best-fitting Freundlich isotherm yielded a low K_F value of 9.2×10^{-12} L/kg. None of the isotherms showed a high goodness-of-fit (i.e., R^2) for either G313/SB-306 or G313/SB-313, with the highest correlation being 0.51, and were associated with erroneously high (1700 L/kg) and low (-690 L/kg) partition coefficients. An accurate sulfate partition coefficient could therefore not be calculated from any of the data.

6. GEOCHEMICAL CONCEPTUAL SITE MODEL

6.1 Source and Mobilization Mechanisms

Boron is naturally abundant in coals associated with organic matrices and is concentrated within CCR, primarily as polyborate (B_2O_3) surface coatings on particles (EPRI 1998; Izquierdo & Querol, 2012). Boron was identified in the CCR porewater at concentrations up to 4 mg/L. The likely primary source of boron to the UA is the AP1 CCR porewater based on boron concentrations within the source.

Reduced sulfur species (e.g. pyrite) can be naturally abundant in coals; after coal fly ash production, sulfate is the dominant sulfur species associated with fly ash. Sulfate is concentrated on the surface of fly ash particles and the majority of sulfate mineral phases are soluble under environmental conditions, such that sulfate associated with fly ash is leachable (Izquierdo & Querol, 2012). The primary source of sulfate to the UA and LCU/DA is AP1 CCR porewater. Sulfate was identified in the CCR leachate or porewater at concentrations up to 860 mg/L for recently collected samples, and up to 1,600 mg/L for historic samples.

The multiple instances of observations of groundwater locations where sulfate and boron concentrations appear uncoupled, the presence of elevated boron concentrations at background well G306, and the detection of sulfate concentrations higher than those observed in AP1 source water at downgradient wells indicate that the groundwater in the vicinity of AP1 is likely impacted by multiple potential sources.

6.2 Potential and Observed Attenuation Mechanisms

Boron exceedances were identified in the UA. Boron is anticipated to largely be present as the neutral $B(OH)_3^o$ boric acid species as groundwater pH values in the UA are below the pK_a for boric acid (9.2). The presence of iron oxides in some UA and LCU solids (Table 4), and the potential for amorphous ferrihydrite formation based on modeling of Eh-pH conditions indicates a portion of the boron in the groundwater system might be attenuated via surface complexation reactions within portions of the UA, LCU, and DA. Given the low abundance of total manganese in the solids (Table 2) and the predicted instability of solid manganese phases (Figures 8a and 8b), manganese oxides are not expected to be an important source of adsorption sites. Boron is also known to be attenuated via interactions with clay minerals (Goldberg 1997); the XRD results identified the presence of clay minerals across the UA, LCU, and DA (Table 4). These lines of evidence support the partition coefficient calculated from batch attenuation testing for boron, which indicated boron chemical attenuation is possible, if limited, at locations downgradient of AP1.

Sulfate exceedances were identified in the UA, LCU, and DA. Sulfate is typically considered to be a conservative species within groundwater at circumneutral pH conditions, although sorption onto mineral surfaces is a potential attenuation mechanism. Sulfate attenuation is expected to occur largely as the result of sorption onto positively charged iron oxides and oxyhydroxides associated with solids under acidic conditions. XRD analyses (Table 4) support the presence of iron oxides crystalline phases across the Site in the UA, LCU, and DA, with the additional potential for amorphous phases to form at some locations based on modeled redox conditions. However, chemical attenuation of sulfate is anticipated to be limited, as batch attenuation testing was not able to determine a partition coefficient for sulfate at the Site. Any attenuation of sulfate will likely contribute to a reduction of TDS in the groundwater.

7. REFERENCES

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TABLES

Table 1. CEC and LOI of Site Solids
Geochemical Conceptual Site Model
Coffeen Power Plant - Ash Pond No. 1

Well ID	G270	G306	G311	G313	G316	G314	G314	G314	G401	G407	G410	G410	G307D	G307D
Depth (ft bgs)	**(12-16)**	**(14-16)**	**(14-15)**	**(8-9)**	**(13-14, 15-16)**	**(13-18)**	**(18-23)**	**(38-43)**	**(16-20)**	**(10-13)**	**(11-12)**	**(12.5-13)**	**(4-12.8)**	**(12.8-14)**
Well Characterization	**AP2 Background**	**AP1 Background**	**AP1 Adjacent**	**AP1 Compliance**	**AP1 Compliance**	**AP1 Compliance**	**AP1 Compliance**	**AP1 Compliance**	**AP2 Compliance**	**AP2 Compliance**	**AP2 Sidegradient**	**AP2 Sidegradient**	**AP1 Compliance**	**AP1 Compliance**
Sampled Aquifer Unit	**UA**	**UA**	**UA**	**UA**	**UA**	**LCU**	**LCU**	**DA**	**UA**	**UA**	**UA**	**UA**	**UCU**	**UA**
Field Boring Log Description	**Silty Sand**	**Sand**	**Sand**	**Sand**	**Sand**	**Sandy to silty till**	**Sandy to silty till**	**Sand and sandy silt/clay**	**Sand to Sandy Clay**	**Sandy to gravelly silt**	**Sandy to gravelly silt**	**Sandy to gravelly silt**	**Clay**	**Sand**
CEC (meq/100 g solid)	-	-	-	-	-	17.84	18.95	14.39	-	11.41	15.39	31.02	18.82	3.32
LOI (%)	-	-	-	-	-	12.43	12.33	12.30	-	2.54	3.75	11.96	-	-
TOC (%)	0.14	0.41	0.77	0.78	0.26	-	-	-	0.08	-	-	-	0.06	1.12
AVS (mg/kg)	<0.19	<0.18	0.24	<0.16M	0.28	<0.22	<0.22	<0.22	<0.19	<0.23	<0.23	<0.21	-	-
Total Carbon (%)	-	1.65	2.76	3.26	0.46	-	-	-	-	-	-	-	-	-
Sulfur (%)	<0.005	0.01	0.01	0.01	0.01	-	-	-	0.01	-	-	-	0.01	<0.0066
Sulfide (%)	<0.04	<0.04	<0.04	<0.04	<0.04	-	-	-	<0.04	-	-	-	-	-

Well ID	G307D	G307D	G307D	G311D	G311D	G311D	G311D	G314D	G314D	G314D	G1001	XPW01	XPW02
Depth (ft bgs)	**(18-34.9)**	**(40-54)**	**(54-60)**	**(4-12)**	**(12-14)**	**(18-42)**	**(44-52)**	**(4.2-17)**	**(17.3-21.6)**	**(21.8-45.5)**	**(6-11)**	**(0-8)**	**(0-8)**
Well Characterization	**AP1 Compliance**	**AP1 Compliance**	**AP1 Compliance**	**AP1 Adjacent**	**AP1 Adjacent**	**AP1 Adjacent**	**AP1 Adjacent**	**AP1 Compliance**	**AP1 Compliance**	**AP1 Compliance**	**AP2 Compliance**	**CCR Material**	**CCR Material**
Sampled Aquifer Unit	**UA**	**LCU**	**LCU**	**UCU**	**UA**	**UA**	**LCU**	**UCU/UA**	**UA/LCU**	**LCU**	**LCU**	**-**	**-**
Field Boring Log Description	**Sandy to gravelly silt**	**Clay**	**Clay**	**Clay**	**Sand and sandy silt/clay**	**Clay**	**Clay**	**Clay with trace sand**	**Clay with trace sand**	**Clay**	**Clay with trace sand**	**Ash**	**Ash**
CEC (meq/100 g solid)	3.91	8.31	17.24	9.36	9.23	9.61	13.05	9.44	9.72	12.45	-	2.26	0.28
LOI (%)	-	-	-	-	-	-	-	-	-	-	-	-	-
TOC (%)	1.67	1.24	0.11	<0.0318	1.15	1.48	0.06	<0.0498	1.74	0.85	0.85	4.02	3.84
AVS (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Carbon (%)	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfur (%)	0.14	0.09	0.01	0.01	0.08	0.08	0.08	0.01	0.11	<0.008	0.03	0.05	0.01
Sulfide (%)	-	-	-	-	-	-	-	-	-	-	0.05	-	-

Notes
Sample depth is shown in feet below ground surface (ft bgs)
Dashes indicate sample was not analyzed for analyte
M - Reporting limit elevated due to matrix interference
meq/100 g solid: milliequivalents per 100 grams solids
LOI: loss on ignition
TOC: total organic carbon
AVS: acid volatile sulfides
mg/kg: milligrams per kilogram
AP1: Ash Pond 1
AP2: Ash Pond 2
CCR: Coal combustion residual
UCU: Upper Confining Unit
LCU: Lower Confining Unit
DA: Deep Aquifer
UA: Uppermost Aquifer

Table 2. Bulk Characterization of Site Solids
Geochemical Conceptual Site Model
Coffeen Power Plant - Ash Pond No. 1

Well ID	**G270**	**G306**	**G311**	**G313**	**G316**	**G307D**	**G307D**	**G307D**	**G307D**	**G307D**	**G311D**	**G311D**	**G311D**	**G311D**	**G314D**	**G314D**	**G314D**	**G401**	**G1001**	**XPW01**	**XPW02**
Depth (ft bgs)	**(12-16)**	**(14-16)**	**(14-15)**	**(8-9)**	**(13-14, 15-16)**	**(4-12.8)**	**(12.8-14)**	**(18-34.9)**	**(40-54)**	**(54-60)**	**(4-12)**	**(12-14)**	**(18-42)**	**(44-52)**	**(4.2-17)**	**(17.3-21.6)**	**(21.8-45.5)**	**(16-20)**	**(6-11)**	**(0-8)**	**(0-8)**
Well Characterization	**AP2 Background**	**AP1 Background**	**AP1 Adjacent**	**AP1 Compliance**	**AP1 Compliance**	**AP1 Compliance**	**AP1 Compliance**	**AP1 Compliance**	**AP1 Compliance**	**AP1 Compliance**	**AP1 Adjacent**	**AP1 Adjacent**	**AP1 Adjacent**	**AP1 Adjacent**	**AP1 Compliance**	**AP1 Compliance**	**AP1 Compliance**	**AP2 Compliance**	**AP2 Compliance**	**CCR Material**	**CCR Material**
Sampled Aquifer Unit	**UA**	**UA**	**UA**	**UA**	**UA**	**UCU**	**UA**	**UA**	**LCU**	**LCU**	**UCU**	**UA**	**UA**	**LCU**	**UCU/UA**	**UA/LCU**	**LCU**	**UA**	**LCU**	**-**	**-**
Field Boring Log Description	**Silty Sand**	**Sand**	**Sand**	**Sand**	**Sand**	**Clay**	**Sand**	**Sandy to gravelly silt**	**Clay**	**Clay**	**Clay**	**Sand and sandy silt/clay**	**Clay**	**Clay**	**Clay with trace cand**	**Clay with trace sand**	**Clay**	**Sand to Sandy Clay**	**Clay with trace sand**	**Ash**	**Ash**
Analyte	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	9600	13000	11000	31000	32000	-	-	-	-	-	-	-	-	-	-	-	-	9700	8200	-	-
Antimony	<0.8	<0.8	<0.8	<0.8	<0.8	<2.6	<2	<2.6	<2.8	<2.4	<3	<3.2	<3	<2.8	<2.8	<3	<2.4	<0.8	<0.8	<2.7	<2.8
Arsenic	12	6.7	2.7	5.6	5.1	7.5	1.7	2.9	5.7	4.2	3.2	3.5	2.8	3.2	1.3	2.7	3.8	5.5	6.2	6.9	<0.93
Barium	210	98	58	310	320	150	10	20	93	110	57	44	69	90	63	27	140	190	120	710	850
Beryllium	0.48	0.5	0.4	0.7	0.7	<0.86	<0.66	<0.87	<0.93	<0.79	<1	<1.1	<1	<0.95	<0.93	<1	<0.8	0.35	0.45	1.9	1.6
Bismuth	0.18	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	0.25	0.23	-	-
Boron	5	-	-	-	-	<8.6	<6.6	<8.7	<9.3	<7.9	<10	<11	<10	<9.5	<9.3	<10	<8	4	6	110.0	70.0
Cadmium	0.12	0.1	0.1	0.2	0.1	1.2	<0.66	<0.87	<0.93	<0.79	<1	<1.1	<1	<0.95	<0.93	<1	<0.8	0.03	0.13	1.0	<0.93
Calcium	5000	35000	52000	69000	10000	-	-	-	-	-	-	-	-	-	-	-	-	1900	42000	-	-
Chloride	-	-	-	-	-	<10	19	<10	<10	<10	<1	<1	<1	<1	<10	<10	<10	-	-	<10	<10
Chromium	16	130.0	100.0	130.0	150.0	9.5	3.8	8.5	10.0	8.5	10.0	8.0	10.0	12.0	8.7	9.9	25.0	14	15	41.0	24.0
Cobalt	10	6.0	4.0	7.0	4.0	25.0	1.4	4.5	7.1	6.0	3.1	4.0	5.0	5.9	<1.9	5.2	10.0	6.1	8.8	4.8	4.3
Copper	12	14	10	12	10	-	-	-	-	-	-	-	-	-	-	-	-	7.8	11	-	-
Fluoride	-	-	-	-	-	3.1	<2.5	<2.5	4.2	6.8	<0.25	<0.25	<0.25	<0.25	<2.5	<2.5	3.1	-	-	<2.5	<2.5
Iron	22000	-	-	-	-	20000	4900	11000	10000	19000	10000	8600	11000	12000	4900	11000	21000	14000	16000	57000	50000
Lead	12	9.0	7.0	11.0	12.0	15.0	3.3	5.9	7.7	7.2	8.1	5.4	6.9	8.7	5.5	7.3	11.0	9.5	11	4.7	1.3
Lithium	11	11.0	11.0	19.0	14.0	<4.3	<3.3	10.0	7.1	6.8	<5	6.4	8.4	10.0	<4.6	9.1	28.0	7	9	18.0	20.0
Magnesium	4700	15000	27000	35000	6700	-	-	-	-	-	-	-	-	-	-	-	-	1600	18000	-	-
Manganese	1200	470	310	1200	260	3100	120	290	430	470	110	250	290	380	34	320	370	54	450	170	170
Mercury	-	-	-	-	-	<0.17	<0.13	<0.17	<0.19	<0.16	<0.2	<0.21	<0.2	<0.19	<0.19	<0.2	<0.16	-	-	<0.18	<0.19
Molybdenum	0.8	5.8	2.7	1.6	8.1	1.3	<0.66	<0.87	1.4	<0.79	<1	1.2	1.2	1.3	<0.93	1.2	<0.8	0.4	1.5	7.0	2.5
Nickel	20	15	11	17	13	-	-	-	-	-	-	-	-	-	-	-	-	10	15	-	-
Nitrogen (total)	-	-	-	-	-	160	<63	260	360	310	510	360	370	530	140	360	260	-	-	110	100
Potassium	1400	3700	3600	13000	14000	-	-	-	-	-	-	-	-	-	-	-	-	770	1100	-	-
Selenium	<0.7	<0.7	<0.7	<0.7	<0.7	<0.86	<0.66	<0.87	<0.93	<0.79	<1	<1.1	<1	<0.95	<0.93	<1	1.0	<0.7	<0.7	7.5	<0.93
Silver	< 0.05	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	< 0.05	< 0.05	-	-
Sodium	110	590	830	6000	6400	-	-	-	-	-	-	-	-	-	-	-	-	80	110	-	-
Strontium	10	26	35	100	89	-	-	-	-	-	-	-	-	-	-	-	-	9.1	35	-	-
Sulfate	-	-	-	-	-	220	170	30	<10	<10	2	<1	<1	<1	76	210	<10	-	-	450	85
Thallium	0.16	0.2	0.1	0.3	0.3	<0.86	<0.66	<0.87	<0.93	<0.79	<1	<1.1	<1	<0.95	<0.93	<1	<0.8	0.12	0.16	<0.91	<0.93
Tin	< 0.5	<6	<6	<6	<6	-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	0.6	-	-
Titanium	230	370	320	1500	1200	-	-	-	-	-	-	-	-	-	-	-	-	65	170	-	-
Uranium	1.46	0.5	0.6	1.0	1.0	-	-	-	-	-	-	-	-	-	-	-	-	0.39	0.82	-	-
Vanadium	22	28	20	35	29	-	-	-	-	-	-	-	-	-	-	-	-	14	19	-	-
Yttrium	9.4	9	8	11	10	-	-	-	-	-	-	-	-	-	-	-	-	8.2	8.1	-	-
Zinc	50	35	27	41	34	-	-	-	-	-	-	-	-	-	-	-	-	28	35	-	-

Notes:
Sample depth is shown in feet below ground surface (ft bgs)
Dashes indicate analyte was not reported by lab for sample
Non-detect values are shown as less than the reporting limit
mg/kg: milligrams per kilogram
AP1: Ash Pond 1
AP2: Ash Pond 2
CCR: Coal Combustion Residual
UCU: Upper Confining Unit
LCU: Lower Confining Unit
UA: Uppermost Aquifer

Table 3. XRF Analysis of Site Solids
Geochemical Conceptual Site Model
Coffeen Power Plant - Ash Pond No. 1

Well ID	G314	G314	G314	G407	G410	G410
Depth (ft bgs)	(13-18)	(18-23)	(38-43)	(10-13)	(11-12)	(12.5-13)
Well Characterization	AP1 Compliance	AP1 Compliance	AP1 Compliance	AP2 Compliance	AP2 Sidegradient	AP2 Sidegradient
Sampled Aquifer Unit	LCU	LCU	DA	UA	UA	UA
Field Boring Log Description	Sandy to silty till	Sandy to silty till	Sand and sandy silt/clay	Sandy to gravelly silt	Sandy to gravelly silt	Sandy to gravelly silt
Analyte	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)
Al_2O_3	8.36	8.41	8.35	6.73	8.14	4.92
CaO	6.73	6.72	6.69	0.52	1.04	9.10
Cr_2O_3	<0.01	0.02	0.02	0.01	<0.01	<0.01
Fe_2O_3	3.19	3.48	3.71	2.08	2.77	1.69
K_2O	1.88	1.88	1.89	2.01	2.42	1.59
MgO	3.71	3.66	3.62	0.54	0.77	4.44
Mn_3O_4	0.07	0.07	0.07	0.03	0.13	0.08
Na_2O	0.79	0.80	0.77	0.82	0.85	0.69
P_2O_5	0.07	0.08	0.08	0.06	0.06	0.05
SiO_2	62.07	61.80	61.72	84.59	80.21	64.55
TiO_2	0.49	0.50	0.50	0.36	0.40	0.26
V_2O_5	0.01	<0.01	0.01	<0.01	0.01	<0.01

Notes
Sample depth is shown in feet below ground surface (ft bgs).
Non-detect values are shown as less than the reporting limit.
Results are not normalized to 100%, with some portion of sample mass uncharacterized.
Analytes are presented as the respective oxide species of the element of interest, consistent with the sample processing prior to analysis.
wt %: percentage by weight
AP1: Ash Pond 1
AP2: Ash Pond 2
LCU: Lower Confining Unit
DA: Deep Aquifer
UA: Upper Aquifer

Table 4. XRD Analysis of Site Solids
Geochemical Conceptual Site Model
Coffeen Power Plant - Ash Pond No. 1

Well ID			**G306**	**G311**	**G313**	**G316**	**G314**	**G314**	**G314**
Depth (ft bgs)			**(14-16)**	**(14-15)**	**(8-9)**	**(13-14, 15-16)**	**(13-18)**	**(18-23)**	**(38-43)**
Well Characterization			**AP1 Background**	**AP1 Adjacent**	**AP1 Compliance**	**AP1 Compliance**	**AP1 Compliance**	**AP1 Compliance**	**AP1 Compliance**
Sampled Aquifer Unit			**UA**	**UA**	**UA**	**UA**	**LCU**	**LCU**	**DA**
Field Boring Log Description			**Sand**	**Sand**	**Sand**	**Sand**	**Sandy to silty till**	**Sandy to silty till**	**Sand and sandy silt/clay**
Mineral/Compound	**Formula**	**Mineral Type**	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)
Quartz	SiO_2	Silicate	70.9	58.9	51.3	67.6	53.9	67.5	73.5
Dolomite	$CaMg(CO_3)_2$	Carbonate	3.5	12.1	15.7	1.9	13.3	0.5	0.0
Calcite	$CaCO_3$	Carbonate	0.5	2.5	4.1	-	4.1	0.4	-
Ankerite	$CaFe(CO_3)_2$	Carbonate	2.1	5.0	7.7	0.8	7.2	1.2	0.5
Kutnohorite	$CaMn(CO_3)_2$	Carbonate	-	-	-	-	0.5	0.3	0.2
Albite	$NaAlSi_3O_8$	Feldspar	9.6	8.6	7.9	9.6	6.1	8.3	8.2
Microcline	$KAlSi_3O_8$	Feldspar	8.5	7.4	7.6	9.8	5.1	9.7	7.8
Actinolite	$Ca_2(Mg,Fe)_5Si_8O_{22}(OH)_2$	Amphibole	-	-	-	-	0.3	0.7	0.8
Diopside	$CaMgSi_2O_6$	Pyroxene	3.1	3.8	4.6	1.3	1.0	0.7	0.7
Magnetite	Fe_3O_4	Oxide	-	-	-	-	-	0.2	0.0
Pyrite	FeS_2	Sulfide	-	-	-	-	-	-	-
Biotite	$K(Mg,Fe)_3(AlSi_3O_{10})(OH)_2$	Mica	-	-	-	-	-	-	-
Muscovite	$KAl_2(AlSi_3O_{10})(OH)_2$	Mica	-	-	-	7.3	1.0	4.8	3.3
Clay Minerals									
Montmorillonite	$(Na,Ca)_{0.3}(Al,Mg)_2Si_4O_{10}(OH)_2\cdot 10H_2O$	Clay	-	-	-	-	1.1	1.0	1.1
Illite	$(K,H_3O)(Al,Mg,Fe)_2(Si,Al)_4O_{10}[(OH)_2,(H_2O)]$	Clay	-	-	-	-	4.0	2.0	1.7
Illite-Montmorillonite	$KAl_4(Si,Al)_8O_{20}(OH)_4\cdot 8H_2O$	Clay	-	-	-	-	-	-	-
Kaolinite	$Al_2Si_2O_5(OH)_4$	Clay	-	-	-	-	0.7	1.1	0.7
Stilpnomelane	$K(Fe^{2+},Mg,Fe^{3+})_8(Si,Al)_{12}(O,OH)_{27}\cdot n(H_2O)$	Sheet silicate	-	-	-	-	-	-	-
Chlorite	$(Fe,(Mg,Mn)_5,Al)(Si_3Al)O_{10}(OH)_8$	Sheet silicate	1.8	1.7	1.1	1.7	1.6	1.7	1.5
Clay Minerals Total			1.8	1.7	1.1	1.7	7.4	5.8	5.0

Notes
Dashes indicate mineral was not identified by lab
Sample depth is shown in feet below ground surface (ft bgs).
ft bgs: feet below ground surface
wt %: percentage by weight
AP1: Ash Pond 1
LCU: Lower Confining Unit
DA: Deep Aquifer
UA: Uppermost Aquifer

Table 4. XRD Analysis of Site Solids
Geochemical Conceptual Site Model
Coffeen Power Plant - Ash Pond No. 2

Well ID			G407	G410	G410	G1001
Depth (ft bgs)			(10-13)	(11-12)	(12.5-13)	(6-11)
Well Characterization			AP2 Compliance	AP2 Sidegradient	AP2 Sidegradient	AP2 Compliance
Sampled Aquifer Unit			UA	UA	UA	LCU
Field Boring Log Description			Sandy to gravelly silt	Sandy to gravelly silt	Sandy to gravelly silt	Clay with trace sand
Mineral/Compound	Formula	Mineral Type	(wt %)	(wt %)	(wt %)	(wt %)
Quartz	SiO_2	Silicate	51.2	50.7	50.5	46.3
Dolomite	$CaMg(CO_3)_2$	Carbonate	6.0	7.6	8.1	11.3
Calcite	$CaCO_3$	Carbonate	2.4	2.6	2.8	4.2
Ankerite	$CaFe(CO_3)_2$	Carbonate	9.4	8.4	8.1	1.5
Kutnohorite	$CaMn(CO_3)_2$	Carbonate	0.1	-	0.2	-
Albite	$NaAlSi_3O_8$	Feldspar	6.8	7.4	7.5	10.4
Microcline	$KAlSi_3O_8$	Feldspar	7.2	5.9	5.8	7.8
Actinolite	$Ca_2(Mg,Fe)_5Si_8O_{22}(OH)_2$	Amphibole	0.5	0.6	0.6	0.9
Diopside	$CaMgSi_2O_6$	Pyroxene	0.4	0.5	0.7	0.8
Magnetite	Fe_3O_4	Oxide	0.1	0.1	0.2	-
Pyrite	FeS_2	Sulfide	-	-	-	0.1
Biotite	$K(Mg,Fe)_3(AlSi_3O_{10})(OH)_2$	Mica	-	-	-	2.4
Muscovite	$KAl_2(AlSi_3O_{10})(OH)_2$	Mica	5.5	4.4	4.3	10.3
Montmorillonite	$(Na,Ca)_{0.3}(Al,Mg)_2Si_4O_{10}(OH)_2 \cdot 10H_2O$	Clay	3.2	3.2	2.9	-
Illite	$(K,H_3O)(Al,Mg,Fe)_2(Si,Al)_4O_{10}[(OH)_2,(H_2O)]$	Clay	3.3	3.0	2.9	-
Illite-Montmorillonite	$KAl_4(Si,Al)_8O_{20}(OH)_4 \cdot 8H_2O$	Clay	-	1.3	1.7	-
Kaolinite	$Al_2Si_2O_5(OH)_4$	Clay	0.9	0.6	0.6	-
Stilpnomelane	$K(Fe^{2+},Mg,Fe^{3+})_8(Si,Al)_{12}(O,OH)_{27} \cdot n(H_2O)$	Sheet silicate	-	-	-	2.6
Chlorite	$(Fe,(Mg,Mn)_5,Al)(Si_3Al)O_{10}(OH)_8$	Sheet silicate	3.0	3.9	3.2	1.5
Clay Minerals Total			10.4	12.0	11.3	4.1

Notes
Dashes indicate mineral was not identified by lab
Sample depth is shown in feet below ground surface (ft bgs).
ft bgs: feet below ground surface
wt %: percentage by weight
AP1: Ash Pond 1
AP2: Ash Pond 2
LCU: Lower Confining Unit
DA: Deep Aquifer
UA: Uppermost Aquifer

Table 5. AP1 Eh-pH Diagram Inputs
Geochemical Conceptual Site Model
Coffeen Power Plant - Ash Pond No. 1

Well ID		**G313**	**G314**
Sample Date		**6/6/2023**	**6/1/2023**
Aquifer Unit		**UA**	**LCU**
Input Parameter	**Unit**		
Temperature	°C	18.3	16.1
pH	SU	6.94	6.78
Calcium	mg/L	200	250
Chloride	mg/L	23	30
Bicarbonate Alkalinity	mg/L	490	660
Magnesium	mg/L	100	83
Sodium	mg/L	150	390
Potassium	mg/L	0.93	3.1
Sulfate	mg/L	720	2000
Total Manganese	mg/L	0.37	1.1
Total Iron	mg/L	0.37	1.2

Notes
°C - degrees Celsius
mg/L - milligrams per liter
SU - standard units
UA - uppermost aquifer

Table 6. Total and Dissolved Aqueous Iron and Manganese Results
Geochemical Conceptual Site Model
Coffeen Power Plant - Ash Pond No. 1

Well ID	Well Characterization	Sampled Aquifer Unit	Date	Iron, total (mg/L)	Iron, dissolved (mg/L)	Manganese, total (mg/L)	Manganese, dissolved (mg/L)
G281	AP1 Background	UA	2023/06/08	0.88	0.016	0.7	0.31
			2023/08/14	0.194	<0.0175	0.352	0.291
G301	AP1 Compliance	UA	2023/06/06	0.84	0.17	2.3	2.3
			2023/08/09	0.394	0.0697	2.03	2.04
G302	AP1 Compliance	UA	2023/05/31	2.3	0.66	1.8	1
			2023/08/09	0.489	0.284	0.483	0.424
G303	AP1 Compliance	UA	2023/05/31	1	1.1	0.39	0.4
			2023/08/09	2.07	0.612	0.383	0.323
G305	AP1 Compliance	UA	2023/06/06	6.3	0.011	0.43	0.24
			2023/08/10	0.549	0.022	0.143	0.0984
G306	AP1 Background	UA	2023/06/05	0.91	0.0094	0.078	0.006
			2023/08/10	13.8	<0.0115	0.581	0.0833
G307	AP1 Compliance	UA	2023/06/05	0.15	0.015	1.8	1.8
G307D	AP1 Compliance	LCU	2023/06/05	4.1	0.2	0.63	0.58
			2023/08/10	3.05	0.99	0.324	0.417
G308	AP1 Compliance	UA	2023/06/01	0.38	0.0057	0.35	0.32
G310	AP1 Compliance	UA	2023/06/01	0.16	0.0021	0.34	0.31
			2023/08/09	0.0255	<0.0115	0.372	0.336
G312	AP1 Compliance	UA	2023/06/01	0.048	0.0062	2.4	3
			2023/08/09	0.2	0.024	5.74	4.68
G313	AP1 Compliance	UA	2023/06/06	0.37	0.068	0.37	0.37
			2023/08/09	0.289	0.0745	0.399	0.386
G314	AP1 Compliance	LCU	2023/06/01	1.2	0.34	1.1	1.1
			2023/08/09	6.31	6.3	1.84	2.54
G314D	AP1 Compliance	DA	2023/06/01	3.6	4.9	1.6	1.4
			2023/08/09	0.944	0.704	1.1	1.01
G315	AP1 Compliance	UA	2023/06/07	3	<0.01	0.4	0.24
			2023/08/10	0.258	0.012	0.395	0.306
G316	AP1 Compliance	LCU	2023/05/31	17	17	9	8.7
			2023/08/09	15.6	16.3	9.28	9.82
XPW01	AP1 Porewater	CCR	2023/06/06	2.8	0.87	0.098	0.093
			2023/08/10	1.77	1.06	0.124	0.115
XPW02	AP1 Porewater	CCR	2023/06/06	1.9	1.3	0.1	0.12
			2023/08/10	1.21	0.742	0.0903	0.0809

Notes
mg/L: milligrams per liter
Non-detect values are shown as less than the reporting limit.
CCR: Coal Combustion Residual
AP1: Ash Pond 1
LCU: Lower Confining Unit
UA: Uppermost Aquifer

Table 7. Batch Attenuation Testing Data Summary
Geochemical Conceptual Site Model
Coffeen Power Plant Ash Pond No. 1

Groundwater Sample ID	Soil Sample ID	Soil: Water Ratio	Amendment	Target Concentration
G311	SB-311 (14-15 ft bgs)	2:1.4	2.76 g of Na_2SO_4	1500 mg/L sulfate
		1:1.3		
		1:5.7		
		1:11.3		
		1:27.8		
G313	SB-306 (14-16 ft bgs)	2:1.5	19.73 mL of a 2 g/L H_3BO_3 & 2.98 g of Na_2SO_4	5 mg/L boron; 1500 mg/L sulfate
		1:1.3		
		1:6.0		
		1:11.7		
		1:28.8		
G313	SB-313 (8-9 ft bgs)	2:1.5	19.73 mL of a 2 g/L H_3BO_3 & 1.98 g of Na_2SO_4	5 mg/L boron; 1500 mg/L sulfate
		1:1.3		
		1:6.0		
		1:11.7		
		1:28.8		

Notes:
ft bgs: feet below ground surface
g: grams
mL: milliliters
mg/L: milligrams per liter
g/L: grams per liter
Na_2SO_4: sodium sulfate
H_3BO_3: boric acid

Table 8a. Batch Attenuation Testing Results, G311
Geochemical Conceptual Site Model
Coffeen Power Plant - Ash Pond No. 1

Groundwater Sample ID	Geologic Material Sample ID	Treatment	Date	Day	Replicate	Dissolved Sulfate	pH	ORP
						mg/L	SU	mV
G311	--	Groundwater Only Control	25-Jan-22	0	G311-1a	1,589	6.83	-62
					G311-2a	1,826	6.88	-66
					Average Concentration (mg/L)	**1,708**	**6.86**	**-64**
			1-Feb-22	7	G311-1	1,617	6.85	42
					G311-2	1,478	6.85	38
					Average Concentration (mg/L)	**1,548**	**6.85**	**40**
	G311 SB-311 Geologic Material	2:1 Soil:Water Ratio	25-Jan-22	0				
			1-Feb-22	7	SB-311:G311 2:1-1	1,321	6.92	50
					SB-311:G311 2:1-2	1,302	6.86	100
					Average Concentration (mg/L)	**1,311**	**6.89**	**75**
		1:1 Soil:Water Ratio	25-Jan-22	0				
			1-Feb-22	7	SB-311:G311 1:1-1	1,727	6.92	51
					SB-311:G311 1:1-2	860	6.88	24
					Average Concentration (mg/L)	**1,294**	**6.90**	**38**
		1:5 Soil:Water Ratio	25-Jan-22	0				
			1-Feb-22	7	SB-311:G311 1:5-1	1,326	6.87	93
					SB-311:G311 1:5-2	1,516	6.88	56
					Average Concentration (mg/L)	**1,421**	**6.88**	**75**
		1:10 Soil:Water Ratio	25-Jan-22	0				
			1-Feb-22	7	SB-311:G311 1:10-1	1,570	6.89	27
					SB-311:G311 1:10-2	1,551	6.86	133
					Average Concentration (mg/L)	**1,560**	**6.88**	**80**
		1:20 Soil:Water Ratio	25-Jan-22	0				
			1-Feb-22	7	SB-311:G311 1:20-1	1,511	6.88	88
					SB-311:G311 1:20-2	1,588	6.86	39
					Average Concentration (mg/L)	**1,550**	**6.87**	**64**

Notes:

mg/L - milligrams per liter

mV - millivolts

SU - Standard Units

ORP - oxidation/reduction potential

Table 8b. Batch Attenuation Testing Results, G313
Geochemical Conceptual Site Model
Coffeen Power Plant - Ash Pond No. 1

Groundwater Sample ID	Geologic Material Sample ID	Treatment	Date	Day	Replicate	Dissolved Boron	Dissolved Sulfate	pH	ORP
						mg/L	mg/L	SU	mV
G313	--	Groundwater Only Control	25-Jan-22	0	G313-1a	6.5	1,372	6.98	-60
					G313-2a	6.7	1,473	6.98	-21
					Average Concentration (mg/L)	**6.6**	**1,423**	**6.98**	**-41**
			1-Feb-22	7	G313-1	6.3	1,158	6.98	113
					G313-2	6.2	1,058	6.97	40
					Average Concentration (mg/L)	**6.2**	**1,108**	**6.98**	**77**
	G313 SB-306 Geologic Material	2:1 Soil:Water Ratio	25-Jan-22	0					
			1-Feb-22	7	SB-306:G313 2:1-1	4.5	884	6.95	46
					SB-306:G313 2:1-2	4.7	779	6.95	44
					Average Concentration (mg/L)	**4.6**	**831**	**6.95**	**45**
		1:1 Soil:Water Ratio	25-Jan-22	0					
			1-Feb-22	7	SB-306:G313 1:1-1	5.3	1,049	6.94	75
					SB-306:G313 1:1-2	5.3	976	6.93	44
					Average Concentration (mg/L)	**5.3**	**1,012**	**6.94**	**60**
		1:5 Soil:Water Ratio	25-Jan-22	0					
			1-Feb-22	7	SB-306:G313 1:5-1	5.8	243	6.95	80
					SB-306:G313 1:5-2	6.1	1,005	6.96	-5
					Average Concentration (mg/L)	**5.9**	**624**	**6.96**	**38**
		1:10 Soil:Water Ratio	25-Jan-22	0					
			1-Feb-22	7	SB-306:G313 1:10-1	6.1	958	6.96	203
					SB-306:G313 1:10-2	6.1	832	6.97	90
					Average Concentration (mg/L)	**6.1**	**895**	**6.97**	**147**
		1:20 Soil:Water Ratio	25-Jan-22	0					
			1-Feb-22	7	SB-306:G313 1:20-1	6.0	881	6.96	39
					SB-306:G313 1:20-2	6.0	1,409	6.94	81
					Average Concentration (mg/L)	**6.0**	**1,145**	**6.95**	**60**
	G313 SB-313 Geologic Material	2:1 Soil:Water Ratio	25-Jan-22	0					
			1-Feb-22	7	SB-313:G313 2:1-1	4.3	852	6.96	164
					SB-313:G313 2:1-2	4.6	900	6.93	143
					Average Concentration (mg/L)	**4.5**	**876**	**6.95**	**154**
		1:1 Soil:Water Ratio	25-Jan-22	0					
			1-Feb-22	7	SB-313:G313 1:1-1	4.9	482	6.99	78
					SB-313:G313 1:1-2	5.0	1,000	6.95	39
					Average Concentration (mg/L)	**4.9**	**741**	**6.97**	**59**
		1:5 Soil:Water Ratio	25-Jan-22	0					
			1-Feb-22	7	SB-313:G313 1:5-1	6.0	1,227	6.96	23
					SB-313:G313 1:5-2	6.2	837	6.97	25
					Average Concentration (mg/L)	**6.1**	**1,032**	**6.97**	**24**
		1:10 Soil:Water Ratio	25-Jan-22	0					
			1-Feb-22	7	SB-313:G313 1:10-1	6.0	1,459	6.97	63
					SB-313:G313 1:10-2	5.8	2,105	6.98	85
					Average Concentration (mg/L)	**5.9**	**1,782**	**6.98**	**74**
		1:20 Soil:Water Ratio	25-Jan-22	0					
			1-Feb-22	7	SB-313:G313 1:20-1	5.8	1,000	6.96	125
					SB-313:G313 1:20-2	6.0	1,043	6.97	47
					Average Concentration (mg/L)	**5.9**	**1,022**	**6.97**	**86**

Notes:

mg/L - milligrams per liter
mV - millivolts
SU - Standard Units
ORP - oxidation/reduction potential

Table 9a. Partition Coefficient Results, G311 Geochemical Conceptual Site Model Coffeen Power Plant - Ash Pond No. 1

Analyte	Isotherm	Variable	Value
Sulfate	Linear	R^2	0.61
		K_D (L/kg)	10.11
	Langmuir	R^2	0.65
		q_m (mg/g)	-0.10
		K_L (L/kg)	-6.24E+02
	Freundlich	R^2	0.78
		1/n	10.27
		K_F (L/kg)	9.20E-12

Notes:

K_D - linear partition coefficient

K_L - Langmuir partition coefficient

K_F - Freundlich partition coefficient

q_m - inverse of the slope of the linearized Langmuir isotherm

n - non-linearity constant of the Freundlich isotherm

Table 9b. Partition Coefficient Results, G313
Geochemical Conceptual Site Model Coffeen
Power Plant - Ash Pond No. 1

Materials	Analyte	Isotherm	Variable	Value
G313/SB-306	Boron	Linear	R^2	0.37
			K_D (L/kg)	6.13
		Langmuir	R^2	0.76
			q_m (mg/g)	0.00
			K_L (L/kg)	-1.51E+05
		Freundlich	R^2	0.64
			1/n	6.65
			K_F (L/kg)	6.50E-01
	Sulfate	Linear	R^2	0.05
			K_D (L/kg)	3.97
		Langmuir	R^2	0.01
			q_m (mg/g)	2.20
			K_L (L/kg)	1.19E+03
		Freundlich	R^2	0.00
			1/n	-0.06
			K_F (L/kg)	1.70E+03
G313/SB-313	Boron	Linear	R^2	0.24
			K_D (L/kg)	5.68
		Langmuir	R^2	0.50
			q_m (mg/g)	0.00
			K_L (L/kg)	-1.43E+05
		Freundlich	R^2	0.46
			1/n	5.25
			K_F (L/kg)	2.03E+00
	Sulfate	Linear	R^2	0.21
			K_D (L/kg)	-6.50
		Langmuir	R^2	0.51
			q_m (mg/g)	-0.66
			K_L (L/kg)	-6.91E+02
		Freundlich	R^2	--
			1/n	--
			K_F (L/kg)	--

Notes:

The Freundlich isotherm was not calculated for G313/SB-313 because the data were not conducive to log transformation

K_D - linear partition coefficient

K_L - Langmuir partition coefficient

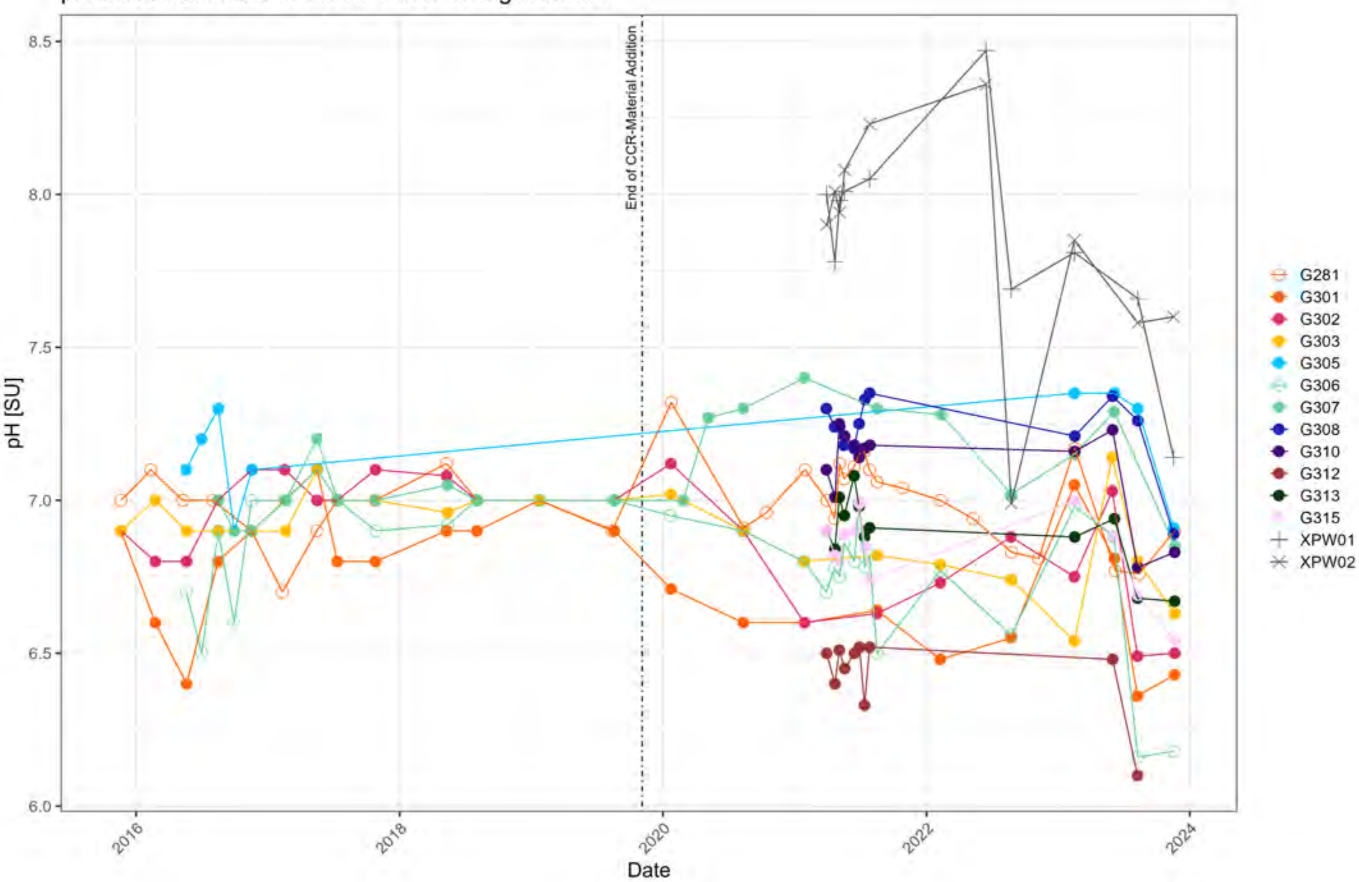
K_F - Freundlich partition coefficient

q_m - inverse of the slope of the linearized Langmuir isotherm

n - non-linearity constant of the Freundlich isotherm

FIGURES

pH across UA wells in the AP1 Monitoring Network



Notes:
SU: Standard Units
Background wells shown with open symbols.

pH Time Series – Uppermost Aquifer

Coffeen Power Plant – Ash Pond No. 1

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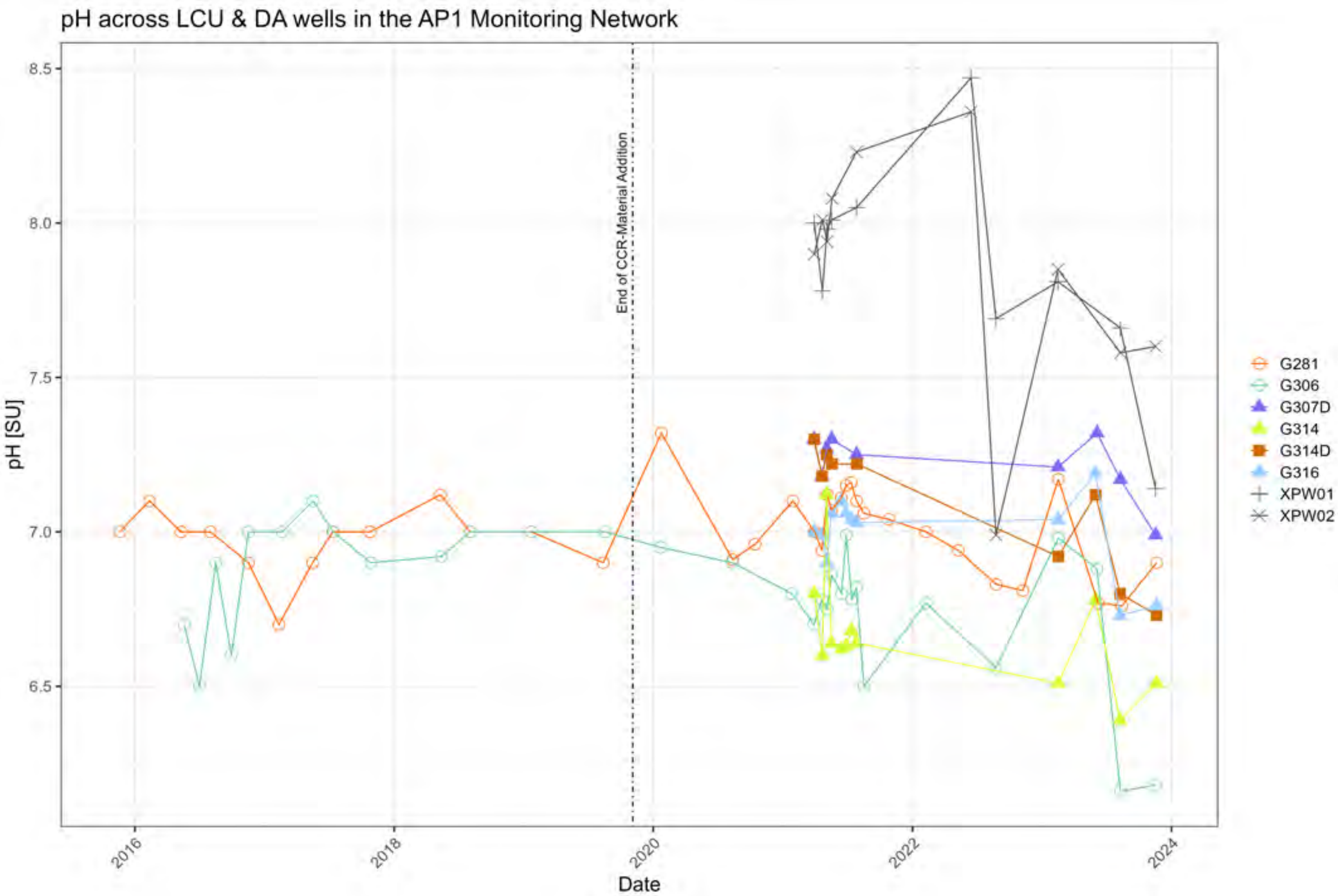
Figure **1a**

Columbus, Ohio | February 2024



Notes:
SU: Standard Units
Background wells shown with open symbols.

pH Time Series – Lower Confining Unit & Deep Aquifer

Coffeen Power Plant – Ash Pond No. 1

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Figure **1b**

Columbus, Ohio | February 2024

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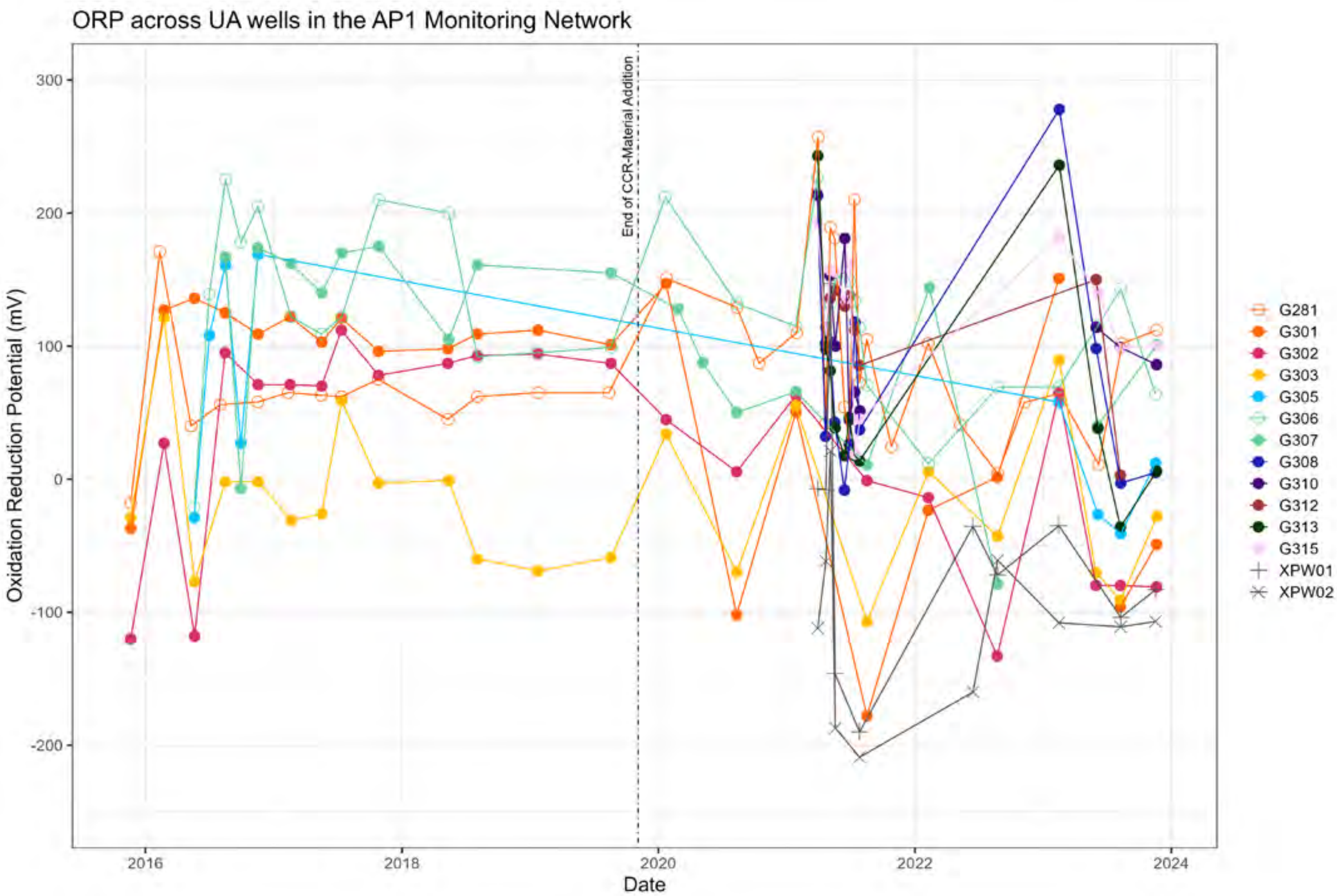

Notes:
mV: millivolts
Background wells shown with open symbols.

ORP Time Series – Uppermost Aquifer

Coffeen Power Plant – Ash Pond No. 1

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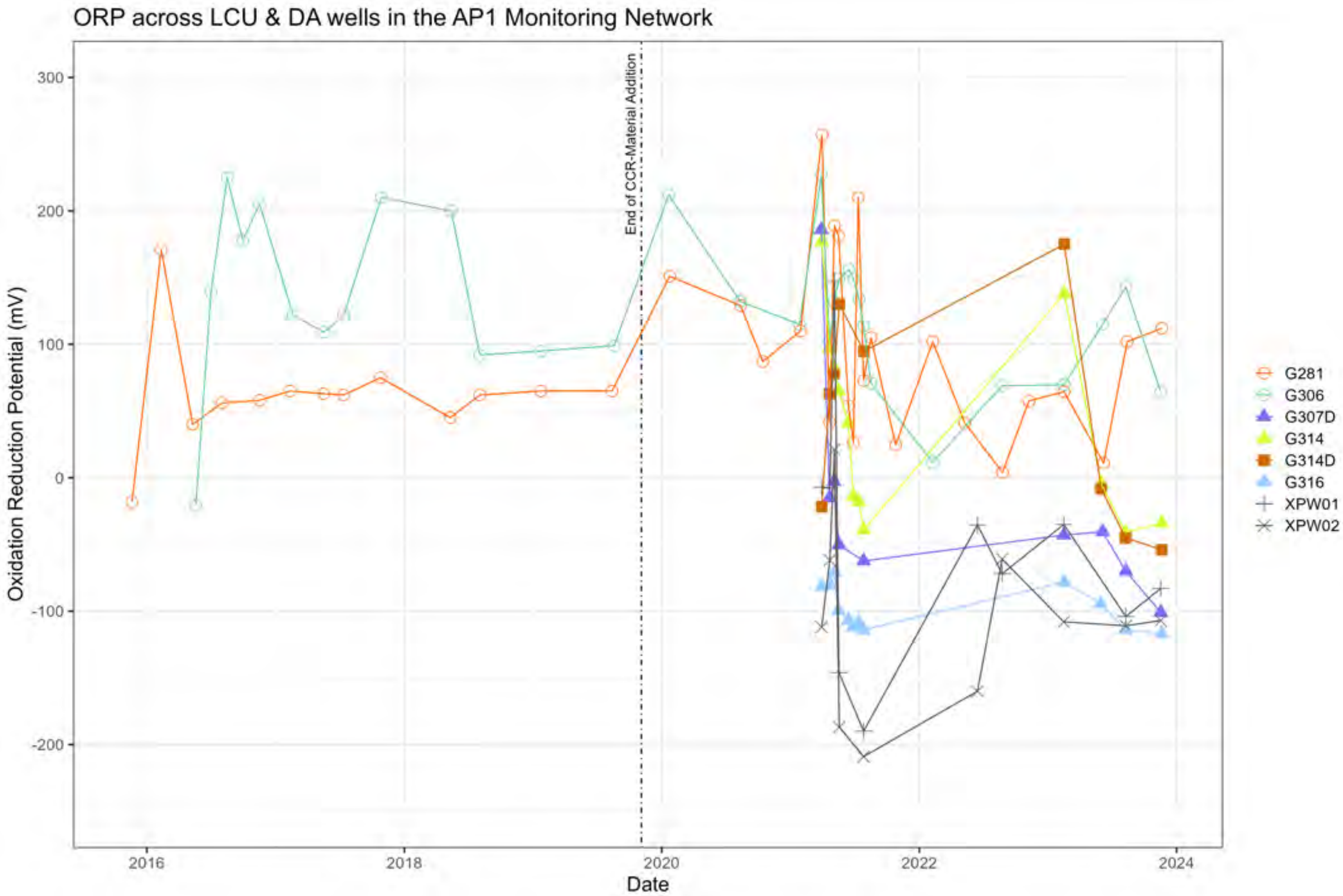
Figure

2a

Columbus, Ohio

February 2024



Notes:
mV: millivolts
Background wells shown with open symbols.

ORP Time Series – Lower Confining Unit & Deep Aquifer
Coffeen Power Plant – Ash Pond No. 1

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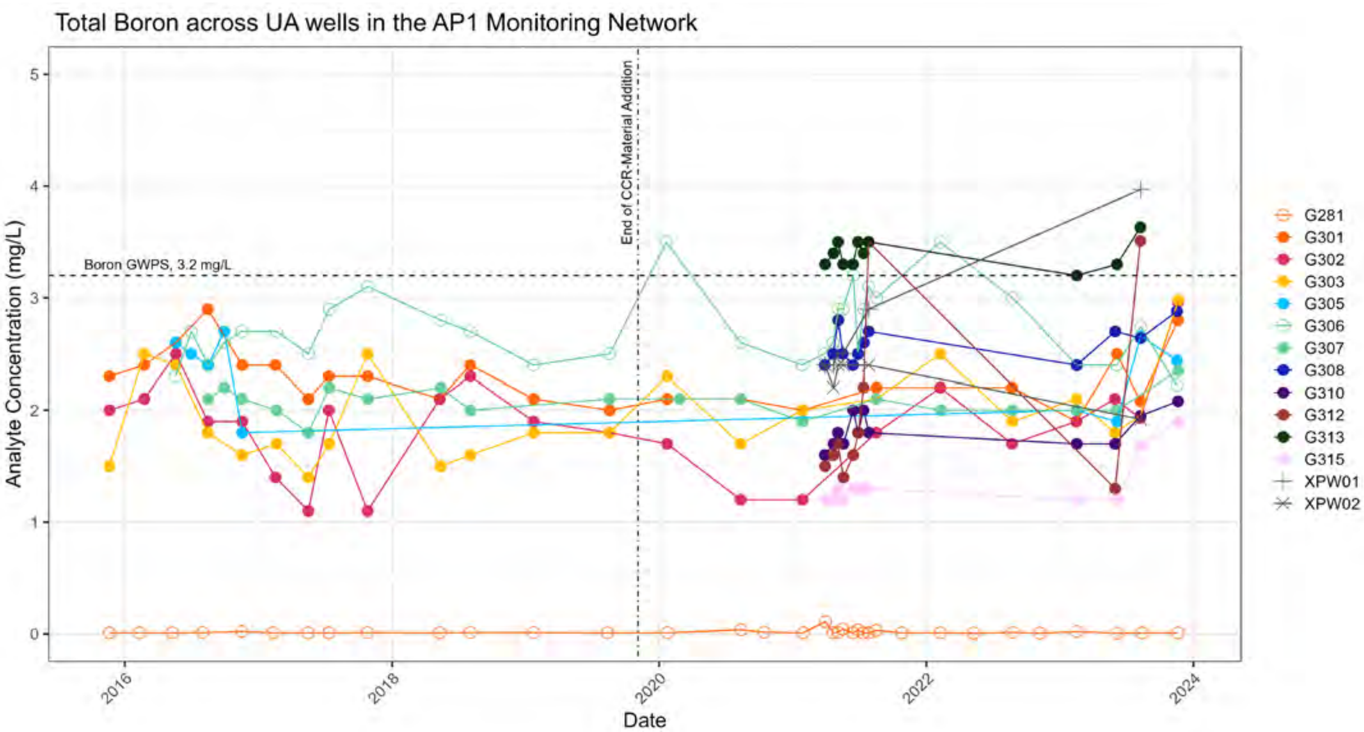
Figure **2b**

Columbus, Ohio | February 2024



Notes:
mg/L: milligrams per liter
GWPS: Groundwater Protection Standard
Background wells shown with open symbols.

Boron Concentration Time Series – Uppermost Aquifer

Coffeen Power Plant – Ash Pond No. 1

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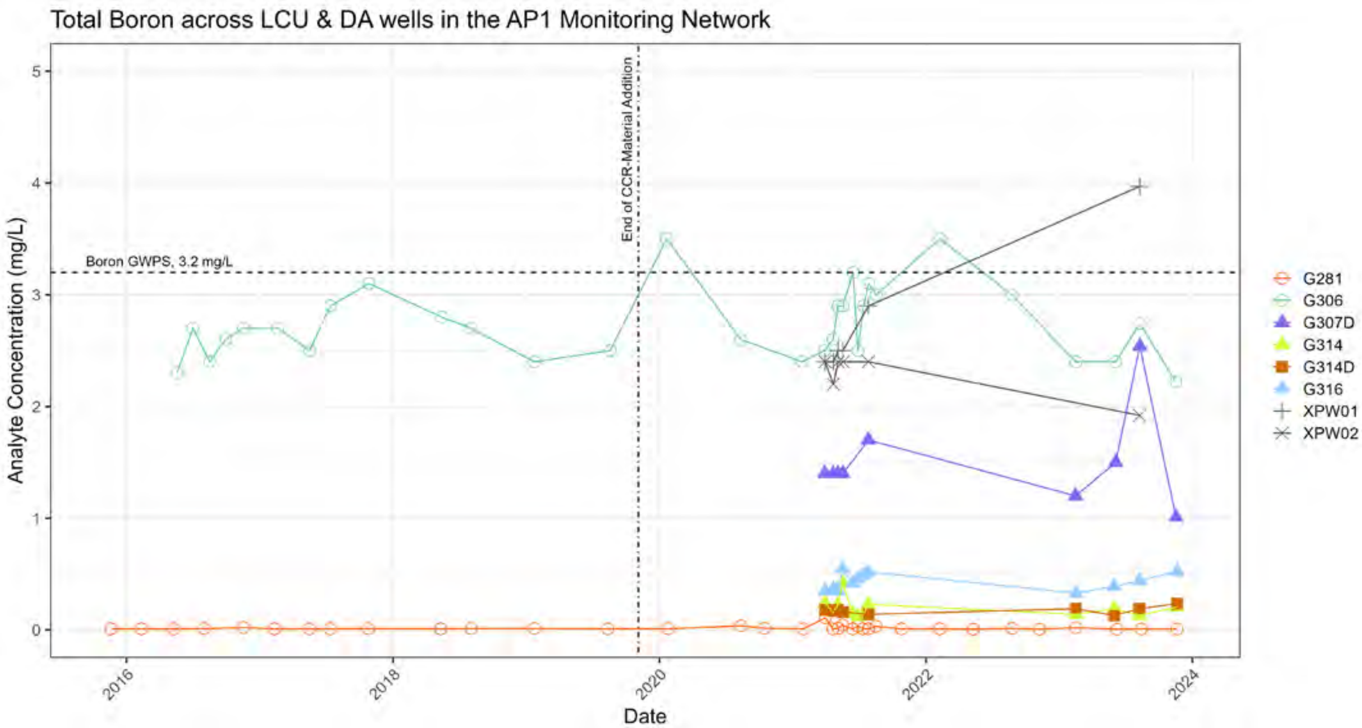
Figure **3a**

Columbus, Ohio | February 2024



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Notes:
mg/L: milligrams per liter
GWPS: Groundwater Protection Standard
Background wells shown with open symbols.

Boron Concentration Time Series –
Lower Confining Unit & Deep Aquifer
Coffeen Power Plant – Ash Pond No. 1

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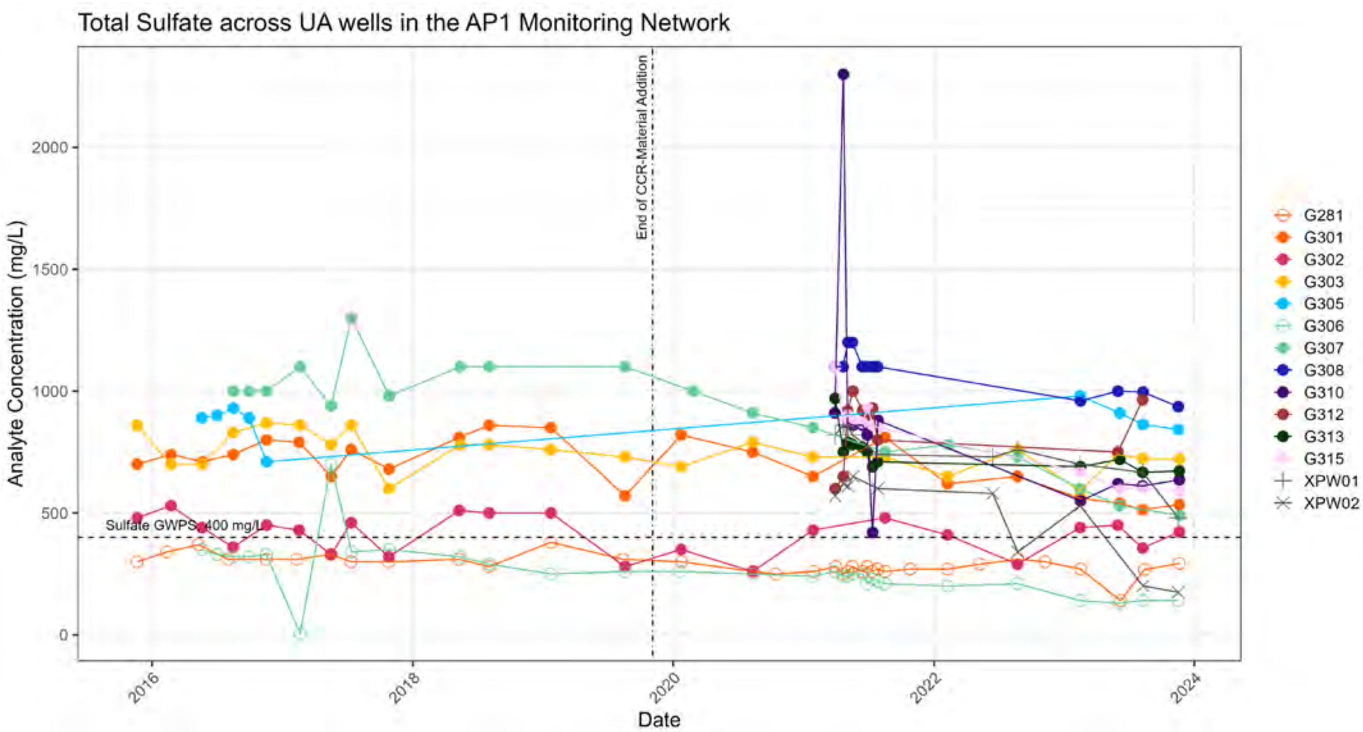
Figure **3b**

Columbus, Ohio | February 2024



Notes:
mg/L: milligrams per liter
GWPS: Groundwater Protection Standard
Background wells shown with open symbols.

Sulfate Concentration Time Series – Uppermost Aquifer

Coffeen Power Plant – Ash Pond No. 1

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Figure **4a**

Columbus, Ohio

February 2024

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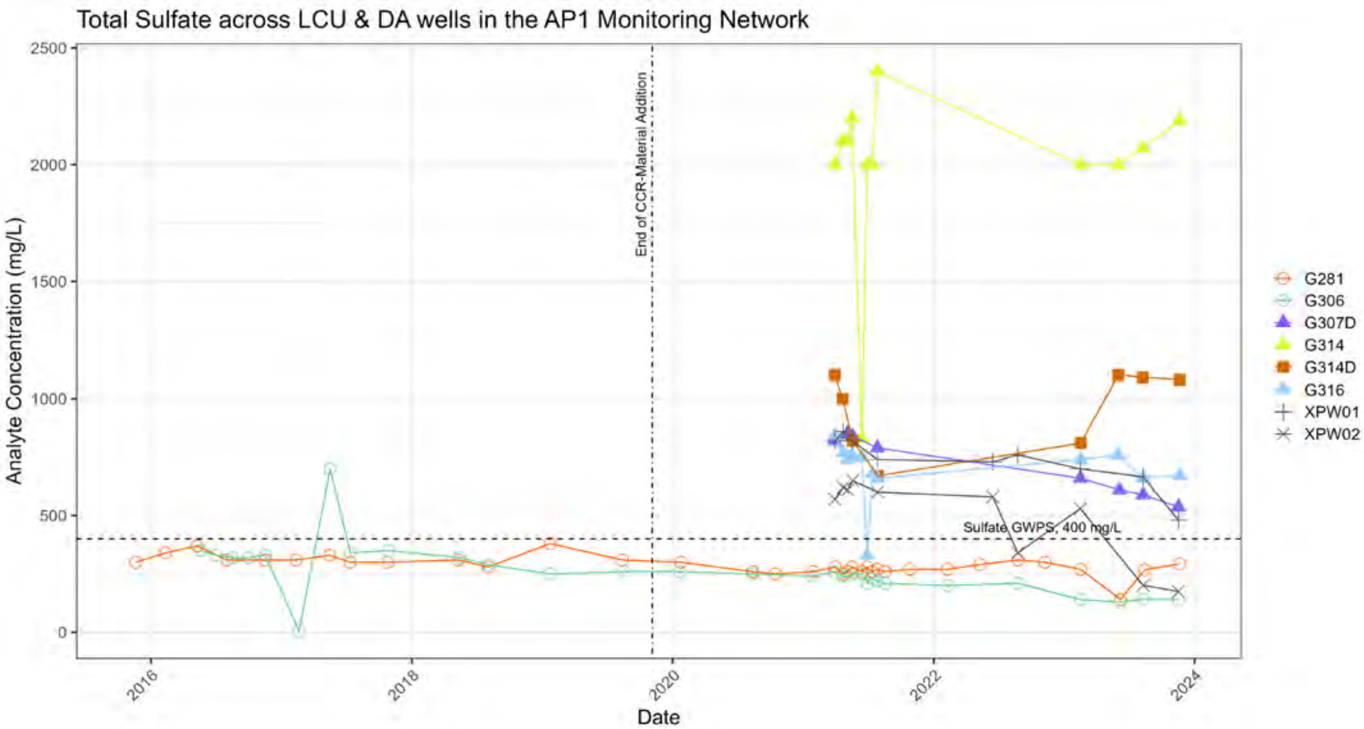

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Notes:
mg/L: milligrams per liter
GWPS: Groundwater Protection Standard
Background wells shown with open symbols.

Sulfate Concentration Time Series –
Lower Confining Unit & Deep Aquifer
Coffeen Power Plant – Ash Pond No. 1

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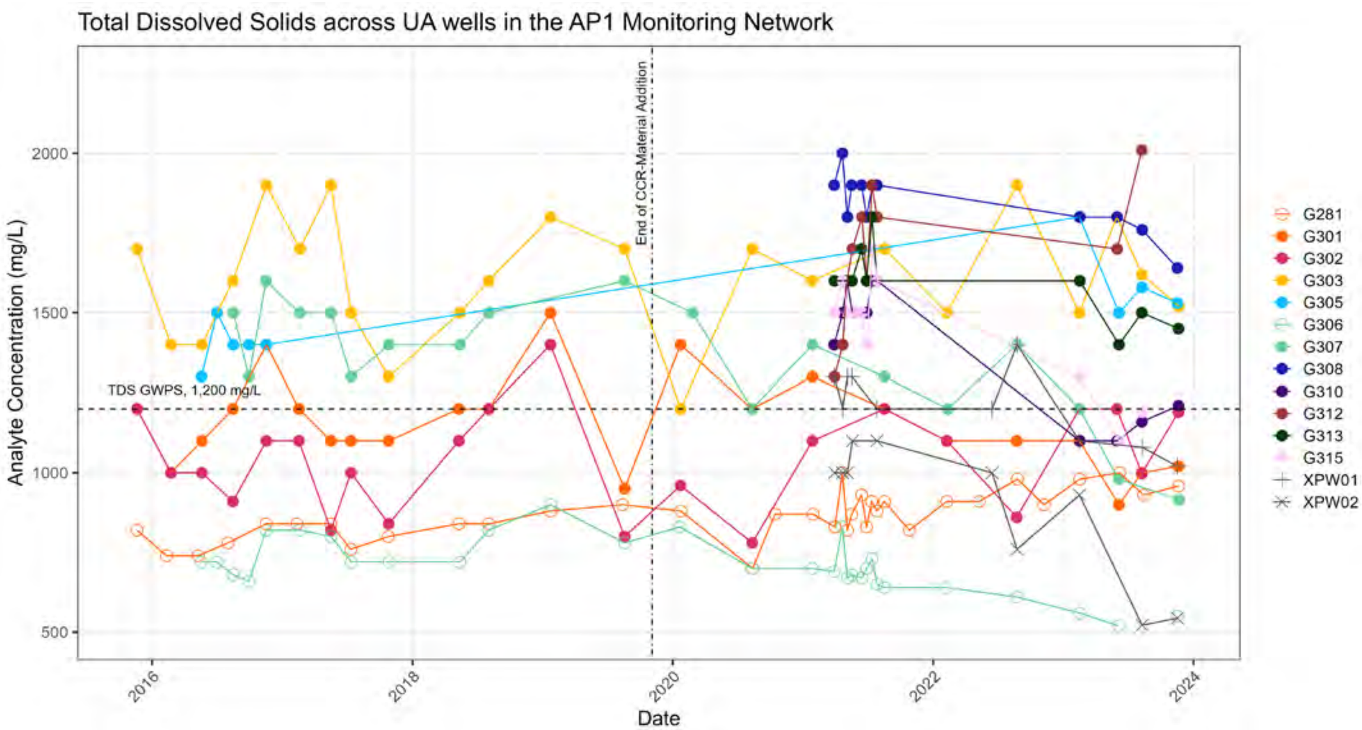
Figure
4b

Columbus, Ohio | February 2024



Notes:
mg/L: milligrams per liter
GWPS: Groundwater Protection Standard
Background wells shown with open symbols.

Total Dissolved Solids Concentration Time Series – Uppermost Aquifer
Coffeen Power Plant – Ash Pond No. 1

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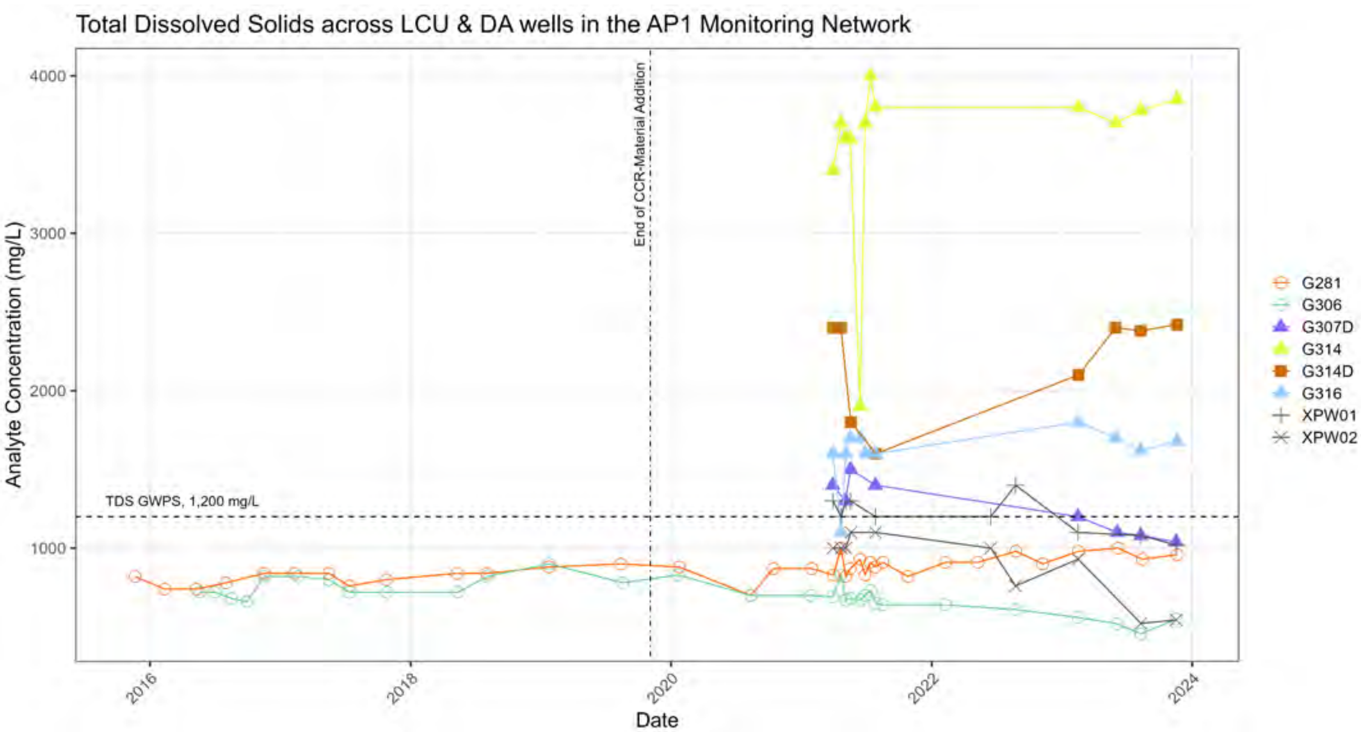
Figure **5a**

Columbus, Ohio | February 2024



Notes:
mg/L: milligrams per liter
GWPS: Groundwater Protection Standard
Background wells shown with open symbols.

Total Dissolved Solids Concentration Time Series – Lower Confining Unit & Deep Aquifer
Coffeen Power Plant – Ash Pond No. 1

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Figure **5b**

Columbus, Ohio

February 2024

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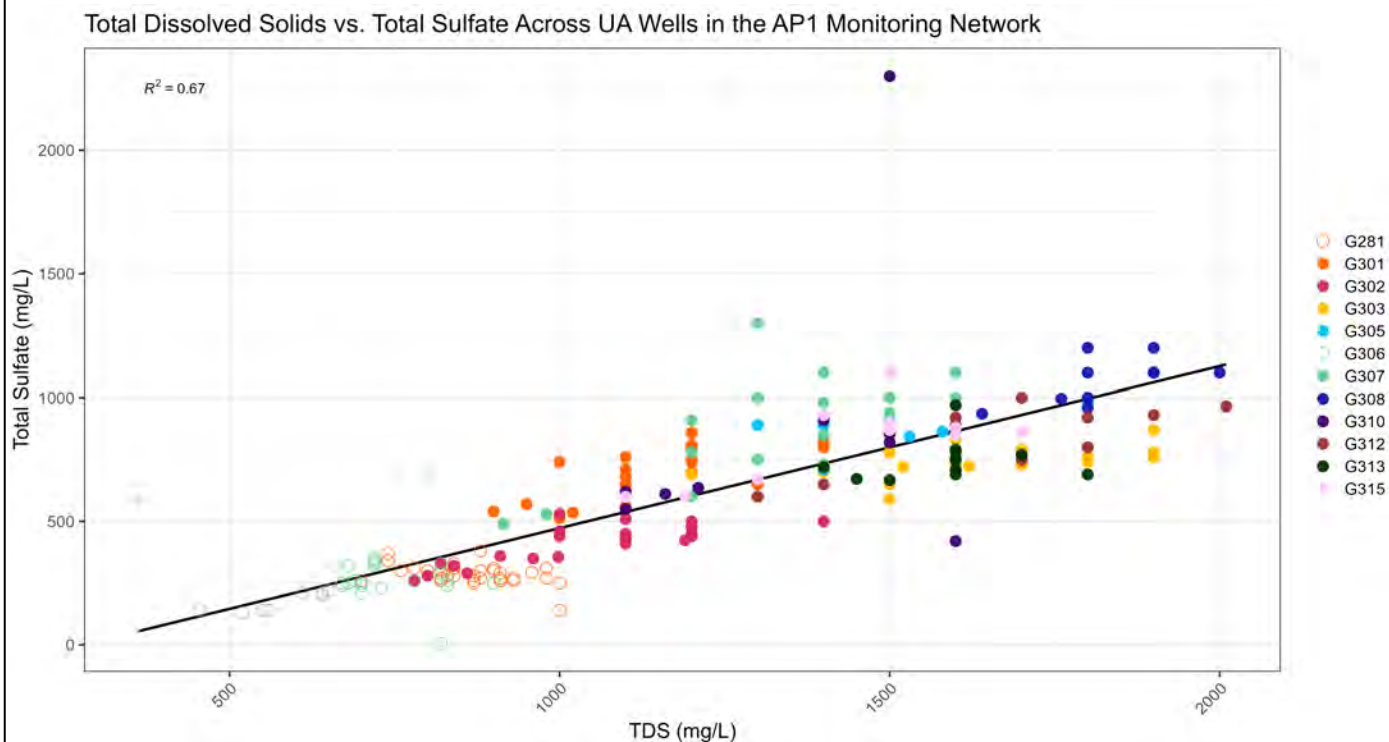

Notes:
mg/L: milligrams per liter
Background wells shown with open symbols.

TDS Concentration vs Sulfate Concentration – Uppermost Aquifer

Coffeen Power Plant – Ash Pond No. 1

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Figure **6a**

Columbus, Ohio | May 2024

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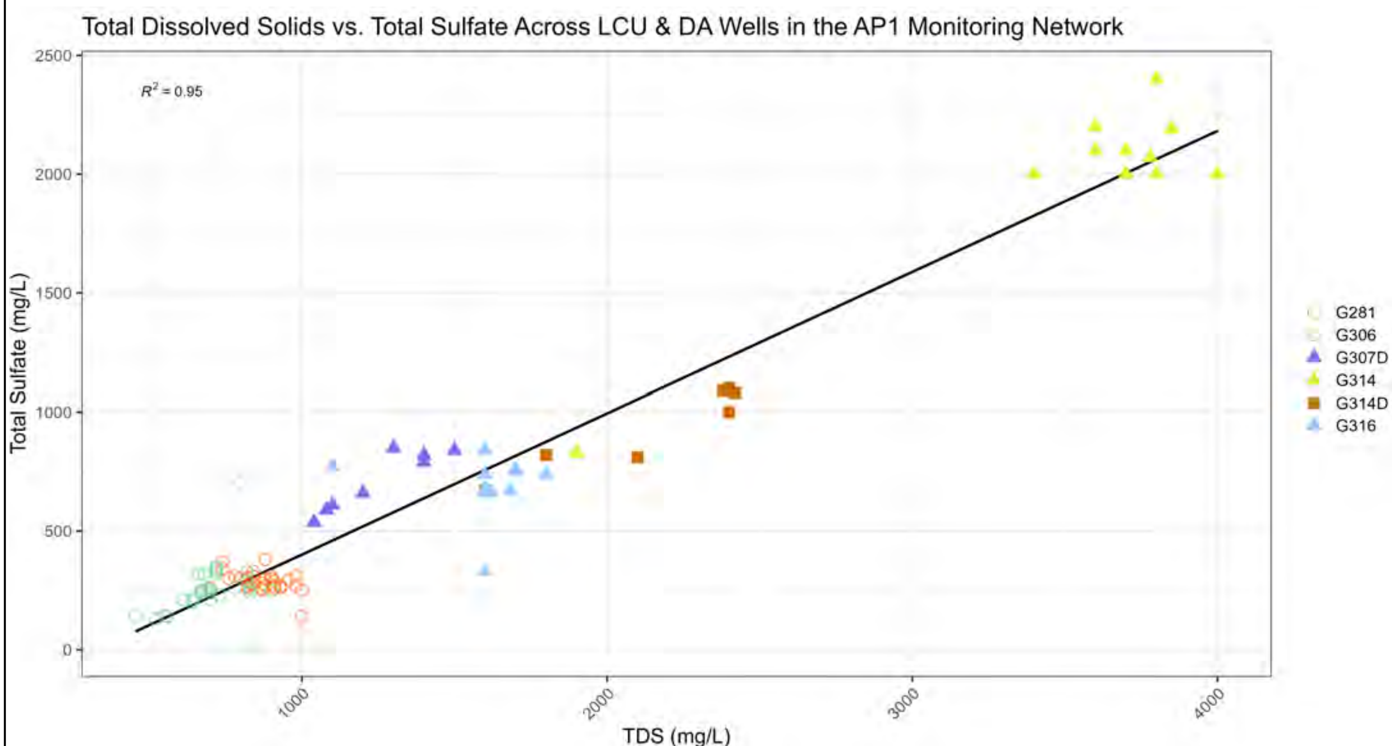

Notes:
mg/L: milligrams per liter
Background wells shown with open symbols.

TDS Concentration vs Sulfate Concentration – Lower Confining Unit & Deep Aquifer

Coffeen Power Plant – Ash Pond No. 1

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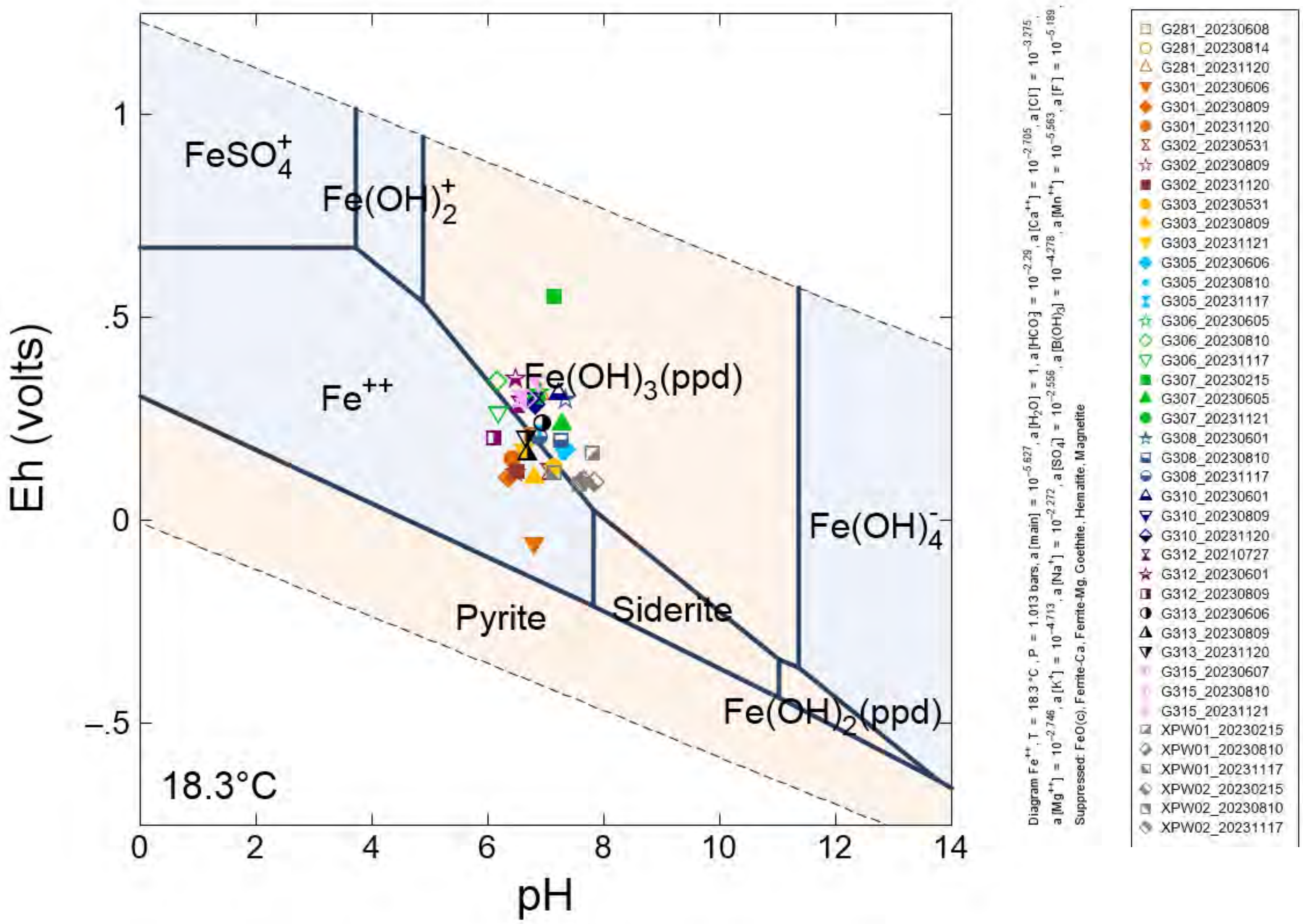
Figure **6b**

Columbus, Ohio | May 2024



Notes:

1. Diagram was generated using conditions detected at well G313 on 6/6/2023.
2. Well G313 is screened within the uppermost aquifer.
3. The most recent available pH and ORP data for each location are displayed.
4. Hematite, ferrite-Ca, ferrite-Mg, goethite, crystalline iron oxide, and magnetite were suppressed during model generation.

Iron Pourbaix Diagram; Crystalline Phases Suppressed – Uppermost Aquifer

Coffeen Power Plant – Ash Pond No. 1

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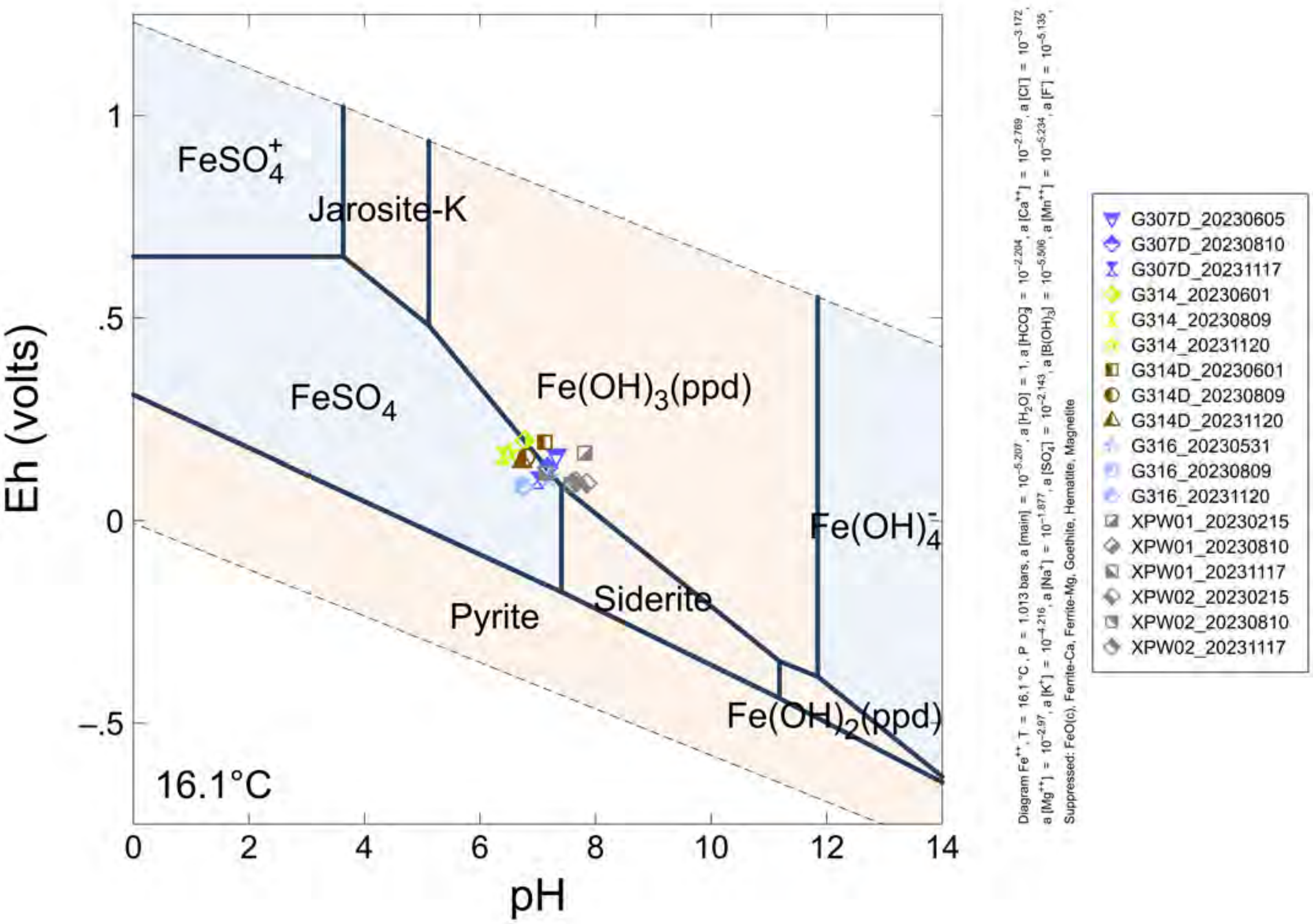
Figure **7a**

Columbus, Ohio | February 2024



Notes:

1. Diagram was generated using conditions detected at well G314 on 6/1/2023.
2. Well G314 is screened in the lower confining unit.
3. The most recent available pH and ORP data for each location are displayed.
4. Hematite, ferrite-Ca, ferrite-Mg, goethite, crystalline iron oxide, and magnetite were suppressed during model generation.

Iron Pourbaix Diagram; Crystalline Phases Suppressed – Lower Confining Unit & Deep Aquifer
Coffeen Power Plant – Ash Pond No. 1

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Figure **7b**

Columbus, Ohio | February 2024

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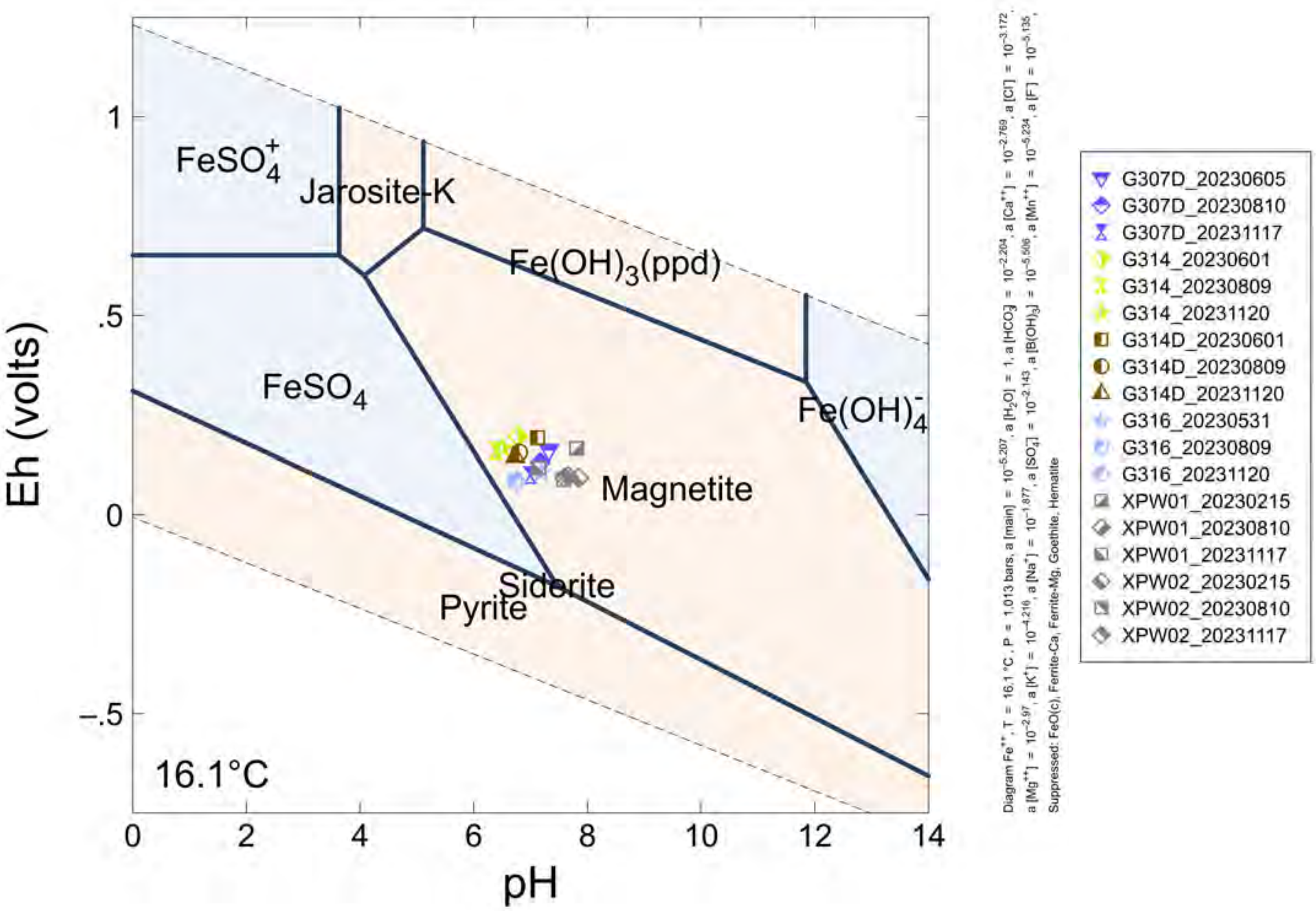

Notes:

1. Diagram was generated using conditions detected at well G314 on 6/1/2023.
2. Well G314 is screened in the lower confining unit.
3. The most recent available pH and ORP data for each location are displayed.
4. Ferrite-Ca, ferrite-Mg, goethite, crystalline iron oxide, and hematite were suppressed during model generation.

Iron Pourbaix Diagram –
Lower Confining Unit & Deep Aquifer
Coffeen Power Plant – Ash Pond No. 1

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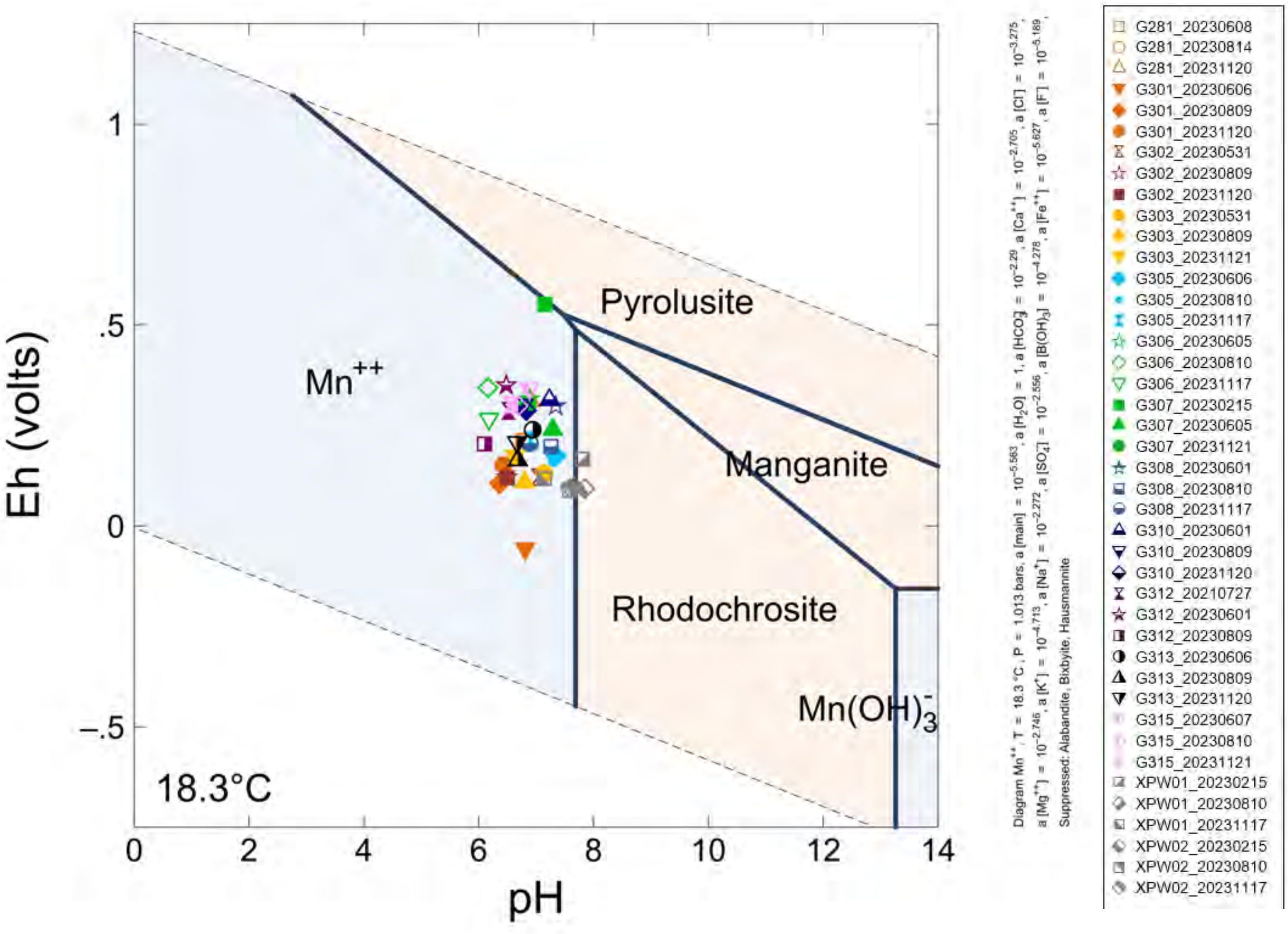
Figure **7c**

Columbus, Ohio | February 2024



Notes:

1. Diagram was generated using conditions detected at well G313 on 6/6/2023.
2. The most recent available pH and ORP data for each location are displayed.
3. Alabandite, bixbyite, and hausmannite were suppressed during model generation.

Manganese Pourbaix Diagram – Uppermost Aquifer

Coffeen Power Plant – Ash Pond No. 1

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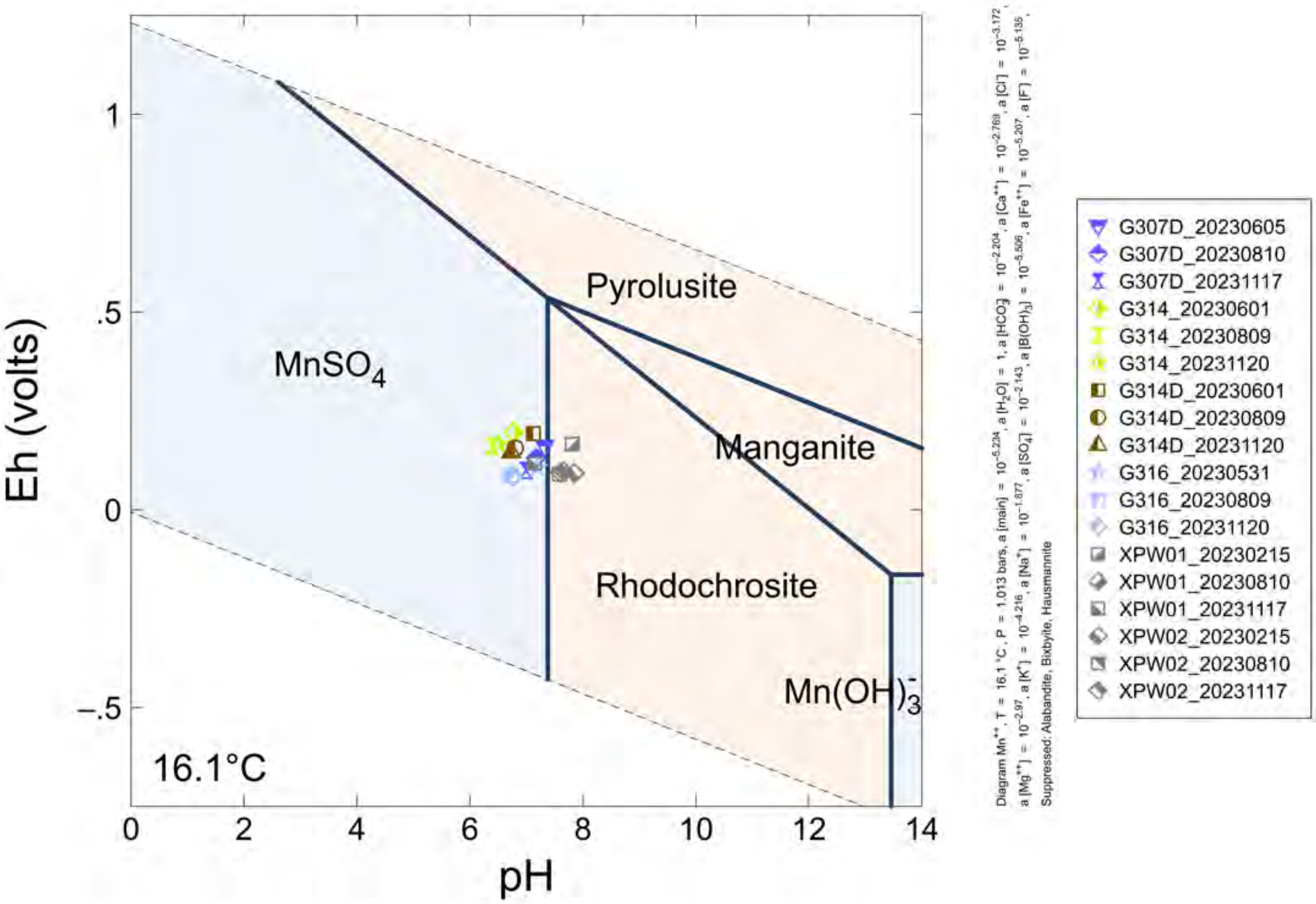
Figure **8a**

Columbus, Ohio | February 2024



Notes:

1. Diagram was generated using conditions detected at well G314 on 6/1/2023.
2. Well G314 is screened in the lower confining unit.
3. The most recent available pH and ORP data for each location are displayed.
4. Alabandite, bixbyite, and hausmannite were suppressed during model generation.

Manganese Pourbaix Diagram –
Lower Confining Unit & Deep Aquifer
Coffeen Power Plant – Ash Pond No. 1

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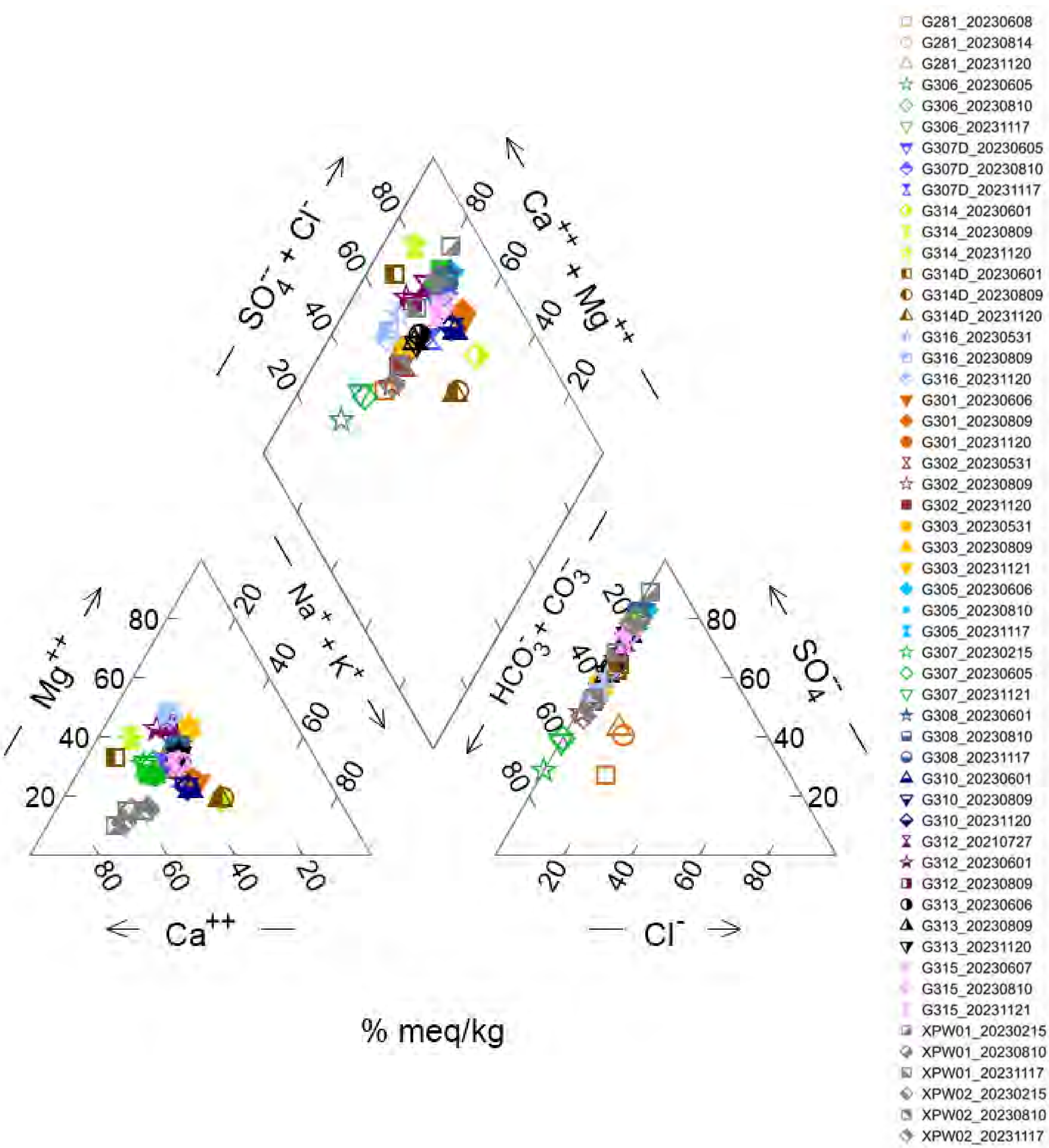
Columbus, Ohio

February 2024

Figure **8b**



Notes:

1. The three most recent available data points for each location are displayed.

% meq/kg: percent milliequivalents per kilogram

Piper Diagram

Coffeen Power Plant – Ash Pond No. 1

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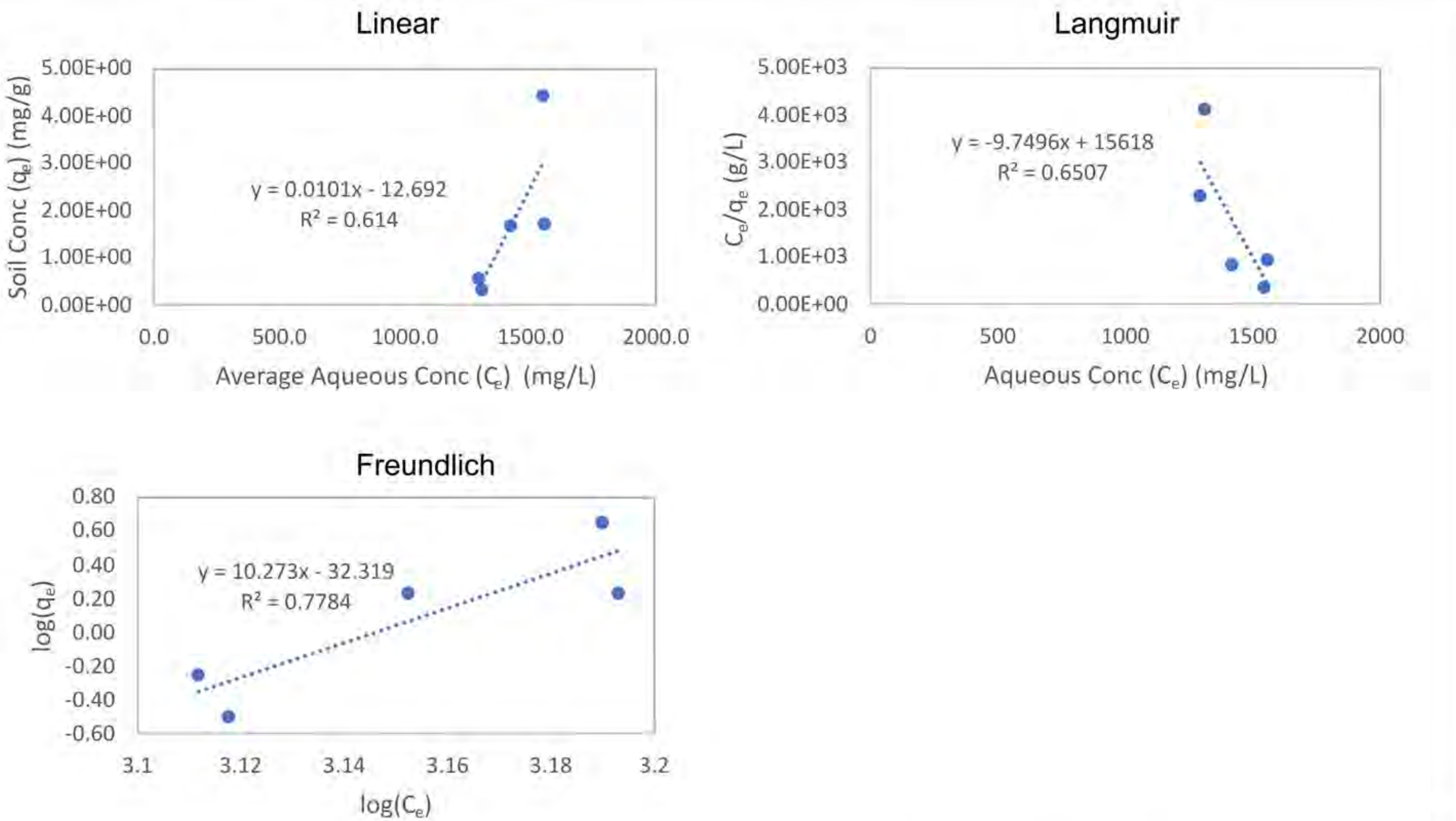
Figure **9**

Columbus, Ohio | February 2024



Notes:

q_e - mass of constituent adsorbed to the solid phase
C_e - remaining aqueous constituent concentration
mg/L - milligrams per liter
mg/g - milligrams per gram
g/L - grams per liter

G311 Sulfate Partitioning Coefficients
Coffeen Power Plant AP-1
Coffeen, Illinois

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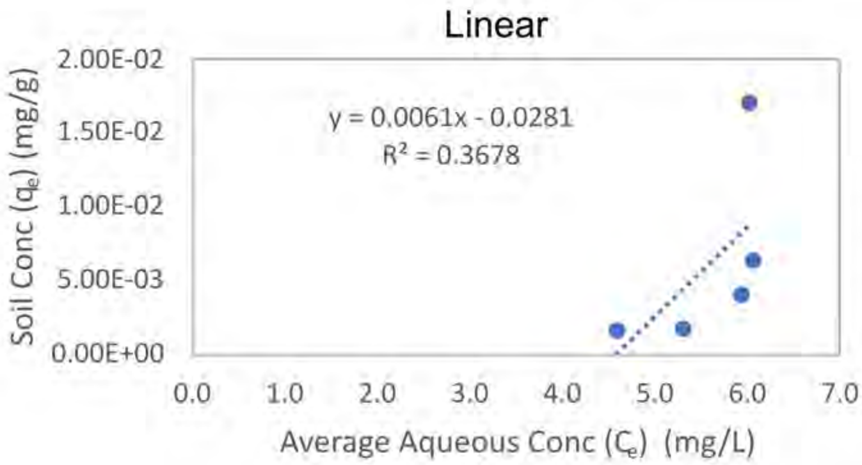
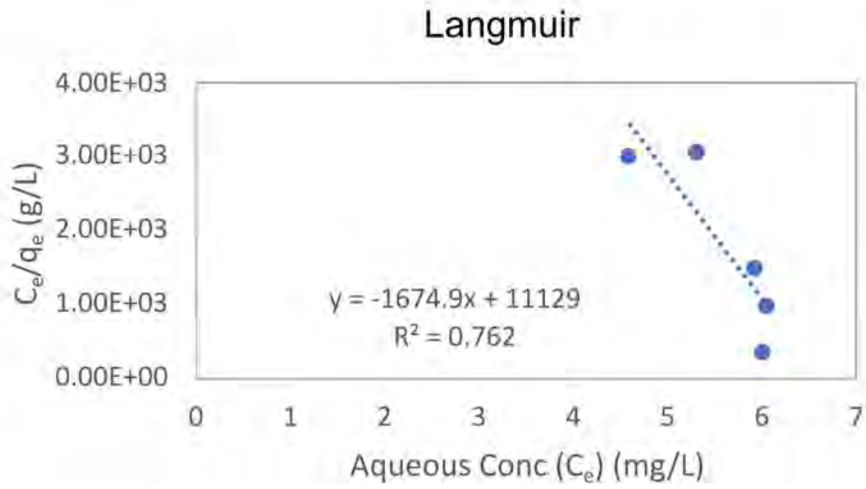
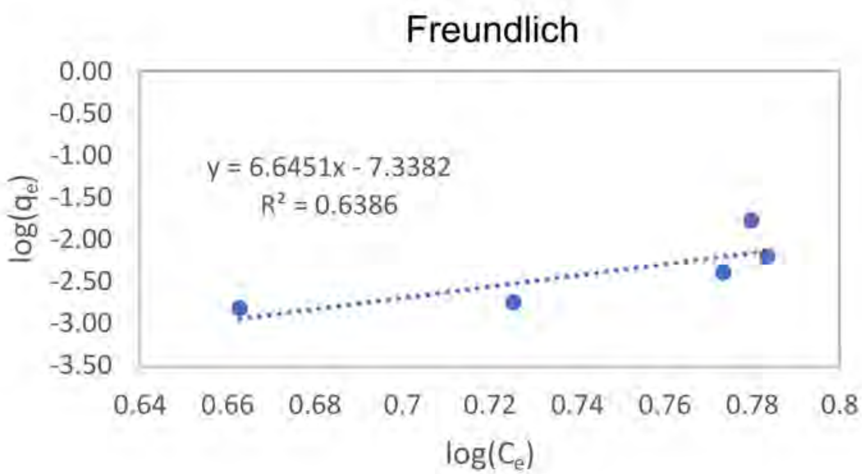
Columbus, OH | January 2024

Figure **10a**







Notes:

q_e - mass of constituent adsorbed to the solid phase
C_e - remaining aqueous constituent concentration
mg/L - milligrams per liter
mg/g - milligrams per gram
g/L - grams per liter

G313/SB-306 Boron Partitioning Coefficients
Coffeen Power Plant AP-1
Coffeen, Illinois

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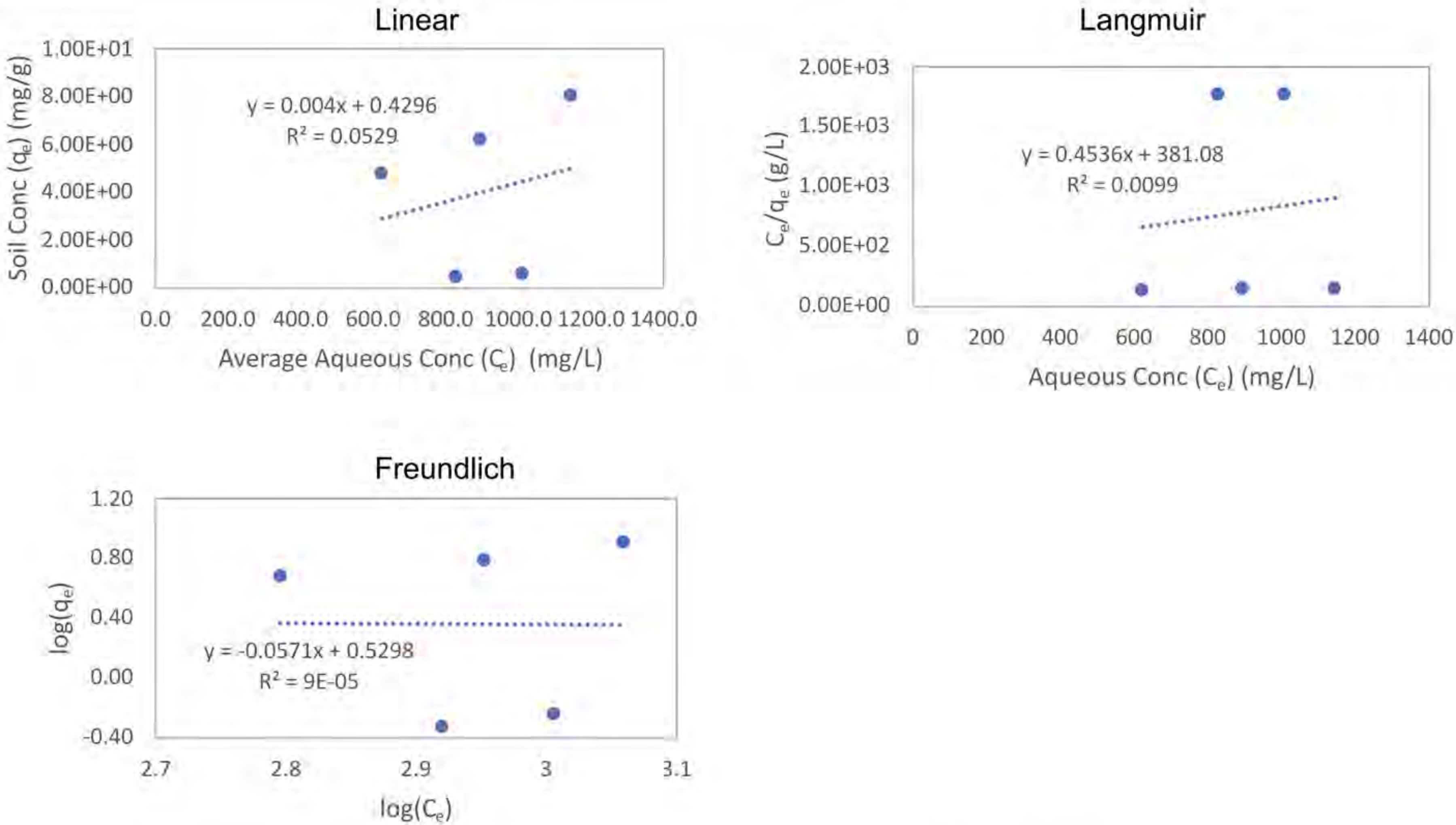
Columbus, OH | January 2024

Figure **10b**



Notes:

q_e - mass of constituent adsorbed to the solid phase
C_e - remaining aqueous constituent concentration
mg/L - milligrams per liter
mg/g - milligrams per gram
g/L - grams per liter

G313/SB-306 Sulfate Partitioning Coefficients
Coffeen Power Plant AP-1
Coffeen, Illinois

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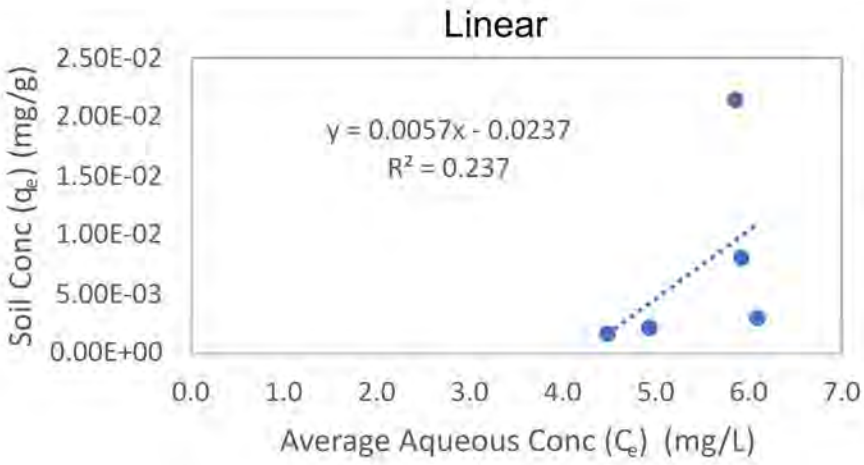
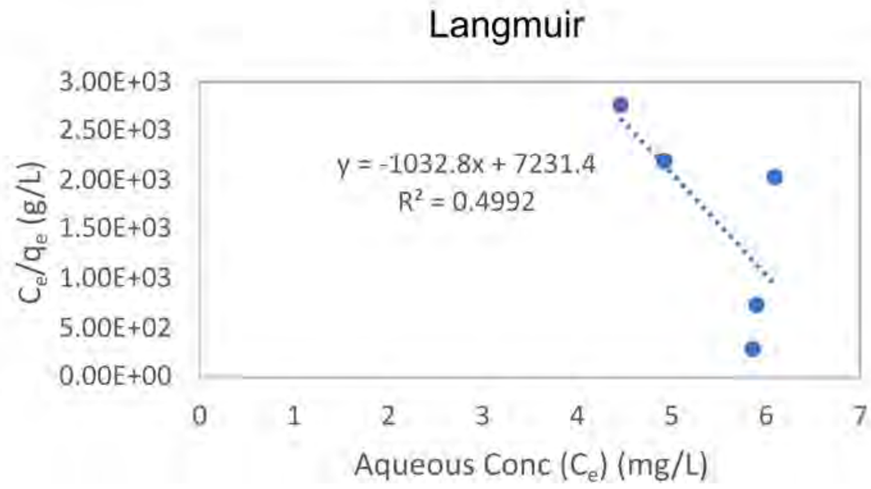
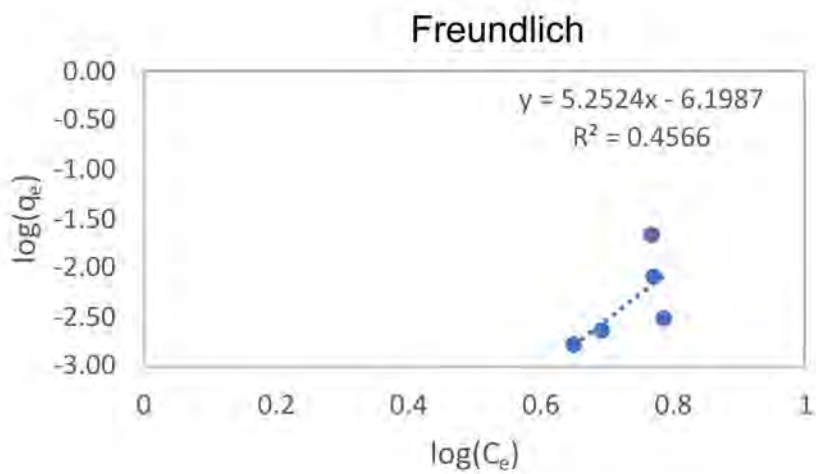
Columbus, OH | January 2024

Figure **10c**







Notes:

q_e - mass of constituent adsorbed to the solid phase
C_e - remaining aqueous constituent concentration
mg/L - milligrams per liter
mg/g - milligrams per gram
g/L - grams per liter

G313/SB-313 Boron Partitioning Coefficients
Coffeen Power Plant AP-1
Coffeen, Illinois

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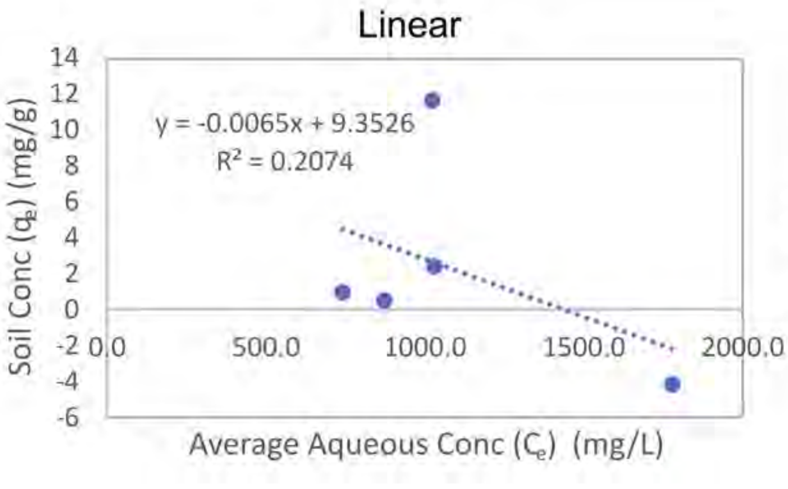
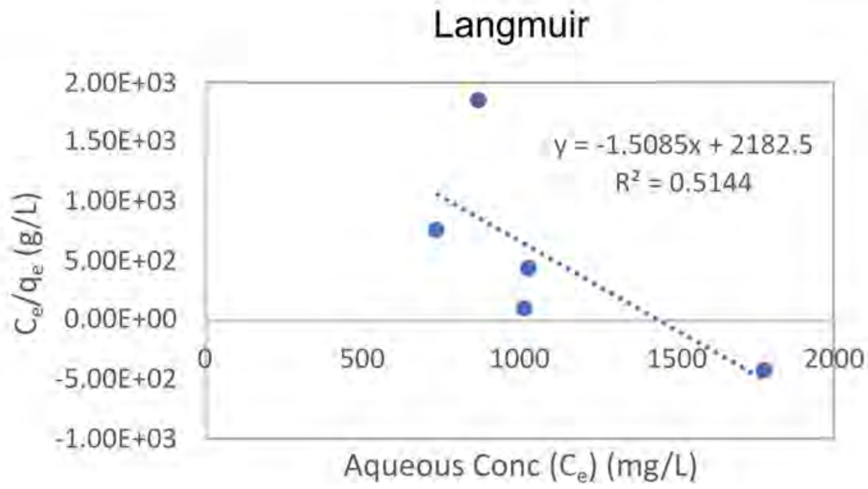
Columbus, OH | January 2024

Figure **10d**





Notes:

The Freundlich isotherm was not calculated because the data were not conducive to log transformation.

q_e - mass of constituent adsorbed to the solid phase
C_e - remaining aqueous constituent concentration
mg/L - milligrams per liter
mg/g - milligrams per gram
g/L - grams per liter

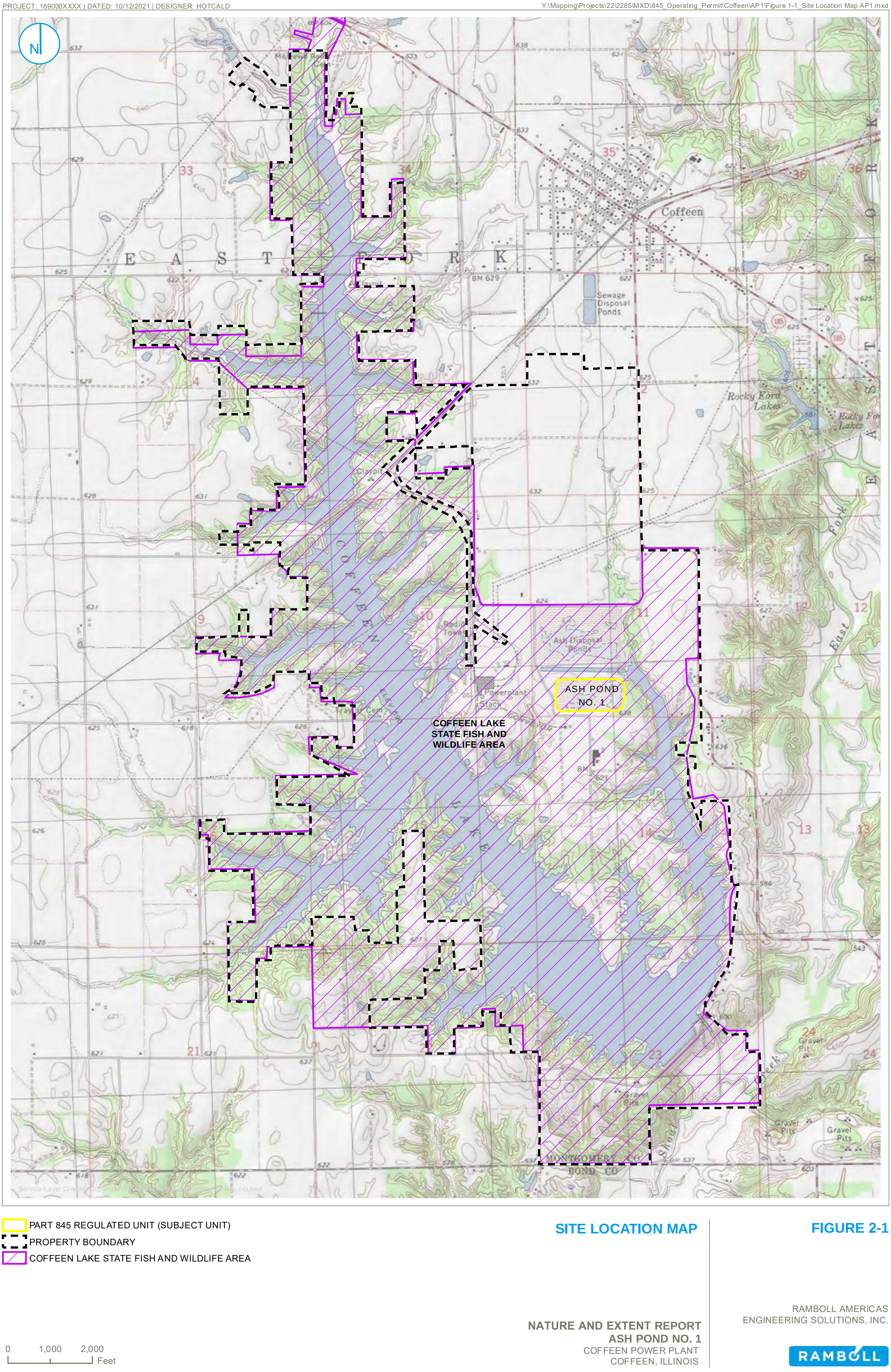
G313/SB-313 Sulfate Partitioning Coefficients
Coffeen Power Plant AP-1
Coffeen, Illinois

Geosyntec consultants

Columbus, OH | January 2024

Figure
10e

Attachment A
Site Layout Figure



SITE LOCATION MAP

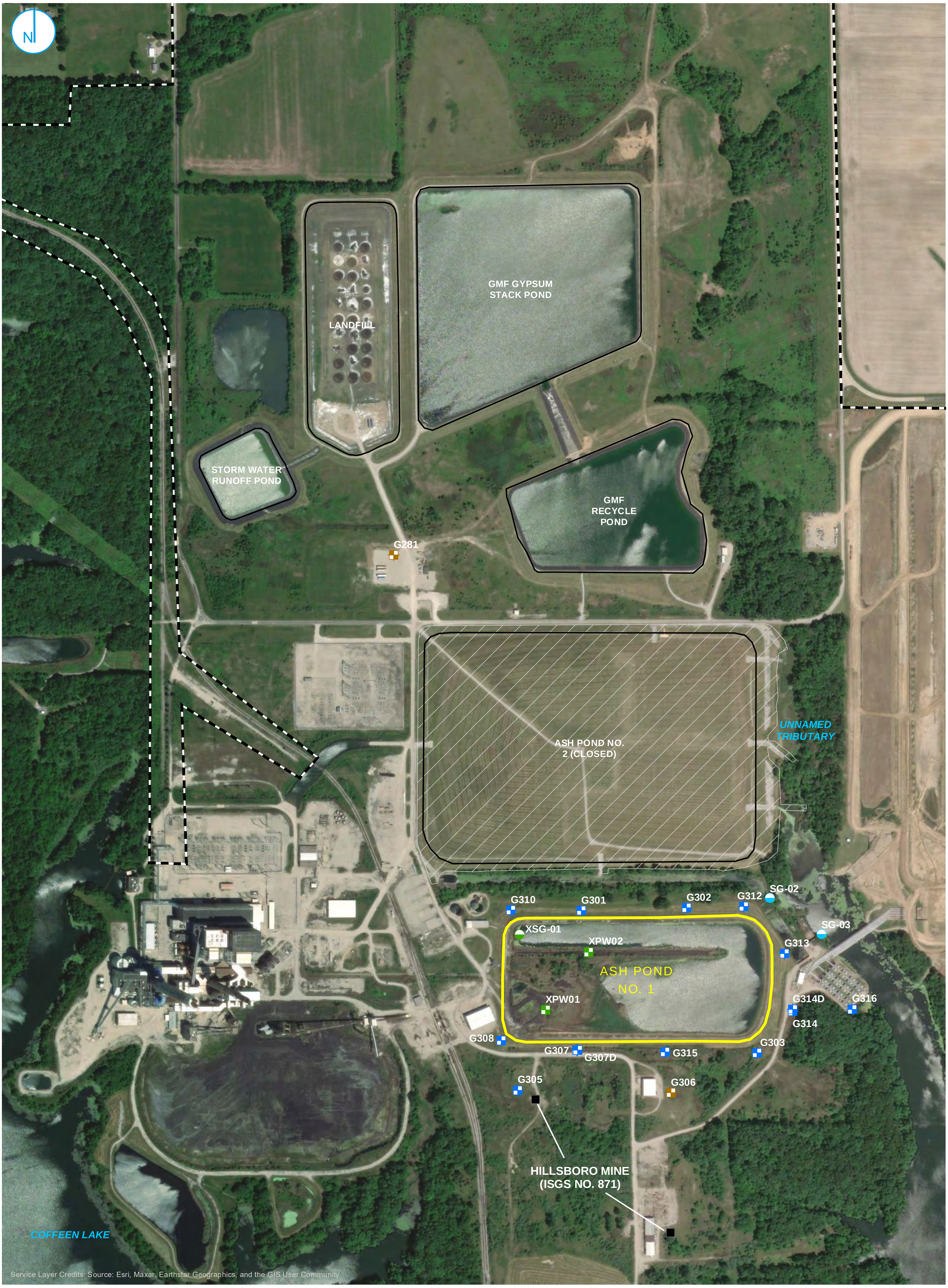
FIGURE 2-1

NATURE AND EXTENT REPORT
ASH POND NO. 1
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

Attachment B

Proposed Part 845 Groundwater Monitoring Network



COMPLIANCE MONITORING WELL
BACKGROUND MONITORING WELL
PORE WATER WELL
STAFF GAGE, CCR UNIT
STAFF GAGE, RIVER
COAL MINE SHAFT

REGULATED UNIT (SUBJECT UNIT)
SITE FEATURE
LIMITS OF FINAL COVER
PROPERTY BOUNDARY

0 275 550 Feet

MONITORING WELL LOCATION MAP

FIGURE 2-2

NATURE AND EXTENT REPORT
ASH POND NO. 1
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

Attachment C

Monitoring Well Construction Information

Table 3-1. Monitoring Well Construction Details
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 1
Coffeen, IL

Location	HSU	Date Constructed	Top of PVC Elevation (ft)	Measuring Point Elevation (ft)	Measuring Point Description	Ground Elevation (ft)	Screen Top Depth (ft bgs)	Screen Bottom Depth (ft bgs)	Screen Top Elevation (ft)	Screen Bottom Elevation (ft)	Well Depth (ft bgs)	Bottom of Boring Elevation (ft)	Screen Length (ft)	Screen Diameter (inches)	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)
G281	UA	09/08/2015	--	626.43	Top of Disk	623.82	15.51	20.16	608.31	603.66	20.3	603.50	4.7	2	39.0654052	-89.3993221
G301	UA	09/04/2015	--	622.56	Top of Disk	620.88	11.31	15.96	608.96	604.31	16.21	604.10	4.7	2	39.05951	-89.395415
G302	UA	09/04/2015	--	619.95	Top of Disk	618.52	13.21	17.86	604.74	600.09	18.39	599.60	4.7	2	39.059544	-89.393192
G303	UA	08/26/2010	--	621.93	Top of Disk	619.33	10	20	609.07	599.07	20.4	598.70	10	2	39.057144	-89.391721
G305	UA	05/03/2016	625.67	625.84	Top of PVC	623.23	13.44	18.27	609.10	604.27	18.5	604.10	4.8	2	39.056558	-89.396798
G306	UA	05/03/2016	625.91	626.08	Top of PVC	623.57	13.07	17.68	609.77	605.16	17.9	604.80	4.6	2	39.056494	-89.393556
G307	UA	07/27/2016	624.60	624.60	Top of PVC	624.73	12.96	17.8	609.12	604.28	18.22	603.90	4.8	2	39.057214	-89.395545
G307D	LCU	01/19/2021	624.88	625.05	Top of PVC	622.51	48.98	58.75	573.53	563.76	59.6	562.50	9.8	2	39.05721	-89.39552
G308	UA	01/18/2021	624.59	624.76	Top of PVC	621.59	10.1	14.89	611.49	606.70	15.24	605.80	4.8	2	39.057379	-89.397134
G310	UA	02/09/2021	622.87	622.88	Top of PVC	619.89	10.24	15.03	609.65	604.86	15.38	604.00	4.8	2	39.059532	-89.396907
G312	UA	01/15/2021	619.78	619.95	Top of PVC	616.92	9.79	14.58	607.13	602.34	14.93	601.70	4.8	2	39.059558	-89.391983
G313	UA	02/05/2021	614.30	614.30	Top of PVC	611.51	6.3	11.11	605.21	600.40	11.46	599.50	4.8	2	39.058773	-89.391124
G314	LCU	02/05/2021	613.88	614.05	Top of PVC	611.11	14.56	19.58	596.55	591.53	20.02	591.10	5	2	39.05782	-89.390964
G314D	DA	02/04/2021	613.70	613.71	Top of PVC	610.87	39.34	49.11	571.53	561.76	49.47	510.60	9.8	2	39.057852	-89.390958
G315	UA	01/14/2021	623.52	623.69	Top of PVC	620.94	9.69	14.48	611.25	606.46	14.85	605.00	4.8	2	39.057165	-89.393667
G316	LCU	02/26/2021	602.59	602.59	Top of PVC	599.64	10.02	14.82	589.62	584.82	15.16	583.90	4.8	2	39.057847	-89.389698
XPW01	CCR	01/14/2021	634.57	634.36	Top of PVC	631.85	8.21	12.98	623.64	618.87	13.36	617.90	4.8	2	39.057878	-89.396196
XPW02	CCR	02/08/2021	639.69	639.86	Top of PVC	636.64	8.05	17.85	628.59	618.79	18.2	618.40	9.8	2	39.058828	-89.395267

Notes:
All elevation data are presented relative to the North American Vertical Datum of 1988 (NAVD88), GEOID 12A
-- = not measured/recorded
bgs = below ground surface
CCR = Coal Combustion Residuals
DA = Deep Aquifer
ft = foot or feet
HSU = Hydrostratigraphic Unit
LCU = Lower Confining Unit
PVC = polyvinyl chloride
UA = Uppermost Aquifer

RAMBOLL

Attachment D
Boring Logs

COMPLIANCE MONITORING WELL
BACKGROUND MONITORING WELL
PORE WATER WELL
LEACHATE WELL
MONITORING WELL
STAFF GAGE, CCR UNIT
STAFF GAGE, RIVER

GROUNDWATER ELEVATION CONTOUR (2-FT CONTOUR INTERVAL, NAVD88)
INFERRED GROUNDWATER ELEVATION CONTOUR
GROUNDWATER FLOW DIRECTION
REGULATED UNIT (SUBJECT UNIT)
LIMITS OF FINAL COVER
PROPERTY BOUNDARY
SITE FEATURE

0 325 650 Feet

NOTES:
1. ELEVATIONS IN PARENTHESES WERE NOT USED FOR CONTOURING.
2. ELEVATION CONTOURS SHOWN IN FEET, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

UPPERMOST AQUIFER POTENTIOMETRIC SURFACE MAP MAY 30, 2023 (E001)

NATURE AND EXTENT REPORT
ASH POND NO. 1

COFFEEN POWER PLANT
COFFEEN, ILLINOIS

FIGURE 2-8

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

RAMBOLL

Geosyntec consultants engineers | scientists | innovators	Client: Dynegy Project: GLP8005, Coffeen Power Station Address: Coffeen, IL 62017	**WELL LOG** **Well No. G1001** **Page: 1 of 2**

Drilling Start Date:	**04/05/2021**	Boring Depth (ft): **32**		Well Depth (ft):	**12**
Drilling End Date:	**04/05/2021**	Boring Diameter (in): **6**		Well Diameter (in):	**1**
Drilling Company:	**Roberts Drilling**	DTW During Drilling (ft):		Screen Slot (in):	**0.010**
Drilling Method:	**Direct Push**	DTW After Drilling (ft):		Riser Material:	**Sch 40 PVC**
Drilling Equipment:	**Geoprobe**	Top of Casing Elev. (ft)		Screen Material:	**Sch 40 PVC Slotted**
Driller:		Ground Elev. (ft):		Seal Material(s):	**Bentonite Chips**
Logged By:	**A. Toye**	Northing, Easting (NAD83):		Filter Pack:	**Sand**

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Recovery (in)	COLLECT: Blow Counts	COLLECT: N Value RQD (%)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: Lab Sample	DEPTH (ft)
0				DP	24/48			(0') SILT (ML); very dark grayish brown (2.5Y 3/2), medium soft, moist, trace gravel 2-2.5' bgs.		0
4				DP	48/48			(4') CLAY (CL); with trace sand, yellowish brown (10YR 5/6), stiff, moist, trace gravel.		
5										5
6									Chem (6-11')	
8				DP	48/48			(8') As above: medium stiff, brown (10YR 4/3) with yellowish brown (10YR 5/6) mottling.		
10										10
12				DP	48/48			(12') CLAY (CL); dark gray (10YR 4/1), medium stiff, moist.		
15										15
16				DP	48/48			(16') As above: dark gray (2.5Y 4/1).		
20										20

NOTES: No groundwater encountered.

Geosyntec consultants
engineers | scientists | innovators

Client: Dynegy
Project: GLP8005, Coffeen Power Station
Address: Coffeen, IL 62017

WELL LOG

Well No. G1001

Drilling Start Date:	**04/05/2021**	Boring Depth (ft):	**32**	Well Depth (ft):	**12**
Drilling End Date:	**04/05/2021**	Boring Diameter (in):	**6**	Well Diameter (in):	**1**
Drilling Company:	**Roberts Drilling**	DTW During Drilling (ft):		Screen Slot (in):	**0.010**
Drilling Method:	**Direct Push**	DTW After Drilling (ft):		Riser Material:	**Sch 40 PVC**
Drilling Equipment:	**Geoprobe**	Top of Casing Elev. (ft)		Screen Material:	**Sch 40 PVC Slotted**
Driller:		Ground Elev. (ft):		Seal Material(s):	**Bentonite Chips**
Logged By:	**A. Toye**	Northing, Easting (NAD83):		Filter Pack:	**Sand**

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Recovery (in)	COLLECT: Blow Counts	COLLECT: N Value RQD (%)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: Lab Sample	DEPTH (ft)
20				DP	48/48			(20') As above: gravel at 1 ft.		20
24				DP	48/48			(24') As above: dry pocket at 2.8 ft.		
25										25
28				DP	18/48			(28') As above: trace gravel and silt at 2 ft.		
30										30
32								(32') End of Boring.		
35										35

NOTES: No groundwater encountered.

FIELD BORING LOG

HANSON

CLIENT: AEC Coffeen Power Station
Site: CCB Management Facility
Location: Coffeen, Illinois
Project: 05S3004A
DATES: Start: 2/26/2008
Finish: 2/26/2008
WEATHER: Overcast, cold

CONTRACTOR: Testing Service Corp.
Rig mfg/model: CME-650 Track Drill
Drilling Method: 3¼" HSA w/SS & CME samplers

FIELD STAFF: Driller: B. Williamson
Helper: R. Keedy
Eng/Geo: .

BOREHOLE ID: G270
Well ID: G270
Surface Elev: 622.92 ft. MSL
Completion: 18.27 ft. BGS
Station: 874,801.92N
2,514,996.84E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▼ = 16.00 - While drilling
▼ = 5.62 - 3/12/08
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft³)	Qu (tsf) *Qp (tsf)* Failure Type
	20/24 *83%*	SS	*2-2 2-4* N=4			
1A				24		
2A	19/24 *79%*	SS	*3-4 5-9* N=9	22		2.33 B
2B				20		5.04 Sh
	20/24 *83%*	SS	*14-5 7-8*			
3A			N=12	17		2.52 Sh
4A	24/24 *100%*	SS	*8-6 7-5* N=13	21		1.24 BSh
4B				21		1.20 B
	22/24 *92%*	SS	*2-3 4-4*			
5A			N=7	21		1.36 B
6A	24/24 *100%*	SS	*1-2 2-3* N=4	21		0.74 BSh
6B				24		0.78 B
	17/24 *71%*	SS	*2-2 2-3* N=4			
7A				21		
8A				20		
	19/24 *79%*	SS	*1-3 5-6* N=8			
8B				17		4.46 Sh
9A	24/24 *100%*	SS	*6-8 30-35* N=38	20		
9B				8		

Lithologic Description
Dark grayish brown (10YR4/2), moist, firm, clayey SILT
Dark grayish brown (10YR4/2), moist, firm, silty CLAY
Dark grayish brown (10YR4/2) with 5% yellowish brown (10YR5/8) mottles, moist, firm, silty CLAY, slight trace sand
Gray (10YR5/1) with 70% yellowish brown (10YR5/8) mottles, moist, firm, silty CLAY, slight trace sand and gravel
Dark gray (10YR4/1) with 5% yellowish brown (10YR5/8) mottles, moist, firm, silty CLAY, trace sand, slight trace gravel
Gray (10YR5/1) with 10% yellowish brown (10YR5/8) mottles, moist, firm, silty CLAY, trace sand, slight trace gravel
Gray (10YR5/1) with 60% yellowish brown (10YR5/8) mottles, moist, firm, silty CLAY, trace sand, slight trace gravel
Gray (10YR5/1), moist, soft, sandy CLAY
Gray (10YR5/1), moist, soft, sandy CLAY, trace gravel
Gray (10YR5/1), moist, soft, fine- to coarse-grained SAND, trace gravel
Dark yellowish brown (10YR4/4), moist, soft, sandy CLAY
Gray (10YR5/1) with 10% yellowish brown (10YR5/8) mottles, moist, firm, silty CLAY, slight trace sand and gravel
Yellowish brown (10YR5/4), wet, soft, fine to coarse SAND
Gray (10YR5/1), moist, hard, silty CLAY, trace sand and gravel

End of Boring = 18.27 ft. BGS

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Coffeen Power Station
Location: Coffeen, Illinois
Project: 15E0030
DATES: Start: 5/3/2016
Finish: 5/3/2016
WEATHER: Sunny, calm, warm, lo 60s

CONTRACTOR: Ramsey Geotechnical Engineering LLC
Rig mfg/model: D-50 Turbo Tracked MST 800ATV
Drilling Method: 4 ¼" HSA, split spoon sampler

FIELD STAFF: Driller: B. Williamson
Helper: D. Crump
Eng/Geo: S. Keim

BOREHOLE ID: G306
Well ID: G306
Surface Elev: 622.84 ft. MSL
Completion: 18.00 ft. BGS
Station: 2,516,120.41N
871,140.98E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork
Section 14, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▼ = 5.50 - During Drilling
▼ =
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
1A	12/24 *50%*	ss	*1-3 3-4* N=6	14			0–2	Very dark brown (10YR2/2), moist, medium, SILT with little clay and few very fine- to medium-grained sand, roots, trace coal fragments.		622	
2A	24/24 *100%*	ss	*5-4 5-4* N=9	21			2	Dark gray (10YR4/1) with 5% dark yellowish brown (10YR3/6) mottles, moist, stiff, SILT with little clay and trace very fine- to medium-grained sand.		620	
2B				19			4	Gray (10YR6/1) with 10% yellowish brown (10YR5/6) mottles, moist, very stiff, SILT with little clay and trace very fine-grained sand.			
3A	22/24 *92%*	ss	*2-2 3-3* N=5	30			6	Gray (10YR6/1) with 20% yellowish brown (10YR5/6) mottles, moist, very stiff, SILT with some clay and trace very fine-grained sand.		618	
4A	20/24 *83%*	ss	*3-4 6-6* N=10	26			8			616	
5A	24/24 *100%*	ss	*2-2 3-3* N=5	23			10	Gray (10YR5/1) with 30% dark yellowish brown (10YR4/6) mottles, moist, very stiff, silty CLAY with trace very fine- to coarse-grained sand.		614	
6A	22/24 *92%*	ss	*1-2 3-4* N=5	20			12			612	
7A	20/24 *83%*	ss	*5-6 6-6* N=12	21			14	Gray (10YR5/1) with 30% dark yellowish brown (10YR4/6) mottles, moist, stiff, silty CLAY with few very fine- to coarse-grained sand.		610	
8A	20/24 *83%*	ss	*2-2 8-14* N=10	15			15	Yellowish brown (10YR5/6), wet, soft, very fine- to coarse-grained sandy CLAY with little silt.		608	
8B				12			16	Yellowish brown (10YR5/6), wet, medium dense, silty, very fine- to medium-grained SAND with trace coarse-grained sand.			
9A	23/24 *96%*	ss	*14-17 28-50/5"* N=45	10			17	Yellowish brown (10YR5/6), moist, dense, fine- to coarse-grained SAND with little silt, little very fine-grained sand, and trace small gravel.		606	
9B				13			18	Brown (10YR5/3) with 20% dark yellowish brown (10YR4/6) mottles, moist, hard, SILT with little clay, few very fine- to coarse-grained sand, and trace small gravel.			

End of boring = 18.0 feet

NOTE(S): G306 installed in borehole.

FIELD BORING LOG

HANSON

CLIENT: Illinois Power Generating Co.
Site: Coffeen Power Station Ash Pond 1
Location: Coffeen, Illinois
Project: 16E0108
DATES: Start: 07/26/2016
Finish: 07/27/2016
WEATHER: Overcast, warm & humid (mid-80s)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: CME 55LC Track Drill
Drilling Method: 4¼" Hollow Stem Auger w/Continuous Split Spoon
FIELD STAFF: Driller: J. Gates
Helper: C. Clines
Eng/Geo: R. Hasenyager

BOREHOLE ID: G307
Well ID: G307
Surface Elev: 622.08 ft. MSL
Completion: 18.22 ft. BGS
Station: 871,398.55N
2,515,553.26E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen
Township: East Fork
Section 11, **Tier** 7N; **Range** 3W

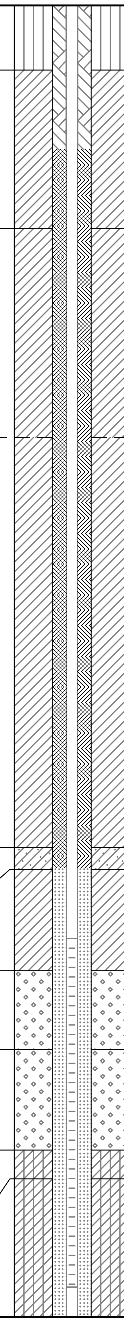
WATER LEVEL INFORMATION:
▼ = 14.00 - during drilling
▼ = -1.76 - 7/27/2016 @ 07:30
▽ =

SAMPLE Number	SAMPLE Recov / Total (in) *% Recovery*	SAMPLE Type	TESTING *Blows / 6 in* N - Value **RQD**	TESTING Moisture (%)	TESTING Dry Den. (lb/ft³)	TESTING Qu (tsf) *Qp (tsf)* Failure Type
1A	18/24 *75%*	SS	*1-3 3-2* N=6	22		
2A	22/24 *92%*	SS	*2-1 3-3* N=4	28		
3A	24/24 *100%*	SS	*1-2 3-4* N=5	26		
4A	24/24 *100%*	SS	*1-3 3-3* N=6	18		
5A	24/24 *100%*	SS	*3-3 4-5* N=7	19		
6A	24/24 *100%*	SS	*3-3 4-5* N=7	20		
7A	24/24 *100%*	SS	*woh-2 5-13* N=7	20		
7B				11		
8A	24/24 *100%*	SS	*12-9 6-9* N=15	20		
9A	18/18 *100%*	SS	*8-30 50* N=80	8		
	0/9 *0%*	BD				

Lithologic Description
Brown (10YR5/3), moist, stiff, SILT with few clay, trace sand, gravel and roots.
Gray (10YR5/1), moist, soft, CLAY, with some silt, trace sand, gravel and roots.
Gray (10YR5/1) with 30% yellowish brown (10YR5/8) mottles, moist, soft, CLAY with some silt, trace sand, gravel and roots.
Yellowish brown (10YR5/6) with 20% gray (10YR5/1) mottles, moist, medium CLAY,with some silt, few very fine- to medium-grained sand, and trace gravel.
Gray (10YR5/1), moist, medium, CLAY with little silt and very fine to very coarse sand, trace gravel.
Gray (10YR5/1) with 25% yellowish brown (10YR5/8) mottles, moist, soft, CLAY with some silt, trace sand and gravel.
Gray (10YR6/1), wet, medium dense, very fine- to very coarse-grained SAND with few silt and trace clay.
Yellow brown (10YR5/6), wet. medium dense, very fine- to very coarse-grained SAND, with little silt and trace gravel.
Yellowish brown (10YR5/8), moist, hard, SILT with some clay, little very fine- to very coarse-grained sand and trace gravel.
Gray (10YR5/1), moist, hard, SILT with some clay, little very fine- to very coarse-grained sand and trace gravel.

Depth ft. BGS: 2, 4, 6, 8, 10, 12, 14, 16, 18

Borehole Detail



Elevation ft. MSL: 620, 618, 616, 614, 612, 610, 608, 606, 604

Remarks

End of boring = 18.2 feet

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: Start: 2/5/2021
Finish: 2/5/2021
WEATHER: Clear, cold (20s)

CONTRACTOR: Roberts
Rig mfg/model:
Drilling Method: 4.25" HSA w/SS sampler

FIELD STAFF: Driller: Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G311
Well ID: G311
Surface Elev: 618.32 ft. MSL
Completion: 14.40 ft. BGS
Station: 872,238.70N
2,515,881.80E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork
Section 11, **Tier** 7N; **Range** 3W

SAMPLE			TESTING								
Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
							2			618	
							4			616	
							6			614	
							8			612	
							10			610	
							12			608	
							14			606	
										604	

NOTE(S): G311 installed in borehole.

FIELD BORING LOG

HANSON

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: Start: 2/5/2021
Finish: 2/5/2021
WEATHER: Clear, cold (20s)

CONTRACTOR: Roberts
Rig mfg/model: CME-75 Track Rig
Drilling Method: 3.25" HSA w/SS sampler
FIELD STAFF: Driller: Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G311D
Well ID: G311D
Surface Elev: 618.39 ft. MSL
Completion: 60.00 ft. BGS
Station: 872,238.70N
2,515,881.80E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▽ = 11.20 - During Drilling
▼ =
▼ =

Number	Recov / Total (in) % Recovery	Type	Blows / 6 in N - Value RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
1A	13/24 54%	SS	0-4 4-4 N=8				0–1.6	Yellowish brown (10YR5/6), moist, stiff, lean CLAY, with some silt, few very fine- to fine-grained sand, trace small gravel.		
2A	24/24 100%	SS	3-4 5-6 N=9				1.6–3.6	Gray (10YR5/1) with 20% yellowish brown (10YR5/6) and 5% very dark grayish brown (10YR3/2) mottles, moist, stiff, lean CLAY, with some silt, trace very fine- to fine-grained sand, and small gravel.		
3A	24/24 100%	SS	2-4 5-7 N=9				3.6–11.2	Very dark grayish brown (10YR3/2) with 10% gray (10YR5/1) mottles, moist, stiff, lean CLAY, with some silt, trace very fine- to fine-grained sand, and small gravel.		
4A	24/24 100%	SH						Gray (10YR5/1) with 15% yellowish brown (10YR5/6) mottles, moist, stiff, lean CLAY, with some silt, little very fine- to fine-grained sand, few small gravel.		
5A	18/24 75%	SS	1-2 4-5 N=6							
6A	24/24 100%	SS	1-3 3-4 N=6				11.2–12.0	Gray (10YR5/1) with 10% yellowish brown (10YR5/6) mottles, moist to wet, medium stiff, lean CLAY, with some very fine- to fine-grained sand, little silt, few small gravel.		
7A	24/24 100%	SS	2-6 12-13 N=18				12.0–12.9	Yellowish brown (10YR5/6), moist to wet, medium stiff, lean CLAY, with some very fine- to fine-grained sand, little silt, few small gravel.		
							12.9–14.0	Gray (10YR5/1), moist to wet, medium stiff, SILT, with some very fine- to fine-grained sand, few clay, trace small gravel.		1" wet, SAND at 13.5 ft.
8A	24/24 100%	SS	2-6 12-13 N=18				14.0–18.4	Yellowish brown (10YR5/6), moist, hard, SILT, with some clay, some to little sand, few small gravel.		
9A	24/24 100%	SS	6-15 18-22 N=33							Vertical fracture with very fine- to fine-grained sand from 16.9 to 18 ft.
10A	24/24 100%	SS	6-13 16-22 N=29				18.4–20.0	Dark grayish brown (10YR4/2) with frequent yellowish red (5YR4/6) oxidation along fractures, moist, hard, lean CLAY, with some silt, few very fine- to fine-grained sand, trace small gravel.		

NOTE(S): G311D installed in borehole.

FIELD BORING LOG

HANSON

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: Start: 2/5/2021
Finish: 2/5/2021
WEATHER: Clear, cold (20s)

CONTRACTOR: Roberts
Rig mfg/model: CME-75 Track Rig
Drilling Method: 3.25" HSA w/SS sampler
FIELD STAFF: Driller: Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G311D
Well ID: G311D
Surface Elev: 618.39 ft. MSL
Completion: 60.00 ft. BGS
Station: 872,238.70N
2,515,881.80E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▽ = 11.20 - During Drilling
▼ =
▼ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
11A	24/24 *100%*	SS	*5-15 20-26* N=35						598	
12A	12/24 *50%*	SS	*2-3 14-17* N=17				22		596	No oxidation below 22 ft.
13A	24/24 *100%*	SS	*6-11 14-20* N=25				24		594	Trace medium gravel below 24 ft.
14A	24/24 *100%*	SS	*4-8 11-16* N=19				26		592	
15A	24/24 *100%*	SH					28		590	
16A	24/24 *100%*	SS	*0-3 5-8* N=8				30	Dark gray (10YR4/1) with frequent yellowish red (5YR4/6) oxidation along fractures, moist, hard, lean CLAY, with some silt, few very fine- to fine-grained sand, trace small gravel.	588	
17A	24/24 *100%*	SS	*2-4 6-8* N=10				32		586	
18A	24/24 *100%*	SS	*2-5 7-7* N=12				34		584	Gravel plugged shoe in Run 18. Trace large gravel from 35 to 36 ft.
19A	13/24 *54%*	SS	*2-7 8-11* N=15				36		582	Trace lignite and wood fragments below 36 ft.
20A	24/24 *100%*	SS	*2-6 10-8* N=16				38		580	
							40			

NOTE(S): G311D installed in borehole.

FIELD BORING LOG

HANSON

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: Start: 2/5/2021
Finish: 2/5/2021
WEATHER: Clear, cold (20s)

CONTRACTOR: Roberts
Rig mfg/model: CME-75 Track Rig
Drilling Method: 3.25" HSA w/SS sampler
FIELD STAFF: Driller: Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G311D
Well ID: G311D
Surface Elev: 618.39 ft. MSL
Completion: 60.00 ft. BGS
Station: 872,238.70N
2,515,881.80E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
= 11.20 - During Drilling
=
=

Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp (tsf)* Failure Type
21A	16/24 *67%*	SS	*3-3 6-8* N=9			
22A						
22B	24/24 *100%*	SS	*3-4 7-8* N=11			
23A	24/24 *100%*	SS	*1-3 5-7* N=8			
24A	20/24 *83%*	SS	*3-4 10-8* N=14			
25A	24/24 *100%*	SS	*3-5 8-13* N=13			
26A	24/24 *100%*	SS	*2-5 10-12* N=15			
27A	24/24 *100%*	SS	*2-6 10-14* N=16			
28A	24/24 *100%*	SS	*4-7 7-11* N=14			
29A	24/24 *100%*	SS	*2-5 9-11* N=14			
30A	24/24 *100%*	SS	*3-7 10-13* N=17			

Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
to 42	Dark gray (10YR4/1) with frequent yellowish red (5YR4/6) oxidation along fractures, moist, hard, lean CLAY, with some silt, few very fine- to fine-grained sand, trace small gravel. *[Continued from previous page]*	578	
42	Greenish gray (GLEY15/1) with 20% dark reddish brown (10YR3/2) mottles, moist, medium stiff, lean CLAY, with some silt.	576	
42.4–53.6	Dark grayish brown (10YR4/1) with frequent yellowish red (5YR4/6) oxidation along fractures, moist, hard, lean CLAY, with some silt, few very fine- to fine-grained sand, trace small to large gravel.	574, 572, 570, 568, 566	
53.6–56	Dark gray (10YR4/1) with 20% greenish gray (GLEY15/1) and 5% yellowish brown (10YR5/6) mottles, moist, very stiff, lean CLAY, with some silt, trace very fine-grained sand and small gravel.	564	Trace small gravel below 54.3 ft.
56–58	Greenish gray (GLEY16/1) with 40% yellowish brown (10YR5/6) mottles, moist, very stiff, lean CLAY, with some silt, trace very fine-grained sand and small gravel.	562	0.5" small to medium GRAVEL.
58–60	Yellowish brown (10YR5/6) with 30% greenish gray (GLEY16/1) mottles, moist, very stiff, lean CLAY, with some silt, trace very fine-grained sand and small gravel.	560	

Depth scale: 42, 44, 46, 48, 50, 52, 54, 56, 58, 60

NOTE(S): G311D installed in borehole.

FIELD BORING LOG

HANSON

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: Start: 2/5/2021
Finish: 2/5/2021
WEATHER: Clear, cold (20s)

CONTRACTOR: Roberts
Rig mfg/model: CME-75 Track Rig
Drilling Method: 3.25" HSA w/SS sampler
FIELD STAFF: Driller: Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G311D
Well ID: G311D
Surface Elev: 618.39 ft. MSL
Completion: 60.00 ft. BGS
Station: 872,238.70N
2,515,881.80E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▽ = 11.20 - During Drilling
▼ =
▼ =

SAMPLE			TESTING								
Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
								End of boring = 60.0 feet			

NOTE(S): G311D installed in borehole.

FIELD BORING LOG

HANSON

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: Start: 1/14/2021
Finish: 1/14/2021
WEATHER: Overcast, cool (40s)

CONTRACTOR: Roberts
Rig mfg/model: GeoProbe 8040DT
Drilling Method: 4.25" HSA w/SS sampler
FIELD STAFF: Driller: Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G313
Well ID: G313
Surface Elev: 611.51 ft. MSL
Completion: 12.00 ft. BGS
Station: 871,976.80N
2,516,803.70E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▽ = 9.80 - During Drilling
▽ =
▼ =

SAMPLE: Number	Recov / Total (in) *% Recovery*	Type	TESTING: *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
1A 1B	17/24 *71%*	SS	*0-2* *3-3* N=5				0–1.2	Dark yellowish brown (10YR4/4), wet, stiff, lean CLAY, with some silt, few roots, trace small gravel.		
							1.2–2	Gray (10YR6/1) with 15% yellowish brown (10YR5/6) mottles, moist, very stiff, SILT, with little clay, few roots.	610	
2A	13/24 *54%*	SS	*0-2* *2-3* N=4				2–4.7	Dark gray (10YR4/1) with 5% black (10YR2/1) mottles, moist, stiff, lean CLAY, with some silt.	608	
3A	19/24 *79%*	SS	*2-3* *5-5* N=8				4.7–6	Dark gray (10YR4/1) with 20% yellowish brown (10YR5/6) mottles, moist, stiff, lean CLAY, with some silt, trace very fine- to fine-grained sand and small gravel.	606	
4A	22/24 *92%*	SS	*2-3* *4-5* N=7				6–8.9	Very dark gray (10YR3/1), moist, stiff, lean CLAY, with some silt, little very fine- to fine-grained sand and small gravel.	604	
5A	22/24 *92%*	SS	*2-5* *9-12* N=14				8.9–9.8	Yellowish brown (10YR5/6) with 10% very dark gray (10YR3/1) mottles, moist, stiff SILT, with some very fine- to fine-grained sand and clay, few small gravel.	602	
6A 6B	21/24 *88%*	SS	*9-12* *21-22* N=33				9.8–11.3	Yellowish brown (10YR5/4), wet, medium dense, very fine- to medium-grained SAND, with some silt, few small gravel.		
							11.3–12	Dark grayish brown (10YR4/2) with 10% yellowish brown (10YR5/6) mottles, moist, hard, SILT, with some very fine- to fine-grained sand, few clay and small gravel, trace medium gravel.	600	

End of boring = 12.0 feet

NOTE(S): G313 installed in borehole.

FIELD BORING LOG

HANSON

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: Start: 2/10/2021
Finish: 2/12/2021
WEATHER: Overcast, very cold (10s)

CONTRACTOR: Roberts
Rig mfg/model: CME-75 Track Rig
Drilling Method: 4.25" HSA w/SS sampler

FIELD STAFF: Driller: Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G314D
Well ID: G314D
Surface Elev: 610.87 ft. MSL
Completion: 100.30 ft. BGS
Station: 871,642.00N
2,516,853.90E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
$\underline{\nabla}$ = During Drilling
$\underline{\blacktriangledown}$ =
$\underline{\blacktriangledown}$ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp (tsf)* Failure Type
1A	4/24 *17%*	SS	*13-7* *4-5* N=11			
	1/24 *4%*	SS	*3-4* *5-5* N=9			
3A	24/24 *100%*	SS	*1-3* *4-5* N=7			
4A	24/24 *100%*	SS	*2-5* *15-17* N=20			
5A	24/24 *100%*	SS	*4-10* *12-16* N=22			
6A	24/24 *100%*	SS	*4-5* *14-18* N=19			
7A	24/24 *100%*	SS	*3-11* *14-18* N=25			
8A	24/24 *100%*	SS	*3-9* *13-18* N=22			
9A	24/24 *100%*	SS	*1-7* *9-13* N=16			

Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
0–1	Moist, dense, small to large GRAVEL. [FILL]	610	
1–6.8	Gray (10YR6/1) with 30% yellowish brown (10YR5/6) mottles, moist, stiff, lean CLAY, with some silt, few very fine- to fine-grained sand, trace small gravel.	608, 606	
6.8–9.4	Yellowish brown (10YR5/6) with occasional yellowish red (5YR4/6) oxidation along fractures, moist, hard, lean CLAY, with some silt and very fine- to fine-grained sand, trace small gravel.	604, 602	
9.4–16.9	Yellowish brown (10YR5/6) with 10% very dark grayish brown (10YR3/2) mottles and occasional yellowish red (5YR4/6) oxidation along fractures, moist, hard, lean CLAY, with some silt and very fine- to fine-grained sand, trace small gravel.	600, 598, 596	1" wet, SAND, with some silt at 11.6 ft.
16.9–18	Yellowish brown (10YR5/6) with 10% very dark grayish brown (10YR3/2) and 10% dark yellowish brown (10YR4/6) mottles and occasional yellowish red (5YR4/6) oxidation along fractures, moist, hard, lean CLAY, with some silt and very fine- to fine-grained sand, trace small gravel.	594	
18–20	Dark grayish brown (10YR4/2) with 15% yellowish brown (10YR5/6) mottles and occasional yellowish red (5YR4/6) oxidation along fractures, moist, hard, lean CLAY, with some silt and very fine- to fine-grained sand, trace small gravel.	592	

NOTE(S): G314D installed in borehole.

FIELD BORING LOG

HANSON

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: Start: 2/10/2021
Finish: 2/12/2021
WEATHER: Overcast, very cold (10s)

CONTRACTOR: Roberts
Rig mfg/model: CME-75 Track Rig
Drilling Method: 4.25" HSA w/SS sampler

FIELD STAFF: Driller: Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G314D
Well ID: G314D
Surface Elev: 610.87 ft. MSL
Completion: 100.30 ft. BGS
Station: 871,642.00N
2,516,853.90E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▽ = During Drilling
▼ =
▼ =

Number	Recov / Total (in) / % Recovery	Type	Blows / 6 in / N - Value / RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) / Qp (tsf) / Failure Type	Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
10A	24/24 100%	SS	1-5 10-13 N=15					Dark grayish brown (10YR4/2) with 15% yellowish brown (10YR5/6) and 5% dark yellowish brown (10YR4/6) mottles and occasional yellowish red (5YR4/6) oxidation along fractures, moist, hard, lean CLAY, with some silt and very fine- to fine-grained sand, trace small gravel. *[Continued from previous page]*	590	1" wet, SAND, with some silt at 20 ft.
11A	24/24 100%	SS	1-6 9-12 N=15				22		588	Frequent oxidation below 21.7 ft.
12A	24/24 100%	SS	4-7 10-13 N=17				24	Dark grayish brown (10YR4/2), moist, hard, lean CLAY, with some silt and very fine- to fine-grained sand, trace small gravel.	586	
13A	24/24 100%	SS	3-7 10-13 N=17				26		584	
14A	24/24 100%	SS	4-6 10-10 N=16				28		582	1 ft vertical fracture with yellowish red (5YR4/6) oxidation at 28.3 ft.
15A	24/24 100%	SS	3-9 10-12 N=19				30		580	
16A	24/24 100%	SS	2-3 7-8 N=10				32		578	Trace roots below 34 ft.
17A	24/24 100%	SS	2-4 7-9 N=11				34	Gray (GLEY15/), moist, stiff, lean CLAY, with some silt.	576	
18A	21/24 88%	SH					36	Dark grayish brown (10YR4/2), moist, hard, lean CLAY, with some silt and very fine- to fine-grained sand, trace small gravel and roots.	574	
			2-5				38		572	
							40			

NOTE(S): G314D installed in borehole.

FIELD BORING LOG

HANSON

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: Start: 2/10/2021
Finish: 2/12/2021
WEATHER: Overcast, very cold (10s)

CONTRACTOR: Roberts
Rig mfg/model: CME-75 Track Rig
Drilling Method: 4.25" HSA w/SS sampler
FIELD STAFF: Driller: Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G314D
Well ID: G314D
Surface Elev: 610.87 ft. MSL
Completion: 100.30 ft. BGS
Station: 871,642.00N
2,516,853.90E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▽ = During Drilling
▽ =
▼ =

SAMPLE: Number	Recov / Total (in) % Recovery	Type	TESTING: Blows / 6 in N - Value RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type
19A	24/24 100%	SS	7-12 N=12			
20A	24/24 100%	SS	4-8 10-14 N=18			
21A	24/24 100%	SS	3-9 13-16 N=22			
22A / 22B	24/24 100%	SS	12-31 14-11 N=45			
23A	24/24 100%	SS	3-4 6-9 N=10			
24A	24/24 100%	SS	5-11 14-17 N=25			
25A	24/24 100%	SS	4-6 11-15 N=17			
26A	20/24 83%	SS	4-5 18-30 N=23			
27A	20/24 83%	SS	9-22 33-33 N=55			
28A	24/24 100%	SS	7-19 29-43			

Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
40–46	Dark grayish brown (10YR4/2), moist, hard, lean CLAY, with some silt and very fine- to fine-grained sand, trace small gravel and roots. *[Continued from previous page]*	570, 568, 566	Trace medium gravel below 41.3 ft.
46–47	Gray (10YR5/1), wet, dense, SAND, with some silt, few small gravel.	564	
47–51	Gray (GLEY15/) with 10% yellowish brown (10YR5/6) mottles, moist, stiff, lean CLAY, with some silt, trace very fine-grained sand.	562, 560	1" SILT, with some sand at 48.2 ft.
51–55.4	Yellowish brown (10YR5/6) with 20% gray (GLEY15/) mottles, moist, stiff, lean CLAY, with some silt, trace very fine-grained sand.	558, 556	
55.4–57.8	Yellowish brown (10YR5/6), moist, hard, lean CLAY, with some silt, little very fine- to fine-grained sand and small gravel.	554	
57.8–58.8	Yellowish brown (10YR5/6) with 20% gray (GLEY15/) mottles, moist, hard, lean CLAY, with some silt, little very fine- to fine-grained sand and small gravel.		
58.8–60	Yellowish brown (10YR5/6) with 10% gray (GLEY15/) and 5% dark yellowish brown (10YR4/6) mottles, moist, hard, lean CLAY, with some silt, little very fine- to fine-grained sand and small gravel.	552	

NOTE(S): G314D installed in borehole.

FIELD BORING LOG

HANSON

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: Start: 2/10/2021
Finish: 2/12/2021
WEATHER: Overcast, very cold (10s)

CONTRACTOR: Roberts
Rig mfg/model: CME-75 Track Rig
Drilling Method: 4.25" HSA w/SS sampler
FIELD STAFF: Driller: Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G314D
Well ID: G314D
Surface Elev: 610.87 ft. MSL
Completion: 100.30 ft. BGS
Station: 871,642.00N
2,516,853.90E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
= During Drilling
=
=

Number	Recov / Total (in) % Recovery	Type	Blows / 6 in N - Value RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
			N=48						550	
29A	20/24 83%	SS	13-20 30-38 N=50				62	Yellowish brown (10YR5/6) with 10% gray (GLEY15/) and 5% dark yellowish brown (10YR4/6) mottles, moist, hard, lean CLAY, with some silt, little very fine- to fine-grained sand and small gravel. *[Continued from previous page]*	548	
30A	24/24 100%	SS	8-15 30-34 N=45				64		546	
31A	24/24 100%	SS	5-17 28-29 N=45				66		544	
32A	24/24 100%	SS	7-18 29-43 N=47				68	Yellowish brown (10YR5/6) with 10% gray (GLEY15/), 5% dark yellowish brown (10YR4/6) and 5% very dark grayish brown (10YR3/2) mottles, moist, hard, lean CLAY, with some silt, little very fine- to fine-grained sand and small gravel.	542	
33A	24/24 100%	SS	5-14 32-26 N=46				70	Dark grayish brown (10YR4/2) with 5% gray (GLEY15/), 5% yellowish brown (10YR5/6), and 5% light gray (10YR7/1) mottles, moist, hard, lean CLAY, with some silt, little sand and gravel.	540	
34A	24/24 100%	SS	8-17 26-38 N=43				72	Yellowish brown (10YR5/6) with 5% gray (GLEY15/), 5% dark grayish brown (10YR4/2), and 5% light gray (10YR7/1) mottles.	538	
35A	24/24 100%	SS	5-12 24-24 N=36				74 / 76	Dark grayish brown (10YR4/2) with 5% gray (GLEY15/), 5% yellowish brown (10YR5/6), and 5% light gray (10YR7/1) mottles.	536	
36A	24/24 100%	SS	14-24 20-33 N=44				78	Dark grayish brown (10YR5/2) with 20% reddish brown (5YR4/4) and 5% light gray (10YR7/1) mottles, moist, hard, lean CLAY, with some silt, trace very fine- to fine-grained sand and small gravel.	534	
37A	24/24 100%	SS	6-14 17-31 N=31				80	Dark gray (10YR4/1) with 5% light gray (10YR7/1) mottles, moist, hard, lean CLAY, with some silt, trace very fine- to fine-grained sand and small gravel.	532	

NOTE(S): G314D installed in borehole.

FIELD BORING LOG

HANSON

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: **Start:** 2/10/2021
Finish: 2/12/2021
WEATHER: Overcast, very cold (10s)

CONTRACTOR: Roberts
Rig mfg/model: CME-75 Track Rig
Drilling Method: 4.25" HSA w/SS sampler
FIELD STAFF: **Driller:** Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G314D
Well ID: G314D
Surface Elev: 610.87 ft. MSL
Completion: 100.30 ft. BGS
Station: 871,642.00N
2,516,853.90E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▽ = During Drilling
▼ =
▼ =

Number	Recov / Total (in) % Recovery	Type	Blows / 6 in N - Value RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
38A	24/24 100%	SS	7-17 21-29 N=38				82	Dark gray (10YR4/1) with 5% light gray (10YR7/1) mottles, moist, hard, lean CLAY, with some silt, trace very fine- to fine-grained sand and small gravel. *[Continued from previous page]*	530, 528	Trace roots at 82 ft.
39A	24/24 100%	SS	8-24 26-27 N=50				84	Very dark gray (10YR3/1), moist, hard, lean CLAY, with some silt.		
40A	24/24 100%	SS	5-9 10-13 N=19				86	Dark gray (10YR4/1) with 5% black (10YR2/1) mottles, moist, hard, lean CLAY, with some silt.	526, 524	
41A	24/24 100%	SS	6-10 25-33 N=35				88	Dark greenish gray (GLEY14/1) with 5% yellowish brown (10YR5/6) mottles, moist, hard, lean CLAY, with some silt.	522	Few very fine- to fine-grained sand below 88 ft.
42A	11/11 100%	SS	3-50/5"				90	Light reddish brown (2.5YR6/3) with 10% gray (GLEY15/), dry, hard, SILT, with few clay and very fine-grained sand.	520	
43A	5/5 100%	SS	50/5"				92		518	
44A	5/5 100%	SS	50/5"				94		516	
45A	8/8 100%	SS	49-50/2"				96	Light reddish brown (2.5YR6/3) with 10% gray (GLEY15/) and 5% dark yellowish brown (10YR4/6) mottles, dry, hard, SILT, with few clay and very fine-grained sand.	514	
46A	11/11 100%	SS	25-50/5"				98, 100		512	

NOTE(S): G314D installed in borehole.

FIELD BORING LOG

HANSON

CLIENT:	Illinois Power Generating Co.	**CONTRACTOR:**	Roberts		
Site:	Coffeen Part 845 Groundwater	**Rig mfg/model:**	CME-75 Track Rig	**BOREHOLE ID:**	G314D
Location:	Coffeen, Illinois	**Drilling Method:**	4.25" HSA w/SS sampler	**Well ID:**	G314D
Project:	20E0111A			**Surface Elev:**	610.87 ft. MSL
DATES: Start:	2/10/2021	**FIELD STAFF: Driller:**	Matt	**Completion:**	100.30 ft. BGS
Finish:	2/12/2021	**Helper:**	Corey	**Station:**	871,642.00N
WEATHER:	Overcast, very cold (10s)	**Eng/Geo:**	C. Colin Winter		2,516,853.90E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▽ = During Drilling
▼ =
▼ =

SAMPLE			TESTING								
Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
47A	3/3 *100%*	SS	*50/3"*								
								End of boring = 100.3 feet			

NOTE(S): G314D installed in borehole.

FIELD BORING LOG

HANSON

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: Start: 1/14/2021
Finish: 1/14/2021
WEATHER: Overcast, cold (30s)

CONTRACTOR: Roberts
Rig mfg/model: GeoProbe 8040DT
Drilling Method: 4.25" HSA w/SS sampler
FIELD STAFF: Driller: Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: G316
Well ID: G316
Surface Elev: 599.64 ft. MSL
Completion: 15.75 ft. BGS
Station: 871,643.10N
2,517,211.60E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▽ = 8.60 - During Drilling
▼ = 13.80 - During Drilling
▼ =

Number	Recov / Total (in) % Recovery	Type	Blows / 6 in N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) Qp (tsf) Failure Type
1A	15/24 *63%*	SS	*10-9 5-4* N=14			
2A	10/24 *42%*	SS	*1-3 4-6* N=7			
3A	14/24 *58%*	SS	*2-2 3-3* N=5			
4A	10/24 *42%*	SS	*0-1 1-2* N=2			
5A						
5B	22/24 *92%*	SS	*1-1 1-2* N=2			
6A	20/24 *83%*	SS	*1-2 4-7* N=6			
7A	22/24 *92%*	SS	*0-2 3-3* N=5			
8A	21/17 *124%*	SS	*2-2 26-50/3"* N=28			
8B						

Depth ft. BGS	Lithologic Description	Elevation ft. MSL
0–1.5	Brown (10YR5/3), moist, medium dense, small to large GRAVEL, with some clay and fine to coarse grained sand. [FILL]	598
1.5–4	Gray (10YR5/1), moist, hard, lean CLAY, with some silt, few small gravel and very fine- to fine-grained sand.	596
4–6.4	Gray (10YR5/1) with 10% yellowish brown (10YR5/6) mottles, moist, stiff, lean CLAY, with some silt, few small gravel and very fine- to fine-grained sand.	594
6.4–8.6	Gray (10YR5/1) with 30% black (10YR2/1) mottles, moist, stiff, lean CLAY, with some silt, few very fine-grained sand, organics and wood fragments.	592
8.6–10.2	Very dark gray (10YR3/1), wet, medium stiff to stiff, SILT, with some clay and very fine- to fine-grained sand.	590
10.2–12.3	Brown (10YR4/3), moist, very stiff, lean CLAY, with some silt, little very fine- to fine-grained sand, few small gravel.	588
12.3–13.8	Dark gray (10YR4/1) with 20% yellowish brown (10YR5/6) mottles, moist, medium stiff to stiff, lean CLAY, with some silt, little very fine- to fine-grained sand, few small gravel.	586
13.8–15.2	Brown (10YR4/3), wet, loose, very fine- to fine-grained SAND, with some silt, trace clay.	
15.2–15.75	Yellowish brown (10YR5/6), moist, hard, SILT, with some very fine- to fine-grained sand, trace small gravel.	584

End of boring = 15.75 feet

NOTE(S): G316 installed in borehole.

FIELD BORING LOG

HANSON

CLIENT: Natural Resource Technology, Inc.
Site: Coffeen Energy Center
Location: Coffeen, Illinois
Project: 15E0030
DATES: Start: 9/14/2015
Finish: 9/14/2015
WEATHER: Sunny, hi 60's

CONTRACTOR: Ramsey Geotechnical Engineering, LLC
Rig mfg/model: D-50 Turbo Tracked MST 800ATV
Drilling Method: Hollow Stem Auger (3¼"overdrill / 4¼")
FIELD STAFF: Driller: D. Crump
Helper: D. Groves
Eng/Geo: R. Hasenyager

BOREHOLE ID: G401
Well ID: G401
Surface Elev: 623.03 ft. MSL
Completion: 19.30 ft. BGS
Station: 2,515,614.84N
872,510.57E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▼ = Dry - During Drilling
▼ =
▽ =

SAMPLE: Number	Recov / Total (in) *% Recovery*	Type	TESTING: *Blows / 6 in* N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type
1A	16/24 *67%*	SS	*2-2 3-7* N=5	17		
2A	21/24 *88%*	SS	*8-11 8-9* N=19	17		*1.80*
2B				25		
3A	23/24 *96%*	SS	*3-4 7-8* N=11	23		*2.50*
4A	24/24 *100%*	SS	*8-9 12-14* N=21	21		*3.30*
4B				19		*2.80*
5A	24/24 *100%*	SS	*2-3 4-5* N=7	21		*1.30*
6A	24/24 *100%*	SS	*2-4 5-6* N=9	17		*2.50*
7A	24/24 *100%*	SS	*9-7 8-9* N=15	21		*1.40*
8A	24/24 *100%*	SS	*2-3 2-4* N=5	17		*1.30*
8B				19		
9A	20/24 *83%*	SS	*5-4 5-10* N=9	21		
9B				16		
10A	12/16 *75%*	SS	*23-41 50/4"*	6		*4.50*

Depth ft. BGS	Lithologic Description
	Dark grayish brown (10YR4/2), moist, soft, CLAY with little silt and trace very fine- to fine-grained sand - FILL.
2	Yellowish brown (10YR5/6) moist, medium, CLAY with some silt and trace very fine- to coarse-grained sand - FILL.
	Dark gray (10YR4/1), moist, stiff, SILT with little clay and trace very fine-grained sand.
4	Yellowish brown (10YR5/6), moist, stiff, CLAY with some silt and trace very fine- to fine-grained sand.
6	Gray (10YR5/1) with 20% yellowish brown (10YR5/6) mottles, moist, medium, CLAY with some silt and trace very fine- to fine-grained sand.
8	Gray (10YR5/1) with 30% yellowish brown (10YR5/8) mottles, moist, stiff, SILT and very fine-grained SAND with trace clay.
10, 12, 14	Gray (10YR5/1) with 30% yellowish brown (10YR5/6) mottles, moist, medium, CLAY with some silt and trace very fine- to fine-grained sand.
	Gray (10YR6/1), moist soft, CLAY with very fine- to fine-grained sand and little silt.
16	Yellowish brown (10YR5/6), wet, loose, very fine- to fine-grained SAND with trace silt.
	Yellowish brown (10YR5/6), wet medium, SILT with some very fine-grained sand and little clay.
	Yellowish brown (10YR5/6), wet, loose, very fine- to medium-grained SAND with trace silt.
18	Gray (10YR5/1), moist, very hard, SILT with few clay and little very fine- to very coarse sand.

Borehole Detail | Elevation ft. MSL: 622, 620, 618, 616, 614, 612, 610, 608, 606, 604 | Remarks

End of boring = 19.3 feet

NOTE(S): G401 installed in borehole.

FIELD BORING LOG

HANSON

CLIENT: Natural Resources Technology, Inc.
Site: Coffeen Power Station - Ash Pond 2
Location: 134 CIPS Lane, Coffeen, IL 62017
Project: 16E0080
DATES: Start: 8/16/2016
Finish: 8/16/2016
WEATHER: Rain, (mid-70s)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: CME-750 ATV Drill
Drilling Method: 4 1/4" Hollow Stem Auger

FIELD STAFF: Driller: J. Dittmaier
Helper: M. Hill
Eng/Geo: K. Theesfeld

BOREHOLE ID: G407
Well ID: G407
Surface Elev: 618.35 ft. MSL
Completion: 20.00 ft. BGS
Station: 2,513,705.87N
2,513,705.87E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen
Township: East Fork
Section 10, **Tier** 7 N.; **Range** 3 W.

WATER LEVEL INFORMATION:
▼ = 16.00 - During Drilling
▼ =
▽ =

SAMPLE Number	Recov / Total (in) % Recovery	Type	Blows / 6 in N - Value **RQD**	Moisture (%)	Dry Den. (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
1A	12/24 *50%*	SS	*4-3 3-3* N=6	14		*3.50*	0	Very dark gray (10YR3/1), wet, medium, SILT with some organics. [Fill]	618	
								Gray (10YR6/1), wet, loose, SAND with some gravel and little clay. [Fill]		
2A	20/24 *83%*	SS	*2-2 4-4* N=6	18		*1.50*	2	Yellowish brown (10YR5/6) with 5% dark yellowish brown (10YR3/6) mottles, moist, very stiff, SILT with some clay and trace very fine- to fine-grained sand.	616	
								Brown (10YR5/3) with 10% yellowish brown (10YR5/6) mottles, moist, stiff, SILT with some clay, little fine- to coarse-grained sand, and trace small gravel.		
3A	23/24 *96%*	SS	*1-2 3-4* N=5	19		*1.75*	4	Brown (10YR5/3) with 25% yellowish brown (10YR5/6) mottles, moist, stiff, CLAY with some silt, trace fine-grained sand and trace small gravel.	614	
4A	24/24 *100%*	SS	*1-3 3-5* N=6	19		*1.50*	6	Brown (10YR5/3) with 10% yellowish brown (10YR5/6) mottles, moist, stiff, CLAY with some silt, little fine- to coarse-grained sand and trace small gravel.	612	
5A	21/24 *88%*	SS	*1-2 4-4* N=6	19		*0.50*	8	Yellowish brown (10YR5/6) with 25% brown (10YR5/3) mottles, moist, medium, CLAY with few silt, few fine-grained sand, and trace small gravel.	610	
6A	22/24 *92%*	SS	*1-2 2-1* N=4	17			10	Yellowish brown (10YR5/8) with 5% gray (10YR5/1) mottles, moist, very loose, fine-grained SAND with some clay and trace small gravel.	608	
7A	24/24 *100%*	SS	*7-29 33-17* N=62	8			12	Gray (10YR5/1) with 25% yellowish brown (10YR5/8) mottles, moist, very dense, fine-grained SAND	606	
								Brown (10YR5/3), moist, hard, SILT with some clay and little fine- to coarse-grained sand.		
8A	24/24 *100%*	SS	*3-7 12-17* N=19	12		*4.50*	14	Yellowish brown (10YR5/4) with 5% yellowish brown (10YR5/6) and 5% black (10YR2/1) mottles, SILT with some clay and little fine- to coarse-grained sand.	604	
9A	24/24 *100%*	SS	*4-9 14-20* N=23	13		*4.00*	▼ 16	Yellowish brown (10YR5/4) with 5% yellowish brown (10YR5/6), 5% dark gray (10YR4/1) and 5% black (10YR2/1) mottles, moist, hard, SILT with little fine- to coarse-grained sand and trace small gravel.	602	
10A	24/24 *100%*	SS	*2-8 14-19* N=22	14		*4.50*	18	Yellowish brown (10YR5/4) with 5% yellowish brown (10YR5/6), 5% dark gray (10YR4/1) and 5% black (10YR2/1) mottles, wet, stiff, SILT with little fine- to coarse-grained sand and little small gravel.	600	
							20	Dark grayish brown (10YR4/2) with 10% dark yellowish brown (10YR3/6) mottles, moist, hard, CLAY with some silt, little fine- to coarse-grained sand and trace small gravel.		

End of Boring = 20.0 ft. BGS

NOTE(S): G407 installed in boring.

FIELD BORING LOG

HANSON

CLIENT: Illinois Power Generating Company
Site: Coffeen Power Station - Ash Pond 2
Location: Coffeen, Illinois
Project: 16E0031A
DATES: Start: 2/23/2018
Finish: 2/23/2018
WEATHER: Overcast, mild (mid-40s)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: CME-750 ATV Drill
Drilling Method: 4¼" HSA with continuous split spoon
FIELD STAFF: Driller: C. Dutton
Helper: M. Baetje
Eng/Geo: R. Hasenyager

BOREHOLE ID: G410
Well ID: G410
Surface Elev: 617.21 ft. MSL
Completion: 14.09 ft. BGS
Station: 872,968.54N
2,513,206.33E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen
Township: East Fork
Section 10, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▼ = 11.00 - During drilling
▼ = 13.30 - Upon completion
▽ = 4.82 - 1 March 2018

SAMPLE Number	Recov / Total (in) % Recovery	Type	Blows / 6 in N - Value RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
1A	14/24 58%	SS	2-3 1-5 N=4	26.7				FILL - Light gray (10YR7/1), moist, loose, very fine- to very coarse-grained SAND with few small to medium gravel.		
								Very dark grayish brown (10YR3/2), moist, soft, CLAY with some silt and trace very fine- to fine-grained sand.	616	
								Yellowish brown (10YR5/4), moist, soft, CLAY with some silt and trace very fine- to fine-grained sand.		
2A	15/24 63%	SS	4-4 4-5 N=8	25.2			2		614	
3A	17/24 71%	SS	2-3 4-6 N=7	17.9			4	Gray (10YR6/1) with 25% yellowish brown (10YR5/6) mottles, moist, medium,CLAY with some silt and trace very fine- to fine-grained sand.	612	
4A	20/24 83%	SS	3-4 5-6 N=9	17.2			6		610	
5A	11/24 46%	SS	3-3 5-6 N=8	17.5			8	Gray (10YR5/1) with 30% yellowish brown (10YR5/8) mottles, moist, medium, CLAY with some silt, little very fine- to very coarse-grained sand, and trace small to medium gravel.	608	
6A	22/24 92%	SS	2-3 4-6 N=7	16.9			10	Gray (10YR6/1), moist, loose, very fine- to medium-grained SAND with few silt and few clay.	606	
6B				16.8				Yellowish brown (10YR5/8) with 10% gray (10YR5/1) mottles, moist, medium, CLAY with some silt, little very fine- to very coarse-grained sand, and trace small to medium gravel.		
7A	24/24 100%	SS	6-28 36-42 N=64	10.3			12	Yellowish brown (10YR5/6), moist, hard, SILT with some clay, few very fine- to very coarse-grained sand, and trace small to medium gravel.	604	
	0/1 0%	BD					14			

End of Boring = 14.09 ft bgs

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: Start: 2/8/2021
Finish: 2/8/2021
WEATHER: Overcast, very cold (10s)

CONTRACTOR: Roberts
Rig mfg/model: CME-75 Track Rig
Drilling Method: 4.25" HSA w/SS sampler

FIELD STAFF: Driller: Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: XPW01
Well ID: XPW01
Surface Elev: 631.85 ft. MSL
Completion: 14.00 ft. BGS
Station: 871,638.70N
2,515,366.30E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▽ = 5.00 - Approx. During Drilling
▼ =
▼ =

SAMPLE Number	Recov / Total (in) % Recovery	Type	TESTING Blows / 6 in N - Value RQD	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) Qp (tsf) Failure Type
1A	19/24 79%	SS	11-20 21-13 N=41			
2A	24/24 100%	SS	3-6 8-6 N=14			
3A	0/24 0%	SH				
4A	24/24 100%	SS	1-5 7-8 N=12			
5A	19/24 79%	SS	1-1 1-6 N=2			
6A	15/24 63%	SS	4-5 4-4 N=9			
7A / 7B	18/24 75%	SS	1-3 5-6 N=8			

Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
0–2	Black (10YR2/1), moist, BOTTOM ASH, fine- to coarse-grained, cohesionless. [FILL]	631.85–630	
2–6	Black (10YR2/1), moist, BOTTOM ASH, very fine- to fine-grained, cohesive. [FILL]	628	
6–12.8	Black (10YR2/1), wet, BOTTOM ASH, fine- to coarse-grained. [FILL]	626–620	
12.8–14	Gray (10YR5/1) with 20% yellowish brown (10YR5/6), moist, stiff, lean CLAY, some silt, trace very fine grained sand.	618	

End of boring = 14.0 feet

NOTE(S): XPW01 installed in borehole.

FIELD BORING LOG

HANSON

CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: Start: 2/8/2021
Finish: 2/8/2021
WEATHER: Overcast, very cold (10s)

CONTRACTOR: Roberts
Rig mfg/model: CME-75 Track Rig
Drilling Method: 4.25" HSA w/SS sampler

FIELD STAFF: Driller: Matt
Helper: Corey
Eng/Geo: C. Colin Winter

BOREHOLE ID: XPW02
Well ID: XPW02
Surface Elev: 636.64 ft. MSL
Completion: 18.00 ft. BGS
Station: 871,987.10N
2,515,627.30E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

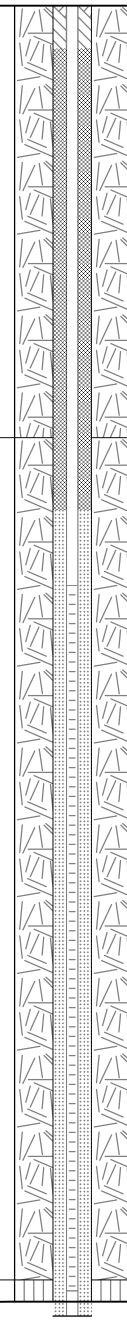
WATER LEVEL INFORMATION:
▽ = 6.00 - During Drilling
▼ =
▼ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type
1A	19/24 *79%*	SS	*5-5 10-15* N=15			
2A	21/24 *88%*	SS	*5-14 17-18* N=31			
3A	24/24 *100%*	SS	*4-13 15-14* N=28			
	24/24 *100%*	SS	*4-9 13-15* N=22			
5A	22/24 *92%*	SS	*3-4 7-12* N=11			
6A	23/24 *96%*	SS	*1-9 14-14* N=23			
7A	24/24 *100%*	SS	*5-7 7-7* N=14			
8A	21/24 *88%*	SS	*4-4 5-4* N=9			
9A 9B	24/24 *100%*	SS	*0-1 1-2* N=2			

Depth ft. BGS	Lithologic Description
0–6	Black (10YR2/1), moist, BOTTOM ASH, fine- to coarse-grained, cohesionless. [FILL]
6 (▽) – 17.7	Black (10YR2/1), wet, BOTTOM ASH, fine- to coarse-grained, cohesionless. [FILL]
17.7–18	Dark gray (10YR4/1), moist, very soft, SILT, some clay.

End of boring = 18.0 feet

Borehole Detail



Elevation ft. MSL
636
634
632
630
628
626
624
622
620

Remarks

NOTE(S): XPW02 installed in borehole.

Attachment E

Site Solids Bulk Characterization Analytical Data

PDC Laboratories, Inc.
PROFESSIONAL • DEPENDABLE • COMMITTED

March 09, 2021

Rhonald Hasenyager
Hanson Professional Services, Inc.
1525 South Sixth Street
Springfield, IL 62703-2886

RE: HANSON VISTRA SOIL

Dear Rhonald Hasenyager:

Please find enclosed the analytical results for the **14** sample(s) the laboratory received on **2/12/21 3:12 pm** and logged in under work order **EB02539**. All testing is performed according to our current TNI accreditations unless otherwise noted. This report cannot be reproduced, except in full, without the written permission of PDC Laboratories, Inc.

If you have any questions regarding your report, please contact your project manager. Quality and timely data is of the utmost importance to us.

PDC Laboratories, Inc. appreciates the opportunity to provide you with analytical expertise. We are always trying to improve our customer service and we welcome you to contact the Director of Client Services, Lisa Grant, with any feedback you have about your experience with our laboratory at 309-683-1764 or lgrant@pdclab.com.

Sincerely,

Gail g Schindler

Gail Schindler
Project Manager
(309) 692-9688 x1716
gschindler@pdclab.com

SAMPLE RECEIPT CHECK LIST

Items not applicable will be marked as in compliance

Work Order EB02539

YES	Samples received within temperature compliance when applicable
YES	COC present upon sample receipt
YES	COC completed & legible
YES	Sampler name & signature present
YES	Unique sample IDs assigned
YES	Sample collection location recorded
YES	Date & time collected recorded on COC
YES	Relinquished by client signature on COC
YES	COC & labels match
YES	Sample labels are legible
YES	Appropriate bottle(s) received
YES	Sufficient sample volume received
YES	Sample containers recieved undamaged
YES	Zero headspace, <6 mm present in VOA vials
NO	Trip blank(s) received
YES	All non-field analyses received within holding times
NO	Short hold time analysis
YES	Current PDC COC submitted
NO	Case narrative provided

ANALYTICAL RESULTS

Sample: EB02539-01
Name: G314D - S1
Matrix: Soil - Composite

Sampled: 02/10/21 15:00
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	9.44	meq/100g			1	1			Subcontracted

Sample: EB02539-02
Name: G314D - S2
Matrix: Soil - Composite

Sampled: 02/11/21 11:00
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	9.72	meq/100g			1	1			Subcontracted

Sample: EB02539-03
Name: G314D - S3
Matrix: Soil - Composite

Sampled: 02/11/21 14:00
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	12.45	meq/100g			1	1			Subcontracted

Sample: EB02539-04
Name: G314D - S2 DUPLICATE
Matrix: Soil - Composite

Sampled: 02/11/21 11:00
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	9.15	meq/100g			1	1			Subcontracted

ANALYTICAL RESULTS

Sample: EB02539-05
Name: G307D - S1
Matrix: Soil - Composite

Sampled: 02/09/21 10:30
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	18.82	meq/100g			1	1			Subcontracted

Sample: EB02539-06
Name: G307D - S2
Matrix: Soil - Composite

Sampled: 02/09/21 10:40
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	3.32	meq/100g			1	1			Subcontracted

Sample: EB02539-07
Name: G307D - S3
Matrix: Soil - Composite

Sampled: 02/09/21 14:45
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	3.91	meq/100g			1	1			Subcontracted

Sample: EB02539-08
Name: G307D - S4
Matrix: Soil - Composite

Sampled: 02/09/21 16:00
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	8.31	meq/100g			1	1			Subcontracted

ANALYTICAL RESULTS

Sample: EB02539-09 **Sampled:** 02/09/21 16:30
Name: G307D - S5 **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	17.24	meq/100g			1	1			Subcontracted

Sample: EB02539-10 **Sampled:** 02/09/21 14:45
Name: G307D - S3 DUPLICATE **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	6.05	meq/100g			1	1			Subcontracted

Sample: EB02539-11 **Sampled:** 02/08/21 11:15
Name: XPW - 01 - S1 **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	2.26	meq/100g			1	1			Subcontracted

Sample: EB02539-12 **Sampled:** 02/08/21 14:45
Name: XPW - 01 - S1 DUPLICATE **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	1.57	meq/100g			1	1			Subcontracted

ANALYTICAL RESULTS

Sample: EB02539-13 **Sampled:** 02/08/21 14:30
Name: XPW - 02 - S1 **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	0.28	meq/100g			1	1			Subcontracted

Sample: EB02539-14 **Sampled:** 02/08/21 14:30
Name: XPW - 02 - S1 DUPLICATE **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	0.38	meq/100g			1	1			Subcontracted

ANALYTICAL RESULTS

Sample: EB02539-01 **Sampled:** 02/10/21 15:00
Name: G314D - S1 **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	342 J	mg/kg			1.66	498	02/20/21 14:30		SM 5310C 2000

Sample: EB02539-02 **Sampled:** 02/11/21 11:00
Name: G314D - S2 **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	17400	mg/kg			4.81	1440	02/20/21 14:42		SM 5310C 2000

ANALYTICAL RESULTS

Sample: EB02539-03 **Sampled:** 02/11/21 14:00
Name: G314D - S3 **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	8540	mg/kg			2.49	747	02/20/21 14:55		SM 5310C 2000

Sample: EB02539-04 **Sampled:** 02/11/21 11:00
Name: G314D - S2 DUPLICATE **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	12900	mg/kg			4.81	1440	02/20/21 13:52		SM 5310C 2000

Sample: EB02539-05 **Sampled:** 02/09/21 10:30
Name: G307D - S1 **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	553	mg/kg			1.01	303	02/22/21 13:56		SM 5310C 2000

Sample: EB02539-06 **Sampled:** 02/09/21 10:40
Name: G307D - S2 **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	11200	mg/kg			6.39	1920	02/20/21 15:20		SM 5310C 2000

Sample: EB02539-07 **Sampled:** 02/09/21 14:45
Name: G307D - S3 **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	16700	mg/kg			4.81	1440	02/20/21 15:58		SM 5310C 2000

ANALYTICAL RESULTS

Sample: EB02539-08
Name: G307D - S4
Matrix: Soil - Composite

Sampled: 02/09/21 16:00
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	12400	mg/kg			4.91	1470	02/20/21 16:11		SM 5310C 2000

Sample: EB02539-09
Name: G307D - S5
Matrix: Soil - Composite

Sampled: 02/09/21 16:30
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	1070	mg/kg			1.97	591	02/20/21 16:24		SM 5310C 2000

Sample: EB02539-10
Name: G307D - S3 DUPLICATE
Matrix: Soil - Composite

Sampled: 02/09/21 14:45
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	24900 F1	mg/kg			4.98	1490	02/20/21 17:02		SM 5310C 2000

Sample: EB02539-11
Name: XPW - 01 - S1
Matrix: Soil - Composite

Sampled: 02/08/21 11:15
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	40200	mg/kg			95.24	28600	02/20/21 16:36		SM 5310C 2000

Sample: EB02539-12
Name: XPW - 01 - S1 DUPLICATE
Matrix: Soil - Composite

Sampled: 02/08/21 14:45
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	9400 F1 F2	mg/kg			1.69	507	02/22/21 14:21		SM 5310C 2000

ANALYTICAL RESULTS

Sample: EB02539-13 **Sampled:** 02/08/21 14:30
Name: XPW - 02 - S1 **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	38400	mg/kg			1.37	411	02/22/21 14:09		SM 5310C 2000

Sample: EB02539-14 **Sampled:** 02/08/21 14:30
Name: XPW - 02 - S1 DUPLICATE **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	3150	mg/kg			1.76	528	02/22/21 15:00		SM 5310C 2000

ANALYTICAL RESULTS

Sample: EB02539-01 **Sampled:** 02/10/21 15:00
Name: G314D - S1 **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	0.54	pCi/g dry wt			1		03/03/21 14:23		Subcontracted
Radium 228 - subcontracted	-0.0977	pCi/g dry wt	U		1		03/05/21 09:17		Subcontracted

Sample: EB02539-02 **Sampled:** 02/11/21 11:00
Name: G314D - S2 **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	0.592	pCi/g dry wt			1		03/03/21 14:23		Subcontracted
Radium 228 - subcontracted	0.988	pCi/g dry wt			1		03/05/21 09:17		Subcontracted

ANALYTICAL RESULTS

Sample: EB02539-03
Name: G314D - S3
Matrix: Soil - Composite

Sampled: 02/11/21 14:00
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	0.583	pCi/g dry wt			1		03/03/21 14:23		Subcontracted
Radium 228 - subcontracted	0.158 U	pCi/g dry wt			1		03/05/21 09:17		Subcontracted

Sample: EB02539-04
Name: G314D - S2 DUPLICATE
Matrix: Soil - Composite

Sampled: 02/11/21 11:00
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	0.513	pCi/g dry wt			1		03/03/21 14:23		Subcontracted
Radium 228 - subcontracted	0.587	pCi/g dry wt			1		03/05/21 09:17		Subcontracted

Sample: EB02539-05
Name: G307D - S1
Matrix: Soil - Composite

Sampled: 02/09/21 10:30
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	0.413	pCi/g dry wt			1		03/08/21 17:06		Subcontracted
Radium 228 - subcontracted	0.809	pCi/g dry wt			1		03/05/21 09:17		Subcontracted

Sample: EB02539-06
Name: G307D - S2
Matrix: Soil - Composite

Sampled: 02/09/21 10:40
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	0.398	pCi/g dry wt			1		03/03/21 14:23		Subcontracted
Radium 228 - subcontracted	0.129 U	pCi/g dry wt			1		03/05/21 09:17		Subcontracted

PDC Laboratories, Inc.

ANALYTICAL RESULTS

Sample: EB02539-07 **Sampled:** 02/09/21 14:45
Name: G307D - S3 **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	0.374	pCi/g dry wt			1		03/03/21 14:23		Subcontracted
Radium 228 - subcontracted	-0.223	pCi/g dry wt	U		1		03/05/21 09:17		Subcontracted

Sample: EB02539-08 **Sampled:** 02/09/21 16:00
Name: G307D - S4 **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	0.565	pCi/g dry wt			1		03/03/21 15:52		Subcontracted
Radium 228 - subcontracted	0.776	pCi/g dry wt			1		03/05/21 13:45		Subcontracted

Sample: EB02539-09 **Sampled:** 02/09/21 16:30
Name: G307D - S5 **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	0.569	pCi/g dry wt			1		03/03/21 15:52		Subcontracted
Radium 228 - subcontracted	-0.145	pCi/g dry wt	U		1		03/05/21 13:45		Subcontracted

Sample: EB02539-10 **Sampled:** 02/09/21 14:45
Name: G307D - S3 DUPLICATE **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	0.492	pCi/g dry wt			1		03/03/21 15:52		Subcontracted
Radium 228 - subcontracted	0.307 J	pCi/g dry wt			1		03/05/21 13:45		Subcontracted

ANALYTICAL RESULTS

Sample: EB02539-11 **Sampled:** 02/08/21 11:15
Name: XPW - 01 - S1 **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	1.04	pCi/g dry wt			1		03/03/21 15:52		Subcontracted
Radium 228 - subcontracted	0.701	pCi/g dry wt			1		03/05/21 13:45		Subcontracted

Sample: EB02539-12 **Sampled:** 02/08/21 14:45
Name: XPW - 01 - S1 DUPLICATE **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	1.89	pCi/g dry wt			1		03/03/21 15:52		Subcontracted
Radium 228 - subcontracted	0.888	pCi/g dry wt			1		03/05/21 13:45		Subcontracted

Sample: EB02539-13 **Sampled:** 02/08/21 14:30
Name: XPW - 02 - S1 **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	2.19	pCi/g dry wt			1		03/03/21 15:53		Subcontracted
Radium 228 - subcontracted	1.56	pCi/g dry wt			1		03/05/21 13:45		Subcontracted

Sample: EB02539-14 **Sampled:** 02/08/21 14:30
Name: XPW - 02 - S1 DUPLICATE **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	2.1	pCi/g dry wt			1		03/03/21 15:53		Subcontracted
Radium 228 - subcontracted	0.836	pCi/g dry wt			1		03/05/21 13:45		Subcontracted

ANALYTICAL RESULTS

ANALYTICAL RESULTS

Sample: EB02539-01
Name: G314D - S1
Matrix: Soil - Composite

Sampled: 02/10/21 15:00
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 10	mg/kg		02/16/21 17:19	1	10	02/16/21 17:19	CRD	EPA 9056A
Sulfate	76	mg/kg		02/16/21 17:19	1	10	02/16/21 17:19	CRD	EPA 9056A
General Chemistry - PIA									
Fluoride	< 2.5	mg/kg		02/17/21 14:01	1	2.5	02/17/21 14:01	TTH	SM 4500F C 1997
Solids - total solids (TS)	88	%		02/15/21 13:07	1	0.050	02/15/21 15:17	BMA/BCR	SM 2540G*
Total Nitrogen	140	mg/kg dry		02/17/21 11:37	1	57	02/18/21 10:31	BMS	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	7000	mg/kg		02/16/21 14:27	10	40	02/23/21 08:25	JMW	calculated
Manganese as MnO2	54	mg/kg		02/16/21 14:27	10	1.5	02/18/21 09:58	JMW	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	0.30	mg/kg		02/17/21 11:37	1	0.20	02/17/21 12:07	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	120	mg/kg		02/16/21 09:26	1	50	02/18/21 10:31	BMS	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 2.8	mg/kg		02/16/21 14:27	10	2.8	02/18/21 09:58	JMW	EPA 6020A
Arsenic	1.3	mg/kg		02/16/21 14:27	10	0.93	02/18/21 09:58	JMW	EPA 6020A
Barium	63	mg/kg		02/16/21 14:27	10	0.93	02/18/21 09:58	JMW	EPA 6020A
Beryllium	< 0.93	mg/kg		02/16/21 14:27	10	0.93	02/18/21 09:58	JMW	EPA 6020A
Boron	< 9.3	mg/kg		02/16/21 14:27	10	9.3	02/18/21 09:58	JMW	EPA 6020A*
Cadmium	< 0.93	mg/kg		02/16/21 14:27	10	0.93	02/18/21 09:58	JMW	EPA 6020A
Chromium	8.7	mg/kg		02/16/21 14:27	10	3.7	02/18/21 09:58	JMW	EPA 6020A
Cobalt	< 1.9	mg/kg		02/16/21 14:27	10	1.9	02/18/21 09:58	JMW	EPA 6020A
Iron	4900	mg/kg		02/16/21 14:27	10	28	02/23/21 08:25	JMW	EPA 6020A*
Lead	5.5	mg/kg		02/16/21 14:27	10	0.93	02/18/21 09:58	JMW	EPA 6020A
Manganese	34	mg/kg		02/16/21 14:27	10	0.93	02/18/21 09:58	JMW	EPA 6020A
Molybdenum	< 0.93	mg/kg		02/16/21 14:27	10	0.93	02/18/21 09:58	JMW	EPA 6020A
Selenium	< 0.93	mg/kg		02/16/21 14:27	10	0.93	02/18/21 09:58	JMW	EPA 6020A
Thallium	< 0.93	mg/kg		02/16/21 14:27	10	0.93	02/18/21 09:58	JMW	EPA 6020A
Mercury	< 0.19	mg/kg		02/16/21 14:27	10	0.19	02/18/21 09:58	JMW	EPA 6020A
Lithium	< 4.6	mg/kg		02/16/21 14:27	1	4.6	02/18/21 09:27	TJJ	EPA 6010B*
Sulfur	100	mg/kg		02/16/21 14:27	10	93	02/17/21 14:52	AMB	EPA 6010B*

ANALYTICAL RESULTS

Sample: EB02539-02
Name: G314D - S2
Matrix: Soil - Composite

Sampled: 02/11/21 11:00
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 10	mg/kg		02/16/21 17:38	1	10	02/16/21 17:38	CRD	EPA 9056A
Sulfate	210	mg/kg		02/17/21 17:41	5	50	02/17/21 17:41	CRD	EPA 9056A
General Chemistry - PIA									
Fluoride	< 2.5	mg/kg		02/17/21 14:03	1	2.5	02/17/21 14:03	TTH	SM 4500F C 1997
Solids - total solids (TS)	86	%		02/15/21 13:07	1	0.050	02/15/21 15:17	BMA/BCR	SM 2540G*
Total Nitrogen	360	mg/kg dry		02/17/21 11:37	1	58	02/18/21 10:32	BMS	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	16000	mg/kg		02/16/21 14:27	10	43	02/23/21 10:46	JMW	calculated
Manganese as MnO2	500	mg/kg		02/16/21 14:27	10	1.6	02/18/21 10:02	JMW	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	< 0.20	mg/kg		02/17/21 11:37	1	0.20	02/17/21 12:07	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	310	mg/kg		02/16/21 09:26	1	50	02/18/21 10:32	BMS	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 3.0	mg/kg		02/16/21 14:27	10	3.0	02/18/21 10:02	JMW	EPA 6020A
Arsenic	2.7	mg/kg		02/16/21 14:27	10	1.0	02/18/21 10:02	JMW	EPA 6020A
Barium	27	mg/kg		02/16/21 14:27	10	1.0	02/18/21 10:02	JMW	EPA 6020A
Beryllium	< 1.0	mg/kg		02/16/21 14:27	10	1.0	02/18/21 10:02	JMW	EPA 6020A
Boron	< 10	mg/kg		02/16/21 14:27	10	10	02/18/21 10:02	JMW	EPA 6020A*
Cadmium	< 1.0	mg/kg		02/16/21 14:27	10	1.0	02/18/21 10:02	JMW	EPA 6020A
Chromium	9.9	mg/kg		02/16/21 14:27	10	4.0	02/18/21 10:02	JMW	EPA 6020A
Cobalt	5.2	mg/kg		02/16/21 14:27	10	2.0	02/18/21 10:02	JMW	EPA 6020A
Iron	11000	mg/kg		02/16/21 14:27	10	30	02/23/21 10:46	JMW	EPA 6020A*
Lead	7.3	mg/kg		02/16/21 14:27	10	1.0	02/18/21 10:02	JMW	EPA 6020A
Manganese	320	mg/kg		02/16/21 14:27	10	1.0	02/18/21 10:02	JMW	EPA 6020A
Molybdenum	1.2	mg/kg		02/16/21 14:27	10	1.0	02/18/21 10:02	JMW	EPA 6020A
Selenium	< 1.0	mg/kg		02/16/21 14:27	10	1.0	02/18/21 10:02	JMW	EPA 6020A
Thallium	< 1.0	mg/kg		02/16/21 14:27	10	1.0	02/18/21 10:02	JMW	EPA 6020A
Mercury	< 0.20	mg/kg		02/16/21 14:27	10	0.20	02/18/21 10:02	JMW	EPA 6020A
Lithium	9.1	mg/kg		02/16/21 14:27	1	5.0	02/18/21 09:29	TJJ	EPA 6010B*
Sulfur	1100	mg/kg		02/16/21 14:27	10	100	02/17/21 14:54	AMB	EPA 6010B*

PDC Laboratories, Inc.

ANALYTICAL RESULTS

Sample: EB02539-03
Name: G314D - S3
Matrix: Soil - Composite

Sampled: 02/11/21 14:00
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 10	mg/kg		02/16/21 17:56	1	10	02/16/21 17:56	CRD	EPA 9056A
Sulfate	< 10	mg/kg		02/16/21 17:56	1	10	02/16/21 17:56	CRD	EPA 9056A
General Chemistry - PIA									
Fluoride	3.1	mg/kg		02/17/21 14:10	1	2.5	02/17/21 14:10	TTH	SM 4500F C 1997
Solids - total solids (TS)	88	%		02/15/21 13:07	1	0.050	02/15/21 15:17	BMA/BCR	SM 2540G*
Total Nitrogen	260	mg/kg dry		02/17/21 11:37	1	57	02/18/21 10:32	BMS	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	30000	mg/kg		02/16/21 14:27	100	340	02/23/21 10:50	JMW	calculated
Manganese as MnO2	590	mg/kg		02/16/21 14:27	10	1.3	02/18/21 10:06	JMW	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	0.48	mg/kg		02/17/21 11:37	1	0.20	02/17/21 12:08	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	230	mg/kg		02/16/21 09:26	1	50	02/18/21 10:32	BMS	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 2.4	mg/kg		02/16/21 14:27	10	2.4	02/18/21 10:06	JMW	EPA 6020A
Arsenic	3.8	mg/kg		02/16/21 14:27	10	0.80	02/18/21 10:06	JMW	EPA 6020A
Barium	140	mg/kg		02/16/21 14:27	10	0.80	02/18/21 10:06	JMW	EPA 6020A
Beryllium	< 0.80	mg/kg		02/16/21 14:27	10	0.80	02/18/21 10:06	JMW	EPA 6020A
Boron	< 8.0	mg/kg		02/16/21 14:27	10	8.0	02/18/21 10:06	JMW	EPA 6020A*
Cadmium	< 0.80	mg/kg		02/16/21 14:27	10	0.80	02/18/21 10:06	JMW	EPA 6020A
Chromium	25	mg/kg		02/16/21 14:27	10	3.2	02/18/21 10:06	JMW	EPA 6020A
Cobalt	10	mg/kg		02/16/21 14:27	10	1.6	02/18/21 10:06	JMW	EPA 6020A
Iron	21000	mg/kg		02/16/21 14:27	100	240	02/23/21 10:50	JMW	EPA 6020A*
Lead	11	mg/kg		02/16/21 14:27	10	0.80	02/18/21 10:06	JMW	EPA 6020A
Manganese	370	mg/kg		02/16/21 14:27	10	0.80	02/18/21 10:06	JMW	EPA 6020A
Molybdenum	< 0.80	mg/kg		02/16/21 14:27	10	0.80	02/18/21 10:06	JMW	EPA 6020A
Selenium	0.98	mg/kg		02/16/21 14:27	10	0.80	02/24/21 11:51	JMW	EPA 6020A
Thallium	< 0.80	mg/kg		02/16/21 14:27	10	0.80	02/18/21 10:06	JMW	EPA 6020A
Mercury	< 0.16	mg/kg		02/16/21 14:27	10	0.16	02/18/21 10:06	JMW	EPA 6020A
Lithium	28	mg/kg		02/16/21 14:27	1	4.0	02/18/21 09:31	TJJ	EPA 6010B*
Sulfur	< 80	mg/kg		02/16/21 14:27	10	80	02/17/21 14:56	AMB	EPA 6010B*

ANALYTICAL RESULTS

Sample: EB02539-04
Name: G314D - S2 DUPLICATE
Matrix: Soil - Composite

Sampled: 02/11/21 11:00
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 10	mg/kg	Q2	02/16/21 18:14	1	10	02/16/21 18:14	CRD	EPA 9056A
Sulfate	95	mg/kg	Q4	02/16/21 18:14	1	10	02/16/21 18:14	CRD	EPA 9056A
General Chemistry - PIA									
Fluoride	2.8	mg/kg		02/17/21 14:05	1	2.5	02/17/21 14:05	TTH	SM 4500F C 1997
Solids - total solids (TS)	86	%		02/15/21 13:07	1	0.050	02/15/21 15:17	BMA/BCR	SM 2540G*
Total Nitrogen	360	mg/kg dry		02/17/21 11:37	1	58	02/18/21 10:37	BMS	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	19000	mg/kg		02/16/21 14:27	100	430	02/23/21 10:54	JMW	calculated
Manganese as MnO2	990	mg/kg		02/16/21 14:27	10	1.6	02/18/21 10:29	JMW	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	0.68	mg/kg		02/17/21 11:37	1	0.20	02/17/21 12:04	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	310	mg/kg		02/16/21 09:26	1	50	02/18/21 10:37	BMS	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 3.0	mg/kg		02/16/21 14:27	10	3.0	02/18/21 10:29	JMW	EPA 6020A
Arsenic	5.8	mg/kg		02/16/21 14:27	10	1.0	02/18/21 10:29	JMW	EPA 6020A
Barium	80	mg/kg	Q3	02/16/21 14:27	10	1.0	02/18/21 10:29	JMW	EPA 6020A
Beryllium	< 1.0	mg/kg		02/16/21 14:27	10	1.0	02/18/21 10:29	JMW	EPA 6020A
Boron	< 10	mg/kg	Q3	02/16/21 14:27	10	10	02/18/21 10:29	JMW	EPA 6020A*
Cadmium	< 1.0	mg/kg		02/16/21 14:27	10	1.0	02/18/21 10:29	JMW	EPA 6020A
Chromium	22	mg/kg	Q3	02/16/21 14:27	10	4.0	02/18/21 10:29	JMW	EPA 6020A
Cobalt	9.8	mg/kg		02/16/21 14:27	10	2.0	02/18/21 10:29	JMW	EPA 6020A
Iron	14000	mg/kg		02/16/21 14:27	100	300	02/23/21 10:54	JMW	EPA 6020A*
Lead	14	mg/kg		02/16/21 14:27	10	1.0	02/18/21 10:29	JMW	EPA 6020A
Manganese	620	mg/kg		02/16/21 14:27	10	1.0	02/18/21 10:29	JMW	EPA 6020A
Molybdenum	1.9	mg/kg		02/16/21 14:27	10	1.0	02/18/21 10:29	JMW	EPA 6020A
Selenium	< 1.0	mg/kg		02/16/21 14:27	10	1.0	02/24/21 11:55	JMW	EPA 6020A
Thallium	< 1.0	mg/kg		02/16/21 14:27	10	1.0	02/18/21 10:29	JMW	EPA 6020A
Mercury	< 0.20	mg/kg		02/16/21 14:27	10	0.20	02/18/21 10:29	JMW	EPA 6020A
Lithium	9.9	mg/kg		02/16/21 14:27	1	5.0	02/18/21 09:33	TJJ	EPA 6010B*
Sulfur	770	mg/kg	Q3	02/16/21 14:27	10	100	02/17/21 14:58	AMB	EPA 6010B*

ANALYTICAL RESULTS

Sample: EB02539-05
Name: G307D - S1
Matrix: Soil - Composite

Sampled: 02/09/21 10:30
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 10	mg/kg		02/16/21 19:08	1	10	02/16/21 19:08	CRD	EPA 9056A
Sulfate	220	mg/kg		02/17/21 17:59	5	50	02/17/21 17:59	CRD	EPA 9056A
General Chemistry - PIA									
Fluoride	3.1	mg/kg		02/17/21 14:11	1	2.5	02/17/21 14:11	TTH	SM 4500F C 1997
Solids - total solids (TS)	83	%		02/15/21 13:07	1	0.050	02/15/21 15:17	BMA/BCR	SM 2540G*
Total Nitrogen	160	mg/kg dry		02/17/21 11:37	1	60	02/18/21 10:39	BMS	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	28000	mg/kg		02/16/21 14:27	100	370	02/23/21 12:02	JMW	calculated
Manganese as MnO2	4900	mg/kg		02/16/21 14:27	10	1.4	02/18/21 10:41	JMW	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	< 0.20	mg/kg		02/17/21 11:37	1	0.20	02/17/21 12:09	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	140	mg/kg		02/16/21 09:26	1	50	02/18/21 10:39	BMS	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 2.6	mg/kg		02/16/21 14:27	10	2.6	02/18/21 10:41	JMW	EPA 6020A
Arsenic	7.5	mg/kg		02/16/21 14:27	10	0.86	02/18/21 10:41	JMW	EPA 6020A
Barium	150	mg/kg		02/16/21 14:27	10	0.86	02/18/21 10:41	JMW	EPA 6020A
Beryllium	< 0.86	mg/kg		02/16/21 14:27	10	0.86	02/18/21 10:41	JMW	EPA 6020A
Boron	< 8.6	mg/kg		02/16/21 14:27	10	8.6	02/18/21 10:41	JMW	EPA 6020A*
Cadmium	1.2	mg/kg		02/16/21 14:27	10	0.86	02/18/21 10:41	JMW	EPA 6020A
Chromium	9.5	mg/kg		02/16/21 14:27	10	3.4	02/18/21 10:41	JMW	EPA 6020A
Cobalt	25	mg/kg		02/16/21 14:27	10	1.7	02/18/21 10:41	JMW	EPA 6020A
Iron	20000	mg/kg		02/16/21 14:27	100	260	02/23/21 12:02	JMW	EPA 6020A*
Lead	15	mg/kg		02/16/21 14:27	10	0.86	02/18/21 10:41	JMW	EPA 6020A
Manganese	3100	mg/kg		02/16/21 14:27	10	0.86	02/18/21 10:41	JMW	EPA 6020A
Molybdenum	1.3	mg/kg		02/16/21 14:27	10	0.86	02/18/21 10:41	JMW	EPA 6020A
Selenium	< 0.86	mg/kg		02/16/21 14:27	10	0.86	02/24/21 12:29	JMW	EPA 6020A
Thallium	< 0.86	mg/kg		02/16/21 14:27	10	0.86	02/18/21 10:41	JMW	EPA 6020A
Mercury	< 0.17	mg/kg		02/16/21 14:27	10	0.17	02/18/21 10:41	JMW	EPA 6020A
Lithium	< 4.3	mg/kg		02/16/21 14:27	1	4.3	02/18/21 09:41	TJJ	EPA 6010B*
Sulfur	100	mg/kg		02/16/21 14:27	10	86	02/17/21 15:03	AMB	EPA 6010B*

ANALYTICAL RESULTS

Sample: EB02539-06
Name: G307D - S2
Matrix: Soil - Composite

Sampled: 02/09/21 10:40
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	19	mg/kg		02/16/21 20:02	1	10	02/16/21 20:02	CRD	EPA 9056A
Sulfate	170	mg/kg		02/22/21 19:38	5	50	02/22/21 19:38	CRD	EPA 9056A
General Chemistry - PIA									
Fluoride	< 2.5	mg/kg		02/17/21 14:13	1	2.5	02/17/21 14:13	TTH	SM 4500F C 1997
Solids - total solids (TS)	79	%		02/15/21 13:07	1	0.050	02/15/21 15:17	BMA/BCR	SM 2540G*
Total Nitrogen	< 63	mg/kg dry		02/17/21 11:37	1	63	02/18/21 10:40	BMS	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	7100	mg/kg		02/16/21 14:27	10	28	02/23/21 11:09	JMW	calculated
Manganese as MnO2	190	mg/kg		02/16/21 14:27	10	1.0	02/18/21 10:45	JMW	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	< 0.20	mg/kg		02/17/21 11:37	1	0.20	02/17/21 12:10	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	< 50	mg/kg		02/16/21 09:26	1	50	02/18/21 10:40	BMS	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 2.0	mg/kg		02/16/21 14:27	10	2.0	02/18/21 10:45	JMW	EPA 6020A
Arsenic	1.7	mg/kg		02/16/21 14:27	10	0.66	02/18/21 10:45	JMW	EPA 6020A
Barium	10	mg/kg		02/16/21 14:27	10	0.66	02/18/21 10:45	JMW	EPA 6020A
Beryllium	< 0.66	mg/kg		02/16/21 14:27	10	0.66	02/18/21 10:45	JMW	EPA 6020A
Boron	< 6.6	mg/kg		02/16/21 14:27	10	6.6	02/18/21 10:45	JMW	EPA 6020A*
Cadmium	< 0.66	mg/kg		02/16/21 14:27	10	0.66	02/18/21 10:45	JMW	EPA 6020A
Chromium	3.8	mg/kg		02/16/21 14:27	10	2.6	02/18/21 10:45	JMW	EPA 6020A
Cobalt	1.4	mg/kg		02/16/21 14:27	10	1.3	02/18/21 10:45	JMW	EPA 6020A
Iron	4900	mg/kg		02/16/21 14:27	10	20	02/23/21 11:09	JMW	EPA 6020A*
Lead	3.3	mg/kg		02/16/21 14:27	10	0.66	02/18/21 10:45	JMW	EPA 6020A
Manganese	120	mg/kg		02/16/21 14:27	10	0.66	02/18/21 10:45	JMW	EPA 6020A
Molybdenum	< 0.66	mg/kg		02/16/21 14:27	10	0.66	02/18/21 10:45	JMW	EPA 6020A
Selenium	< 0.66	mg/kg		02/16/21 14:27	10	0.66	02/18/21 10:45	JMW	EPA 6020A
Thallium	< 0.66	mg/kg		02/16/21 14:27	10	0.66	02/18/21 10:45	JMW	EPA 6020A
Mercury	< 0.13	mg/kg		02/16/21 14:27	10	0.13	02/18/21 10:45	JMW	EPA 6020A
Lithium	< 3.3	mg/kg		02/16/21 14:27	1	3.3	02/18/21 09:43	TJJ	EPA 6010B*
Sulfur	< 66	mg/kg		02/16/21 14:27	10	66	02/17/21 15:05	AMB	EPA 6010B*

ANALYTICAL RESULTS

Sample: EB02539-07 **Sampled:** 02/09/21 14:45
Name: G307D - S3 **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 10	mg/kg		02/16/21 20:21	1	10	02/16/21 20:21	CRD	EPA 9056A
Sulfate	30	mg/kg		02/16/21 20:21	1	10	02/16/21 20:21	CRD	EPA 9056A
General Chemistry - PIA									
Fluoride	< 2.5	mg/kg		02/17/21 14:14	1	2.5	02/17/21 14:14	TTH	SM 4500F C 1997
Solids - total solids (TS)	92	%		02/15/21 13:07	1	0.050	02/15/21 15:17	BMA/BCR	SM 2540G*
Total Nitrogen	260	mg/kg dry		02/17/21 11:37	1	54	02/18/21 10:41	BMS	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	15000	mg/kg		02/16/21 14:27	10	37	02/23/21 11:39	JMW	calculated
Manganese as MnO2	450	mg/kg		02/16/21 14:27	10	1.4	02/18/21 10:49	JMW	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	0.25	mg/kg		02/17/21 11:37	1	0.20	02/17/21 12:11	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	240	mg/kg		02/16/21 09:26	1	50	02/18/21 10:41	BMS	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 2.6	mg/kg		02/16/21 14:27	10	2.6	02/18/21 10:49	JMW	EPA 6020A
Arsenic	2.9	mg/kg		02/16/21 14:27	10	0.87	02/18/21 10:49	JMW	EPA 6020A
Barium	20	mg/kg		02/16/21 14:27	10	0.87	02/18/21 10:49	JMW	EPA 6020A
Beryllium	< 0.87	mg/kg		02/16/21 14:27	10	0.87	02/18/21 10:49	JMW	EPA 6020A
Boron	< 8.7	mg/kg		02/16/21 14:27	10	8.7	02/18/21 10:49	JMW	EPA 6020A*
Cadmium	< 0.87	mg/kg		02/16/21 14:27	10	0.87	02/18/21 10:49	JMW	EPA 6020A
Chromium	8.5	mg/kg		02/16/21 14:27	10	3.5	02/18/21 10:49	JMW	EPA 6020A
Cobalt	4.5	mg/kg		02/16/21 14:27	10	1.7	02/18/21 10:49	JMW	EPA 6020A
Iron	11000	mg/kg		02/16/21 14:27	10	26	02/23/21 11:39	JMW	EPA 6020A*
Lead	5.9	mg/kg		02/16/21 14:27	10	0.87	02/18/21 10:49	JMW	EPA 6020A
Manganese	290	mg/kg		02/16/21 14:27	10	0.87	02/18/21 10:49	JMW	EPA 6020A
Molybdenum	< 0.87	mg/kg		02/16/21 14:27	10	0.87	02/18/21 10:49	JMW	EPA 6020A
Selenium	< 0.87	mg/kg		02/16/21 14:27	10	0.87	02/18/21 10:49	JMW	EPA 6020A
Thallium	< 0.87	mg/kg		02/16/21 14:27	10	0.87	02/18/21 10:49	JMW	EPA 6020A
Mercury	< 0.17	mg/kg		02/16/21 14:27	10	0.17	02/18/21 10:49	JMW	EPA 6020A
Lithium	10	mg/kg		02/16/21 14:27	1	4.4	02/18/21 09:45	TJJ	EPA 6010B*
Sulfur	1400	mg/kg		02/16/21 14:27	10	87	02/17/21 15:07	AMB	EPA 6010B*

PDC Laboratories, Inc.

ANALYTICAL RESULTS

Sample: EB02539-08
Name: G307D - S4
Matrix: Soil - Composite

Sampled: 02/09/21 16:00
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 10	mg/kg		02/16/21 20:39	1	10	02/16/21 20:39	CRD	EPA 9056A
Sulfate	< 10	mg/kg		02/16/21 20:39	1	10	02/16/21 20:39	CRD	EPA 9056A
General Chemistry - PIA									
Fluoride	4.2	mg/kg		02/17/21 14:16	1	2.5	02/17/21 14:16	TTH	SM 4500F C 1997
Solids - total solids (TS)	86	%		02/15/21 13:07	1	0.050	02/15/21 15:17	BMA/BCR	SM 2540G*
Total Nitrogen	360	mg/kg dry		02/17/21 11:37	1	58	02/18/21 10:42	BMS	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	14000	mg/kg		02/16/21 14:27	10	40	02/23/21 11:43	JMW	calculated
Manganese as MnO2	670	mg/kg		02/16/21 14:27	10	1.5	02/18/21 10:52	JMW	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	0.32	mg/kg		02/17/21 11:37	1	0.20	02/17/21 12:17	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	310	mg/kg		02/16/21 09:26	1	50	02/18/21 10:42	BMS	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 2.8	mg/kg		02/16/21 14:27	10	2.8	02/18/21 10:52	JMW	EPA 6020A
Arsenic	5.7	mg/kg		02/16/21 14:27	10	0.93	02/18/21 10:52	JMW	EPA 6020A
Barium	93	mg/kg		02/16/21 14:27	10	0.93	02/18/21 10:52	JMW	EPA 6020A
Beryllium	< 0.93	mg/kg		02/16/21 14:27	10	0.93	02/18/21 10:52	JMW	EPA 6020A
Boron	< 9.3	mg/kg		02/16/21 14:27	10	9.3	02/18/21 10:52	JMW	EPA 6020A*
Cadmium	< 0.93	mg/kg		02/16/21 14:27	10	0.93	02/18/21 10:52	JMW	EPA 6020A
Chromium	10	mg/kg		02/16/21 14:27	10	3.7	02/18/21 10:52	JMW	EPA 6020A
Cobalt	7.1	mg/kg		02/16/21 14:27	10	1.9	02/18/21 10:52	JMW	EPA 6020A
Iron	10000	mg/kg		02/16/21 14:27	10	28	02/23/21 11:43	JMW	EPA 6020A*
Lead	7.7	mg/kg		02/16/21 14:27	10	0.93	02/18/21 10:52	JMW	EPA 6020A
Manganese	430	mg/kg		02/16/21 14:27	10	0.93	02/18/21 10:52	JMW	EPA 6020A
Molybdenum	1.4	mg/kg		02/16/21 14:27	10	0.93	02/18/21 10:52	JMW	EPA 6020A
Selenium	< 0.93	mg/kg		02/16/21 14:27	10	0.93	02/18/21 10:52	JMW	EPA 6020A
Thallium	< 0.93	mg/kg		02/16/21 14:27	10	0.93	02/18/21 10:52	JMW	EPA 6020A
Mercury	< 0.19	mg/kg		02/16/21 14:27	10	0.19	02/18/21 10:52	JMW	EPA 6020A
Lithium	7.1	mg/kg		02/16/21 14:27	1	4.7	02/18/21 09:46	TJJ	EPA 6010B*
Sulfur	850	mg/kg		02/16/21 14:27	10	93	02/17/21 15:13	AMB	EPA 6010B*

ANALYTICAL RESULTS

Sample: EB02539-09
Name: G307D - S5
Matrix: Soil - Composite

Sampled: 02/09/21 16:30
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 10	mg/kg		02/16/21 20:57	1	10	02/16/21 20:57	CRD	EPA 9056A
Sulfate	< 10	mg/kg		02/16/21 20:57	1	10	02/16/21 20:57	CRD	EPA 9056A
General Chemistry - PIA									
Fluoride	6.8	mg/kg		02/17/21 14:23	1	2.5	02/17/21 14:23	TTH	SM 4500F C 1997
Solids - total solids (TS)	81	%		02/15/21 13:07	1	0.050	02/15/21 15:17	BMA/BCR	SM 2540G*
Total Nitrogen	310	mg/kg dry		02/17/21 11:37	1	61	02/18/21 10:43	BMS	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	28000	mg/kg		02/16/21 14:27	100	340	02/23/21 12:06	JMW	calculated
Manganese as MnO2	740	mg/kg		02/16/21 14:27	10	1.2	02/18/21 10:56	JMW	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	1.5	mg/kg		02/17/21 11:37	1	0.20	02/17/21 12:17	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	250	mg/kg		02/16/21 09:26	1	50	02/18/21 10:43	BMS	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 2.4	mg/kg		02/16/21 14:27	10	2.4	02/18/21 10:56	JMW	EPA 6020A
Arsenic	4.2	mg/kg		02/16/21 14:27	10	0.79	02/18/21 10:56	JMW	EPA 6020A
Barium	110	mg/kg		02/16/21 14:27	10	0.79	02/18/21 10:56	JMW	EPA 6020A
Beryllium	< 0.79	mg/kg		02/16/21 14:27	10	0.79	02/18/21 10:56	JMW	EPA 6020A
Boron	< 7.9	mg/kg		02/16/21 14:27	10	7.9	02/18/21 10:56	JMW	EPA 6020A*
Cadmium	< 0.79	mg/kg		02/16/21 14:27	10	0.79	02/18/21 10:56	JMW	EPA 6020A
Chromium	8.5	mg/kg		02/16/21 14:27	10	3.2	02/18/21 10:56	JMW	EPA 6020A
Cobalt	6.0	mg/kg		02/16/21 14:27	10	1.6	02/18/21 10:56	JMW	EPA 6020A
Iron	19000	mg/kg		02/16/21 14:27	100	240	02/23/21 12:06	JMW	EPA 6020A*
Lead	7.2	mg/kg		02/16/21 14:27	10	0.79	02/18/21 10:56	JMW	EPA 6020A
Manganese	470	mg/kg		02/16/21 14:27	10	0.79	02/18/21 10:56	JMW	EPA 6020A
Molybdenum	< 0.79	mg/kg		02/16/21 14:27	10	0.79	02/18/21 10:56	JMW	EPA 6020A
Selenium	< 0.79	mg/kg		02/16/21 14:27	10	0.79	02/24/21 12:33	JMW	EPA 6020A
Thallium	< 0.79	mg/kg		02/16/21 14:27	10	0.79	02/18/21 10:56	JMW	EPA 6020A
Mercury	< 0.16	mg/kg		02/16/21 14:27	10	0.16	02/18/21 10:56	JMW	EPA 6020A
Lithium	6.8	mg/kg		02/16/21 14:27	1	4.0	02/18/21 09:48	TJJ	EPA 6010B*
Sulfur	85	mg/kg		02/16/21 14:27	10	79	02/17/21 15:15	AMB	EPA 6010B*

ANALYTICAL RESULTS

Sample: EB02539-10
Name: G307D - S3 DUPLICATE
Matrix: Soil - Composite

Sampled: 02/09/21 14:45
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 10	mg/kg	Q3	02/16/21 21:15	1	10	02/16/21 21:15	CRD	EPA 9056A
Sulfate	45	mg/kg	Q3	02/16/21 21:15	1	10	02/16/21 21:15	CRD	EPA 9056A
General Chemistry - PIA									
Fluoride	< 2.5	mg/kg		02/17/21 14:28	1	2.5	02/17/21 14:28	TTH	SM 4500F C 1997
Solids - total solids (TS)	90	%		02/15/21 13:07	1	0.050	02/15/21 15:17	BMA/BCR	SM 2540G*
Total Nitrogen	250	mg/kg dry		02/17/21 11:37	1	55	02/18/21 10:44	BMS	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	13000	mg/kg		02/16/21 14:27	10	43	02/23/21 11:51	JMW	calculated
Manganese as MnO2	420	mg/kg		02/16/21 14:27	10	1.6	02/18/21 11:00	JMW	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	< 0.20	mg/kg		02/17/21 11:37	1	0.20	02/17/21 12:19	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	220	mg/kg		02/16/21 09:26	1	50	02/18/21 10:44	BMS	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 3.0	mg/kg		02/16/21 14:27	10	3.0	02/18/21 11:00	JMW	EPA 6020A
Arsenic	3.2	mg/kg	Q1	02/16/21 14:27	10	1.0	02/18/21 11:00	JMW	EPA 6020A
Barium	17	mg/kg		02/16/21 14:27	10	1.0	02/18/21 11:00	JMW	EPA 6020A
Beryllium	< 1.0	mg/kg	Q1	02/16/21 14:27	10	1.0	02/18/21 11:00	JMW	EPA 6020A
Boron	< 10	mg/kg	Q1, R	02/16/21 14:27	10	10	02/18/21 11:00	JMW	EPA 6020A*
Cadmium	< 1.0	mg/kg		02/16/21 14:27	10	1.0	02/18/21 11:00	JMW	EPA 6020A
Chromium	7.3	mg/kg	Q1	02/16/21 14:27	10	4.0	02/18/21 11:00	JMW	EPA 6020A
Cobalt	4.2	mg/kg	Q1	02/16/21 14:27	10	2.0	02/18/21 11:00	JMW	EPA 6020A
Iron	9100	mg/kg		02/16/21 14:27	10	30	02/23/21 11:51	JMW	EPA 6020A*
Lead	5.2	mg/kg		02/16/21 14:27	10	1.0	02/18/21 11:00	JMW	EPA 6020A
Manganese	270	mg/kg		02/16/21 14:27	10	1.0	02/18/21 11:00	JMW	EPA 6020A
Molybdenum	< 1.0	mg/kg		02/16/21 14:27	10	1.0	02/18/21 11:00	JMW	EPA 6020A
Selenium	< 1.0	mg/kg	Q1	02/16/21 14:27	10	1.0	02/18/21 11:00	JMW	EPA 6020A
Thallium	< 1.0	mg/kg		02/16/21 14:27	10	1.0	02/18/21 11:00	JMW	EPA 6020A
Mercury	< 0.20	mg/kg		02/16/21 14:27	10	0.20	02/18/21 11:00	JMW	EPA 6020A
Lithium	8.1	mg/kg		02/16/21 14:27	1	5.0	02/18/21 09:50	TJJ	EPA 6010B*
Sulfur	1400	mg/kg	Q3	02/16/21 14:27	10	100	02/17/21 15:17	AMB	EPA 6010B*

ANALYTICAL RESULTS

Sample: EB02539-11 **Sampled:** 02/08/21 11:15
Name: XPW - 01 - S1 **Received:** 02/12/21 15:12
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 10	mg/kg		02/17/21 14:40	1	10	02/17/21 14:40	CRD	EPA 9056A
Fluoride	< 2.5	mg/kg		02/17/21 14:40	1	2.5	02/17/21 14:40	CRD	EPA 9056A
Sulfate	450	mg/kg		02/22/21 19:56	10	100	02/22/21 19:56	CRD	EPA 9056A
General Chemistry - PIA									
Solids - total solids (TS)	78	%		02/15/21 13:07	1	0.050	02/15/21 15:17	BMA/BCR	SM 2540G*
Total Nitrogen	110	mg/kg dry		02/17/21 11:37	1	64	02/18/21 10:50	BMS	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	81000	mg/kg		02/23/21 09:23	100	390	02/26/21 11:05	JMW	calculated
Manganese as MnO2	270	mg/kg		02/23/21 09:23	10	1.4	02/24/21 12:52	JMW	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	< 0.20	mg/kg		02/17/21 11:37	1	0.20	02/17/21 12:18	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	85	mg/kg		02/16/21 09:26	1	50	02/18/21 10:50	BMS	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 2.7	mg/kg		02/23/21 09:23	10	2.7	02/25/21 10:07	JMW	EPA 6020A
Arsenic	6.9	mg/kg		02/23/21 09:23	10	0.91	02/24/21 12:52	JMW	EPA 6020A
Barium	710	mg/kg		02/23/21 09:23	10	0.91	02/25/21 10:07	JMW	EPA 6020A
Beryllium	1.9	mg/kg		02/23/21 09:23	10	0.91	03/02/21 09:19	JMW	EPA 6020A
Boron	110	mg/kg		02/23/21 09:23	10	9.1	03/02/21 09:19	JMW	EPA 6020A*
Cadmium	0.96	mg/kg		02/23/21 09:23	10	0.91	02/25/21 10:07	JMW	EPA 6020A
Chromium	41	mg/kg		02/23/21 09:23	10	3.6	02/24/21 12:52	JMW	EPA 6020A
Cobalt	4.8	mg/kg		02/23/21 09:23	10	1.8	02/24/21 12:52	JMW	EPA 6020A
Iron	57000	mg/kg		02/23/21 09:23	100	270	02/26/21 11:05	JMW	EPA 6020A*
Lead	4.7	mg/kg		02/23/21 09:23	10	0.91	02/25/21 10:07	JMW	EPA 6020A
Manganese	170	mg/kg	Q2	02/23/21 09:23	10	0.91	02/24/21 12:52	JMW	EPA 6020A
Molybdenum	7.0	mg/kg		02/23/21 09:23	10	0.91	02/25/21 10:07	JMW	EPA 6020A
Selenium	7.5	mg/kg		02/23/21 09:23	10	0.91	02/24/21 12:52	JMW	EPA 6020A
Thallium	< 0.91	mg/kg		02/23/21 09:23	10	0.91	02/25/21 10:07	JMW	EPA 6020A
Mercury	< 0.18	mg/kg		02/23/21 09:23	10	0.18	02/25/21 10:07	JMW	EPA 6020A
Lithium	18	mg/kg		02/23/21 09:23	1	4.6	02/24/21 09:59	AMB	EPA 6010B*
Sulfur	480	mg/kg		02/23/21 09:23	1	9.1	02/23/21 15:16	TJJ	EPA 6010B*

ANALYTICAL RESULTS

Sample: EB02539-12
Name: XPW - 01 - S1 DUPLICATE
Matrix: Soil - Composite

Sampled: 02/08/21 14:45
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 10	mg/kg	Q3	02/17/21 14:58	1	10	02/17/21 14:58	CRD	EPA 9056A
Fluoride	< 2.5	mg/kg	Q3	02/17/21 14:58	1	2.5	02/17/21 14:58	CRD	EPA 9056A
Sulfate	230	mg/kg		02/22/21 20:14	10	100	02/22/21 20:14	CRD	EPA 9056A
General Chemistry - PIA									
Solids - total solids (TS)	82	%		02/15/21 13:07	1	0.050	02/15/21 15:17	BMA/BCR	SM 2540G*
Total Nitrogen	160	mg/kg dry		02/17/21 11:37	1	61	02/18/21 10:51	BMS	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	61000	mg/kg		02/23/21 09:23	100	400	02/26/21 11:09	JMW	calculated
Manganese as MnO2	210	mg/kg		02/23/21 09:23	10	1.5	02/24/21 13:27	JMW	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	< 0.20	mg/kg		02/17/21 11:37	1	0.20	02/17/21 12:22	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	130	mg/kg		02/16/21 09:26	1	50	02/18/21 10:51	BMS	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 2.8	mg/kg		02/23/21 09:23	10	2.8	02/25/21 08:39	JMW	EPA 6020A
Arsenic	2.3	mg/kg		02/23/21 09:23	10	0.93	02/24/21 13:27	JMW	EPA 6020A
Barium	680	mg/kg		02/23/21 09:23	10	0.93	02/25/21 08:39	JMW	EPA 6020A
Beryllium	1.5	mg/kg		02/23/21 09:23	10	0.93	03/02/21 09:21	JMW	EPA 6020A
Boron	71	mg/kg		02/23/21 09:23	10	9.3	03/02/21 09:21	JMW	EPA 6020A*
Cadmium	< 0.93	mg/kg		02/23/21 09:23	10	0.93	02/25/21 08:39	JMW	EPA 6020A
Chromium	29	mg/kg		02/23/21 09:23	10	3.7	02/24/21 13:27	JMW	EPA 6020A
Cobalt	4.7	mg/kg		02/23/21 09:23	10	1.9	02/24/21 13:27	JMW	EPA 6020A
Iron	43000	mg/kg		02/23/21 09:23	100	280	02/26/21 11:09	JMW	EPA 6020A*
Lead	1.7	mg/kg		02/23/21 09:23	10	0.93	02/25/21 08:39	JMW	EPA 6020A
Manganese	140	mg/kg		02/23/21 09:23	10	0.93	02/24/21 13:27	JMW	EPA 6020A
Molybdenum	2.4	mg/kg		02/23/21 09:23	10	0.93	02/25/21 08:39	JMW	EPA 6020A
Selenium	1.4	mg/kg		02/23/21 09:23	10	0.93	02/24/21 13:27	JMW	EPA 6020A
Thallium	< 0.93	mg/kg		02/23/21 09:23	10	0.93	02/25/21 08:39	JMW	EPA 6020A
Mercury	< 0.19	mg/kg		02/23/21 09:23	10	0.19	02/25/21 08:39	JMW	EPA 6020A
Lithium	16	mg/kg		02/23/21 09:23	1	4.6	02/24/21 10:01	AMB	EPA 6010B*
Sulfur	220	mg/kg	Q3	02/23/21 09:23	1	9.3	02/23/21 15:18	TJJ	EPA 6010B*

ANALYTICAL RESULTS

Sample: EB02539-13
Name: XPW - 02 - S1
Matrix: Soil - Composite

Sampled: 02/08/21 14:30
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 10	mg/kg		02/17/21 15:16	1	10	02/17/21 15:16	CRD	EPA 9056A
Fluoride	< 2.5	mg/kg		02/17/21 15:16	1	2.5	02/17/21 15:16	CRD	EPA 9056A
Sulfate	85	mg/kg		02/17/21 15:16	1	10	02/17/21 15:16	CRD	EPA 9056A
General Chemistry - PIA									
Solids - total solids (TS)	88	%		02/15/21 13:07	1	0.050	02/15/21 15:17	BMA/BCR	SM 2540G*
Total Nitrogen	100	mg/kg dry		02/17/21 16:56	1	57	02/18/21 10:56	BMS	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	72000	mg/kg		02/23/21 09:23	100	400	02/26/21 11:12	JMW	calculated
Manganese as MnO2	270	mg/kg		02/23/21 09:23	10	1.5	02/24/21 13:35	JMW	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	< 0.20	mg/kg		02/17/21 11:37	1	0.20	02/17/21 12:22	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	89	mg/kg		02/17/21 16:56	1	50	02/18/21 10:56	BMS	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 2.8	mg/kg		02/23/21 09:23	10	2.8	02/25/21 08:50	JMW	EPA 6020A
Arsenic	< 0.93	mg/kg		02/23/21 09:23	10	0.93	02/24/21 13:35	JMW	EPA 6020A
Barium	850	mg/kg		02/23/21 09:23	10	0.93	02/25/21 08:50	JMW	EPA 6020A
Beryllium	1.6	mg/kg		02/23/21 09:23	10	0.93	03/02/21 09:30	JMW	EPA 6020A
Boron	70	mg/kg		02/23/21 09:23	10	9.3	03/02/21 09:30	JMW	EPA 6020A*
Cadmium	< 0.93	mg/kg		02/23/21 09:23	10	0.93	02/25/21 08:50	JMW	EPA 6020A
Chromium	24	mg/kg		02/23/21 09:23	10	3.7	02/24/21 13:35	JMW	EPA 6020A
Cobalt	4.3	mg/kg		02/23/21 09:23	10	1.9	02/24/21 13:35	JMW	EPA 6020A
Iron	50000	mg/kg		02/23/21 09:23	100	280	02/26/21 11:12	JMW	EPA 6020A*
Lead	1.3	mg/kg		02/23/21 09:23	10	0.93	02/25/21 08:50	JMW	EPA 6020A
Manganese	170	mg/kg		02/23/21 09:23	10	0.93	02/24/21 13:35	JMW	EPA 6020A
Molybdenum	2.5	mg/kg		02/23/21 09:23	10	0.93	02/25/21 08:50	JMW	EPA 6020A
Selenium	< 0.93	mg/kg		02/23/21 09:23	10	0.93	02/24/21 13:35	JMW	EPA 6020A
Thallium	< 0.93	mg/kg		02/23/21 09:23	10	0.93	02/25/21 08:50	JMW	EPA 6020A
Mercury	< 0.19	mg/kg		02/23/21 09:23	10	0.19	02/25/21 08:50	JMW	EPA 6020A
Lithium	20	mg/kg		02/23/21 09:23	1	4.7	02/24/21 10:06	AMB	EPA 6010B*
Sulfur	130	mg/kg		02/23/21 09:23	1	9.3	02/23/21 15:24	TJJ	EPA 6010B*

ANALYTICAL RESULTS

Sample: EB02539-14
Name: XPW - 02 - S1 DUPLICATE
Matrix: Soil - Composite

Sampled: 02/08/21 14:30
Received: 02/12/21 15:12

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 10	mg/kg	Q3	02/17/21 16:11	1	10	02/17/21 16:11	CRD	EPA 9056A
Fluoride	< 2.5	mg/kg		02/17/21 16:11	1	2.5	02/17/21 16:11	CRD	EPA 9056A
Sulfate	120	mg/kg		02/22/21 20:32	5	50	02/22/21 20:32	CRD	EPA 9056A
General Chemistry - PIA									
Solids - total solids (TS)	85	%		02/15/21 13:07	1	0.050	02/15/21 15:17	BMA/BCR	SM 2540G*
Total Nitrogen	130	mg/kg dry		02/17/21 16:56	1	59	02/18/21 11:01	BMS	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	24000	mg/kg		02/23/21 09:23	10	40	02/24/21 13:39	JMW	calculated
Manganese as MnO2	95	mg/kg		02/23/21 09:23	10	1.5	02/24/21 13:39	JMW	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	< 0.20	mg/kg		02/17/21 11:37	1	0.20	02/17/21 12:26	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	110	mg/kg		02/17/21 16:56	1	50	02/18/21 11:01	BMS	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 2.8	mg/kg	Q1, R	02/23/21 09:23	10	2.8	02/25/21 09:53	JMW	EPA 6020A
Arsenic	1.4	mg/kg	Q1, R	02/23/21 09:23	10	0.92	02/24/21 13:39	JMW	EPA 6020A
Barium	290	mg/kg		02/23/21 09:23	10	0.92	02/25/21 09:53	JMW	EPA 6020A
Beryllium	< 0.92	mg/kg		02/23/21 09:23	10	0.92	03/02/21 09:33	JMW	EPA 6020A
Boron	49	mg/kg	Q2, R	02/23/21 09:23	10	9.2	03/02/21 09:33	JMW	EPA 6020A*
Cadmium	< 0.92	mg/kg	Q1, R	02/23/21 09:23	10	0.92	02/25/21 09:53	JMW	EPA 6020A
Chromium	9.9	mg/kg	Q1, R	02/23/21 09:23	10	3.7	02/24/21 13:39	JMW	EPA 6020A
Cobalt	< 1.8	mg/kg	Q1, R	02/23/21 09:23	10	1.8	02/24/21 13:39	JMW	EPA 6020A
Iron	17000	mg/kg		02/23/21 09:23	10	28	02/24/21 13:39	JMW	EPA 6020A*
Lead	< 0.92	mg/kg	Q1, R	02/23/21 09:23	10	0.92	02/25/21 09:53	JMW	EPA 6020A
Manganese	60	mg/kg	Q3, R	02/23/21 09:23	10	0.92	02/24/21 13:39	JMW	EPA 6020A
Molybdenum	1.4	mg/kg	Q1, R	02/23/21 09:23	10	0.92	02/25/21 09:53	JMW	EPA 6020A
Selenium	< 0.92	mg/kg	Q1, R	02/23/21 09:23	10	0.92	02/24/21 13:39	JMW	EPA 6020A
Thallium	< 0.92	mg/kg	Q1, R	02/23/21 09:23	10	0.92	02/25/21 09:53	JMW	EPA 6020A
Mercury	< 0.18	mg/kg	Q1, R	02/23/21 09:23	10	0.18	02/25/21 09:53	JMW	EPA 6020A
Lithium	7.4	mg/kg		02/23/21 09:23	1	4.6	02/24/21 10:08	AMB	EPA 6010B*
Sulfur	250	mg/kg	Q3	02/23/21 09:23	1	9.2	02/24/21 15:05	TJJ	EPA 6010B*

NOTES

Specifications regarding method revisions and method modifications used for analysis are available upon request. Please contact your project manager.

* Not a TNI accredited analyte

Certifications

CHI - McHenry, IL - 4314-A W. Crystal Lake Road, McHenry, IL 60050
TNI Accreditation for Drinking Water and Wastewater Fields of Testing through IL EPA Accreditation No. 100279
Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory Registry No. 17556

PIA - Peoria, IL - 2231 W. Altorfer Drive, Peoria, IL 61615
TNI Accreditation for Drinking Water, Wastewater, Solid and Hazardous Material Fields of Testing through IL EPA Accreditation No. 100230
Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory Registry No. 17553
Drinking Water Certifications/Accreditations: Iowa (240); Kansas (E-10338); Missouri (870)
Wastewater Certifications/Accreditations: Arkansas (88-0677); Iowa (240); Kansas (E-10338)
Solid and Hazardous Material Certifications/Accreditations: Arkansas (88-0677); Iowa (240); Kansas (E-10338)

SPMO - Springfield, MO - 1805 W Sunset Street, Springfield, MO 65807
USEPA DMR-QA Program

STL - Hazelwood, MO - 944 Anglum Rd, Hazelwood, MO 63042
TNI Accreditation for Wastewater, Solid and Hazardous Material Fields of Testing through KS KDHE Certification No. E-10389
TNI Accreditation for Wastewater, Solid and Hazardous Material Fields of Testing through IL EPA Accreditation No. - 200080
Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory, Registry No. 171050
Missouri Department of Natural Resources - Certificate of Approval for Microbiological Laboratory Service - No. 1050

Qualifiers

Q1 Matrix Spike failed % recovery acceptance limits. The associated blank spike recovery was acceptable.
Q2 Matrix Spike Duplicate failed % recovery acceptance limits. The associated blank spike recovery was acceptable.
Q3 Matrix Spike/Matrix Spike Duplicate both failed % recovery acceptance limits. The associated blank spike recovery was acceptable.
Q4 The matrix spike recovery result is unusable since the analyte concentration in the sample is greater than four times the spike level. The associated blank spike was acceptable.
R Matrix Spike/Matrix Spike Duplicate Failed %Relative Percent Difference criterion.

Gail g Schindler

Certified by: Gail Schindler, Project Manager

September 15, 2021

Michael Healy
SiREM
130 Stone Road West
Guelph, Ontario, Canada N1G 3Z2

RE: Report of Findings, Measurement of AVS
Client ID: Coffeen AP1 MNA
PRIMA ID: Sirem 08312021-Coffeen AP1

Dear Mr. Healy:

This letter report describes the results of analyses conducted on four soil samples. Each soil was analyzed for acid volatile sulfide (AVS). Results are reported herein.

Sample Receipt and Preparation

Samples were received on August 31, 2021. The samples were placed in an anaerobic glovebox upon receipt. All sample preparation was conducted in the glove box.

Procedures

AVS was measured via sequential extraction of soil based on methods provided by Microseeps, Inc. In order to minimize exposure of the soil or extraction fluid to oxygen, the soil samples were transferred to the extraction vessel while in the glove box and the extractions were carried out on the bench top under a flow of nitrogen. A brief description of the extraction procedure is provided below.

WAS-Fe. Approximately 10 g of soil is extracted with 1 N hydrochloric acid (HCl) for 30 minutes at room temperature (approximately 20° C), after which an aliquot of the HCl is withdrawn and analyzed for ferrous iron and total iron colorimetrically using a Hach DR2800 spectrophotometer and appropriate Hach test kit reagents. Dilutions are made as needed using deoxygenated, deionized (DO/DI) water.

AVS. Hydrogen sulfide generated during the WAS extraction step is collected in a trap filled with 1.25 N sodium hydroxide (NaOH). After collection of the WAS Fe sample, concentrated HCl is added to the soil and the mixture is heated for 30 minutes. The concentration of sulfide in trap is then measured using the methylene blue method via a

Hach DR2800 spectrophotometer and appropriate Hach test kit reagents. Dilutions are made as needed using DO/DI water.

Results

The amount of AVS in each sample is shown in **Table 1** (attached). QC results are given in **Table 2** (attached).

If you have any questions regarding these results, please give me a call at 916-939-7300. Thank you for the opportunity to be of service.

Sincerely,
PRIMA Environmental, Inc.

Cindy G. Schreier

Cindy G. Schreier, Ph.D.
President

Attachments

Table 1. AVS Results.

Sample	AVS, mg/kg
SB-306-(14-16)	< 0.18
SB-311-(14-15)	0.24
SB-313-(8-9)	< 1.6 M
SB-316-(13-14, 15-16)	0.28

M Reporting limit elevated due to matrix interference

Table 2. QC Results for AVS.

Sample ID	Result	Units
Blank *		
AVS	< 0.025	mg/L
FeS standard		
Sulfide concentration	365	g/kg
AVS	378	g/kg
% Recovered as AVS	104	%

* A blank was run in the absence of a solid material. Therefore, values are concentrations in the extraction fluids or traps.

PRIMA Environmental Inc. Questions Answered.
5070 Robert J Mathews Parkway, Suite 300
El Dorado Hills, CA 95762
916-939-7300
www.primaenvironmental.com

Sample Receipt Summary

Date/Time: 8/31/21 10:40

Client/Company: SiRem - AVS 08312021

Project: Coffeen AP1 MNA

	Yes	No	N/A
Custody seals intact?	☐	☐	☒
Chain of custody Present?	☒	☐	☐
If no, list number of samples and Sample ID			
Ice present?	☒ Blue ice	☐	☐
If no, what is temperature? _____			
Samples in good condition?	☒	☐	☐
If no, explain:			
Do sample IDs on containers match IDs on COC?	☒	☐	☐
If no, explain:			

Other Comments:
electrical tape around lids.
Store in glove box

PRIMA ENVIRONMENTAL INC. Mathews Parkway, Suite 300 El Dorado Hills, CA 95762
(916) 939-7300; (916) 939-7398 Fax
www.primaenvironmental.com

CHAIN of CUSTODY

Project Manager: Michael Healey
Project Name: Coffeen AP1 MNA
Job Number:
Sampler Signature:

Phone: (519) 822-2265
Fax: (519) 822-3151
Email: mhealey@siremlab.com
TAT: 1 week

SAMPLE ID	Date	Time	Matrix	# Containers	Acid Volatile Sulfide										Comments
SB-306-(14-16)	26-Aug-21	12:15	S	1	X										
SB-311-(14-15)	26-Aug-21	12:30	S	1	X										
SB-313-(8-9)	26-Aug-21	12:45	S	1	X										
SB-316-(13-14,15-16)	26-Aug-21	1:00	S	1	X										

Special Instructions	Relinquished by:		Received by:
	Company S:REM	Date 26Aug21	Company
	Printed Name Rachel Hallman	Time 12:00pm.	Printed Name
	Signature [signature]		Signature
	Relinquished by:		**Received by:**
	Company	Date 8/31/21	Company PRIMA
	Printed Name	Time 10:40	Printed Name Molly Scott
	Signature		Signature Molly Scott

Matrix key: S - soil/sediment; W - water; OT - other

September 1, 2021

Michael Healy
SiREM
130 Stone Road West
Guelph, Ontario, Canada N1G 3Z2

RE: Report of Findings, Measurement of AVS
Client ID: Coffeen MNA
PRIMA ID: Sirem 08202021-Coffeen

Dear Mr. Healy:

This letter report describes the results of analyses conducted on two soil samples. Each soil was analyzed for acid volatile sulfide (AVS). Results are reported herein.

Sample Receipt and Preparation

Samples were received on August 20, 2021. The samples were frozen upon receipt, then thawed in a nitrogen-filled glove box. All sample preparation was conducted in the glove box.

Procedures

AVS was measured via sequential extraction of soil based on methods provided by Microseeps, Inc. In order to minimize exposure of the soil or extraction fluid to oxygen, the soil samples were transferred to the extraction vessel while in the glove box and the extractions were carried out on the bench top under a flow of nitrogen. A brief description of the extraction procedure is provided below.

WAS-Fe. Approximately 10 g of soil is extracted with 1 N hydrochloric acid (HCl) for 30 minutes at room temperature (approximately 20° C), after which an aliquot of the HCl is withdrawn and analyzed for ferrous iron and total iron colorimetrically using a Hach DR2800 spectrophotometer and appropriate Hach test kit reagents. Dilutions are made as needed using deoxygenated, deionized (DO/DI) water.

AVS. Hydrogen sulfide generated during the WAS extraction step is collected in a trap filled with 1.25 N sodium hydroxide (NaOH). After collection of the WAS Fe sample, concentrated HCl is added to the soil and the mixture is heated for 30 minutes. The concentration of sulfide in trap is then measured using the methylene blue method via a Hach DR2800 spectrophotometer and appropriate Hach test kit reagents. Dilutions are made as needed using DO/DI water.

Results

The amount of AVS in each sample is shown in **Table 1** (attached). QC results are given in **Table 2** (attached).

If you have any questions regarding these results, please give me a call at 916-939-7300. Thank you for the opportunity to be of service.

Sincerely,
PRIMA Environmental, Inc.

Cindy G. Schreier

Cindy G. Schreier, Ph.D.
President

Attachments

Table 1. AVS Results.

Sample	AVS, mg/kg
401B-(16-20)	< 0.19
270A-(12-16)	< 0.19

Table 2. QC Results for AVS.

Sample ID	Result	Units
Blank *		
AVS	< 0.025	mg/L
FeS standard		
Sulfide concentration	365	g/kg
AVS	364	g/kg
% Recovered as AVS	100	%

* A blank was run in the absence of a solid material. Therefore, values are concentrations in the extraction fluids or traps.

PRIMA ENVIRONMENTAL INC.
Questions Answered.

5070 Robert J Mathews Parkway, Suite 300
El Dorado Hills, CA 95762
916-939-7300
www.primaenvironmental.com

Sample Receipt Summary

Date/Time: 8/20/21 10:00 AM

Client/Company: SiRem lab - Michael Healey

Project: Coffeen MNA (2)
Miami Fort MNA (4)
Vermillion MNA (5)

	Yes	No	N/A
Custody seals intact?	☐	☐	☒
Chain of custody Present?	☒	☐	☐

If no, list number of samples and Sample ID

	Yes	No	N/A
Ice present?	☒	☐	☐

If no, what is temperature? _____

	Yes	No	N/A
Samples in good condition?	☒	☐	☐

If no, explain:

Ice appears melted.

	Yes	No	N/A
Do sample IDs on containers match IDs on COC?	☒	☐	☐

If no, explain:

3 Chains of custody
11 soil Jars Total

Other Comments:

PRIMA ENVIRONMENTAL INC
Mathews Parkway, Suite 300 El Dorado Hills, CA 95762
(916) 939-7300; (916) 939-7398 Fax
www.primaenvironmental.com

CHAIN of CUSTODY

Project Manager: Michael Healey
Project Name: Coffeen MNA
Job Number:
Sampler Signature:

Phone: (519) 822-2265
Fax: (519) 822-3151
Email: mhealey@siremlab.com
TAT: 1 week

SAMPLE ID	Date	Time	Matrix	# Containers	Acid Volatile Sulfide										Comments
401B-(16-20) ✓	18-Aug-21	3:00	S	1	X										
270A-(12-16) ✓	18-Aug-21	3:15	S	1	X										

Special Instructions

Relinquished by:				Received by:	
Company	SiREM Labs	Date	18 Aug 21	Company	PRIMA 8/20/21
Printed Name	Rachel Hallman	Time	5:30 pm.	Printed Name	Chris B. 10:00 AM
Signature				Signature	

Relinquished by:				Received by:	
Company		Date		Company	
Printed Name		Time		Printed Name	
Signature				Signature	

Matrix key: S - soil/sediment; W - water; OT - other

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

13-September-2021

SiREM Laboratory
Attn : Michael Healey

130 Stone Road W, Guelph
Canada, N1G 3Z2
Phone: 519-822-2265, Fax:519-822-3151

Date Rec. : 13 September 2021
LR Report: **CA15261-SEP21**
Reference: P.O# 800003210A

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Sample ID	Sample Date & Time	S %
1: Analysis Start Date		13-Sep-21
2: Analysis Start Time		15:44
3: Analysis Completed Date		13-Sep-21
4: Analysis Completed Time		17:17
5: G1001-(6-11)	17-May-21 10:00	0.031
6: 401B-(16-20)	17-May-21 10:15	0.008
7: 270A-(12-16)	17-May-21 10:30	< 0.005

Catharine Arnold

CHARTERED CATHARINE ARNOLD CHEMIST ASSOCIATION OF THE CHEMICAL PROFESSION OF ONTARIO

Catharine Arnold, B.Sc., C.Chem
Project Specialist,
Environment, Health & Safety

OnLine LIMS

0002638711

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Project : Coffeen AP1 MNA, PO# 800003210A

21-December-2021

SiREM Laboratory
Attn : Michael Healey

130 Stone Road W, Guelph
Canada, N1G 3Z2
Phone: 519-822-2265, Fax:519-822-3151

Date Rec. : 16 November 2021
LR Report: **CA14794-NOV21**
Reference: Project Name: Coffeen AP1 MNA, PO# 800003210A

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Sample ID	Sample Date & Time	B g/t
5: SB-306-(14-16)	26-Aug-21 10:00	< 40
6: SB-311-(14-15)	26-Aug-21 10:15	< 40
7: SB-313-(8-9)	26-Aug-21 10:30	< 40
8: SB-316-(13-14,15-16)	26-Aug-21 10:45	< 40

Catharine Arnold

CHARTERED CATHARINE ARNOLD CHEMIST

Catharine Arnold, B.Sc., C.Chem
Project Specialist,
Environment, Health & Safety

OnLine LIMS

0002751323

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

13-September-2021

SiREM Laboratory
Attn : Michael Healey

130 Stone Road W
Guelph, ON
N1G 3Z2, Canada

Phone: 519-822-2265
Fax:519-822-3151

Date Rec. : 31 August 2021
LR Report: **CA19062-AUG21**
Reference: Project Name: Coffeen AP1 MNA, PO# 800003210A

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: SB-306-(14-16)	6: SB-311-(14-15)	7: SB-313-(8-9)	8: SB-316-(13-14,15-16)
Sample Date & Time					26-Aug-21 10:00	26-Aug-21 10:15	26-Aug-21 10:30	26-Aug-21 10:45
Ag [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	< 0.5	< 0.5	< 0.5	< 0.5
Al [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	13000	11000	31000	32000
As [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	6.7	2.7	5.6	5.1
Ba [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	98	58	310	320
Be [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	0.45	0.37	0.73	0.69
Bi [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	0.10	0.10	0.11	0.12
Ca [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	35000	52000	69000	10000
Cd [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	0.11	0.08	0.20	0.06
Co [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	6	4	7	4
Cr [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	130	100	130	150
Cu [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	14	10	12	10
Fe [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	20000	12000	27000	17000
K [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	3700	3600	13000	14000
Li [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	11	11	19	14
Mg [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	15000	27000	35000	6700
Mn [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	470	310	1200	260
Mo [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	5.8	2.7	1.6	8.1
Na [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	590	830	6000	6400
Ni [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	15	11	17	13
P [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	230	200	250	230
Pb [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	9	7	11	12
Sb [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	< 0.8	< 0.8	< 0.8	< 0.8
Se [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	< 0.7	< 0.7	< 0.7	< 0.7
Sn [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	< 6	< 6	< 6	< 6
Sr [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	26	35	100	89
Ti [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	370	320	1500	1200
Tl [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	0.15	0.13	0.26	0.31
U [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	0.54	0.55	1.0	1.0
V [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	28	20	35	29
Y [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	9.1	8.2	11	10
Zn [µg/g]	09-Sep-21	19:00	10-Sep-21	10:47	35	27	41	34
C [%]	10-Sep-21	08:20	10-Sep-21	14:51	1.65	2.76	3.26	0.457

OnLine LIMS

0002638704

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

LR Report : CA19062-AUG21

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: SB-306-(14-16)	6: SB-311-(14-15)	7: SB-313-(8-9)	8: SB-316-(13-14,15-16)
S [%]	10-Sep-21	08:20	10-Sep-21	14:51	0.005	0.014	0.007	0.012
TOC [%]	10-Sep-21	14:26	10-Sep-21	16:31	0.413	0.772	0.775	0.257
Sulphide [%]	10-Sep-21	18:37	13-Sep-21	09:15	< 0.04	< 0.04	< 0.04	< 0.04

Catharine Arnold

ASSOCIATION OF THE CHEMICAL PROFESSION OF ONTARIO
CHARTERED
CATHARINE ARNOLD
CHEMIST

Catharine Arnold, B.Sc., C.Chem
Project Specialist,
Environment, Health & Safety

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Project : Coffeen MNA

09-June-2021

SiREM Laboratory
Attn : Michael Healey

130 Stone Road W
Guelph, ON
N1G 3Z2, Canada

Phone: 519-822-2265
Fax:519-822-3151

Date Rec. : 18 May 2021
LR Report: **CA12646-MAY21**
Reference: P.O# 800003210A

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: G1001-(6-11)	6: 401B-(16-20)	7: 270A-(12-16)
Sample Date & Time					17-May-21 10:00	17-May-21 10:15	17-May-21 10:30
Temp Upon Receipt [°C]	---	---	---	---	5.0	5.0	5.0
Sulphide1 [%]	03-Jun-21	15:12	03-Jun-21	16:31	0.05	< 0.04	< 0.04
TOC [%]	07-Jun-21	09:12	07-Jun-21	15:08	0.852	0.082	0.138
Ag [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	< 0.05	< 0.05	< 0.05
Al [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	8200	9700	9600
As [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	6.2	5.5	12
Ba [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	120	190	210
Be [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	0.45	0.35	0.48
B [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	6	4	5
Bi [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	0.23	0.25	0.18
Ca [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	42000	1900	5000
Cd [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	0.13	0.03	0.12
Co [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	8.8	6.1	10
Cr [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	15	14	16
Cu [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	11	7.8	12
Fe [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	16000	14000	22000
K [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	1100	770	1400
Li [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	9	7	11
Mg [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	18000	1600	4700
Mn [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	450	540	1200
Mo [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	1.5	0.4	0.8
Na [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	110	80	110
Ni [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	15	10	20
Pb [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	11	9.5	12
Sb [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	< 0.8	< 0.8	< 0.8
Se [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	< 0.7	< 0.7	< 0.7
Sn [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	0.6	< 0.5	< 0.5
Sr [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	35	9.1	10
Ti [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	170	65	230
Tl [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	0.16	0.12	0.16
U [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	0.82	0.39	0.46
V [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	19	14	22
W [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	0.07	0.04	0.13

OnLine LIMS

0002522990

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Project : Coffeen MNA

LR Report : **CA12646-MAY21**

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: G1001-(6-11)	6: 401B-(16-20)	7: 270A-(12-16)
Y [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	8.1	8.2	9.4
Zn [µg/g]	04-Jun-21	15:33	07-Jun-21	10:42	35	28	50

Catharine Arnold

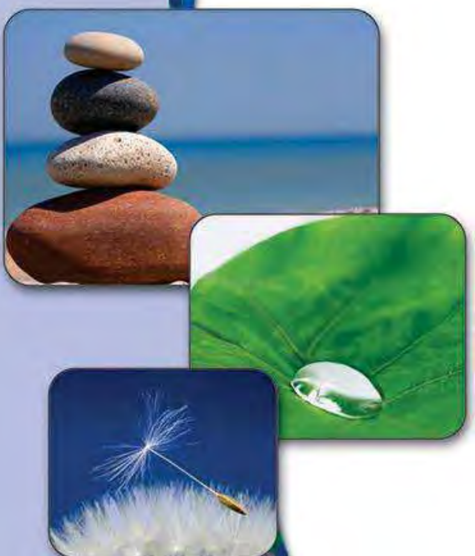
ASSOCIATION OF THE CHEMICAL PROFESSION OF ONTARIO
CHARTERED
CATHARINE ARNOLD
CHEMIST

Catharine Arnold, B.Sc., C.Chem
Project Specialist,
Environment, Health & Safety

OnLine LIMS

0002522990

Environment Testing America



ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Tel: (717)656-2300

Laboratory Job ID: 410-29682-1
Client Project/Site: EB02539

For:
PDC Laboratories, Inc.
2231 W. Altorfer Drive
Peoria, Illinois 61615

Attn: Gail Schindler

Authorized for release by:
2/23/2021 11:07:33 AM

Marrissa Williams, Project Manager
(717)556-7246
Marrissa.Williams@eurofinset.com

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Marrissa Williams

Marrissa Williams
Project Manager
2/23/2021 11:07:33 AM

Table of Contents

Client: PDC Laboratories, Inc. Job ID: 410-29682-1
Project/Site: EB02539

Qualifiers

General Chemistry

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Job ID: 410-29682-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Narrative

Job Narrative
410-29682-1

Receipt

The samples were received on 2/18/2021 8:37 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was -0.6°C

General Chemistry

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: PDC Laboratories, Inc. Job ID: 410-29682-1
Project/Site: EB02539

Client Sample ID: EB02539-01 Lab Sample ID: 410-29682-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	342	J	498	166	mg/Kg	1.66		Lloyd Kahn	Total/NA

Client Sample ID: EB02539-02 Lab Sample ID: 410-29682-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	17400		1440	481	mg/Kg	4.81		Lloyd Kahn	Total/NA

Client Sample ID: EB02539-03 Lab Sample ID: 410-29682-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	8540		747	249	mg/Kg	2.49		Lloyd Kahn	Total/NA

Client Sample ID: EB02539-04 Lab Sample ID: 410-29682-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	12900		1440	481	mg/Kg	4.81		Lloyd Kahn	Total/NA

Client Sample ID: EB02539-05 Lab Sample ID: 410-29682-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	553		303	101	mg/Kg	1.01		Lloyd Kahn	Total/NA

Client Sample ID: EB02539-06 Lab Sample ID: 410-29682-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	11200		1920	639	mg/Kg	6.39		Lloyd Kahn	Total/NA

Client Sample ID: EB02539-07 Lab Sample ID: 410-29682-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	16700		1440	481	mg/Kg	4.81		Lloyd Kahn	Total/NA

Client Sample ID: EB02539-08 Lab Sample ID: 410-29682-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	12400		1470	491	mg/Kg	4.91		Lloyd Kahn	Total/NA

Client Sample ID: EB02539-09 Lab Sample ID: 410-29682-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	1070		591	197	mg/Kg	1.97		Lloyd Kahn	Total/NA

Client Sample ID: EB02539-10 Lab Sample ID: 410-29682-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	24900	F1	1490	498	mg/Kg	4.98		Lloyd Kahn	Total/NA

Client Sample ID: EB02539-11 Lab Sample ID: 410-29682-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	40200		28600	9520	mg/Kg	95.24		Lloyd Kahn	Total/NA

Client Sample ID: EB02539-12 Lab Sample ID: 410-29682-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	9400	F2 F1	507	169	mg/Kg	1.69		Lloyd Kahn	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: EB02539-13 Lab Sample ID: 410-29682-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	3840		411	137	mg/Kg	1.37		Lloyd Kahn	Total/NA

Client Sample ID: EB02539-14 Lab Sample ID: 410-29682-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	3150		528	176	mg/Kg	1.76		Lloyd Kahn	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: EB02539-01

Lab Sample ID: 410-29682-1
Date Collected: 02/10/21 15:00
Matrix: Solid
Date Received: 02/18/21 08:37

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	342	J	498	166	mg/Kg			02/20/21 14:30	1.66
Percent Moisture	11.2		1.0	1.0	%			02/19/21 12:49	1
Percent Solids	88.8		1.0	1.0	%			02/19/21 12:49	1

Client Sample ID: EB02539-02

Lab Sample ID: 410-29682-2
Date Collected: 02/11/21 11:00
Matrix: Solid
Date Received: 02/18/21 08:37

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	17400		1440	481	mg/Kg			02/20/21 14:42	4.81
Percent Moisture	14.0		1.0	1.0	%			02/19/21 12:49	1
Percent Solids	86.0		1.0	1.0	%			02/19/21 12:49	1

Client Sample ID: EB02539-03

Lab Sample ID: 410-29682-3
Date Collected: 02/11/21 14:00
Matrix: Solid
Date Received: 02/18/21 08:37

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	8540		747	249	mg/Kg			02/20/21 14:55	2.49
Percent Moisture	11.7		1.0	1.0	%			02/19/21 12:49	1
Percent Solids	88.3		1.0	1.0	%			02/19/21 12:49	1

Client Sample ID: EB02539-04

Lab Sample ID: 410-29682-4
Date Collected: 02/11/21 11:00
Matrix: Solid
Date Received: 02/18/21 08:37

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	12900		1440	481	mg/Kg			02/20/21 13:52	4.81
Percent Moisture	11.9		1.0	1.0	%			02/19/21 12:49	1
Percent Solids	88.1		1.0	1.0	%			02/19/21 12:49	1

Client Sample ID: EB02539-05

Lab Sample ID: 410-29682-5
Date Collected: 02/09/21 10:30
Matrix: Solid
Date Received: 02/18/21 08:37

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	553		303	101	mg/Kg			02/22/21 13:56	1.01
Percent Moisture	25.3		1.0	1.0	%			02/19/21 12:49	1
Percent Solids	74.7		1.0	1.0	%			02/19/21 12:49	1

Client Sample ID: EB02539-06

Lab Sample ID: 410-29682-6
Date Collected: 02/09/21 10:40
Matrix: Solid
Date Received: 02/18/21 08:37

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	11200		1920	639	mg/Kg			02/20/21 15:20	6.39
Percent Moisture	15.0		1.0	1.0	%			02/19/21 12:49	1

Client Sample ID: EB02539-06 Lab Sample ID: 410-29682-6

Date Collected: 02/09/21 10:40 **Matrix: Solid**
Date Received: 02/18/21 08:37

General Chemistry (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	85.0		1.0	1.0	%			02/19/21 12:49	1

Client Sample ID: EB02539-07 Lab Sample ID: 410-29682-7

Date Collected: 02/09/21 14:45 **Matrix: Solid**
Date Received: 02/18/21 08:37

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	16700		1440	481	mg/Kg			02/20/21 15:58	4.81
Percent Moisture	7.6		1.0	1.0	%			02/19/21 12:49	1
Percent Solids	92.4		1.0	1.0	%			02/19/21 12:49	1

Client Sample ID: EB02539-08 Lab Sample ID: 410-29682-8

Date Collected: 02/09/21 16:00 **Matrix: Solid**
Date Received: 02/18/21 08:37

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	12400		1470	491	mg/Kg			02/20/21 16:11	4.91
Percent Moisture	13.6		1.0	1.0	%			02/19/21 12:49	1
Percent Solids	86.4		1.0	1.0	%			02/19/21 12:49	1

Client Sample ID: EB02539-09 Lab Sample ID: 410-29682-9

Date Collected: 02/09/21 16:30 **Matrix: Solid**
Date Received: 02/18/21 08:37

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1070		591	197	mg/Kg			02/20/21 16:24	1.97
Percent Moisture	16.6		1.0	1.0	%			02/19/21 12:49	1
Percent Solids	83.4		1.0	1.0	%			02/19/21 12:49	1

Client Sample ID: EB02539-10 Lab Sample ID: 410-29682-10

Date Collected: 02/09/21 14:45 **Matrix: Solid**
Date Received: 02/18/21 08:37

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	24900	F1	1490	498	mg/Kg			02/20/21 17:02	4.98
Percent Moisture	8.3		1.0	1.0	%			02/19/21 12:49	1
Percent Solids	91.7		1.0	1.0	%			02/19/21 12:49	1

Client Sample ID: EB02539-11 Lab Sample ID: 410-29682-11

Date Collected: 02/08/21 11:15 **Matrix: Solid**
Date Received: 02/18/21 08:37

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	40200		28600	9520	mg/Kg			02/20/21 16:36	95.24
Percent Moisture	32.9		1.0	1.0	%			02/19/21 12:49	1
Percent Solids	67.1		1.0	1.0	%			02/19/21 12:49	1

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Client Sample ID: EB02539-12 Lab Sample ID: 410-29682-12

Date Collected: 02/09/21 14:45 **Matrix: Solid**
Date Received: 02/18/21 08:37

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	9400	F2 F1	507	169	mg/Kg			02/22/21 14:21	1.69
Percent Moisture	19.4		1.0	1.0	%			02/19/21 12:49	1
Percent Solids	80.6		1.0	1.0	%			02/19/21 12:49	1

Client Sample ID: EB02539-13 Lab Sample ID: 410-29682-13

Date Collected: 02/08/21 14:30 **Matrix: Solid**
Date Received: 02/18/21 08:37

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	3840		411	137	mg/Kg			02/22/21 14:09	1.37
Percent Moisture	16.1		1.0	1.0	%			02/19/21 12:49	1
Percent Solids	83.9		1.0	1.0	%			02/19/21 12:49	1

Client Sample ID: EB02539-14 Lab Sample ID: 410-29682-14

Date Collected: 02/08/21 14:30 **Matrix: Solid**
Date Received: 02/18/21 08:37

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	3150		528	176	mg/Kg			02/22/21 15:00	1.76
Percent Moisture	12.7		1.0	1.0	%			02/19/21 12:49	1
Percent Solids	87.3		1.0	1.0	%			02/19/21 12:49	1

Method: Lloyd Kahn - Organic Carbon, Total (TOC)

Lab Sample ID: MB 410-96043/3
Client Sample ID: Method Blank
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 96043

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		300	100	mg/Kg			02/20/21 13:26	1

Lab Sample ID: LCS 410-96043/4
Client Sample ID: Lab Control Sample
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 96043

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	4300	2985		mg/Kg		69	47 - 143

Lab Sample ID: 410-29682-4 MS
Client Sample ID: EB02539-04
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 96043

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	12900		14500	24610		mg/Kg		81	47 - 143

Lab Sample ID: 410-29682-4 MSD
Client Sample ID: EB02539-04
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 96043

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	12900		14400	28590		mg/Kg		109	47 - 143	15	20

Lab Sample ID: 410-29682-10 MS
Client Sample ID: EB02539-10
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 96043

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	24900	F1	14600	48940	F1	mg/Kg		165	47 - 143

Lab Sample ID: 410-29682-10 MSD
Client Sample ID: EB02539-10
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 96043

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	24900	F1	14700	40150		mg/Kg		104	47 - 143	20	20

Lab Sample ID: MB 410-96500/3
Client Sample ID: Method Blank
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 96500

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		300	100	mg/Kg			02/22/21 13:18	1

Lab Sample ID: LCS 410-96500/4
Client Sample ID: Lab Control Sample
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 96500

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	4300	3376		mg/Kg		79	47 - 143

Method: Lloyd Kahn - Organic Carbon, Total (TOC)

Lab Sample ID: 410-29682-12 MS
Client Sample ID: EB02539-12
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 96500

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	9400	F2 F1	10100	30830	F1	mg/Kg		211	47 - 143

Lab Sample ID: 410-29682-12 MSD
Client Sample ID: EB02539-12
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 96500

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	9400	F2 F1	5120	15800	F2	mg/Kg		125	47 - 143	64	20

Lab Sample ID: 410-29682-14 MS
Client Sample ID: EB02539-14
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 96500

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	3150		5190	6849		mg/Kg		71	47 - 143

Lab Sample ID: 410-29682-14 MSD
Client Sample ID: EB02539-14
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 96500

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	3150		5420	7503		mg/Kg		80	47 - 143	9	20

1 2 3 4 5 6 7 8 9 10 11 12 13 14

General Chemistry

Analysis Batch: 95659

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-29682-1	EB02539-01	Total/NA	Solid	Moisture	
410-29682-2	EB02539-02	Total/NA	Solid	Moisture	
410-29682-3	EB02539-03	Total/NA	Solid	Moisture	
410-29682-4	EB02539-04	Total/NA	Solid	Moisture	
410-29682-5	EB02539-05	Total/NA	Solid	Moisture	
410-29682-6	EB02539-06	Total/NA	Solid	Moisture	
410-29682-7	EB02539-07	Total/NA	Solid	Moisture	
410-29682-8	EB02539-08	Total/NA	Solid	Moisture	
410-29682-9	EB02539-09	Total/NA	Solid	Moisture	
410-29682-10	EB02539-10	Total/NA	Solid	Moisture	
410-29682-11	EB02539-11	Total/NA	Solid	Moisture	
410-29682-12	EB02539-12	Total/NA	Solid	Moisture	
410-29682-13	EB02539-13	Total/NA	Solid	Moisture	
410-29682-14	EB02539-14	Total/NA	Solid	Moisture	

Analysis Batch: 96043

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-29682-1	EB02539-01	Total/NA	Solid	Lloyd Kahn	
410-29682-2	EB02539-02	Total/NA	Solid	Lloyd Kahn	
410-29682-3	EB02539-03	Total/NA	Solid	Lloyd Kahn	
410-29682-4	EB02539-04	Total/NA	Solid	Lloyd Kahn	
410-29682-6	EB02539-06	Total/NA	Solid	Lloyd Kahn	
410-29682-7	EB02539-07	Total/NA	Solid	Lloyd Kahn	
410-29682-8	EB02539-08	Total/NA	Solid	Lloyd Kahn	
410-29682-9	EB02539-09	Total/NA	Solid	Lloyd Kahn	
410-29682-10	EB02539-10	Total/NA	Solid	Lloyd Kahn	
410-29682-11	EB02539-11	Total/NA	Solid	Lloyd Kahn	
MB 410-96043/3	Method Blank	Total/NA	Solid	Lloyd Kahn	
LCS 410-96043/4	Lab Control Sample	Total/NA	Solid	Lloyd Kahn	
410-29682-4 MS	EB02539-04	Total/NA	Solid	Lloyd Kahn	
410-29682-4 MSD	EB02539-04	Total/NA	Solid	Lloyd Kahn	
410-29682-10 MS	EB02539-10	Total/NA	Solid	Lloyd Kahn	
410-29682-10 MSD	EB02539-10	Total/NA	Solid	Lloyd Kahn	

Analysis Batch: 96500

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-29682-5	EB02539-05	Total/NA	Solid	Lloyd Kahn	
410-29682-12	EB02539-12	Total/NA	Solid	Lloyd Kahn	
410-29682-13	EB02539-13	Total/NA	Solid	Lloyd Kahn	
410-29682-14	EB02539-14	Total/NA	Solid	Lloyd Kahn	
MB 410-96500/3	Method Blank	Total/NA	Solid	Lloyd Kahn	
LCS 410-96500/4	Lab Control Sample	Total/NA	Solid	Lloyd Kahn	
410-29682-12 MS	EB02539-12	Total/NA	Solid	Lloyd Kahn	
410-29682-12 MSD	EB02539-12	Total/NA	Solid	Lloyd Kahn	
410-29682-14 MS	EB02539-14	Total/NA	Solid	Lloyd Kahn	
410-29682-14 MSD	EB02539-14	Total/NA	Solid	Lloyd Kahn	

Client: PDC Laboratories, Inc.
Project/Site: EB02539

Job ID: 410-29682-1

Client Sample ID: EB02539-01
Date Collected: 02/10/21 15:00
Date Received: 02/18/21 08:37

Lab Sample ID: 410-29682-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1.66	96043	02/20/21 14:30	NKL9	ELLE
Total/NA	Analysis	Moisture		1	95659	02/19/21 12:49	UVJN	ELLE

Client Sample ID: EB02539-02
Date Collected: 02/11/21 11:00
Date Received: 02/18/21 08:37

Lab Sample ID: 410-29682-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		4.81	96043	02/20/21 14:42	NKL9	ELLE
Total/NA	Analysis	Moisture		1	95659	02/19/21 12:49	UVJN	ELLE

Client Sample ID: EB02539-03
Date Collected: 02/11/21 14:00
Date Received: 02/18/21 08:37

Lab Sample ID: 410-29682-3
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		2.49	96043	02/20/21 14:55	NKL9	ELLE
Total/NA	Analysis	Moisture		1	95659	02/19/21 12:49	UVJN	ELLE

Client Sample ID: EB02539-04
Date Collected: 02/11/21 11:00
Date Received: 02/18/21 08:37

Lab Sample ID: 410-29682-4
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		4.81	96043	02/20/21 13:52	NKL9	ELLE
Total/NA	Analysis	Moisture		1	95659	02/19/21 12:49	UVJN	ELLE

Client Sample ID: EB02539-05
Date Collected: 02/09/21 10:30
Date Received: 02/18/21 08:37

Lab Sample ID: 410-29682-5
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1.01	96500	02/22/21 13:56	NKL9	ELLE
Total/NA	Analysis	Moisture		1	95659	02/19/21 12:49	UVJN	ELLE

Client Sample ID: EB02539-06
Date Collected: 02/09/21 10:40
Date Received: 02/18/21 08:37

Lab Sample ID: 410-29682-6
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		6.39	96043	02/20/21 15:20	NKL9	ELLE
Total/NA	Analysis	Moisture		1	95659	02/19/21 12:49	UVJN	ELLE

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Client Sample ID: EB02539-07 Lab Sample ID: 410-29682-7

Date Collected: 02/09/21 14:45 **Matrix: Solid**
Date Received: 02/18/21 08:37

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		4.81	96043	02/20/21 15:58	NKL9	ELLE
Total/NA	Analysis	Moisture		1	95659	02/19/21 12:49	UVJN	ELLE

Client Sample ID: EB02539-08 Lab Sample ID: 410-29682-8

Date Collected: 02/09/21 16:00 **Matrix: Solid**
Date Received: 02/18/21 08:37

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		4.91	96043	02/20/21 16:11	NKL9	ELLE
Total/NA	Analysis	Moisture		1	95659	02/19/21 12:49	UVJN	ELLE

Client Sample ID: EB02539-09 Lab Sample ID: 410-29682-9

Date Collected: 02/09/21 16:30 **Matrix: Solid**
Date Received: 02/18/21 08:37

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1.97	96043	02/20/21 16:24	NKL9	ELLE
Total/NA	Analysis	Moisture		1	95659	02/19/21 12:49	UVJN	ELLE

Client Sample ID: EB02539-10 Lab Sample ID: 410-29682-10

Date Collected: 02/09/21 14:45 **Matrix: Solid**
Date Received: 02/18/21 08:37

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		4.98	96043	02/20/21 17:02	NKL9	ELLE
Total/NA	Analysis	Moisture		1	95659	02/19/21 12:49	UVJN	ELLE

Client Sample ID: EB02539-11 Lab Sample ID: 410-29682-11

Date Collected: 02/08/21 11:15 **Matrix: Solid**
Date Received: 02/18/21 08:37

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		95.24	96043	02/20/21 16:36	NKL9	ELLE
Total/NA	Analysis	Moisture		1	95659	02/19/21 12:49	UVJN	ELLE

Client Sample ID: EB02539-12 Lab Sample ID: 410-29682-12

Date Collected: 02/09/21 14:45 **Matrix: Solid**
Date Received: 02/18/21 08:37

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1.69	96500	02/22/21 14:21	NKL9	ELLE
Total/NA	Analysis	Moisture		1	95659	02/19/21 12:49	UVJN	ELLE

Client Sample ID: EB02539-13 Lab Sample ID: 410-29682-13
Date Collected: 02/08/21 14:30 **Matrix: Solid**
Date Received: 02/18/21 08:37

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1.37	96500	02/22/21 14:09	NKL9	ELLE
Total/NA	Analysis	Moisture		1	95659	02/19/21 12:49	UVJN	ELLE

Client Sample ID: EB02539-14 Lab Sample ID: 410-29682-14
Date Collected: 02/08/21 14:30 **Matrix: Solid**
Date Received: 02/18/21 08:37

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1.76	96500	02/22/21 15:00	NKL9	ELLE
Total/NA	Analysis	Moisture		1	95659	02/19/21 12:49	UVJN	ELLE

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: PDC Laboratories, Inc. Job ID: 410-29682-1
Project/Site: EB02539

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	004559	01-31-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Lloyd Kahn		Solid	Total Organic Carbon
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Method Summary

Client: PDC Laboratories, Inc.
Job ID: 410-29682-1
Project/Site: EB02539

Method	Method Description	Protocol	Laboratory
Lloyd Kahn	Organic Carbon, Total (TOC)	EPA	ELLE
Moisture	Percent Moisture	EPA	ELLE

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: PDC Laboratories, Inc.
Project/Site: EB02539

Job ID: 410-29682-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
410-29682-1	EB02539-01	Solid	02/10/21 15:00	02/18/21 08:37	
410-29682-2	EB02539-02	Solid	02/11/21 11:00	02/18/21 08:37	
410-29682-3	EB02539-03	Solid	02/11/21 14:00	02/18/21 08:37	
410-29682-4	EB02539-04	Solid	02/11/21 11:00	02/18/21 08:37	
410-29682-5	EB02539-05	Solid	02/09/21 10:30	02/18/21 08:37	
410-29682-6	EB02539-06	Solid	02/09/21 10:40	02/18/21 08:37	
410-29682-7	EB02539-07	Solid	02/09/21 14:45	02/18/21 08:37	
410-29682-8	EB02539-08	Solid	02/09/21 16:00	02/18/21 08:37	
410-29682-9	EB02539-09	Solid	02/09/21 16:30	02/18/21 08:37	
410-29682-10	EB02539-10	Solid	02/09/21 14:45	02/18/21 08:37	
410-29682-11	EB02539-11	Solid	02/08/21 11:15	02/18/21 08:37	
410-29682-12	EB02539-12	Solid	02/09/21 14:45	02/18/21 08:37	
410-29682-13	EB02539-13	Solid	02/08/21 14:30	02/18/21 08:37	
410-29682-14	EB02539-14	Solid	02/08/21 14:30	02/18/21 08:37	

410-29682 Chain of Custody

SUBCONTRACT ORDER
Transfer Chain of Custody

PDC Laboratories, Inc.

EB02539

SENDING LABORATORY

PDC Laboratories, Inc.
2231 W Altorfer Dr
Peoria, IL 61615
(800) 752-6651

RECEIVING LABORATORY

Eurofins Eaton Analytical, Inc. - Lancaster, PA
2425 New Holland Pike
Lancaster, PA 17601
(717) 656-2300

Sample: EB02539-01
Name: G314D - S1
Sampled: 02/10/21 15:00
Matrix: Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/23/21 16:00	03/10/21 15:00	

Sample: EB02539-02
Name: G314D - S2
Sampled: 02/11/21 11:00
Matrix: Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/23/21 16:00	03/11/21 11:00	

Sample: EB02539-03
Name: G314D - S2
Sampled: 02/11/21 14:00
Matrix: Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/23/21 16:00	03/11/21 14:00	

Sample: EB02539-04
Name: G314D - S2 DUPLICATE
Sampled: 02/11/21 11:00
Matrix: Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/23/21 16:00	03/11/21 11:00	MS/MSD

Sample: EB02539-05
Name: G307D - S1
Sampled: 02/09/21 10:30
Matrix: Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/23/21 16:00	03/09/21 10:30	

SUBCONTRACT ORDER
Transfer Chain of Custody

PDC Laboratories, Inc.

EB02539

SENDING LABORATORY

PDC Laboratories, Inc.
2231 W Altorfer Dr
Peoria, IL 61615
(800) 752-6651

RECEIVING LABORATORY

Eurofins Eaton Analytical, Inc. - Lancaster, PA
2425 New Holland Pike
Lancaster, PA 17601
(717) 656-2300

Sample: **EB02539-06**
Name: G307D - S2

Sampled: 02/09/21 10:40
Matrix: Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/23/21 16:00	03/09/21 10:40	

Sample: **EB02539-07**
Name: G307D - S3

Sampled: 02/09/21 14:45
Matrix: Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/23/21 16:00	03/09/21 14:45	

Sample: **EB02539-08**
Name: G307D - S4

Sampled: 02/09/21 16:00
Matrix: Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/23/21 16:00	03/09/21 16:00	

Sample: **EB02539-09**
Name: G307D - S5

Sampled: 02/09/21 16:30
Matrix: Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/23/21 16:00	03/09/21 16:30	

Sample: **EB02539-10**
Name: G307D - S3 DUPLICATE

Sampled: 02/09/21 14:45
Matrix: Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/23/21 16:00	03/09/21 14:45	MS/MSD

SUBCONTRACT ORDER
Transfer Chain of Custody

PDC Laboratories, Inc.

EB02539

SENDING LABORATORY	RECEIVING LABORATORY
PDC Laboratories, Inc. 2231 W Altorfer Dr Peoria, IL 61615 (800) 752-6651	Eurofins Eaton Analytical, Inc. - Lancaster, PA 2425 New Holland Pike Lancaster, PA 17601 (717) 656-2300

Sample: EB02539-11 **Sampled:** 02/08/21 11:15
Name: XPW - 01 - S1 **Matrix:** Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/23/21 16:00	03/08/21 11:15	

Sample: EB02539-12 **Sampled:** 02/09/21 14:45
Name: XPW - 01 - S1 DUPLICATE **Matrix:** Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/23/21 16:00	03/09/21 14:45	MS/MSD

Sample: EB02539-13 **Sampled:** 02/08/21 14:30
Name: XPW - 02 - S1 **Matrix:** Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/23/21 16:00	03/08/21 14:30	

Sample: EB02539-14 **Sampled:** 02/08/21 14:30
Name: XPW - 02 - S1 DUPLICATE **Matrix:** Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/23/21 16:00	03/08/21 14:30	MS/MSD

SUBCONTRACT ORDER
Transfer Chain of Custody

PDC Laboratories, Inc.

EB02539

Please email results to Gail Schindler at gschindler@pdclab.com

Date Shipped: 2/16/21 Total # of Containers: 14 Sample Origin (State): IL PO #: 11506

Turn-Around Time Requested [X] NORMAL [ ] RUSH Date Results Needed: ______

Relinquished By	Date/Time	Received By	Date/Time		
[signature]	2/16/21 1015			Sample Temperature Upon Receipt	____ °C
				Sample(s) Received on Ice	Y or N
				Proper Bottles Received in Good Condition	Y or N
				Bottles Filled with Adequate Volume	Y or N
		[signature]	2/18/21 08:37	Samples Received Within Hold Time	Y or N
				Date/Time Taken From Sample Bottle	Y or N

Login Sample Receipt Checklist

Client: PDC Laboratories, Inc. Job Number: 410-29682-1

Login Number: 29682 **List Source: Eurofins Lancaster Laboratories Env**
List Number: 1
Creator: Rivera, Tatiana

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	N/A	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample Preservation Verified.	N/A	
Residual Chlorine Checked.	N/A	
Sample custody seals are intact.	N/A	

Report Number
F21048-0023
Account Number
67045

a&lgreatlakes LABORATORIES
Scientists who don't mind getting dirty.™

3505 Conestoga Dr.
Fort Wayne, IN 46808
260.483.4759
algreatlakes.com

To: PDC LABORATORIES, INC.
2231 W ALTORFER DR
PEORIA, IL 61615-1807

For: EB02539

P.O. Number: 12450

Date Received: 02/17/2021
Date Reported: 02/24/2021

Attn: JANET CLUTTERS

REPORT OF ANALYSIS

Lab Number	Sample ID	Analysis	Result	Unit	Method
20308	01	Cation Exchange Capacity (NH4-Sat.)	9.44	meq/100g	MSA Part 3 (1996) pp 1220-1221
20309	02	Cation Exchange Capacity (NH4-Sat.)	9.72	meq/100g	MSA Part 3 (1996) pp 1220-1221
20310	03	Cation Exchange Capacity (NH4-Sat.)	12.45	meq/100g	MSA Part 3 (1996) pp 1220-1221
20311	04	Cation Exchange Capacity (NH4-Sat.)	9.15	meq/100g	MSA Part 3 (1996) pp 1220-1221
20312	05	Cation Exchange Capacity (NH4-Sat.)	18.82	meq/100g	MSA Part 3 (1996) pp 1220-1221
20313	06	Cation Exchange Capacity (NH4-Sat.)	3.32	meq/100g	MSA Part 3 (1996) pp 1220-1221
20314	07	Cation Exchange Capacity (NH4-Sat.)	3.91	meq/100g	MSA Part 3 (1996) pp 1220-1221
20315	08	Cation Exchange Capacity (NH4-Sat.)	8.31	meq/100g	MSA Part 3 (1996) pp 1220-1221
20316	09	Cation Exchange Capacity (NH4-Sat.)	17.24	meq/100g	MSA Part 3 (1996) pp 1220-1221
20317	10	Cation Exchange Capacity (NH4-Sat.)	6.05	meq/100g	MSA Part 3 (1996) pp 1220-1221
20318	11	Cation Exchange Capacity (NH4-Sat.)	2.26	meq/100g	MSA Part 3 (1996) pp 1220-1221
20319	12	Cation Exchange Capacity (NH4-Sat.)	1.57	meq/100g	MSA Part 3 (1996) pp 1220-1221

Report reviewed and approved by our professional agronomy staff.

Report Number
F21048-0023
Account Number
67045

a&lgreatlakes LABORATORIES
Scientists who don't mind getting dirty.™

3505 Conestoga Dr.
Fort Wayne, IN 46808
260.483.4759
algreatlakes.com

To: PDC LABORATORIES, INC.
2231 W ALTORFER DR
PEORIA, IL 61615-1807

For: EB02539

P.O. Number: 12450

Date Received: 02/17/2021

Attn: JANET CLUTTERS

REPORT OF ANALYSIS

Date Reported: 02/24/2021

Lab Number	Sample ID	Analysis	Result	Unit	Method
20320	13	Cation Exchange Capacity (NH4-Sat.)	0.28	meq/100g	MSA Part 3 (1996) pp 1220-1221
20321	14	Cation Exchange Capacity (NH4-Sat.)	0.38	meq/100g	MSA Part 3 (1996) pp 1220-1221

Report reviewed and approved by our professional agronomy staff.

SOILMISC

National Center for Testing & Innovation

ANALYTICAL REPORT

March 09, 2021

PDC Laboratory, Inc.

Sample Delivery Group:	L1319216
Samples Received:	02/23/2021
Project Number:	EB02539
Description:	
Report To:	Gail Schindler 2231 W. Altorfer Drive Peoria, IL 61615

Entire Report Reviewed By:

Mark W. Beasley
Project Manager

Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

EB02539-01 L1319216-01 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
	02/10/21 15:00	02/23/21 17:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1626465	1	02/26/21 14:04	03/05/21 09:17	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1627415	1	03/01/21 09:01	03/05/21 09:17	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1627415	1	03/01/21 09:01	03/03/21 14:23	RGT	Mt. Juliet, TN

EB02539-02 L1319216-02 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
	02/11/21 11:00	02/23/21 17:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1626465	1	02/26/21 14:04	03/05/21 09:17	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1627415	1	03/01/21 09:01	03/05/21 09:17	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1627415	1	03/01/21 09:01	03/03/21 14:23	RGT	Mt. Juliet, TN

EB02539-03 L1319216-03 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
	02/11/21 14:00	02/23/21 17:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1626465	1	02/26/21 14:04	03/05/21 09:17	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1627415	1	03/01/21 09:01	03/05/21 09:17	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1627415	1	03/01/21 09:01	03/03/21 14:23	RGT	Mt. Juliet, TN

EB02539-04 L1319216-04 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
	02/11/21 11:00	02/23/21 17:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1626465	1	02/26/21 14:04	03/05/21 09:17	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1627415	1	03/01/21 09:01	03/05/21 09:17	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1627415	1	03/01/21 09:01	03/03/21 14:23	RGT	Mt. Juliet, TN

EB02539-05 L1319216-05 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
	02/09/21 10:30	02/23/21 17:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1626465	1	02/26/21 14:04	03/05/21 09:17	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1627415	1	03/01/21 09:01	03/08/21 17:06	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1627415	1	03/01/21 09:01	03/08/21 17:06	RGT	Mt. Juliet, TN

EB02539-06 L1319216-06 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
	02/09/21 10:40	02/23/21 17:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1626465	1	02/26/21 14:04	03/05/21 09:17	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1627415	1	03/01/21 09:01	03/05/21 09:17	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1627415	1	03/01/21 09:01	03/03/21 14:23	RGT	Mt. Juliet, TN

EB02539-07 L1319216-07 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
	02/09/21 14:45	02/23/21 17:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1626465	1	02/26/21 14:04	03/05/21 13:45	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1627415	1	03/01/21 09:01	03/05/21 13:45	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1627415	1	03/01/21 09:01	03/03/21 14:23	RGT	Mt. Juliet, TN

EB02539-08 L1319216-08 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
	02/09/21 16:00	02/23/21 17:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1626465	1	02/26/21 14:04	03/05/21 13:45	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1627415	1	03/01/21 09:01	03/05/21 13:45	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1627415	1	03/01/21 09:01	03/03/21 15:52	RGT	Mt. Juliet, TN

EB02539-09 L1319216-09 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
	02/09/21 16:30	02/23/21 17:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1626465	1	02/26/21 14:04	03/05/21 13:45	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1627415	1	03/01/21 09:01	03/05/21 13:45	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1627415	1	03/01/21 09:01	03/03/21 15:52	RGT	Mt. Juliet, TN

EB02539-10 L1319216-10 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
	02/09/21 14:45	02/23/21 17:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1626465	1	02/26/21 14:04	03/05/21 13:45	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1627415	1	03/01/21 09:01	03/05/21 13:45	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1627415	1	03/01/21 09:01	03/03/21 15:52	RGT	Mt. Juliet, TN

EB02539-11 L1319216-11 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
	02/08/21 11:15	02/23/21 17:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1626465	1	02/26/21 14:04	03/05/21 13:45	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1627415	1	03/01/21 09:01	03/05/21 13:45	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1627415	1	03/01/21 09:01	03/03/21 15:52	RGT	Mt. Juliet, TN

EB02539-12 L1319216-12 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
	02/09/21 14:45	02/23/21 17:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1626465	1	02/26/21 14:04	03/05/21 13:45	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1627415	1	03/01/21 09:01	03/05/21 13:45	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1627415	1	03/01/21 09:01	03/03/21 15:52	RGT	Mt. Juliet, TN

			Collected by	Collected date/time	Received date/time	
EB02539-13 L1319216-13 Solids and Chemical Materials				02/08/21 14:30	02/23/21 17:00	

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1626465	1	02/26/21 14:04	03/05/21 13:45	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1627415	1	03/01/21 09:01	03/05/21 13:45	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1627415	1	03/01/21 09:01	03/03/21 15:53	RGT	Mt. Juliet, TN

			Collected by	Collected date/time	Received date/time	
EB02539-14 L1319216-14 Solids and Chemical Materials				02/08/21 14:30	02/23/21 17:00	

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1626465	1	02/26/21 14:04	03/05/21 13:45	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1627415	1	03/01/21 09:01	03/05/21 13:45	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1627415	1	03/01/21 09:01	03/03/21 15:53	RGT	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley
Project Manager

Radiochemistry by Method 9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.0977	U	0.276	0.517	03/05/2021 09:17	WG1626465
(T) Barium	*104*			*62.0-143*	*03/05/2021 09:17*	WG1626465
(T) Yttrium	*104*			*79.0-136*	*03/05/2021 09:17*	WG1626465

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	0.540	J	0.443	0.625	03/05/2021 09:17	WG1627415

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	0.540		0.167	0.108	03/03/2021 14:23	WG1627415
(T) Barium-133	*82.2*			*30.0-143*	*03/03/2021 14:23*	WG1627415

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.988		0.252	0.439	03/05/2021 09:17	WG1626465
(T) Barium	*104*			*62.0-143*	*03/05/2021 09:17*	WG1626465
(T) Yttrium	*101*			*79.0-136*	*03/05/2021 09:17*	WG1626465

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	1.58		0.416	0.514	03/05/2021 09:17	WG1627415

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	0.592		0.164	0.0751	03/03/2021 14:23	WG1627415
(T) Barium-133	*86.1*			*30.0-143*	*03/03/2021 14:23*	WG1627415

Radiochemistry by Method 9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.158	U	0.253	0.46	03/05/2021 09:17	WG1626465
(T) Barium	*97.0*			*62.0-143*	*03/05/2021 09:17*	WG1626465
(T) Yttrium	*92.1*			*79.0-136*	*03/05/2021 09:17*	WG1626465

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	0.741		0.403	0.513	03/05/2021 09:17	WG1627415

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	0.583		0.150	0.0526	03/03/2021 14:23	WG1627415
(T) Barium-133	*98.3*			*30.0-143*	*03/03/2021 14:23*	WG1627415

Radiochemistry by Method 9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.587		0.239	0.422	03/05/2021 09:17	WG1626465
(T) Barium	*106*			*62.0-143*	*03/05/2021 09:17*	WG1626465
(T) Yttrium	*105*			*79.0-136*	*03/05/2021 09:17*	WG1626465

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	1.10		0.381	0.498	03/05/2021 09:17	WG1627415

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	0.513		0.142	0.0755	03/03/2021 14:23	WG1627415
(T) Barium-133	*92.4*			*30.0-143*	*03/03/2021 14:23*	WG1627415

Radiochemistry by Method 9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.809		0.206	0.353	03/05/2021 09:17	WG1626465
(T) Barium	*102*			*62.0-143*	*03/05/2021 09:17*	WG1626465
(T) Yttrium	*107*			*79.0-136*	*03/05/2021 09:17*	WG1626465

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	1.22		0.337	0.428	03/08/2021 17:06	WG1627415

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	0.413		0.131	0.0754	03/08/2021 17:06	WG1627415
(T) Barium-133	*94.8*			*30.0-143*	*03/08/2021 17:06*	WG1627415

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.129	U	0.253	0.46	03/05/2021 09:17	WG1626465
(T) Barium	*94.4*			*62.0-143*	*03/05/2021 09:17*	WG1626465
(T) Yttrium	*105*			*79.0-136*	*03/05/2021 09:17*	WG1626465

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	0.527	J	0.388	0.547	03/05/2021 09:17	WG1627415

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	0.398		0.135	0.087	03/03/2021 14:23	WG1627415
(T) Barium-133	*96.5*			*30.0-143*	*03/03/2021 14:23*	WG1627415

Radiochemistry by Method 9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.223	U	0.235	0.452	03/05/2021 13:45	WG1626465
(T) Barium	*99.6*			*62.0-143*	*03/05/2021 13:45*	WG1626465
(T) Yttrium	*109*			*79.0-136*	*03/05/2021 13:45*	WG1626465

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	0.374	J	0.373	0.534	03/05/2021 13:45	WG1627415

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	0.374		0.138	0.0823	03/03/2021 14:23	WG1627415
(T) Barium-133	*84.6*			*30.0-143*	*03/03/2021 14:23*	WG1627415

Radiochemistry by Method 9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.776		0.233	0.42	03/05/2021 13:45	WG1626465
(T) Barium	*95.3*			*62.0-143*	*03/05/2021 13:45*	WG1626465
(T) Yttrium	*104*			*79.0-136*	*03/05/2021 13:45*	WG1626465

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	1.34		0.376	0.473	03/05/2021 13:45	WG1627415

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	0.565		0.143	0.0533	03/03/2021 15:52	WG1627415
(T) Barium-133	*93.2*			*30.0-143*	*03/03/2021 15:52*	WG1627415

Radiochemistry by Method 9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.145	U	0.208	0.402	03/05/2021 13:45	WG1626465
(T) Barium	*97.3*			*62.0-143*	*03/05/2021 13:45*	WG1626465
(T) Yttrium	*98.2*			*79.0-136*	*03/05/2021 13:45*	WG1626465

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	0.569		0.365	0.483	03/05/2021 13:45	WG1627415

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	0.569		0.157	0.0806	03/03/2021 15:52	WG1627415
(T) Barium-133	*87.8*			*30.0-143*	*03/03/2021 15:52*	WG1627415

Radiochemistry by Method 9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.307	J	0.300	0.562	03/05/2021 13:45	WG1626465
(T) Barium	*95.8*			*62.0-143*	*03/05/2021 13:45*	WG1626465
(T) Yttrium	*99.5*			*79.0-136*	*03/05/2021 13:45*	WG1626465

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	0.799		0.433	0.611	03/05/2021 13:45	WG1627415

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	0.492		0.133	0.0485	03/03/2021 15:52	WG1627415
(T) Barium-133	*91.8*			*30.0-143*	*03/03/2021 15:52*	WG1627415

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.701		0.263	0.479	03/05/2021 13:45	WG1626465
(T) Barium	*96.3*			*62.0-143*	*03/05/2021 13:45*	WG1626465
(T) Yttrium	*102*			*79.0-136*	*03/05/2021 13:45*	WG1626465

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	1.74		0.444	0.544	03/05/2021 13:45	WG1627415

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	1.04		0.181	0.0645	03/03/2021 15:52	WG1627415
(T) Barium-133	*101*			*30.0-143*	*03/03/2021 15:52*	WG1627415

Radiochemistry by Method 9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.888		0.329	0.599	03/05/2021 13:45	WG1626465
(T) Barium	*106*			*62.0-143*	*03/05/2021 13:45*	WG1626465
(T) Yttrium	*93.6*			*79.0-136*	*03/05/2021 13:45*	WG1626465

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	2.78		0.592	0.686	03/05/2021 13:45	WG1627415

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	1.89		0.263	0.0874	03/03/2021 15:52	WG1627415
(T) Barium-133	*103*			*30.0-143*	*03/03/2021 15:52*	WG1627415

Radiochemistry by Method 9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.56		0.270	0.462	03/05/2021 13:45	WG1626465
(T) Barium	*101*			*62.0-143*	*03/05/2021 13:45*	WG1626465
(T) Yttrium	*94.2*			*79.0-136*	*03/05/2021 13:45*	WG1626465

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	3.75		0.544	0.528	03/05/2021 13:45	WG1627415

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	2.19		0.274	0.0662	03/03/2021 15:53	WG1627415
(T) Barium-133	*97.9*			*30.0-143*	*03/03/2021 15:53*	WG1627415

Radiochemistry by Method 9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.836		0.244	0.439	03/05/2021 13:45	WG1626465
(T) Barium	*94.1*			*62.0-143*	*03/05/2021 13:45*	WG1626465
(T) Yttrium	*102*			*79.0-136*	*03/05/2021 13:45*	WG1626465

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	2.93		0.516	0.53	03/05/2021 13:45	WG1627415

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	2.10		0.272	0.0906	03/03/2021 15:53	WG1627415
(T) Barium-133	*99.0*			*30.0-143*	*03/03/2021 15:53*	WG1627415

1 Cp | 2 Tc | 3 Ss | 4 Cn | 5 Sr | 6 Qc | 7 Gl | 8 Al | 9 Sc

Method Blank (MB)

(MB) R3628725-1 03/05/21 09:17

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-228	-0.541	U	0.418
(T) Barium	*99.7*		
(T) Yttrium	*104*		

Laboratory Control Sample (LCS)

(LCS) R3628725-2 03/05/21 09:17

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.28	106	80.0-120	
(T) Barium			*103*		
(T) Yttrium			*108*		

L1319216-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1319216-04 03/05/21 09:17 • (MS) R3628725-3 03/05/21 09:17 • (MSD) R3628725-6 03/05/21 09:17

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	4.93	0.587	5.01	4.63	89.7	82.0	1	70.0-130			7.85		20
(T) Barium		*106*			*100*	*99.6*							
(T) Yttrium		*105*			*105*	*103*							

L1319216-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1319216-10 03/05/21 13:45 • (MS) R3628725-4 03/05/21 09:17 • (MSD) R3628725-7 03/05/21 09:17

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	4.93	0.307	6.33	5.81	122	112	1	70.0-130			8.63		20
(T) Barium		*95.8*			*100*	*100*							
(T) Yttrium		*99.5*			*101*	*108*							

L1319216-13 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1319216-13 03/05/21 13:45 • (MS) R3628725-5 03/05/21 09:17 • (MSD) R3628725-8 03/05/21 09:17

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	4.93	1.56	6.17	6.22	93.4	94.5	1	70.0-130			0.872		20
(T) Barium		*101*			*115*	*110*							

L1319216-13 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1319216-13 03/05/21 13:45 • (MS) R3628725-5 03/05/21 09:17 • (MSD) R3628725-8 03/05/21 09:17

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
(T) Yttrium		*94.2*			*104*	*100*							

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3628801-1 03/03/21 11:58

Analyte	MB Result pCi/g	MB Qualifier	MB MDA pCi/g
Radium-226	0.111		0.0551
(T) Barium-133	*88.4*		

Laboratory Control Sample (LCS)

(LCS) R3628801-2 03/03/21 14:22

Analyte	Spike Amount pCi/g	LCS Result pCi/g	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.02	5.95	119	60.0-144	
(T) Barium-133			*85.3*		

L1319216-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1319216-10 03/03/21 15:52 • (MS) R3628801-3 03/03/21 14:22 • (MSD) R3628801-11 03/09/21 07:42

Analyte	Spike Amount pCi/g	Original Result pCi/g	MS Result pCi/g	MSD Result pCi/g	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	5.01	0.492	5.30	5.02	96.0	90.4	1	65.0-135			5.45		20
(T) Barium-133		*91.8*			*84.9*	*102*							

L1319216-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1319216-04 03/03/21 14:23 • (MS) R3628801-9 03/08/21 17:06 • (MSD) R3628801-5 03/03/21 14:22

Analyte	Spike Amount pCi/g	Original Result pCi/g	MS Result pCi/g	MSD Result pCi/g	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	5.01	0.513	4.99	5.25	89.3	94.6	1	65.0-135			5.10		20
(T) Barium-133		*92.4*			*97.4*	*96.7*							

L1319216-13 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1319216-13 03/03/21 15:53 • (MS) R3628801-10 03/08/21 17:06 • (MSD) R3628801-7 03/03/21 14:22

Analyte	Spike Amount pCi/g	Original Result pCi/g	MS Result pCi/g	MSD Result pCi/g	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	5.01	2.19	5.54	6.23	66.7	80.5	1	65.0-135			11.7		20
(T) Barium-133		*97.9*			*102*	*98.1*							

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
U	Below Detectable Limits: Indicates that the analyte was not detected.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN, 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

SUBCONTRACT ORDER
Transfer Chain of Custody

H185

PDC Laboratories, Inc.

EB02539

SENDING LABORATORY

PDC Laboratories, Inc.
2231 W Altorfer Dr
Peoria, IL 61615
(800) 752-6651

RECEIVING LABORATORY

Pace Analytical - Mt Juliet, Tn
12065 Lebanon Rd
Mt Juliet, TN 37122
(615) 758-5858

1319216

Sample: EB02539-01 -01
Name: G314D - S1
Sampled: 02/10/21 15:00
Matrix: Soil
Preservative: Cool <6

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/23/21 16:00	08/09/21 15:00	

Sample: EB02539-02 02
Name: G314D - S2
Sampled: 02/11/21 11:00
Matrix: Soil
Preservative: Cool <6

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/23/21 16:00	08/10/21 11:00	

Sample: EB02539-03 03
Name: G314D - S2
Sampled: 02/11/21 14:00
Matrix: Soil
Preservative: Cool <6

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/23/21 16:00	08/10/21 14:00	

Sample: EB02539-04 04
Name: G314D - S2 DUPLICATE
Sampled: 02/11/21 11:00
Matrix: Soil
Preservative: Cool <6

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/23/21 16:00	08/10/21 11:00	MS/MSD

Sample: EB02539-05 05
Name: G307D - S1
Sampled: 02/09/21 10:30
Matrix: Soil
Preservative: Cool <6

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/23/21 16:00	08/08/21 10:30	

SUBCONTRACT ORDER
Transfer Chain of Custody

PDC Laboratories, Inc.

EB02539

SENDING LABORATORY

PDC Laboratories, Inc.
2231 W Altorfer Dr
Peoria, IL 61615
(800) 752-6651

RECEIVING LABORATORY

Pace Analytical - Mt Juliet, Tn
12065 Lebanon Rd
Mt Juliet, TN 37122
(615) 758-5858

1319214

Sample: EB02539-06 **Name:** G307D - S2
Sampled: 02/09/21 10:40 **Matrix:** Soil **Preservative:** Cool <6

06

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/23/21 16:00	08/08/21 10:40	

Sample: EB02539-07 **Name:** G307D - S3
Sampled: 02/09/21 14:45 **Matrix:** Soil **Preservative:** Cool <6

07

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/23/21 16:00	08/08/21 14:45	

Sample: EB02539-08 **Name:** G307D - S4
Sampled: 02/09/21 16:00 **Matrix:** Soil **Preservative:** Cool <6

08

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/23/21 16:00	08/08/21 16:00	

Sample: EB02539-09 **Name:** G307D - S5
Sampled: 02/09/21 16:30 **Matrix:** Soil **Preservative:** Cool <6

09

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/23/21 16:00	08/08/21 16:30	

Sample: EB02539-10 **Name:** G307D - S3 DUPLICATE
Sampled: 02/09/21 14:45 **Matrix:** Soil **Preservative:** Cool <6

10

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/23/21 16:00	08/08/21 14:45	MS/MSD

SUBCONTRACT ORDER
Transfer Chain of Custody

PDC Laboratories, Inc.

EB02539

1319216

SENDING LABORATORY

PDC Laboratories, Inc.
2231 W Altorfer Dr
Peoria, IL 61615
(800) 752-6651

RECEIVING LABORATORY

Pace Analytical - Mt Juliet, Tn
12065 Lebanon Rd
Mt Juliet, TN 37122
(615) 758-5858

Sample: EB02539-11
Name: XPW - 01 - S1

Sampled: 02/08/21 11:15
Matrix: Soil
Preservative: Cool <6

11

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/23/21 16:00	08/07/21 11:15	

Sample: EB02539-12
Name: XPW - 01 - S1 DUPLICATE

Sampled: 02/09/21 14:45
Matrix: Soil
Preservative: Cool <6

12

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/23/21 16:00	08/08/21 14:45	MS/MSD

13

Sample: EB02539-13
Name: XPW - 02 - S1

Sampled: 02/08/21 14:30
Matrix: Soil
Preservative: Cool <6

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/23/21 16:00	08/07/21 14:30	

Sample: EB02539-14
Name: XPW - 02 - S1 DUPLICATE

Sampled: 02/08/21 14:30
Matrix: Soil
Preservative: Cool <6

14

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/23/21 16:00	08/07/21 14:30	MS/MSD

SUBCONTRACT ORDER
Transfer Chain of Custody

PDC Laboratories, Inc.

EB02539

131921

7729 1192 2915/2926/3110/3565 All Cont < 500 CPM

Sample Receipt Checklist

COC Seal Present/Intact:	Y ✓ N	If Applicable	
COC Signed/Accurate:	✓ Y N	VOA Zero Headspace:	Y N
Bottles arrive intact:	✓ Y N	Pres.Correct/Check:	Y N
Correct bottles used:	✓ Y N		
Sufficient volume sent:	✓ Y N		
RAD Screen <0.5 mR/hr:	✓ Y N		

14 total

NPAT 1.3+.2=1.5

Please email results to Gail Schindler at gschindler@pdclab.com

Date Shipped: 2-15-21 Total # of Containers: 14 Sample Origin (State): IL PO #: 11508

Turn-Around Time Requested ☑ NORMAL ☐ RUSH Date Results Needed: ______

Relinquished By	Date/Time	Received By	Date/Time
[signature]	2-15-21 16:30		
		WPappas	2-23-21 930 1500

Sample Temperature Upon Receipt	____ °C
Sample(s) Received on Ice	Y or N
Proper Bottles Received in Good Condition	Y or N
Bottles Filled with Adequate Volume	Y or N
Samples Received Within Hold Time	Y or N
Date/Time Taken From Sample Bottle	Y or N

PDC LABORATORIES, INC.
WWW.PDCLAB.COM

REGULATORY PROGRAM (CIRCLE):	NPDES
MORBCA	RCRA
CCDD	TACO: RES or IND/COMM

CHAIN OF CUSTODY RECORD

STATE WHERE SAMPLE COLLECTED IL

ALL HIGHLIGHTED AREAS MUST BE COMPLETED BY CLIENT (PLEASE PRINT)

1 CLIENT: HANSON PROFESSIONAL SERVICES
ADDRESS: 1525 S 6TH STREET
CITY STATE ZIP: SPRINGFIELD IL 62703-6801
CONTACT PERSON: MR RHON HASENYAGER

PROJECT NUMBER: COFFEEN AP1
PROJECT LOCATION:
PURCHASE ORDER #:
PHONE NUMBER:
E-MAIL:
DATE SHIPPED:
SAMPLER (PLEASE PRINT): COLIN WINTER
SAMPLER'S SIGNATURE:

MATRIX TYPES:
WW- WASTEWATER
DW- DRINKING WATER
GW- GROUND WATER
WWSL- SLUDGE
NAS- NON AQUEOUS SOLID
LCHT-LEACHATE
OIL-OIL
SO-SOIL
SOL-SOLID

3 ANALYSIS REQUESTED

4 (FOR LAB USE ONLY)
LOGIN # EB02539
LOGGED BY:
CLIENT: HANSON PROFESSIONAL SERVICES
PROJECT: HANSON VISTRA COFFEEN AP1 SOIL
PROJ. MGR.: GJ SCHINDLER

2 SAMPLE DESCRIPTION (UNIQUE DESCRIPTION AS IT WILL APPEAR ON THE ANALYTICAL REPORT)	DATE COLLECTED	TIME COLLECTED	SAMPLE TYPE GRAB	SAMPLE TYPE COMP	MATRIX TYPE	BOTTLE COUNT	PRES CODE CLIENT PROVIDED	SB, AS, BA, BE, B, CD, CA, CR,	CO, FE, PB, LI, MG, MN, MO, K	SE, NA, S, TL, CL, F, SO4, TN	FE OXIDE, MN OXIDE	RAD 226/228	TOC	CEC	REMARKS
G314D-S1	2/10/21	1:30-3		X	SO	SEE JARS									
G314P-S2	2/11/21	8-11AM		X	SO	3									
G314D-S3	2/11/21	11-2PM		X	SO	4									
G314PS2 (MS/MSD/FIELD DUP)	2/11/21	8-11AM		X	SO	2									
G314-S31 (EQUIP BLANK)	2/11/21	1:30PM		X	N/A	8									
G307D-S1	2/9/21	10-10:30		X	SO	3									
G307P-S2	2/9/21	10:30-40		X	SO	2									
G307P-S3	2/9/21	1040-245		X	SO	SEE JARS									

CHEMICAL PRESERVATION CODES: 1 – HCL 2 – H2SO4 3 – HNO3 4 – NAOH 5 – NA2S2O3 6 – UNPRESERVED 7 – OTHER

5 TURNAROUND TIME REQUESTED (PLEASE CIRCLE) (RUSH TAT IS SUBJECT TO PDC LABS APPROVAL AND SURCHARGE) NORMAL RUSH
RUSH RESULTS VIA (PLEASE CIRCLE) EMAIL PHONE
EMAIL IF DIFFERENT FROM ABOVE: PHONE # IF DIFFERENT FROM ABOVE:
DATE RESULTS NEEDED

6 *I understand that by initialing this box I give the lab permission to proceed with analysis, even though it may not meet all sample conformance requirements as defined in the receiving facility's Sample Acceptance Policy and the data will be qualified. Qualified data may NOT be acceptable to report to all regulatory authorities.*
PROCEED WITH ANALYSIS AND QUALIFY RESULTS: (INITIALS) ______

7 RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)	DATE / TIME
	DATE 2/12/21 TIME 9:30AM		DATE 2-12-21 TIME 9:00
RELINQUISHED BY: (SIGNATURE)	DATE 2-12-21 TIME 15:12	RECEIVED BY: (SIGNATURE)	DATE TIME
RELINQUISHED BY: (SIGNATURE)	DATE TIME	RECEIVED BY: (SIGNATURE)	DATE 2/12/21 TIME 1512

8 COMMENTS: (FOR LAB USE ONLY)
SAMPLE TEMPERATURE UPON RECEIPT 2.5 °C
CHILL PROCESS STARTED PRIOR TO RECEIPT Y OR N
SAMPLE(S) RECEIVED ON ICE Y OR N
SAMPLE ACCEPTANCE NONCONFORMANT REPORT IS NEEDED Y OR N
DATE AND TIME TAKEN FROM SAMPLE BOTTLE ______

PDC LABORATORIES, INC.
WWW.PDCLAB.COM

REGULATORY PROGRAM (CIRCLE):	NPDES
MORBCA	RCRA
CCDD	TACO: RES OR IND/COMM

CHAIN OF CUSTODY RECORD

STATE WHERE SAMPLE COLLECTED IL

ALL HIGHLIGHTED AREAS MUST BE COMPLETED BY CLIENT (PLEASE PRINT)

(1) CLIENT: HANSON PROFESSIONAL SERVICES

ADDRESS: 1525 S 6TH STREET

CITY STATE ZIP: SPRINGFIELD IL 62703-6801

CONTACT PERSON: MR RHON HASENYAGER

PROJECT NUMBER: COFFEEN AP1

PROJECT LOCATION:

PURCHASE ORDER #:

PHONE NUMBER:

E-MAIL:

DATE SHIPPED:

SAMPLER (PLEASE PRINT): COLIN WINTER

SAMPLER'S SIGNATURE: [signature]

MATRIX TYPES: WW- WASTEWATER, DW- DRINKING WATER, GW- GROUND WATER, WWSL- SLUDGE, NAS- NON AQUEOUS SOLID, LCHT-LEACHATE, OIL-OIL, SO-SOIL, SOL-SOLID

(3) ANALYSIS REQUESTED: SB, AS, BA, BE, B, CD, CA, CR, | CO, FE, PB, LI, MG, MN, MO, K | SE, NA, S, TL, CL, F, SO4, TN | FE OXIDE, MN OXIDE | RAD 226/228 | TOC | CEC

(4) (FOR LAB USE ONLY)
LOGIN # EB02539
LOGGED BY: [initials]
CLIENT: HANSON PROFESSIONAL SERVICES
PROJECT: HANSON VISTRA COFFEEN AP1 SOIL
PROJ. MGR.: GJ SCHINDLER

(2) SAMPLE DESCRIPTION (UNIQUE DESCRIPTION AS IT WILL APPEAR ON THE ANALYTICAL REPORT)	DATE COLLECTED	TIME COLLECTED	SAMPLE TYPE GRAB	SAMPLE TYPE COMP	MATRIX TYPE	BOTTLE COUNT	PRES CODE CLIENT PROVIDED	SB, AS, BA, BE, B, CD, CA, CR,	CO, FE, PB, LI, MG, MN, MO, K	SE, NA, S, TL, CL, F, SO4, TN	FE OXIDE, MN OXIDE	RAD 226/228	TOC	CEC	REMARKS
G307D-S4	2/9/21	2:45-4		X	SO	4									
G307D-S5	2/9/21	4-4:30		X	SO	3									
G307D-S3 (MS/MSD & FIELD DUP)	2/9/21	10:40-2:45		X	SO	SEE JARS									
G307D-S17 (EQUIP BLANK)	2/9/21	~~[illegible]~~	SEE JARS		N/A	8									
XPW-01-S1	2/8/21	10:45-11:15		X	SOL	3									
XPW-01-S1 (MS/MSD/FIELD DUP)	2/8/21	10:45-11:15		X	SOL	3									
XPW-01- EQUIP BLANK	2/8/21	~~[illegible]~~	SEE JARS	~~X~~	~~[illegible]~~	~~[illegible]~~ 8									

CHEMICAL PRESERVATION CODES: 1 – HCL | 2 – H2SO4 | 3 – HNO3 | 4 – NAOH | 5 – NA2S2O3 | 6 – UNPRESERVED | 7 – OTHER

(5) TURNAROUND TIME REQUESTED (PLEASE CIRCLE) (RUSH TAT IS SUBJECT TO PDC LABS APPROVAL AND SURCHARGE) NORMAL RUSH

DATE RESULTS NEEDED

RUSH RESULTS VIA (PLEASE CIRCLE) EMAIL PHONE

EMAIL IF DIFFERENT FROM ABOVE: PHONE # IF DIFFERENT FROM ABOVE:

(6) *I understand that by initialing this box I give the lab permission to proceed with analysis, even though it may not meet all sample conformance requirements as defined in the receiving facility's Sample Acceptance Policy and the data will be qualified. Qualified data may NOT be acceptable to report to all regulatory authorities.*

PROCEED WITH ANALYSIS AND QUALIFY RESULTS: (INITIALS) ____________

(7) RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)	DATE / TIME
[signature]	DATE 2/12/21 TIME 9:30AM		DATE TIME
RELINQUISHED BY: (SIGNATURE) [signature]	DATE 2-12-21 TIME 15:12	RECEIVED BY: (SIGNATURE)	DATE TIME
RELINQUISHED BY: (SIGNATURE)	DATE TIME	RECEIVED BY: (SIGNATURE) [signature]	DATE 2/12/21 TIME 1512

(8) COMMENTS: (FOR LAB USE ONLY)

SAMPLE TEMPERATURE UPON RECEIPT 2.5 °C
CHILL PROCESS STARTED PRIOR TO RECEIPT Y OR N
SAMPLE(S) RECEIVED ON ICE Y OR N
SAMPLE ACCEPTANCE NONCONFORMANT REPORT IS NEEDED Y OR N
DATE AND TIME TAKEN FROM SAMPLE BOTTLE ____________

PDC LABORATORIES, INC.
WWW.PDCLAB.COM

REGULATORY PROGRAM (CIRCLE):	NPDES
MORBCA	RCRA
CCDD	TACO: RES OR IND/COMM

CHAIN OF CUSTODY RECORD

STATE WHERE SAMPLE COLLECTED IL

*ALL HIGHLIGHTED AREAS **MUST** BE COMPLETED BY CLIENT (PLEASE PRINT)*

(1) CLIENT: HANSON PROFESSIONAL SERVICES
ADDRESS: 1525 S 6TH STREET
CITY STATE ZIP: SPRINGFIELD IL 62703-6801
CONTACT PERSON: MR RHON HASENYAGER

PROJECT NUMBER: COFFEEN AP1
PROJECT LOCATION:
PURCHASE ORDER #:
PHONE NUMBER:
E-MAIL:
DATE SHIPPED:
SAMPLER (PLEASE PRINT): COLIN WINTER
SAMPLER'S SIGNATURE: [signature]

MATRIX TYPES:
WW- WASTEWATER
DW- DRINKING WATER
GW- GROUND WATER
WWSL- SLUDGE
NAS- NON AQUEOUS SOLID
LCHT-LEACHATE
OIL-OIL
SO-SOIL
SOL-SOLID

(3) ANALYSIS REQUESTED

(4) (FOR LAB USE ONLY)
LOGIN # EB02539
LOGGED BY: [initials]
CLIENT: HANSON PROFESSIONAL SERVICES
PROJECT: HANSON VISTRA COFFEEN AP1 SOIL
PROJ. MGR.: GJ SCHINDLER

(2) SAMPLE DESCRIPTION (UNIQUE DESCRIPTION AS IT WILL APPEAR ON THE ANALYTICAL REPORT)	DATE COLLECTED	TIME COLLECTED	SAMPLE TYPE GRAB	SAMPLE TYPE COMP	MATRIX TYPE	BOTTLE COUNT	PRES CODE CLIENT PROVIDED	SB, AS, BA, BE, B, CD, CA, CR,	CO, FE, PB, LI, MG, MN, MO, K	SE, NA, S, TL, CL, F, SO4, TN	FE OXIDE, MN OXIDE	RAD 226/228	TOC	CEC	REMARKS
XPW-02-S1	2/8/21	1:30-2:30		X	SOL	See									
XPW-02-S1 (MS/MSD / FIELD DUP)	2/8/21	1:30-2:30		X	SOL	Sers									
XPW-02-S4 (EQUIP BLANK)	2/8/21	See Jers		N/A	N/A	8									

CHEMICAL PRESERVATION CODES: 1 – HCL | 2 – H2SO4 | 3 – HNO3 | 4 – NAOH | 5 – NA2S2O3 | 6 – UNPRESERVED | 7 – OTHER

(5) TURNAROUND TIME REQUESTED (PLEASE CIRCLE) NORMAL RUSH
(RUSH TAT IS SUBJECT TO PDC LABS APPROVAL AND SURCHARGE)
DATE RESULTS NEEDED
RUSH RESULTS VIA (PLEASE CIRCLE) EMAIL PHONE
EMAIL IF DIFFERENT FROM ABOVE:
PHONE # IF DIFFERENT FROM ABOVE:

(6) *I understand that by initialing this box I give the lab permission to proceed with analysis, even though it may not meet all sample conformance requirements as defined in the receiving facility's Sample Acceptance Policy and the data will be qualified. Qualified data may **NOT** be acceptable to report to all regulatory authorities.*
PROCEED WITH ANALYSIS AND QUALIFY RESULTS: (INITIALS) ______

(7) RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)	DATE / TIME
[signature]	DATE 2/12/21 TIME 9:30AM	[signature]	DATE 2-12-21 TIME 9:00
[signature]	DATE 2-12-21 TIME 15:12		DATE TIME
	DATE TIME	[signature]	DATE 2/12/21 TIME 15:12

(8) COMMENTS: (FOR LAB USE ONLY)
SAMPLE TEMPERATURE UPON RECEIPT 2.5 °C
CHILL PROCESS STARTED PRIOR TO RECEIPT (Y) OR N
SAMPLE(S) RECEIVED ON ICE (Y) OR N
SAMPLE ACCEPTANCE NONCONFORMANT REPORT IS NEEDED Y OR (N)
DATE AND TIME TAKEN FROM SAMPLE BOTTLE ______

March 01, 2021

Rhonald Hasenyager
Hanson Professional Services, Inc.
1525 South Sixth Street
Springfield, IL 62703-2886

RE: HANSON VISTRA SOIL

Dear Rhonald Hasenyager:

Please find enclosed the analytical results for the **6** sample(s) the laboratory received on **2/5/21 4:00 pm** and logged in under work order **EB01458**. All testing is performed according to our current TNI accreditations unless otherwise noted. This report cannot be reproduced, except in full, without the written permission of PDC Laboratories, Inc.

If you have any questions regarding your report, please contact your project manager. Quality and timely data is of the utmost importance to us.

PDC Laboratories, Inc. appreciates the opportunity to provide you with analytical expertise. We are always trying to improve our customer service and we welcome you to contact the Director of Client Services, Lisa Grant, with any feedback you have about your experience with our laboratory at 309-683-1764 or lgrant@pdclab.com.

Sincerely,

Gail g Schindler

Gail Schindler
Project Manager
(309) 692-9688 x1716
gschindler@pdclab.com

SAMPLE RECEIPT CHECK LIST

Items not applicable will be marked as in compliance

Work Order EB01458

NO	Samples received within temperature compliance when applicable
YES	COC present upon sample receipt
YES	COC completed & legible
YES	Sampler name & signature present
YES	Unique sample IDs assigned
YES	Sample collection location recorded
YES	Date & time collected recorded on COC
YES	Relinquished by client signature on COC
YES	COC & labels match
YES	Sample labels are legible
YES	Appropriate bottle(s) received
YES	Sufficient sample volume received
YES	Sample containers recieved undamaged
NO	Zero headspace, <6 mm present in VOA vials
NO	Trip blank(s) received
YES	All non-field analyses received within holding times
NO	Short hold time analysis
YES	Current PDC COC submitted
NO	Case narrative provided

Case Narrative

EB01458 was received February 5, 2021 at 6.9oC.
Sample(s) did not meet regulatory thermal preservation requirement.
Sample(s) were:
1. Received on the same day of collection, above allowable maximum temperature, and not received on ice.

OR

2. Received after the day of collection and were above the allowable maximum temperature.

PLEASE NOTE: Results **MAY** not be acceptable to report to a regulatory authority.
Analyses that do not require thermal preservation are Radiochemistry, Drinking Water Bacteriology, Fluoride, Chloride, Bromide, Mercury 245.1/7470, metals methods 200.7/200.8 and 6010/6020.

ANALYTICAL RESULTS

Sample: EB01458-01
Name: G289-S4 (COFFEEN GMF)
Matrix: Soil - Composite
Sampled: 02/01/21 14:00
Received: 02/05/21 15:34

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	19.81	meq/100g			1	1			Subcontracted

Sample: EB01458-02
Name: G311D-S1 (COFFEEN AP1)
Matrix: Soil - Composite
Sampled: 02/05/21 08:30
Received: 02/05/21 15:34

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	9.36	meq/100g			1	1			Subcontracted

Sample: EB01458-03
Name: G311D-S2 (COFFEEN AP1)
Matrix: Soil - Composite
Sampled: 02/05/21 09:15
Received: 02/05/21 15:34

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	9.23	meq/100g			1	1			Subcontracted

Sample: EB01458-04
Name: G311D-S3 (COFFEEN AP1)
Matrix: Soil - Composite
Sampled: 02/05/21 11:45
Received: 02/05/21 15:34

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	9.61	meq/100g			1	1			Subcontracted

ANALYTICAL RESULTS

Sample: EB01458-05 **Sampled:** 02/05/21 11:45
Name: G311D-S4 (COFFEEN AP1) **Received:** 02/05/21 15:34
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	13.05	meq/100g			1	1			Subcontracted

Sample: EB01458-06 **Sampled:** 02/05/21 11:45
Name: G311D-S2 (COFFEEN AP1) DUPCLIATE **Received:** 02/05/21 15:34
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - A & L Great Lakes Laboratory									
Cation Exchange Capacity - subcontracted	9.63	meq/100g			1	1			Subcontracted

ANALYTICAL RESULTS

Sample: EB01458-01 **Sampled:** 02/01/21 14:00
Name: G289-S4 (COFFEEN GMF) **Received:** 02/05/21 15:34
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	1800	mg/kg			1.98	594	02/12/21 15:42		SM 5310C 2000

Sample: EB01458-02 **Sampled:** 02/05/21 08:30
Name: G311D-S1 (COFFEEN AP1) **Received:** 02/05/21 15:34
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	118 J	mg/kg			1.06	318	02/17/21 12:58		SM 5310C 2000

ANALYTICAL RESULTS

Sample: EB01458-03
Name: G311D-S2 (COFFEEN AP1)
Matrix: Soil - Composite
Sampled: 02/05/21 09:15
Received: 02/05/21 15:34

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	11500	mg/kg			5.02	1510	02/16/21 18:26		SM 5310C 2000

Sample: EB01458-04
Name: G311D-S3 (COFFEEN AP1)
Matrix: Soil - Composite
Sampled: 02/05/21 11:45
Received: 02/05/21 15:34

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	14800	mg/kg			10.03	3010	02/17/21 13:49		SM 5310C 2000

Sample: EB01458-05
Name: G311D-S4 (COFFEEN AP1)
Matrix: Soil - Composite
Sampled: 02/05/21 11:45
Received: 02/05/21 15:34

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	563	mg/kg			1.03	309	02/17/21 14:01		SM 5310C 2000

Sample: EB01458-06
Name: G311D-S2 (COFFEEN AP1) DUPCLIATE
Matrix: Soil - Composite
Sampled: 02/05/21 11:45
Received: 02/05/21 15:34

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
General Chemistry - Eurofins Eaton Analytical, Inc. - Lancaster, PA									
Total Organic Carbon (TOC)	17100	mg/kg			4.55	1370	02/16/21 19:30		SM 5310C 2000

ANALYTICAL RESULTS

ANALYTICAL RESULTS

Sample: EB01458-01 **Sampled:** 02/01/21 14:00
Name: G289-S4 (COFFEEN GMF) **Received:** 02/05/21 15:34
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	0.529	pCi/g dry wt			1	0.0612	02/22/21 14:02		Subcontracted
Radium 228 - subcontracted	0.195 U	pCi/g dry wt			1	0.451	02/24/21 09:05		Subcontracted

Sample: EB01458-02 **Sampled:** 02/05/21 08:30
Name: G311D-S1 (COFFEEN AP1) **Received:** 02/05/21 15:34
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	0.78	pCi/g dry wt			1	0.0752	02/22/21 14:02		Subcontracted
Radium 228 - subcontracted	0.278	pCi/g dry wt			1	0.399	02/24/21 09:05		Subcontracted

Sample: EB01458-03 **Sampled:** 02/05/21 09:15
Name: G311D-S2 (COFFEEN AP1) **Received:** 02/05/21 15:34
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	0.742	pCi/g dry wt			1	0.0569	02/22/21 14:02		Subcontracted
Radium 228 - subcontracted	0.281 J	pCi/g dry wt			1	0.425	02/24/21 09:05		Subcontracted

Sample: EB01458-04 **Sampled:** 02/05/21 11:45
Name: G311D-S3 (COFFEEN AP1) **Received:** 02/05/21 15:34
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	0.693	pCi/g dry wt			1	0.0694	02/22/21 14:02		Subcontracted
Radium 228 - subcontracted	0.621	pCi/g dry wt			1	0.42	02/24/21 09:05		Subcontracted

ANALYTICAL RESULTS

Sample: EB01458-05
Name: G311D-S4 (COFFEEN AP1)
Matrix: Soil - Composite

Sampled: 02/05/21 11:45
Received: 02/05/21 15:34

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	0.518	pCi/g dry wt			1	0.0824	02/22/21 14:02		Subcontracted
Radium 228 - subcontracted	0.946	pCi/g dry wt			1	0.359	02/24/21 09:05		Subcontracted

Sample: EB01458-06
Name: G311D-S2 (COFFEEN AP1) DUPCLIATE
Matrix: Soil - Composite

Sampled: 02/05/21 11:45
Received: 02/05/21 15:34

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Miscellaneous - Pace Analytical - Mt Juliet, Tn									
Radium 226 - subcontracted	0.429	pCi/g dry wt			1	0.0532	02/22/21 14:02		Subcontracted
Radium 228 - subcontracted	-0.41	pCi/g dry wt	U		1	0.372	02/24/21 09:05		Subcontracted

ANALYTICAL RESULTS

ANALYTICAL RESULTS

Sample: EB01458-01
Name: G289-S4 (COFFEEN GMF)
Matrix: Soil - Composite

Sampled: 02/01/21 14:00
Received: 02/05/21 15:34

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 1.0	mg/kg		02/08/21 17:41	1	1.0	02/08/21 17:41	CRD	EPA 9056A
Fluoride	< 0.25	mg/kg		02/08/21 17:41	1	0.25	02/08/21 17:41	CRD	EPA 9056A
Sulfate	< 1.0	mg/kg		02/08/21 17:41	1	1.0	02/08/21 17:41	CRD	EPA 9056A
General Chemistry - PIA									
Solids - total solids (TS)	82	%		02/08/21 15:14	1	0.050	02/08/21 15:57	BMA/BCR	SM 2540G*
Total Nitrogen	410	mg/kg dry		02/10/21 14:37	1	61	02/11/21 11:09	CRS1	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	19000	mg/kg		02/09/21 14:58	10	43	02/10/21 10:55	wjm	calculated
Manganese as MnO2	740	mg/kg		02/09/21 14:58	10	1.6	02/10/21 10:55	wjm	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	0.51	mg/kg		02/10/21 14:37	1	0.20	02/10/21 14:37	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	340	mg/kg		02/08/21 08:02	1	50	02/11/21 11:09	CRS1	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 3.0	mg/kg		02/09/21 14:58	10	3.0	02/10/21 10:55	wjm	EPA 6020A
Arsenic	2.3	mg/kg		02/09/21 14:58	20	2.0	02/10/21 11:37	wjm	EPA 6020A
Barium	86	mg/kg		02/09/21 14:58	10	1.0	02/10/21 10:55	wjm	EPA 6020A
Beryllium	< 1.0	mg/kg		02/09/21 14:58	10	1.0	02/10/21 13:21	KMC	EPA 6020A
Boron	< 10	mg/kg		02/09/21 14:58	10	10	02/10/21 13:21	KMC	EPA 6020A*
Cadmium	< 1.0	mg/kg		02/09/21 14:58	10	1.0	02/10/21 10:55	wjm	EPA 6020A
Chromium	13	mg/kg		02/09/21 14:58	10	4.0	02/10/21 10:55	wjm	EPA 6020A
Cobalt	6.2	mg/kg		02/09/21 14:58	10	2.0	02/10/21 10:55	wjm	EPA 6020A
Iron	13000	mg/kg		02/09/21 14:58	10	30	02/10/21 10:55	wjm	EPA 6020A*
Lead	9.0	mg/kg		02/09/21 14:58	10	1.0	02/10/21 13:21	KMC	EPA 6020A
Manganese	470	mg/kg		02/09/21 14:58	10	1.0	02/10/21 10:55	wjm	EPA 6020A
Molybdenum	< 1.0	mg/kg		02/09/21 14:58	10	1.0	02/10/21 10:55	wjm	EPA 6020A
Selenium	< 2.0	mg/kg		02/09/21 14:58	20	2.0	02/10/21 11:37	wjm	EPA 6020A
Thallium	< 1.0	mg/kg		02/09/21 14:58	10	1.0	02/10/21 13:21	KMC	EPA 6020A
Mercury	< 0.20	mg/kg		02/09/21 14:58	10	0.20	02/10/21 13:21	KMC	EPA 6020A
Lithium	8.8	mg/kg		02/09/21 14:58	1	5.0	02/10/21 09:53	TJJ	EPA 6010B*
Sulfur	130	mg/kg		02/09/21 14:58	1	10	02/11/21 15:08	tjj	EPA 6010B*

PDC Laboratories, Inc.

ANALYTICAL RESULTS

Sample: EB01458-02
Name: G311D-S1 (COFFEEN AP1)
Matrix: Soil - Composite

Sampled: 02/05/21 08:30
Received: 02/05/21 15:34

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 1.0	mg/kg		02/08/21 18:17	1	1.0	02/08/21 18:17	CRD	EPA 9056A
Fluoride	< 0.25	mg/kg		02/08/21 18:17	1	0.25	02/08/21 18:17	CRD	EPA 9056A
Sulfate	2.3	mg/kg		02/08/21 18:17	1	1.0	02/08/21 18:17	CRD	EPA 9056A
General Chemistry - PIA									
Solids - total solids (TS)	84	%		02/10/21 14:48	1	0.050	02/10/21 15:26	BMA/BCR	SM 2540G*
Total Nitrogen	510	mg/kg dry		02/10/21 14:38	1	59	02/11/21 11:10	CRS1	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	14000	mg/kg		02/09/21 14:58	10	43	02/10/21 10:58	wjm	calculated
Manganese as MnO2	180	mg/kg		02/09/21 14:58	10	1.6	02/10/21 10:58	wjm	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	0.29	mg/kg		02/10/21 14:38	1	0.20	02/10/21 14:38	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	430	mg/kg		02/08/21 08:02	1	50	02/11/21 11:10	CRS1	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 3.0	mg/kg		02/09/21 14:58	10	3.0	02/10/21 10:58	wjm	EPA 6020A
Arsenic	3.2	mg/kg		02/09/21 14:58	10	1.0	02/10/21 10:58	wjm	EPA 6020A
Barium	57	mg/kg		02/09/21 14:58	10	1.0	02/10/21 10:58	wjm	EPA 6020A
Beryllium	< 1.0	mg/kg		02/09/21 14:58	10	1.0	02/10/21 13:24	KMC	EPA 6020A
Boron	< 10	mg/kg		02/09/21 14:58	10	10	02/10/21 13:24	KMC	EPA 6020A*
Cadmium	< 1.0	mg/kg		02/09/21 14:58	10	1.0	02/10/21 10:58	wjm	EPA 6020A
Chromium	10	mg/kg		02/09/21 14:58	10	4.0	02/10/21 10:58	wjm	EPA 6020A
Cobalt	3.1	mg/kg		02/09/21 14:58	10	2.0	02/10/21 10:58	wjm	EPA 6020A
Iron	10000	mg/kg		02/09/21 14:58	10	30	02/10/21 10:58	wjm	EPA 6020A*
Lead	8.1	mg/kg		02/09/21 14:58	10	1.0	02/10/21 13:24	KMC	EPA 6020A
Manganese	110	mg/kg		02/09/21 14:58	10	1.0	02/10/21 10:58	wjm	EPA 6020A
Molybdenum	< 1.0	mg/kg		02/09/21 14:58	10	1.0	02/10/21 10:58	wjm	EPA 6020A
Selenium	< 1.0	mg/kg		02/09/21 14:58	10	1.0	02/10/21 10:58	wjm	EPA 6020A
Thallium	< 1.0	mg/kg		02/09/21 14:58	10	1.0	02/10/21 13:24	KMC	EPA 6020A
Mercury	< 0.20	mg/kg		02/09/21 14:58	10	0.20	02/10/21 13:24	KMC	EPA 6020A
Lithium	< 5.0	mg/kg		02/09/21 14:58	1	5.0	02/10/21 10:00	TJJ	EPA 6010B*
Sulfur	65	mg/kg		02/09/21 14:58	1	10	02/11/21 15:09	tjj	EPA 6010B*

ANALYTICAL RESULTS

Sample: EB01458-03
Name: G311D-S2 (COFFEEN AP1)
Matrix: Soil - Composite

Sampled: 02/05/21 09:15
Received: 02/05/21 15:34

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 1.0	mg/kg		02/08/21 18:35	1	1.0	02/08/21 18:35	CRD	EPA 9056A
Fluoride	< 0.25	mg/kg		02/08/21 18:35	1	0.25	02/08/21 18:35	CRD	EPA 9056A
Sulfate	< 1.0	mg/kg		02/08/21 18:35	1	1.0	02/08/21 18:35	CRD	EPA 9056A
General Chemistry - PIA									
Solids - total solids (TS)	87	%		02/10/21 14:48	1	0.050	02/10/21 15:26	BMA/BCR	SM 2540G*
Total Nitrogen	360	mg/kg dry		02/10/21 14:38	1	58	02/11/21 11:11	CRS1	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	12000	mg/kg		02/09/21 14:58	10	45	02/10/21 11:02	wjm	calculated
Manganese as MnO2	400	mg/kg		02/09/21 14:58	10	1.7	02/10/21 11:02	wjm	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	0.21	mg/kg		02/10/21 14:38	1	0.20	02/10/21 14:38	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	310	mg/kg		02/08/21 08:02	1	50	02/11/21 11:11	CRS1	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 3.2	mg/kg		02/09/21 14:58	10	3.2	02/10/21 11:02	wjm	EPA 6020A
Arsenic	3.5	mg/kg		02/09/21 14:58	10	1.1	02/10/21 11:02	wjm	EPA 6020A
Barium	44	mg/kg		02/09/21 14:58	10	1.1	02/10/21 11:02	wjm	EPA 6020A
Beryllium	< 1.1	mg/kg		02/09/21 14:58	10	1.1	02/10/21 13:28	KMC	EPA 6020A
Boron	< 11	mg/kg		02/09/21 14:58	10	11	02/10/21 13:28	KMC	EPA 6020A*
Cadmium	< 1.1	mg/kg		02/09/21 14:58	10	1.1	02/10/21 11:02	wjm	EPA 6020A
Chromium	8.0	mg/kg		02/09/21 14:58	10	4.2	02/10/21 11:02	wjm	EPA 6020A
Cobalt	4.0	mg/kg		02/09/21 14:58	10	2.1	02/10/21 11:02	wjm	EPA 6020A
Iron	8600	mg/kg		02/09/21 14:58	10	32	02/10/21 11:02	wjm	EPA 6020A*
Lead	5.4	mg/kg		02/09/21 14:58	10	1.1	02/10/21 13:28	KMC	EPA 6020A
Manganese	250	mg/kg		02/09/21 14:58	10	1.1	02/10/21 11:02	wjm	EPA 6020A
Molybdenum	1.2	mg/kg		02/09/21 14:58	10	1.1	02/10/21 11:02	wjm	EPA 6020A
Selenium	< 1.1	mg/kg		02/09/21 14:58	10	1.1	02/10/21 11:02	wjm	EPA 6020A
Thallium	< 1.1	mg/kg		02/09/21 14:58	10	1.1	02/10/21 13:28	KMC	EPA 6020A
Mercury	< 0.21	mg/kg		02/09/21 14:58	10	0.21	02/10/21 13:28	KMC	EPA 6020A
Lithium	6.4	mg/kg		02/09/21 14:58	1	5.3	02/10/21 10:02	TJJ	EPA 6010B*
Sulfur	780	mg/kg		02/09/21 14:58	1	11	02/11/21 15:11	tjj	EPA 6010B*

ANALYTICAL RESULTS

Sample: EB01458-04
Name: G311D-S3 (COFFEEN AP1)
Matrix: Soil - Composite

Sampled: 02/05/21 11:45
Received: 02/05/21 15:34

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 1.0	mg/kg		02/08/21 18:53	1	1.0	02/08/21 18:53	CRD	EPA 9056A
Fluoride	< 0.25	mg/kg		02/08/21 18:53	1	0.25	02/08/21 18:53	CRD	EPA 9056A
Sulfate	< 1.0	mg/kg		02/08/21 18:53	1	1.0	02/08/21 18:53	CRD	EPA 9056A
General Chemistry - PIA									
Solids - total solids (TS)	88	%		02/10/21 14:48	1	0.050	02/10/21 15:26	BMA/BCR	SM 2540G*
Total Nitrogen	370	mg/kg dry		02/10/21 14:42	1	57	02/11/21 11:11	CRS1	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	15000	mg/kg		02/11/21 07:32	10	43	02/11/21 15:33	wjm	calculated
Manganese as MnO2	460	mg/kg		02/11/21 07:32	10	1.6	02/11/21 15:33	wjm	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	< 0.20	mg/kg		02/10/21 14:42	1	0.20	02/10/21 14:42	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	330	mg/kg		02/08/21 08:02	1	50	02/11/21 11:11	CRS1	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 3.0	mg/kg		02/11/21 07:32	10	3.0	02/11/21 15:33	wjm	EPA 6020A
Arsenic	2.8	mg/kg		02/11/21 07:32	10	1.0	02/11/21 15:33	wjm	EPA 6020A
Barium	69	mg/kg		02/11/21 07:32	10	1.0	02/11/21 15:33	wjm	EPA 6020A
Beryllium	< 1.0	mg/kg		02/11/21 07:32	10	1.0	02/11/21 15:33	wjm	EPA 6020A
Boron	< 10	mg/kg		02/11/21 07:32	10	10	02/11/21 15:33	wjm	EPA 6020A*
Cadmium	< 1.0	mg/kg		02/11/21 07:32	10	1.0	02/11/21 15:33	wjm	EPA 6020A
Chromium	10	mg/kg		02/11/21 07:32	10	4.0	02/11/21 15:33	wjm	EPA 6020A
Cobalt	5.0	mg/kg		02/11/21 07:32	10	2.0	02/11/21 15:33	wjm	EPA 6020A
Iron	11000	mg/kg		02/11/21 07:32	10	30	02/11/21 15:33	wjm	EPA 6020A*
Lead	6.9	mg/kg		02/11/21 07:32	10	1.0	02/11/21 15:33	wjm	EPA 6020A
Manganese	290	mg/kg		02/11/21 07:32	10	1.0	02/11/21 15:33	wjm	EPA 6020A
Molybdenum	1.2	mg/kg		02/11/21 07:32	10	1.0	02/11/21 15:33	wjm	EPA 6020A
Selenium	< 1.0	mg/kg		02/11/21 07:32	10	1.0	02/11/21 15:33	wjm	EPA 6020A
Thallium	< 1.0	mg/kg		02/11/21 07:32	10	1.0	02/11/21 15:33	wjm	EPA 6020A
Mercury	< 0.20	mg/kg		02/11/21 07:32	10	0.20	02/11/21 15:33	wjm	EPA 6020A
Lithium	8.4	mg/kg		02/11/21 07:32	1	5.0	02/12/21 11:46	AMB	EPA 6010B*
Sulfur	760	mg/kg		02/11/21 07:32	1	10	02/15/21 16:02	AMB	EPA 6010B*

ANALYTICAL RESULTS

Sample: EB01458-05
Name: G311D-S4 (COFFEEN AP1)
Matrix: Soil - Composite

Sampled: 02/05/21 11:45
Received: 02/05/21 15:34

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 1.0	mg/kg		02/08/21 19:48	1	1.0	02/08/21 19:48	CRD	EPA 9056A
Fluoride	< 0.25	mg/kg		02/08/21 19:48	1	0.25	02/08/21 19:48	CRD	EPA 9056A
Sulfate	< 1.0	mg/kg		02/08/21 19:48	1	1.0	02/08/21 19:48	CRD	EPA 9056A
General Chemistry - PIA									
Solids - total solids (TS)	80	%		02/10/21 14:48	1	0.050	02/10/21 15:26	BMA/BCR	SM 2540G*
Total Nitrogen	530	mg/kg dry		02/10/21 14:43	1	63	02/11/21 11:12	CRS1	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	17000	mg/kg		02/11/21 07:32	10	41	02/11/21 15:37	wjm	calculated
Manganese as MnO2	600	mg/kg		02/11/21 07:32	10	1.5	02/11/21 15:37	wjm	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	< 0.20	mg/kg		02/10/21 14:43	1	0.20	02/10/21 14:43	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	420	mg/kg		02/08/21 08:02	1	50	02/11/21 11:12	CRS1	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 2.8	mg/kg		02/11/21 07:32	10	2.8	02/11/21 15:37	wjm	EPA 6020A
Arsenic	3.2	mg/kg		02/11/21 07:32	10	0.95	02/11/21 15:37	wjm	EPA 6020A
Barium	90	mg/kg		02/11/21 07:32	10	0.95	02/11/21 15:37	wjm	EPA 6020A
Beryllium	< 0.95	mg/kg		02/11/21 07:32	10	0.95	02/11/21 15:37	wjm	EPA 6020A
Boron	< 9.5	mg/kg		02/11/21 07:32	10	9.5	02/11/21 15:37	wjm	EPA 6020A*
Cadmium	< 0.95	mg/kg		02/11/21 07:32	10	0.95	02/11/21 15:37	wjm	EPA 6020A
Chromium	12	mg/kg		02/11/21 07:32	10	3.8	02/11/21 15:37	wjm	EPA 6020A
Cobalt	5.9	mg/kg		02/11/21 07:32	10	1.9	02/11/21 15:37	wjm	EPA 6020A
Iron	12000	mg/kg		02/11/21 07:32	10	28	02/11/21 15:37	wjm	EPA 6020A*
Lead	8.7	mg/kg		02/11/21 07:32	10	0.95	02/11/21 15:37	wjm	EPA 6020A
Manganese	380	mg/kg		02/11/21 07:32	10	0.95	02/11/21 15:37	wjm	EPA 6020A
Molybdenum	1.3	mg/kg		02/11/21 07:32	10	0.95	02/11/21 15:37	wjm	EPA 6020A
Selenium	< 0.95	mg/kg		02/11/21 07:32	10	0.95	02/11/21 15:37	wjm	EPA 6020A
Thallium	< 0.95	mg/kg		02/11/21 07:32	10	0.95	02/11/21 15:37	wjm	EPA 6020A
Mercury	< 0.19	mg/kg		02/11/21 07:32	10	0.19	02/11/21 15:37	wjm	EPA 6020A
Lithium	10	mg/kg		02/11/21 07:32	1	4.7	02/12/21 11:48	AMB	EPA 6010B*
Sulfur	820	mg/kg		02/11/21 07:32	1	9.5	02/15/21 16:04	AMB	EPA 6010B*

ANALYTICAL RESULTS

Sample: EB01458-06 **Sampled:** 02/05/21 11:45
Name: G311D-S2 (COFFEEN AP1) DUPCLIATE **Received:** 02/05/21 15:34
Matrix: Soil - Composite

Parameter	Result	Unit	Qualifier	Prepared	Dilution	MRL	Analyzed	Analyst	Method
Anions - PIA									
Chloride	< 1.0	mg/kg	Q2	02/08/21 20:06	1	1.0	02/08/21 20:06	CRD	EPA 9056A
Fluoride	< 0.25	mg/kg		02/08/21 20:06	1	0.25	02/08/21 20:06	CRD	EPA 9056A
Sulfate	< 1.0	mg/kg	Q2	02/08/21 20:06	1	1.0	02/08/21 20:06	CRD	EPA 9056A
General Chemistry - PIA									
Solids - total solids (TS)	84	%		02/10/21 14:48	1	0.050	02/10/21 15:26	BMA/BCR	SM 2540G*
Total Nitrogen	390	mg/kg dry		02/10/21 14:21	1	60	02/11/21 11:06	CRS1	(calc)
Metals by ICP-MS - PIA									
Iron as Fe2O3	15000	mg/kg		02/09/21 14:58	10	43	02/10/21 11:06	wjm	calculated
Manganese as MnO2	420	mg/kg		02/09/21 14:58	10	1.6	02/10/21 11:06	wjm	calculated
Nutrients - PIA									
Nitrate/Nitrite-N	0.41	mg/kg		02/10/21 14:21	1	0.20	02/10/21 14:21	CJP	EPA 353.2 REV 2
Total Kjeldahl Nitrogen (TKN)	330	mg/kg		02/08/21 08:02	1	50	02/11/21 11:06	CRS1	EPA 351.2 REV 2*
Total Metals - PIA									
Antimony	< 3.0	mg/kg		02/09/21 14:58	10	3.0	02/10/21 11:06	wjm	EPA 6020A
Arsenic	2.5	mg/kg	Q3	02/09/21 14:58	10	1.0	02/10/21 11:06	wjm	EPA 6020A
Barium	54	mg/kg		02/09/21 14:58	10	1.0	02/10/21 11:06	wjm	EPA 6020A
Beryllium	< 1.0	mg/kg		02/09/21 14:58	10	1.0	02/10/21 13:32	KMC	EPA 6020A
Boron	< 10	mg/kg		02/09/21 14:58	10	10	02/10/21 13:32	KMC	EPA 6020A*
Cadmium	< 1.0	mg/kg		02/09/21 14:58	10	1.0	02/10/21 11:06	wjm	EPA 6020A
Chromium	8.2	mg/kg		02/09/21 14:58	10	4.0	02/10/21 11:06	wjm	EPA 6020A
Cobalt	4.6	mg/kg		02/09/21 14:58	10	2.0	02/10/21 11:06	wjm	EPA 6020A
Iron	10000	mg/kg	Q4	02/09/21 14:58	10	30	02/10/21 11:06	wjm	EPA 6020A*
Lead	6.5	mg/kg		02/09/21 14:58	10	1.0	02/10/21 13:32	KMC	EPA 6020A
Manganese	260	mg/kg	Q4	02/09/21 14:58	10	1.0	02/10/21 11:06	wjm	EPA 6020A
Molybdenum	1.1	mg/kg		02/09/21 14:58	10	1.0	02/10/21 11:06	wjm	EPA 6020A
Selenium	< 1.0	mg/kg	Q3	02/09/21 14:58	10	1.0	02/10/21 11:06	wjm	EPA 6020A
Thallium	< 1.0	mg/kg		02/09/21 14:58	10	1.0	02/10/21 13:32	KMC	EPA 6020A
Mercury	< 0.20	mg/kg		02/09/21 14:58	10	0.20	02/10/21 13:32	KMC	EPA 6020A
Lithium	7.3	mg/kg		02/09/21 14:58	1	5.0	02/10/21 10:03	TJJ	EPA 6010B*
Sulfur	940	mg/kg		02/09/21 14:58	1	10	02/11/21 15:13	tjj	EPA 6010B*

NOTES

Specifications regarding method revisions and method modifications used for analysis are available upon request. Please contact your project manager.

* Not a TNI accredited analyte

Certifications

CHI - McHenry, IL - 4314-A W. Crystal Lake Road, McHenry, IL 60050
TNI Accreditation for Drinking Water and Wastewater Fields of Testing through IL EPA Accreditation No. 100279
Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory Registry No. 17556

PIA - Peoria, IL - 2231 W. Altorfer Drive, Peoria, IL 61615
TNI Accreditation for Drinking Water, Wastewater, Solid and Hazardous Material Fields of Testing through IL EPA Accreditation No. 100230
Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory Registry No. 17553
Drinking Water Certifications/Accreditations: Iowa (240); Kansas (E-10338); Missouri (870)
Wastewater Certifications/Accreditations: Arkansas (88-0677); Iowa (240); Kansas (E-10338)
Solid and Hazardous Material Certifications/Accreditations: Arkansas (88-0677); Iowa (240); Kansas (E-10338)

SPMO - Springfield, MO - 1805 W Sunset Street, Springfield, MO 65807
USEPA DMR-QA Program

STL - Hazelwood, MO - 944 Anglum Rd, Hazelwood, MO 63042
TNI Accreditation for Wastewater, Solid and Hazardous Material Fields of Testing through KS KDHE Certification No. E-10389
TNI Accreditation for Wastewater, Solid and Hazardous Material Fields of Testing through IL EPA Accreditation No. - 200080
Illinois Department of Public Health Bacterial Analysis in Drinking Water Approved Laboratory, Registry No. 171050
Missouri Department of Natural Resources - Certificate of Approval for Microbiological Laboratory Service - No. 1050

Qualifiers

- Q2 Matrix Spike Duplicate failed % recovery acceptance limits. The associated blank spike recovery was acceptable.
- Q3 Matrix Spike/Matrix Spike Duplicate both failed % recovery acceptance limits. The associated blank spike recovery was acceptable.
- Q4 The matrix spike recovery result is unusable since the analyte concentration in the sample is greater than four times the spike level. The associated blank spike was acceptable.

Gail J Schindler

Certified by: Gail Schindler, Project Manager

NELAP ACCREDITED TNI LABORATORY

Report Number
F21040-0043
Account Number
67045

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To: PDC LABORATORIES, INC.
2231 W ALTORFER DR
PEORIA, IL 61615-1807

For: EB01458

Date Received: 02/09/2021
Date Reported: 02/17/2021 Page: 1 of 1

Attn: JANET CLUTTERS

REPORT OF ANALYSIS

Lab Number	Sample ID	Analysis	Result	Unit	Method
20036	01	Cation Exchange Capacity (NH4-Sat.)	19.81	meq/100g	MSA Part 3 (1996) pp 1220-1221
20037	02	Cation Exchange Capacity (NH4-Sat.)	9.36	meq/100g	MSA Part 3 (1996) pp 1220-1221
20038	03	Cation Exchange Capacity (NH4-Sat.)	9.23	meq/100g	MSA Part 3 (1996) pp 1220-1221
20039	04	Cation Exchange Capacity (NH4-Sat.)	9.61	meq/100g	MSA Part 3 (1996) pp 1220-1221
20040	05	Cation Exchange Capacity (NH4-Sat.)	13.05	meq/100g	MSA Part 3 (1996) pp 1220-1221
20041	06	Cation Exchange Capacity (NH4-Sat.)	9.63	meq/100g	MSA Part 3 (1996) pp 1220-1221

Report reviewed and approved by our professional agronomy staff.

SOILMISC

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ANALYTICAL REPORT

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Tel: (717)656-2300

Laboratory Job ID: 410-28918-1
Client Project/Site: EB01458

For:
PDC Laboratories, Inc.
3278 N. HWY 67
Florissant, Missouri 63033

Attn: Amy Holmes

Marrissa Williams

Authorized for release by:
2/18/2021 8:12:16 AM

Marrissa Williams, Project Manager
(717)556-7246
Marrissa.Williams@eurofinset.com

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Marrissa Williams

Marrissa Williams
Project Manager
2/18/2021 8:12:16 AM

Table of Contents

Client: PDC Laboratories, Inc.
Project/Site: EB01458

Job ID: 410-28918-1

Qualifiers

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Job ID: 410-28918-1

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Narrative

Job Narrative
410-28918-1

Receipt

The samples were received on 2/10/2021 8:26 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 0.0°C

General Chemistry

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: PDC Laboratories, Inc.
Project/Site: EB01458

Job ID: 410-28918-1

Client Sample ID: EB01458-01 — Lab Sample ID: 410-28918-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	1800		594	198	mg/Kg	1.98		Lloyd Kahn	Total/NA

Client Sample ID: EB01458-02 — Lab Sample ID: 410-28918-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	118	J	318	106	mg/Kg	1.06		Lloyd Kahn	Total/NA

Client Sample ID: EB01458-03 — Lab Sample ID: 410-28918-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	11500		1510	502	mg/Kg	5.02		Lloyd Kahn	Total/NA

Client Sample ID: EB01458-04 — Lab Sample ID: 410-28918-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	14800		3010	1000	mg/Kg	10.03		Lloyd Kahn	Total/NA

Client Sample ID: EB01458-05 — Lab Sample ID: 410-28918-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	563		309	103	mg/Kg	1.03		Lloyd Kahn	Total/NA

Client Sample ID: EB01458-06 — Lab Sample ID: 410-28918-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	17100		1370	455	mg/Kg	4.55		Lloyd Kahn	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: PDC Laboratories, Inc.
Project/Site: EB01458

Job ID: 410-28918-1

Client Sample ID: EB01458-01

Lab Sample ID: 410-28918-1

Date Collected: 02/01/21 14:00
Date Received: 02/10/21 08:26

Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1800		594	198	mg/Kg			02/12/21 15:42	1.98
Percent Moisture	17.3		1.0	1.0	%			02/10/21 12:04	1
Percent Solids	82.7		1.0	1.0	%			02/10/21 12:04	1

Client Sample ID: EB01458-02

Lab Sample ID: 410-28918-2

Date Collected: 02/05/21 08:30
Date Received: 02/10/21 08:26

Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	118	J	318	106	mg/Kg			02/17/21 12:58	1.06
Percent Moisture	15.0		1.0	1.0	%			02/10/21 12:04	1
Percent Solids	85.0		1.0	1.0	%			02/10/21 12:04	1

Client Sample ID: EB01458-03

Lab Sample ID: 410-28918-3

Date Collected: 02/05/21 09:15
Date Received: 02/10/21 08:26

Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	11500		1510	502	mg/Kg			02/16/21 18:26	5.02
Percent Moisture	13.5		1.0	1.0	%			02/10/21 12:04	1
Percent Solids	86.5		1.0	1.0	%			02/10/21 12:04	1

Client Sample ID: EB01458-04

Lab Sample ID: 410-28918-4

Date Collected: 02/05/21 11:45
Date Received: 02/10/21 08:26

Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	14800		3010	1000	mg/Kg			02/17/21 13:49	10.03
Percent Moisture	13.9		1.0	1.0	%			02/10/21 12:04	1
Percent Solids	86.1		1.0	1.0	%			02/10/21 12:04	1

Client Sample ID: EB01458-05

Lab Sample ID: 410-28918-5

Date Collected: 02/05/21 11:45
Date Received: 02/10/21 08:26

Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	563		309	103	mg/Kg			02/17/21 14:01	1.03
Percent Moisture	17.0		1.0	1.0	%			02/10/21 12:04	1
Percent Solids	83.0		1.0	1.0	%			02/10/21 12:04	1

Client Sample ID: EB01458-06

Lab Sample ID: 410-28918-6

Date Collected: 02/05/21 11:45
Date Received: 02/10/21 08:26

Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	17100		1370	455	mg/Kg			02/16/21 19:30	4.55
Percent Moisture	14.1		1.0	1.0	%			02/10/21 12:04	1

Client Sample Results

Client: PDC Laboratories, Inc.
Project/Site: EB01458

Job ID: 410-28918-1

Client Sample ID: EB01458-06

Date Collected: 02/05/21 11:45
Date Received: 02/10/21 08:26

Lab Sample ID: 410-28918-6
Matrix: Solid

General Chemistry (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	85.9		1.0	1.0	%			02/10/21 12:04	1

Client: PDC Laboratories, Inc.
Project/Site: EB01458

Job ID: 410-28918-1

Method: Lloyd Kahn - Organic Carbon, Total (TOC)

Lab Sample ID: MB 410-94001/3
Matrix: Solid
Analysis Batch: 94001

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		300	100	mg/Kg			02/12/21 15:04	1

Lab Sample ID: LCS 410-94001/4
Matrix: Solid
Analysis Batch: 94001

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	4300	3266		mg/Kg		76	47 - 143

Lab Sample ID: LCSD 410-94001/5
Matrix: Solid
Analysis Batch: 94001

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	4300	3297		mg/Kg		77	47 - 143	1	20

Lab Sample ID: MB 410-95006/3
Matrix: Solid
Analysis Batch: 95006

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		300	100	mg/Kg			02/16/21 16:45	1

Lab Sample ID: LCS 410-95006/4
Matrix: Solid
Analysis Batch: 95006

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	4300	2835		mg/Kg		66	47 - 143

Lab Sample ID: MB 410-95204/3
Matrix: Solid
Analysis Batch: 95204

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		300	100	mg/Kg			02/17/21 12:33	1

Lab Sample ID: LCS 410-95204/4
Matrix: Solid
Analysis Batch: 95204

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	4300	3276		mg/Kg		76	47 - 143

QC Association Summary

Client: PDC Laboratories, Inc.
Project/Site: EB01458

Job ID: 410-28918-1

General Chemistry

Analysis Batch: 92878

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-28918-1	EB01458-01	Total/NA	Solid	Moisture	
410-28918-2	EB01458-02	Total/NA	Solid	Moisture	
410-28918-3	EB01458-03	Total/NA	Solid	Moisture	
410-28918-4	EB01458-04	Total/NA	Solid	Moisture	
410-28918-5	EB01458-05	Total/NA	Solid	Moisture	
410-28918-6	EB01458-06	Total/NA	Solid	Moisture	

Analysis Batch: 94001

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-28918-1	EB01458-01	Total/NA	Solid	Lloyd Kahn	
410-28918-1	EB01458-01	Total/NA	Solid	Lloyd Kahn	
410-28918-1	EB01458-01	Total/NA	Solid	Lloyd Kahn	
410-28918-1	EB01458-01	Total/NA	Solid	Lloyd Kahn	
MB 410-94001/3	Method Blank	Total/NA	Solid	Lloyd Kahn	
LCS 410-94001/4	Lab Control Sample	Total/NA	Solid	Lloyd Kahn	
LCSD 410-94001/5	Lab Control Sample Dup	Total/NA	Solid	Lloyd Kahn	

Analysis Batch: 95006

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-28918-3	EB01458-03	Total/NA	Solid	Lloyd Kahn	
410-28918-6	EB01458-06	Total/NA	Solid	Lloyd Kahn	
MB 410-95006/3	Method Blank	Total/NA	Solid	Lloyd Kahn	
LCS 410-95006/4	Lab Control Sample	Total/NA	Solid	Lloyd Kahn	

Analysis Batch: 95204

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-28918-2	EB01458-02	Total/NA	Solid	Lloyd Kahn	
410-28918-2	EB01458-02	Total/NA	Solid	Lloyd Kahn	
410-28918-2	EB01458-02	Total/NA	Solid	Lloyd Kahn	
410-28918-2	EB01458-02	Total/NA	Solid	Lloyd Kahn	
410-28918-4	EB01458-04	Total/NA	Solid	Lloyd Kahn	
410-28918-5	EB01458-05	Total/NA	Solid	Lloyd Kahn	
MB 410-95204/3	Method Blank	Total/NA	Solid	Lloyd Kahn	
LCS 410-95204/4	Lab Control Sample	Total/NA	Solid	Lloyd Kahn	

Client: PDC Laboratories, Inc.
Project/Site: EB01458

Job ID: 410-28918-1

Client Sample ID: EB01458-01
Date Collected: 02/01/21 14:00
Date Received: 02/10/21 08:26

Lab Sample ID: 410-28918-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1.98	94001	02/12/21 15:42	NKL9	ELLE
Total/NA	Analysis	Lloyd Kahn		1.97	94001	02/12/21 15:55	NKL9	ELLE
Total/NA	Analysis	Lloyd Kahn		1.96	94001	02/12/21 16:07	NKL9	ELLE
Total/NA	Analysis	Lloyd Kahn		1.97	94001	02/12/21 16:20	NKL9	ELLE
Total/NA	Analysis	Moisture		1	92878	02/10/21 12:04	UVJN	ELLE

Client Sample ID: EB01458-02
Date Collected: 02/05/21 08:30
Date Received: 02/10/21 08:26

Lab Sample ID: 410-28918-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1.06	95204	02/17/21 12:58	NKL9	ELLE
Total/NA	Analysis	Lloyd Kahn		1.05	95204	02/17/21 13:11	NKL9	ELLE
Total/NA	Analysis	Lloyd Kahn		1.06	95204	02/17/21 13:23	NKL9	ELLE
Total/NA	Analysis	Lloyd Kahn		1.06	95204	02/17/21 13:36	NKL9	ELLE
Total/NA	Analysis	Moisture		1	92878	02/10/21 12:04	UVJN	ELLE

Client Sample ID: EB01458-03
Date Collected: 02/05/21 09:15
Date Received: 02/10/21 08:26

Lab Sample ID: 410-28918-3
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		5.02	95006	02/16/21 18:26	NKL9	ELLE
Total/NA	Analysis	Moisture		1	92878	02/10/21 12:04	UVJN	ELLE

Client Sample ID: EB01458-04
Date Collected: 02/05/21 11:45
Date Received: 02/10/21 08:26

Lab Sample ID: 410-28918-4
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		10.03	95204	02/17/21 13:49	NKL9	ELLE
Total/NA	Analysis	Moisture		1	92878	02/10/21 12:04	UVJN	ELLE

Client Sample ID: EB01458-05
Date Collected: 02/05/21 11:45
Date Received: 02/10/21 08:26

Lab Sample ID: 410-28918-5
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1.03	95204	02/17/21 14:01	NKL9	ELLE
Total/NA	Analysis	Moisture		1	92878	02/10/21 12:04	UVJN	ELLE

Lab Chronicle

Client: PDC Laboratories, Inc.
Project/Site: EB01458

Job ID: 410-28918-1

Client Sample ID: EB01458-06
Date Collected: 02/05/21 11:45
Date Received: 02/10/21 08:26

Lab Sample ID: 410-28918-6
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		4.55	95006	02/16/21 19:30	NKL9	ELLE
Total/NA	Analysis	Moisture		1	92878	02/10/21 12:04	UVJN	ELLE

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Laboratory: Eurofins Lancaster Laboratories Env, LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	004559	01-31-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Lloyd Kahn		Solid	Total Organic Carbon
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Authority	Program	Identification Number	Expiration Date
Missouri	State	450	01-31-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Lloyd Kahn		Solid	Total Organic Carbon
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Method Summary

Client: PDC Laboratories, Inc.
Project/Site: EB01458

Job ID: 410-28918-1

Method	Method Description	Protocol	Laboratory
Lloyd Kahn	Organic Carbon, Total (TOC)	EPA	ELLE
Moisture	Percent Moisture	EPA	ELLE

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: PDC Laboratories, Inc.
Project/Site: EB01458

Job ID: 410-28918-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
410-28918-1	EB01458-01	Solid	02/01/21 14:00	02/10/21 08:26	
410-28918-2	EB01458-02	Solid	02/05/21 08:30	02/10/21 08:26	
410-28918-3	EB01458-03	Solid	02/05/21 09:15	02/10/21 08:26	
410-28918-4	EB01458-04	Solid	02/05/21 11:45	02/10/21 08:26	
410-28918-5	EB01458-05	Solid	02/05/21 11:45	02/10/21 08:26	
410-28918-6	EB01458-06	Solid	02/05/21 11:45	02/10/21 08:26	

SUBCONTRACT ORDER
Transfer Chain of Custody

PDC Laboratories, Inc.

EB01458

410-28918 Chain of Custody

SENDING LABORATORY

PDC Laboratories, Inc.
2231 W Altorfer Dr
Peoria, IL 61615
(800) 752-6651

RECEIVING LABORATORY

Eurofins Eaton Analytical, Inc. - Lancaster, PA
2425 New Holland Pike
Lancaster, PA 17601
(717) 656-2300

Sample: EB01458-01
Name: G289-S4 (COFFEEN GMF)
Sampled: 02/01/21 14:00
Matrix: Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/16/21 16:00	03/01/21 14:00	

Sample: EB01458-02
Name: G311D-S1 (COFFEEN AP1)
Sampled: 02/05/21 08:30
Matrix: Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/16/21 16:00	03/05/21 08:30	

Sample: EB01458-03
Name: G311D-S2 (COFFEEN AP1)
Sampled: 02/05/21 09:15
Matrix: Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/16/21 16:00	03/05/21 09:15	

Sample: EB01458-04
Name: G311D-S3 (COFFEEN AP1)
Sampled: 02/05/21 11:45
Matrix: Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/16/21 16:00	03/05/21 11:45	

Sample: EB01458-05
Name: G311D-S4 (COFFEEN AP1)
Sampled: 02/05/21 11:45
Matrix: Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/16/21 16:00	03/05/21 11:45	

JR

SUBCONTRACT ORDER
Transfer Chain of Custody

PDC Laboratories, Inc.

EB01458

SENDING LABORATORY

PDC Laboratories, Inc.
2231 W Altorfer Dr
Peoria, IL 61615
(800) 752-6651

RECEIVING LABORATORY

Eurofins Eaton Analytical, Inc. - Lancaster, PA
2425 New Holland Pike
Lancaster, PA 17601
(717) 656-2300

Sample: EB01458-06
Name: G311D-S2 (COFFEEN AP1) DUPCLIAT

Sampled: 02/05/21 11:45
Matrix: Soil
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
01-TOC-STL	02/16/21 16:00	03/05/21 11:45	MS/MSD

Please email results to Gail Schindler at gschindler@pdclab.com

Date Shipped: 2/8/21 Total # of Containers: 6 Sample Origin (State): IL PO #: 11506

Turn-Around Time Requested ☒ NORMAL ☐ RUSH Date Results Needed: ______

Relinquished By	Date/Time	Received By	Date/Time
[signature]	2/8/21 1330		
		Julissa R	2/10/21 08:26

Sample Temperature Upon Receipt	____ °C	
Sample(s) Received on Ice	Y or N	
Proper Bottles Received in Good Condition	Y or N	
Bottles Filled with Adequate Volume	Y or N	
Samples Received Within Hold Time	Y or N	
Date/Time Taken From Sample Bottle	Y or N	

Login Sample Receipt Checklist

Client: PDC Laboratories, Inc.

Job Number: 410-28918-1

Login Number: 28918
List Number: 1
Creator: Rivera-Santa, Julissa

List Source: Eurofins Lancaster Laboratories Env

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	N/A	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample Preservation Verified.	N/A	
Residual Chlorine Checked.	N/A	
Sample custody seals are intact.	N/A	

National Center for Testing & Innovation

ANALYTICAL REPORT

February 26, 2021

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

PDC Laboratory, Inc.

Sample Delivery Group:	L1316169
Samples Received:	02/11/2021
Project Number:	EB01458
Description:	
Report To:	Gail Schindler 2231 W. Altorfer Drive Peoria, IL 61615

Entire Report Reviewed By:

Mark W. Beasley
Project Manager

Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

EB01458-01 L1316169-01 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
	02/01/21 14:00	02/11/21 10:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1620727	1	02/19/21 08:35	02/24/21 09:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1622719	1	02/20/21 08:10	02/24/21 09:05	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1622719	1	02/20/21 08:10	02/22/21 14:02	RGT	Mt. Juliet, TN

EB01458-02 L1316169-02 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
	02/05/21 08:30	02/11/21 10:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1620727	1	02/19/21 08:35	02/24/21 09:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1622719	1	02/20/21 08:10	02/24/21 09:05	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1622719	1	02/20/21 08:10	02/22/21 14:02	RGT	Mt. Juliet, TN

EB01458-03 L1316169-03 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
	02/05/21 09:15	02/11/21 10:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1620727	1	02/19/21 08:35	02/24/21 09:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1622719	1	02/20/21 08:10	02/24/21 09:05	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1622719	1	02/20/21 08:10	02/22/21 14:02	RGT	Mt. Juliet, TN

EB01458-04 L1316169-04 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
	02/05/21 11:45	02/11/21 10:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1620727	1	02/19/21 08:35	02/24/21 09:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1622719	1	02/20/21 08:10	02/24/21 09:05	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1622719	1	02/20/21 08:10	02/22/21 14:02	RGT	Mt. Juliet, TN

EB01458-05 L1316169-05 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
	02/05/21 11:45	02/11/21 10:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1620727	1	02/19/21 08:35	02/24/21 09:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1622719	1	02/20/21 08:10	02/24/21 09:05	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1622719	1	02/20/21 08:10	02/22/21 14:02	RGT	Mt. Juliet, TN

EB01458-06 L1316169-06 Solids and Chemical Materials

Collected by	Collected date/time	Received date/time
	02/05/21 11:45	02/11/21 10:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 9320	WG1620727	1	02/19/21 08:35	02/24/21 09:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1622719	1	02/20/21 08:10	02/24/21 09:05	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1622719	1	02/20/21 08:10	02/22/21 14:02	RGT	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley
Project Manager

Radiochemistry by Method 9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.195	U	0.251	0.451	02/24/2021 09:05	WG1620727
(T) Barium	*98.2*			*62.0-143*	*02/24/2021 09:05*	WG1620727
(T) Yttrium	*105*			*79.0-136*	*02/24/2021 09:05*	WG1620727

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	0.725		0.382	0.512	02/24/2021 09:05	WG1622719

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	0.529		0.131	0.0612	02/22/2021 14:02	WG1622719
(T) Barium-133	*99.4*			*30.0-143*	*02/22/2021 14:02*	WG1622719

Radiochemistry by Method 9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.278	J	0.223	0.399	02/24/2021 09:05	WG1620727
(T) Barium	*106*			*62.0-143*	*02/24/2021 09:05*	WG1620727
(T) Yttrium	*105*			*79.0-136*	*02/24/2021 09:05*	WG1620727

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	1.06		0.399	0.474	02/24/2021 09:05	WG1622719

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	0.780		0.176	0.0752	02/22/2021 14:02	WG1622719
(T) Barium-133	*94.3*			*30.0-143*	*02/22/2021 14:02*	WG1622719

Radiochemistry by Method 9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.281	J	0.238	0.425	02/24/2021 09:05	WG1620727
(T) Barium	*107*			*62.0-143*	*02/24/2021 09:05*	WG1620727
(T) Yttrium	*110*			*79.0-136*	*02/24/2021 09:05*	WG1620727

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	1.02		0.401	0.482	02/24/2021 09:05	WG1622719

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	0.742		0.163	0.0569	02/22/2021 14:02	WG1622719
(T) Barium-133	*94.3*			*30.0-143*	*02/22/2021 14:02*	WG1622719

Radiochemistry by Method 9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.621		0.240	0.42	02/24/2021 09:05	WG1620727
(T) Barium	*101*			*62.0-143*	*02/24/2021 09:05*	WG1620727
(T) Yttrium	*107*			*79.0-136*	*02/24/2021 09:05*	WG1620727

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	1.31		0.410	0.489	02/24/2021 09:05	WG1622719

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty + / -	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	0.693		0.170	0.0694	02/22/2021 14:02	WG1622719
(T) Barium-133	*93.4*			*30.0-143*	*02/22/2021 14:02*	WG1622719

Radiochemistry by Method 9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.946		0.213	0.359	02/24/2021 09:05	WG1620727
(T) Barium	*111*			*62.0-143*	*02/24/2021 09:05*	WG1620727
(T) Yttrium	*100*			*79.0-136*	*02/24/2021 09:05*	WG1620727

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	1.46		0.356	0.441	02/24/2021 09:05	WG1622719

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	0.518		0.143	0.0824	02/22/2021 14:02	WG1622719
(T) Barium-133	*93.9*			*30.0-143*	*02/22/2021 14:02*	WG1622719

Radiochemistry by Method 9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.410	U	0.198	0.372	02/24/2021 09:05	WG1620727
(T) Barium	*105*			*62.0-143*	*02/24/2021 09:05*	WG1620727
(T) Yttrium	*111*			*79.0-136*	*02/24/2021 09:05*	WG1620727

Radiochemistry by Method Calculation

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
Combined Radium	0.429		0.328	0.425	02/24/2021 09:05	WG1622719

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/g	Qualifier	Uncertainty +/-	MDA pCi/g	Analysis Date date / time	Batch
RADIUM-226	0.429		0.130	0.0532	02/22/2021 14:02	WG1622719
(T) Barium-133	*91.6*			*30.0-143*	*02/22/2021 14:02*	WG1622719

Method Blank (MB)

(MB) R3625131-1 02/24/21 09:05

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-228	0.356	J	0.400
(T) Barium	*110*		
(T) Yttrium	*107*		

L1316169-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1316169-01 02/24/21 09:05 • (DUP) R3625131-11 02/24/21 09:05

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	0.195	0.301	1	42.8	0.306	J	20	3
(T) Barium	*98.2*	*107*						
(T) Yttrium	*105*	*98.5*						

Laboratory Control Sample (LCS)

(LCS) R3625131-2 02/24/21 09:05

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.05	101	80.0-120	
(T) Barium			*101*		
(T) Yttrium			*103*		

L1316169-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1316169-06 02/24/21 09:05 • (MS) R3625131-3 02/24/21 09:05 • (MSD) R3625131-7 02/24/21 09:05

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	4.87	-0.410	5.39	5.09	111	104	1	70.0-130			5.79		20
(T) Barium		*105*			*110*	*105*							
(T) Yttrium		*111*			*103*	*101*							

L1316174-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1316174-04 02/24/21 09:05 • (MS) R3625131-4 02/24/21 09:05 • (MSD) R3625131-8 02/24/21 09:05

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	4.87	0.901	6.01	6.36	105	112	1	70.0-130			5.59		20
(T) Barium		*90.2*			*103*	*111*							

L1316174-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1316174-04 02/24/21 09:05 • (MS) R3625131-4 02/24/21 09:05 • (MSD) R3625131-8 02/24/21 09:05

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
(T) Yttrium		*119*			*106*	*104*							

Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) • (MS) R3625131-5 02/24/21 09:05 • (MSD) R3625131-9 02/24/21 09:05

Analyte	Spike Amount pCi/l	Original Result	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	4.87		6.00	6.45	110	119	1	70.0-130			7.19		20
(T) Barium					*105*	*108*							
(T) Yttrium					*98.5*	*107*							

L1316185-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1316185-01 02/24/21 09:05 • (MS) R3625131-6 02/24/21 09:05 • (MSD) R3625131-10 02/24/21 09:05

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	4.87	0.00928	5.75	6.00	118	123	1	70.0-130			4.24		20
(T) Barium		*97.1*			*106*	*100*							
(T) Yttrium		*114*			*102*	*101*							

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3624208-1 02/22/21 14:02

Analyte	MB Result pCi/g	MB Qualifier	MB MDA pCi/g
Radium-226	0.0917		0.0774
(T) Barium-133	*82.3*		

Laboratory Control Sample (LCS)

(LCS) R3624208-2 02/22/21 14:02

Analyte	Spike Amount pCi/g	LCS Result pCi/g	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.02	4.76	94.9	60.0-144	
(T) Barium-133			*99.1*		

L1316169-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1316169-06 02/22/21 14:02 • (MS) R3624208-3 02/22/21 14:02 • (MSD) R3624208-4 02/22/21 14:02

Analyte	Spike Amount pCi/g	Original Result pCi/g	MS Result pCi/g	MSD Result pCi/g	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	5.01	0.429	5.46	5.71	100	106	1	65.0-135			4.42		20
(T) Barium-133		*91.6*			*96.0*	*99.0*							

L1316174-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1316174-04 02/22/21 14:10 • (MS) R3624208-5 02/22/21 14:10 • (MSD) R3624208-6 02/22/21 14:10

Analyte	Spike Amount pCi/g	Original Result pCi/g	MS Result pCi/g	MSD Result pCi/g	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	4.96	0.347	5.84	5.17	111	97.1	1	65.0-135			12.2		20
(T) Barium-133		*91.4*			*93.8*	*101*							

L1316179-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1316179-02 02/22/21 14:10 • (MS) R3624208-7 02/22/21 14:10 • (MSD) R3624208-8 02/22/21 14:10

Analyte	Spike Amount pCi/g	Original Result pCi/g	MS Result pCi/g	MSD Result pCi/g	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	4.98	0.584	4.89	4.95	86.4	87.9	1	65.0-135			1.32		20
(T) Barium-133		*102*			*100*	*98.2*							

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
U	Below Detectable Limits: Indicates that the analyte was not detected.

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* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

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Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
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Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
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Missouri	340	Wisconsin	998093910
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A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
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[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

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H212

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PDC Laboratories, Inc.
2231 W Altorfer Dr
Peoria, IL 61615
(800) 752-6651

RECEIVING LABORATORY

Pace Analytical - Mt Juliet, Tn
12065 Lebanon Rd
Mt Juliet, TN 37122
(615) 758-5858

Sample: EB01458-01 **Name:** G289-S4 (COFFEEN GMF) | **Sampled:** 02/01/21 14:00 **Matrix:** Soil **Preservative:** Cool <6 — 136169-01

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/16/21 16:00	07/31/21 14:00	

Sample: EB01458-02 **Name:** G311D-S1 (COFFEEN AP1) | **Sampled:** 02/05/21 08:30 **Matrix:** Soil **Preservative:** Cool <6 — 02

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/16/21 16:00	08/04/21 08:30	

Sample: EB01458-03 **Name:** G311D-S2 (COFFEEN AP1) | **Sampled:** 02/05/21 09:15 **Matrix:** Soil **Preservative:** Cool <6 — 03

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/16/21 16:00	08/04/21 09:15	~~04~~

Sample: EB01458-04 **Name:** G311D-S3 (COFFEEN AP1) | **Sampled:** 02/05/21 11:45 **Matrix:** Soil **Preservative:** Cool <6 — 04

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/16/21 16:00	08/04/21 11:45	

Sample: EB01458-05 **Name:** G311D-S4 (COFFEEN AP1) | **Sampled:** 02/05/21 11:45 **Matrix:** Soil **Preservative:** Cool <6 — 05

nalysis	Due	Expires	Comments
-Radium 226/228 combined	02/16/21 16:00	08/04/21 11:45	

SUBCONTRACT ORDER
Transfer Chain of Custody

PDC Laboratories, Inc.

EB01458

SENDING LABORATORY

PDC Laboratories, Inc.
2231 W Altorfer Dr
Peoria, IL 61615
(800) 752-6651

RECEIVING LABORATORY

Pace Analytical - Mt Juliet, Tn
12065 Lebanon Rd
Mt Juliet, TN 37122
(615) 758-5858

L1316169-06

Sample: EB01458-06
Name: G311D-S2 (COFFEEN AP1) DUPCLIAT

Sampled: 02/05/21 11:45
Matrix: Soil
Preservative: Cool <6

Analysis	Due	Expires	Comments
01-Radium 226/228 combined	02/16/21 16:00	08/04/21 11:45	MS/MSD

6 total

Sample Receipt Checklist

COC Seal Present/Intact: Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
RAD Screen <0.5 mR/hr: Y N

If Applicable
VOA Zero Headspace: Y N
Pres.Correct/Check: Y N

All Cont <500 CPM

MPA2 5.6-.3=5.3

Please email results to Gail Schindler at gschindler@pdclab.com

Date Shipped: 2-9-21 Total # of Containers: 6 Sample Origin (State): IL PO #: 11508

Turn-Around Time Requested ☑ NORMAL ☐ RUSH Date Results Needed: ____________

Relinquished By	Date/Time	Received By	Date/Time
[signature]	2-9-21 13:00		
		MPoppe	2-11-21 1015

Sample Temperature Upon Receipt	____ °C
Sample(s) Received on Ice	Y or N
Proper Bottles Received in Good Condition	Y or N
Bottles Filled with Adequate Volume	Y or N
Samples Received Within Hold Time	Y or N
Date/Time Taken From Sample Bottle	Y or N

PDC LABORATORIES, INC.
WWW.PDCLAB.COM

REGULATORY PROGRAM (CIRCLE):	NPDES
MORBCA	RCRA
CCDD	TACO: RES OR IND/COMM

CHAIN OF CUSTODY RECORD

STATE WHERE SAMPLE COLLECTED IL

ALL HIGHLIGHTED AREAS MUST BE COMPLETED BY CLIENT (PLEASE PRINT)

1 CLIENT: HANSON PROFESSIONAL SERVICES
PROJECT NUMBER: COFFEEN GMF AND ASH POND #1
PROJECT LOCATION:
PURCHASE ORDER #:
ADDRESS: 1525 S 6TH STREET
PHONE NUMBER:
E-MAIL:
DATE SHIPPED:
CITY STATE ZIP: SPRINGFIELD IL 62703-6801
SAMPLER (PLEASE PRINT): COLIN WINTER
SAMPLER'S SIGNATURE: [signature]
CONTACT PERSON: MR RHON HASENYAGER

MATRIX TYPES: WW- WASTEWATER; DW- DRINKING WATER; GW- GROUND WATER; WWSL- SLUDGE; NAS- NON AQUEOUS SOLID; LCHT-LEACHATE; OIL-OIL; SO-SOIL; SOL-SOLID

3 ANALYSIS REQUESTED

4 (FOR LAB USE ONLY)
LOGIN # EB01458-06
LOGGED BY: DCW
CLIENT: HANSON PROFESSIONAL SERVICES
PROJECT: HANSON VISTRA COFFEEN GMF SOIL AND ASH POND #1
PRJ. MGR.: GJ SCHINDLER

2 SAMPLE DESCRIPTION (UNIQUE DESCRIPTION AS IT WILL APPEAR ON THE ANALYTICAL REPORT)	DATE COLLECTED	TIME COLLECTED	SAMPLE TYPE GRAB	SAMPLE TYPE COMP	MATRIX TYPE	BOTTLE COUNT	PRES CODE CLIENT PROVIDED	SB, AS, BA, BE, B, CD, CA, CR,	CO, FE, PB, LI, MG, MN, MO, K	SE, NA, S, TL, CL, F, SO4, TN	FE OXIDE, MN OXIDE	RAD 226/228	TOC	CEC	REMARKS
G289-S4 (COFFEEN GMF)	2/1/21	2-3PM		X	SO	See Jars									
G311D-S1 (" " API)	2/5/21	8:30-9		X	SO	3									
G311D-S2 (" " API)	2/5/21	9-11:15		X	SO	3									
G311D-S3 (" " API)	2/5/21	11:15-11:45		X	SO	3									
G311D-S4 (" ")	2/5/21	11:45-12:15		X	SO	3									
G311D-S2 (MS/MSD + FIELD DUP) (" ")	2/5/21	9-11:15		X	SO	3									
G311D-S21 EQUIP BLANK (" ")	2/5/21	11AM	X		N/A										

CHEMICAL PRESERVATION CODES: 1 – HCL | 2 – H2SO4 | 3 – HNO3 | 4 – NAOH | 5 – NA2S2O3 | 6 – UNPRESERVED | 7 – OTHER

5 TURNAROUND TIME REQUESTED (PLEASE CIRCLE) NORMAL RUSH
(RUSH TAT IS SUBJECT TO PDC LABS APPROVAL AND SURCHARGE)
DATE RESULTS NEEDED
RUSH RESULTS VIA (PLEASE CIRCLE) EMAIL PHONE
EMAIL IF DIFFERENT FROM ABOVE: PHONE # IF DIFFERENT FROM ABOVE:

6 *I understand that by initialing this box I give the lab permission to proceed with analysis, even though it may not meet all sample conformance requirements as defined in the receiving facility's Sample Acceptance Policy and the data will be qualified. Qualified data may NOT be acceptable to report to all regulatory authorities.*
PROCEED WITH ANALYSIS AND QUALIFY RESULTS: (INITIALS) ______

7 RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)	DATE / TIME
[signature]	2/5/21 12:40PM	[signature]	2-5-21 12:40 ~~12:30~~
[signature]	2-5-21 1600		
		[signature]	2/5/21 1600

8 COMMENTS: (FOR LAB USE ONLY)
SAMPLE TEMPERATURE UPON RECEIPT 6.9 °C
CHILL PROCESS STARTED PRIOR TO RECEIPT Y OR N (Y)
SAMPLE(S) RECEIVED ON ICE Y OR N (Y)
SAMPLE ACCEPTANCE NONCONFORMANT REPORT IS NEEDED Y OR N (N)
DATE AND TIME TAKEN FROM SAMPLE BOTTLE ______

Attachment F

X-Ray Fluorescence Analytical Data

ANALYSIS REPORT BBM23-31378

To
F400101 SGS CANADA INC
LISA THOMPSON
185 Concession Street
Lakefield K0L 2H0
ON
CANADA

Order Number	PO#	Date Received	23-Aug-2023
Submission Number	CA19113-JUL23 / 6 Pulp	Date Analysed	30-Aug-2023 - 06-Sep-2023
Number of Samples	6	Date Completed	09-Sep-2023
		SGS Order Number	BBM23-31378

Methods Summary

Number of Sample	Method Code	Description
6	G_PHY01V	Loss on ignition (LOI), Furnace, variable wt, variable temp
6	GO_XRF72	Borate Fusion, XRF, Ore Grade

Comments

Preparation of samples was performed at the SGS Lakefield site.
Analysis of samples was performed at the SGS Burnaby site.

Authorised Signatory

John Chiang
Laboratory Operations Manager

SCC Accredited LAB
LAB Accrédité CCN TM

- not analysed | -- element not determined | I.S. insufficient sample | L.N.R. listed not received

SGS Canada Inc. | NAM Minerals Geochemistry 3260 Production Way Burnaby BC. V5A 4W4 CANADA t +1 (604) 638 2349 f +1 (604) 444 5486 www.sgs.com
Member of the SGS Group (SGS SA)

Order Number PO#
Submission Number CA19113-JUL23 / 6 Pulp
Number of Samples 6

ANALYSIS REPORT BBM23-31378

Element	LOI	@Al2O3	@CaO	@Cr2O3	@Fe2O3	@K2O
Method	G_PHY01V	GO_XRF72	GO_XRF72	GO_XRF72	GO_XRF72	GO_XRF72
Lower Limit	-10	0.01	0.01	0.01	0.01	0.01
Upper Limit	100	100	60	5	100	70
Unit	%	%	%	%	%	%
COF1-13-18-20230619	12.4300	8.36	6.73	<0.01	3.19	1.88
COF1-18-23-20230619	12.3300	8.41	6.72	0.02	3.48	1.88
COF1-38-43-20230619	12.3000	8.35	6.69	0.02	3.71	1.89
COF2-10-13-20230619	2.53949	6.73	0.52	0.01	2.08	2.01
COF3-11-12-20230619	3.75000	8.14	1.04	<0.01	2.77	2.42
COF3-12.5-13-20230619	11.9572	4.92	9.10	<0.01	1.69	1.59
*Std OREAS 70b	6.78796	-	-	-	-	-
*Std OREAS 70b	-	7.12	4.28	0.18	7.95	0.71
*Blk BLANK	-	<0.01	<0.01	<0.01	<0.01	<0.01
*Std OREAS 751	-	15.87	1.04	<0.01	2.40	2.89

Element	@MgO	Mn3O4	@Na2O	@P2O5	@SiO2	@TiO2
Method	GO_XRF72	GO_XRF72	GO_XRF72	GO_XRF72	GO_XRF72	GO_XRF72
Lower Limit	0.01	0.01	0.01	0.01	0.01	0.01
Upper Limit	100	100	60	55	100	100
Unit	%	%	%	%	%	%
COF1-13-18-20230619	3.71	0.07	0.79	0.07	62.07	0.49
COF1-18-23-20230619	3.66	0.07	0.80	0.08	61.80	0.50
COF1-38-43-20230619	3.62	0.07	0.77	0.08	61.72	0.50
COF2-10-13-20230619	0.54	0.03	0.82	0.06	84.59	0.36
COF3-11-12-20230619	0.77	0.13	0.85	0.06	80.21	0.40
COF3-12.5-13-20230619	4.44	0.08	0.69	0.05	64.55	0.26
*Std OREAS 70b	22.38	0.16	1.04	0.05	48.48	0.30
*Blk BLANK	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
*Std OREAS 751	0.50	0.10	3.40	0.27	71.34	0.24

- not analysed | -- element not determined | I.S. insufficient sample | L.N.R. listed not received

SGS Canada Inc. | NAM Minerals Geochemistry 3260 Production Way Burnaby BC. V5A 4W4 CANADA t +1 (604) 638 2349 f +1 (604) 444 5486 www.sgs.com

Order Number PO#
Submission Number CA19113-JUL23 / 6 Pulp
Number of Samples 6

ANALYSIS REPORT BBM23-31378

Element	@V2O5	Sum
Method	GO_XRF72	GO_XRF72
Lower Limit	0.01	0.01
Upper Limit	10	100
Unit	%	%
COF1-13-18-20230619	0.01	87.60
COF1-18-23-20230619	<0.01	87.86
COF1-38-43-20230619	0.01	87.81
COF2-10-13-20230619	<0.01	97.81
COF3-11-12-20230619	0.01	96.90
COF3-12.5-13-20230619	<0.01	87.45
*Std OREAS 70b	0.01	93.40
*Blk BLANK	<0.01	0.03
*Std OREAS 751	<0.01	98.27

SGS Canada Minerals Burnaby conforms to the requirements of ISO/IEC17025 for specific tests as listed on their scope of accreditation found at https://www.scc.ca/en/search/laboratories/sgs
Tests and Elements marked with an "@" symbol in the report denote ISO/IEC17025 accreditation.

- not analysed | -- element not determined | I.S. insufficient sample | L.N.R. listed not received

SGS Canada Inc. | NAM Minerals Geochemistry 3260 Production Way Burnaby BC. V5A 4W4 CANADA t +1 (604) 638 2349 f +1 (604) 444 5486 www.sgs.com
Member of the SGS Group (SGS SA)

Attachment G
X-Ray Diffraction Analytical Data

Quantitative X-Ray Diffraction by Rietveld Refinement

Report Prepared for:	*Environmental Services*
Project Number/ LIMS No.	*Custom XRD/MI4544-MAY21*
Sample Receipt:	*May 27, 2021*
Sample Analysis:	*May 31, 2021*
Reporting Date:	*June 17, 2021*

Instrument:	BRUKER AXS D8 Advance Diffractometer
Test Conditions:	Co radiation, 35 kV, 40 mA Regular Scanning: Step: 0.02°, Step time: 1s, 2θ range: 3-80°
Interpretations :	PDF2/PDF4 powder diffraction databases issued by the International Center for Diffraction Data (ICDD). DiffracPlus Eva and Topas software.
Detection Limit :	0.5-2%. Strongly dependent on crystallinity.

Contents:

Kim Gibbs, H.B.Sc., P.Geo.
Senior Mineralogist

Huyun Zhou, Ph.D., P.Geo.
Senior Mineralogist

Method Summary

The Rietveld Method of Mineral Identification by XRD (ME-LR-MIN-MET-MN-D05) method used by SGS Minerals Services is accredited to the requirements of ISO/IEC 17025.

Mineral Identification and Interpretation:

Mineral identification and interpretation involves matching the diffraction pattern of an unknown material to patterns of single-phase reference materials. The reference patterns are compiled by the Joint Committee on Powder Diffraction Standards - International Center for Diffraction Data (JCPDS-ICDD) database and released on software as Powder Diffraction Files (PDF).

Interpretations do not reflect the presence of non-crystalline and/or amorphous compounds, except when internal standards have been added by request. Mineral proportions may be strongly influenced by crystallinity, crystal structure and preferred orientations. Mineral or compound identification and quantitative analysis results should be accompanied by supporting chemical assay data or other additional tests.

Quantitative Rietveld Analysis:

Quantitative Rietveld Analysis is performed by using Topas 4.2 (Bruker AXS), a graphics based profile analysis program built around a non-linear least squares fitting system, to determine the amount of different phases present in a multicomponent sample. Whole pattern analyses are predicated by the fact that the X-ray diffraction pattern is a total sum of both instrumental and specimen factors. Unlike other peak intensity-based methods, the Rietveld method uses a least squares approach to refine a theoretical line profile until it matches the obtained experimental patterns.

Rietveld refinement is completed with a set of minerals specifically identified for the sample. Zero values indicate that the mineral was included in the refinement calculations, but the calculated concentration was less than 0.05wt%. Minerals not identified by the analyst are not included in refinement calculations for specific samples and are indicated with a dash.

Summary of Rietveld Quantitative Analysis X-Ray Diffraction Results

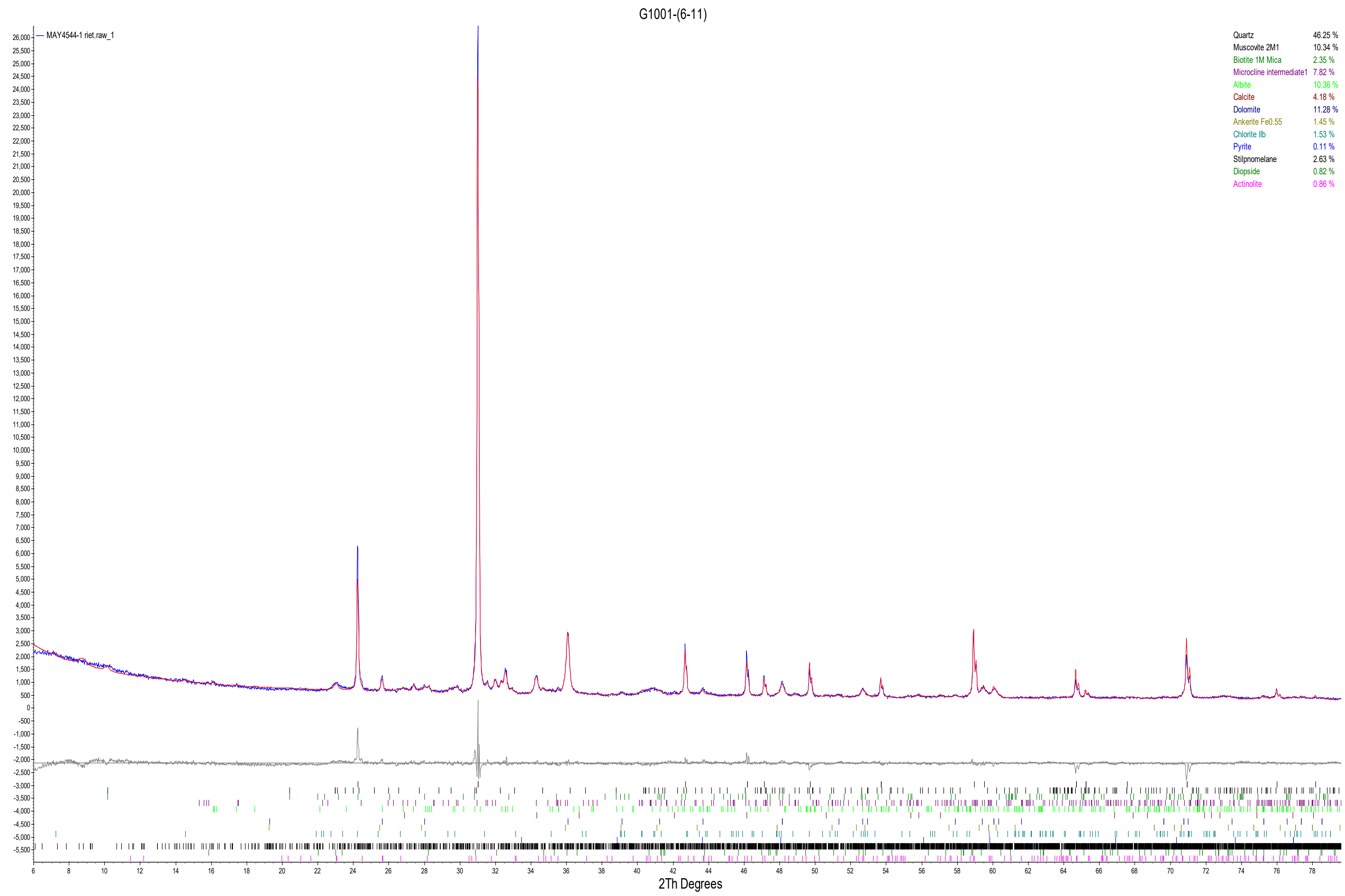
Mineral/Compound	G1001-(6-11) MAY4544-01 (wt %)	401B-(16-20) MAY4544-02 (wt %)	270A-(12-16) MAY4544-03 (wt %)
Quartz	46.3	68.9	60.6
Muscovite	10.3	6.8	9.0
Biotite	2.4	2.1	2.4
Microcline	7.8	7.8	9.8
Albite	10.4	8.6	9.1
Calcite	4.2	-	-
Dolomite	11.3	-	0.6
Ankerite	1.5	0.1	0.5
Chlorite	1.5	-	1.4
Pyrite	0.1	-	0.2
Stilpnomelane	2.6	2.7	2.0
Diopside	0.8	1.4	1.3
Actinolite	0.9	1.4	3.3
TOTAL	100	100	100

Zero values indicate that the mineral was included in the refinement, but the calculated concentration is below a measurable value.

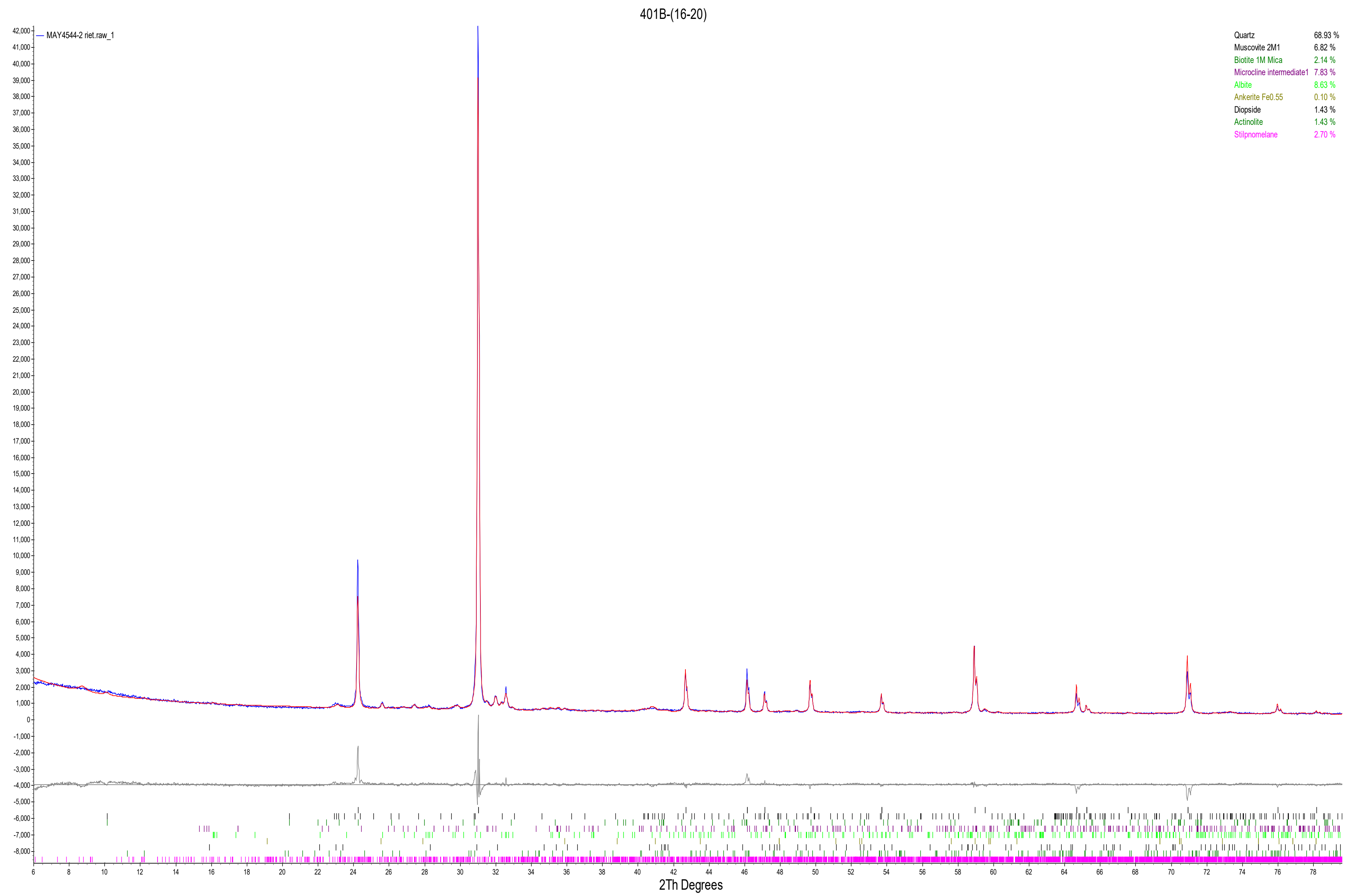
Dashes indicate that the mineral was not identified by the analyst and not included in the refinement calculation for the sample.

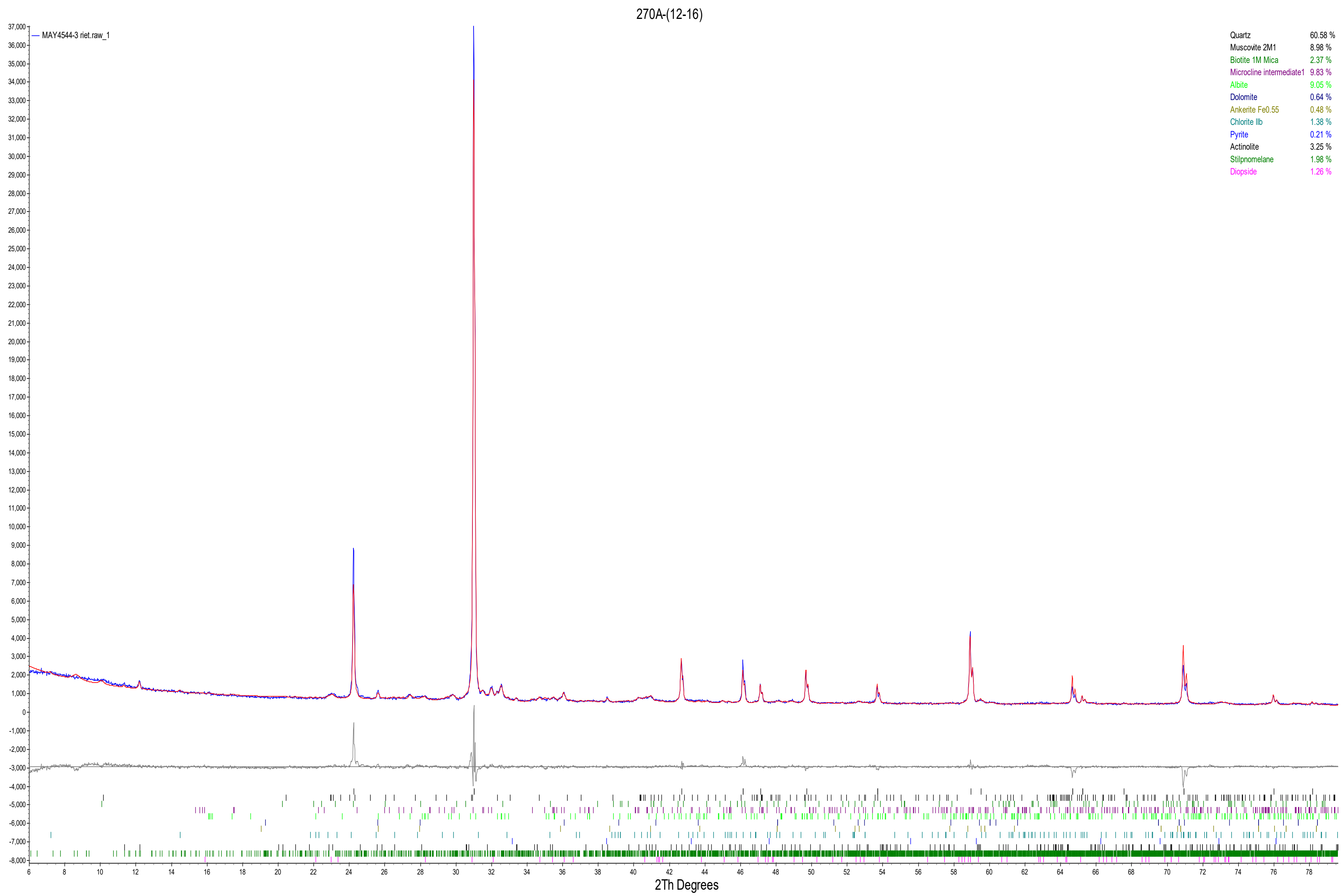
The weight percent quantities indicated have been normalized to a sum of 100%. The quantity of amorphous material has not been determined.

Mineral/Compound	Formula
Quartz	SiO_2
Muscovite	$KAl_2(AlSi_3O_{10})(OH)_2$
Biotite	$K(Mg,Fe)_3(AlSi_3O_{10})(OH)_2$
Microcline	$KAlSi_3O_8$
Albite	$NaAlSi_3O_8$
Calcite	$CaCO_3$
Dolomite	$CaMg(CO_3)_2$
Ankerite	$CaFe(CO_3)_2$
Chlorite	$(Fe,(Mg,Mn)_5,Al)(Si_3Al)O_{10}(OH)_8$
Pyrite	FeS_2
Stilpnomelane	$K(Fe^{2+},Mg,Fe^{3+})_8(Si,Al)_{12}(O,OH)_{27}\cdot n(H_2O)$
Diopside	$CaMgSi_2O_6$
Actinolite	$Ca_2(Mg,Fe)_5Si_8O_{22}(OH)_2$


G1001-(6-11)
MAY4544-1 riet.raw_1
Quartz 46.25 %
Muscovite 2M1 10.34 %
Biotite 1M Mica 2.35 %
Microcline intermediate1 7.82 %
Albite 10.36 %
Calcite 4.18 %
Dolomite 11.28 %
Ankerite Fe0.55 1.45 %
Chlorite IIb 1.53 %
Pyrite 0.11 %
Stilpnomelane 2.63 %
Diopside 0.82 %
Actinolite 0.86 %
2Th Degrees

Environmental Services
Custom XRD/MI4544-MAY21
06/17/2021




270A-(12-16)
MAY4544-3 riet.raw_1
Quartz 60.58 %
Muscovite 2M1 8.98 %
Biotite 1M Mica 2.37 %
Microcline intermediate1 9.83 %
Albite 9.05 %
Dolomite 0.64 %
Ankerite Fe0.55 0.48 %
Chlorite IIb 1.38 %
Pyrite 0.21 %
Actinolite 3.25 %
Stilpnomelane 1.98 %
Diopside 1.26 %
2Th Degrees

Quantitative X-Ray Diffraction by Rietveld Refinement

Report Prepared for:	*Environmental Services*
Project Number/ LIMS No.	*Custom XRD/MI4509-SEP21*
Sample Receipt:	*September 9, 2021*
Sample Analysis:	*September 24, 2021*
Reporting Date:	*October 22, 2021*

Instrument:	BRUKER AXS D8 Advance Diffractometer
Test Conditions:	Co radiation, 35 kV, 40 mA Regular Scanning: Step: 0.02°, Step time: 1s, 2θ range: 3-80°
Interpretations :	PDF2/PDF4 powder diffraction databases issued by the International Center for Diffraction Data (ICDD). DiffracPlus Eva and Topas software.
Detection Limit :	0.5-2%. Strongly dependent on crystallinity.

Contents:

Kim Gibbs, H.B.Sc., P.Geo.
Senior Mineralogist

Huyun Zhou, Ph.D., P.Geo.
Senior Mineralogist

SGS Minerals
a division of SGS Canada Inc.
P.O. Box 4300, 185 Concession Street, Lakefield, Ontario, Canada K0L 2H0
Tel: (705) 652-2000 Fax: (705) 652-6365 www.sgs.com www.sgs.com/met
Member of the SGS Group (SGS SA)

Method Summary

The Rietveld Method of Mineral Identification by XRD (ME-LR-MIN-MET-MN-D05) method used by SGS Minerals Services is accredited to the requirements of ISO/IEC 17025.

Mineral Identification and Interpretation:

Mineral identification and interpretation involves matching the diffraction pattern of an unknown material to patterns of single-phase reference materials. The reference patterns are compiled by the Joint Committee on Powder Diffraction Standards - International Center for Diffraction Data (JCPDS-ICDD) database and released on software as Powder Diffraction Files (PDF).

Interpretations do not reflect the presence of non-crystalline and/or amorphous compounds, except when internal standards have been added by request. Mineral proportions may be strongly influenced by crystallinity, crystal structure and preferred orientations. Mineral or compound identification and quantitative analysis results should be accompanied by supporting chemical assay data or other additional tests.

Quantitative Rietveld Analysis:

Quantitative Rietveld Analysis is performed by using Topas 4.2 (Bruker AXS), a graphics based profile analysis program built around a non-linear least squares fitting system, to determine the amount of different phases present in a multicomponent sample. Whole pattern analyses are predicated by the fact that the X-ray diffraction pattern is a total sum of both instrumental and specimen factors. Unlike other peak intensity-based methods, the Rietveld method uses a least squares approach to refine a theoretical line profile until it matches the obtained experimental patterns.

Rietveld refinement is completed with a set of minerals specifically identified for the sample. Zero values indicate that the mineral was included in the refinement calculations, but the calculated concentration was less than 0.05wt%. Minerals not identified by the analyst are not included in refinement calculations for specific samples and are indicated with a dash.

SGS Minerals
a division of SGS Canada Inc.
P.O. Box 4300, 185 Concession Street, Lakefield, Ontario, Canada K0L 2H0
Tel: (705) 652-2000 Fax: (705) 652-6365 www.sgs.com www.sgs.com/met
Member of the SGS Group (SGS SA)

Summary of Rietveld Quantitative Analysis X-Ray Diffraction Results

Mineral/Compound	SB-306-(14-16) SEP4509-01 (wt %)	SB-311-(14-15) SEP4509-02 (wt %)	SB-313-(8-9) SEP4509-03 (wt %)	SB-316-(13-14,15-16) SEP4509-04 (wt %)
Quartz	70.9	58.9	51.3	67.6
Microcline	8.5	7.4	7.6	9.8
Albite	9.6	8.6	7.9	9.6
Calcite	0.5	2.5	4.1	-
Dolomite	3.5	12.1	15.7	1.9
Ankerite	2.1	5.0	7.7	0.8
Chlorite	1.8	1.7	1.1	1.7
Diopside	3.1	3.8	4.6	1.3
Muscovite	-	-	-	7.3
TOTAL	100	100	100	100

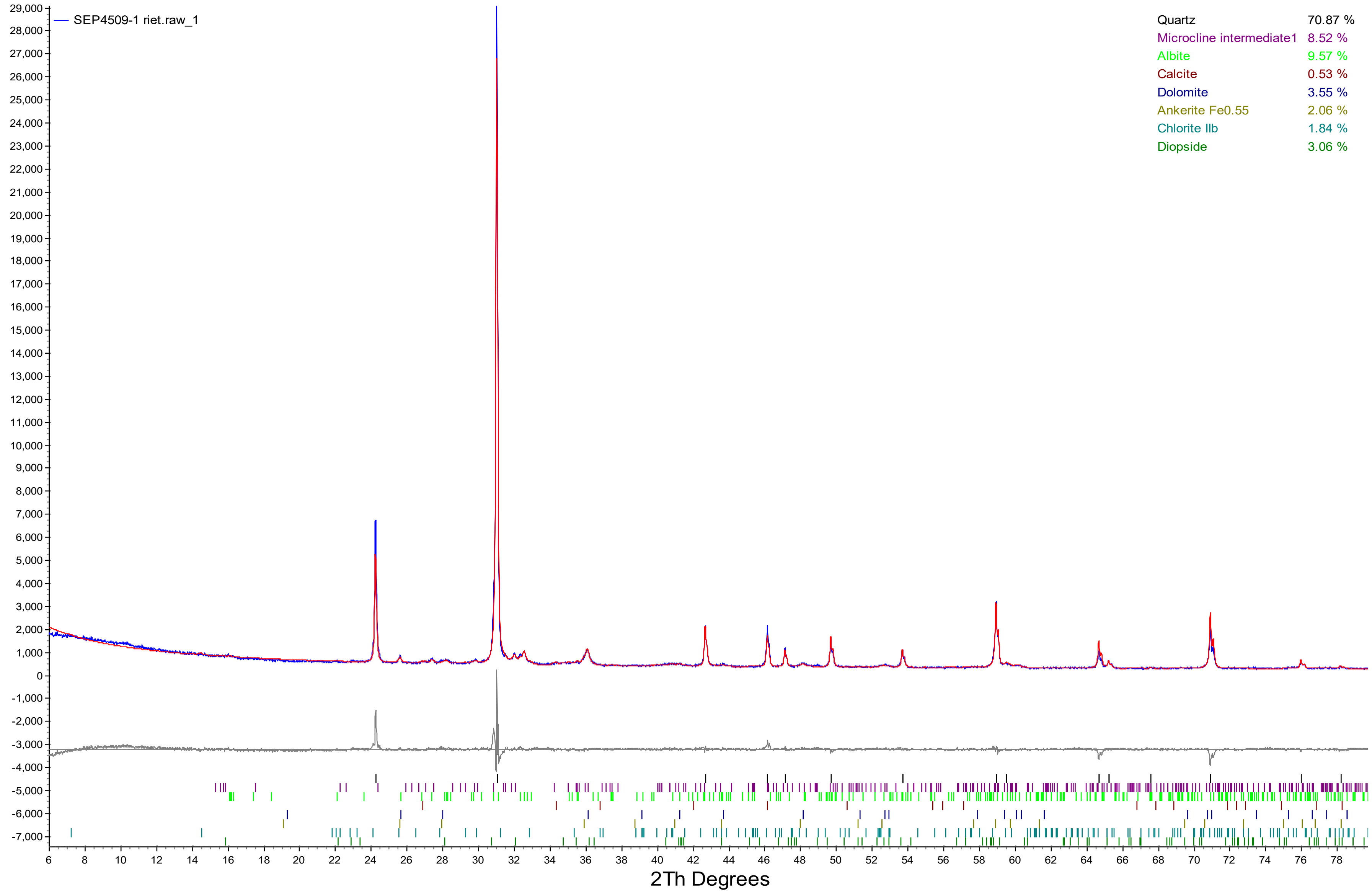
Zero values indicate that the mineral was included in the refinement, but the calculated concentration is below a measurable value.

Dashes indicate that the mineral was not identified by the analyst and not included in the refinement calculation for the sample.

The weight percent quantities indicated have been normalized to a sum of 100%. The quantity of amorphous material has not been determined.

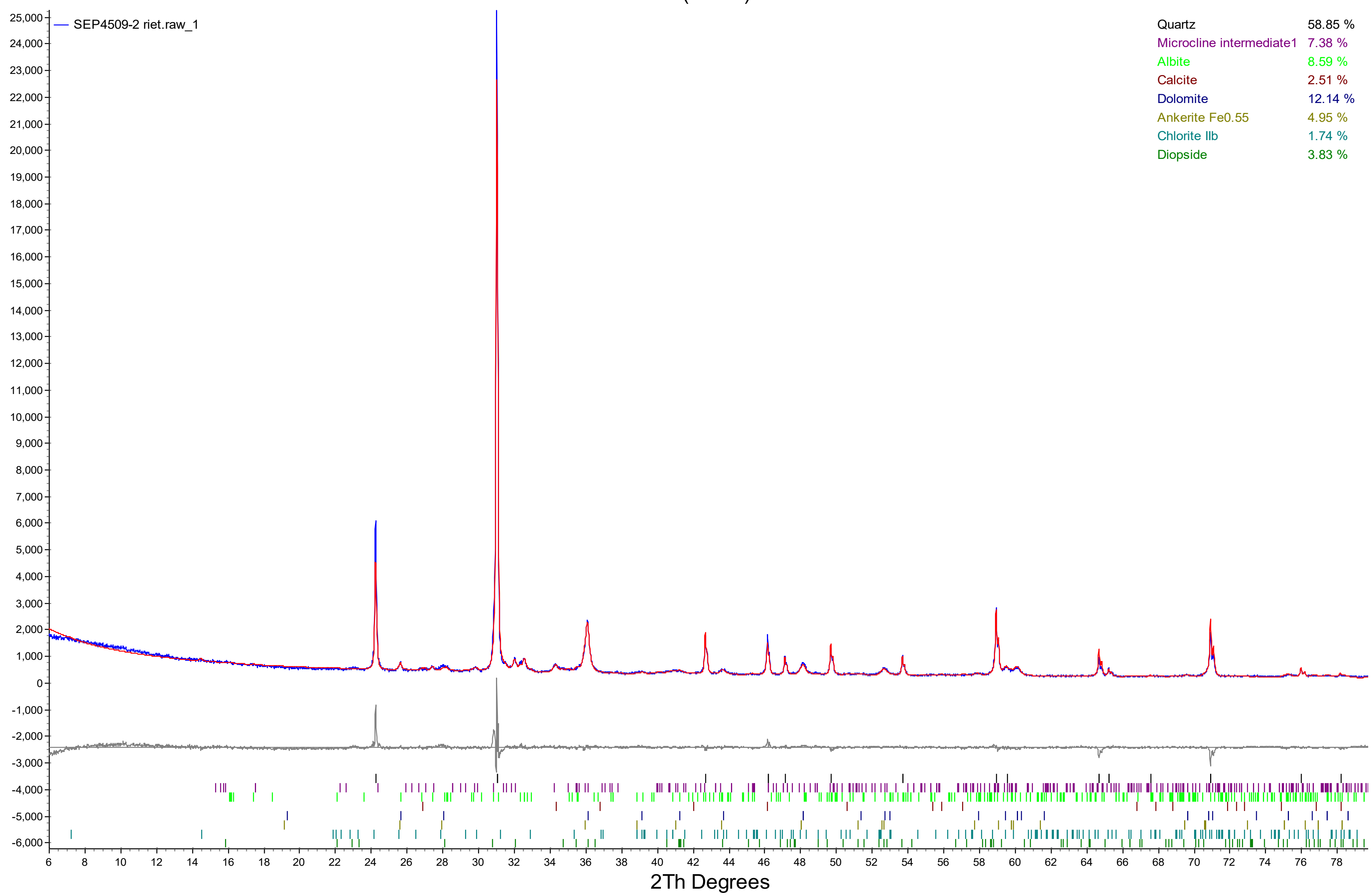
Mineral/Compound	Formula
Quartz	SiO_2
Microcline	$KAlSi_3O_8$
Albite	$NaAlSi_3O_8$
Calcite	$CaCO_3$
Dolomite	$CaMg(CO_3)_2$
Ankerite	$CaFe(CO_3)_2$
Chlorite	$(Fe,(Mg,Mn)_5,Al)(Si_3Al)O_{10}(OH)_8$
Diopside	$CaMgSi_2O_6$
Muscovite	$KAl_2(AlSi_3O_{10})(OH)_2$

SB-306-(14-16)

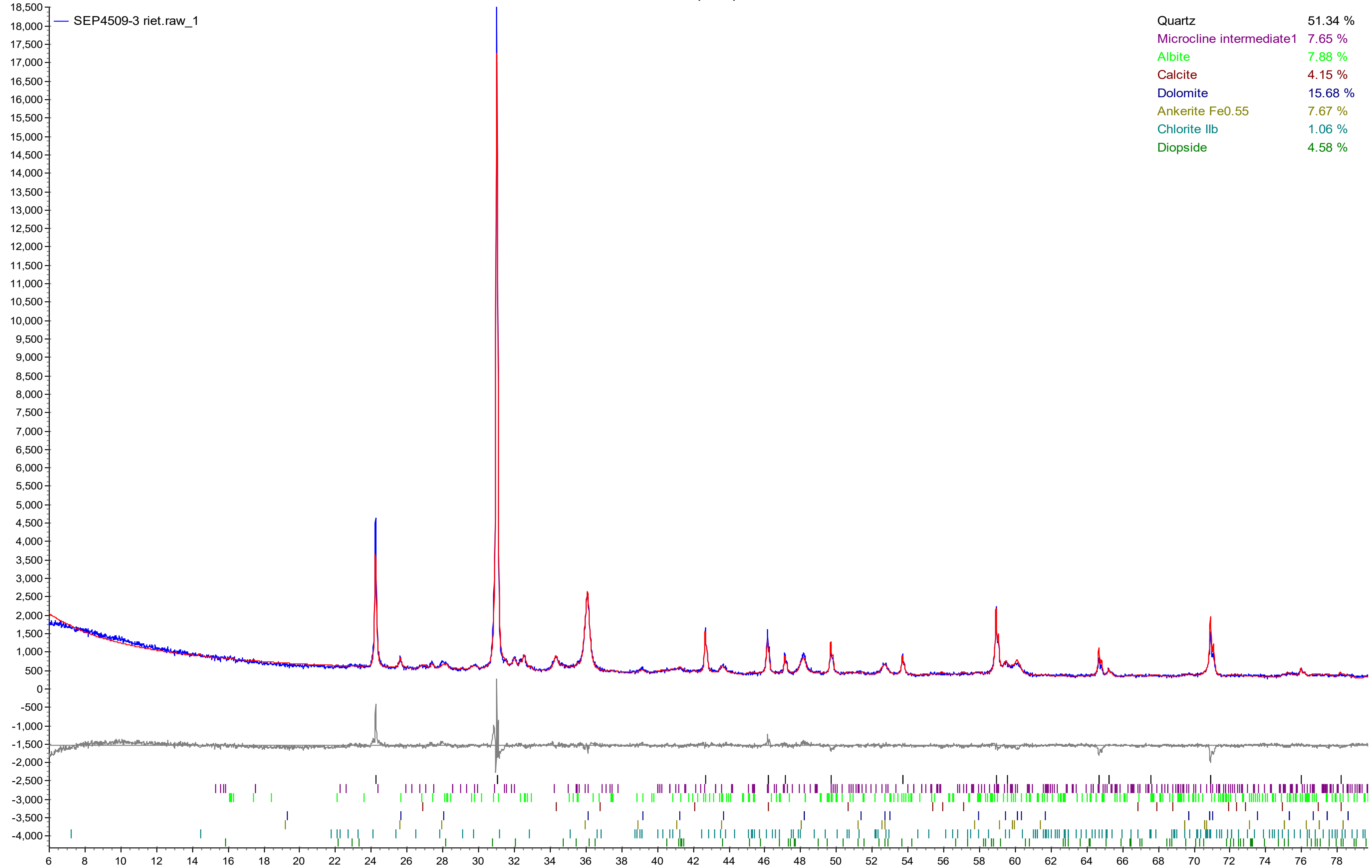

SEP4509-1 riet.raw_1
Quartz 70.87 %
Microcline intermediate1 8.52 %
Albite 9.57 %
Calcite 0.53 %
Dolomite 3.55 %
Ankerite Fe0.55 2.06 %
Chlorite IIb 1.84 %
Diopside 3.06 %
2Th Degrees

Environmental Services
Custom XRD/MI4509-SEP21
22-Oct-21

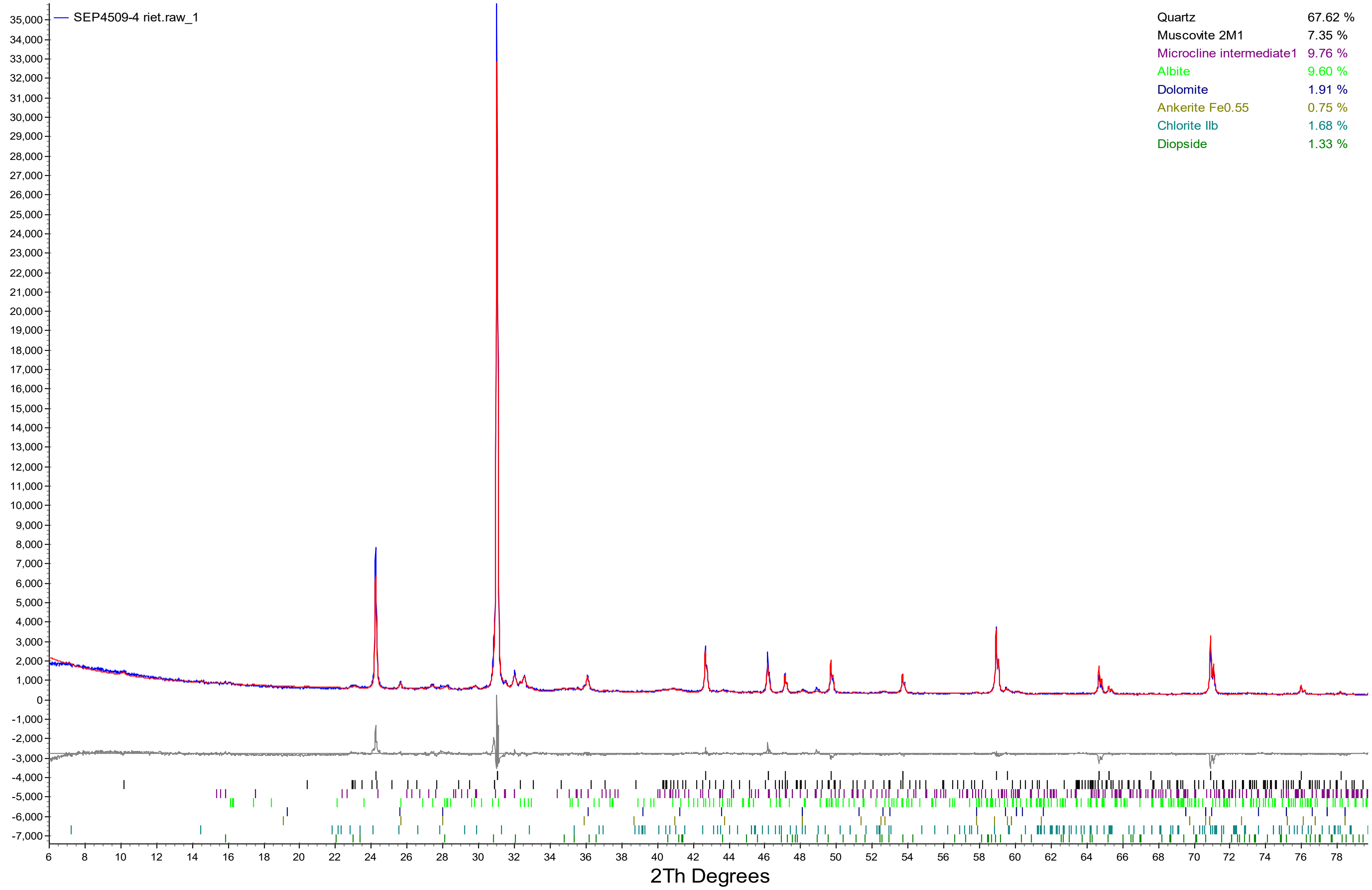
SB-311-(14-15)



SB-313-(8-9)


SEP4509-3 riet.raw_1
Quartz 51.34 %
Microcline intermediate1 7.65 %
Albite 7.88 %
Calcite 4.15 %
Dolomite 15.68 %
Ankerite Fe0.55 7.67 %
Chlorite IIb 1.06 %
Diopside 4.58 %
2Th Degrees

SB-316-(13-14,15-16)



Quantitative X-Ray Diffraction by Rietveld Refinement

Report Prepared for:	*Environmental Services*
Project Number/ LIMS No.	*Custom XRD/MI4528-AUG23*
Sample Receipt:	*August 10, 2023*
Sample Analysis:	*August 31, 2023*
Reporting Date:	*September 15, 2023*

Instrument:	BRUKER AXS D8 Advance Diffractometer
Test Conditions:	Co radiation, 35 kV, 40 mA; Detector: LYNXEYE Regular Scanning: Step: 0.02°, Step time: 0.75s, 2θ range: 6-80° Clay Section Scanning: Step: 0.01°, Step time:0.2s, 2θ range: 3-40°
Interpretations :	PDF2/PDF4 powder diffraction databases issued by the International Center for Diffraction Data (ICDD). DiffracPlus Eva and Topas software.
Detection Limit :	0.5-2%. Strongly dependent on crystallinity.

Contents:

1) Method Summary
2) Quantitative XRD Results
3) XRD Pattern(s)

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Senior Mineralogist

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Senior Mineralogist

Method Summary

The Rietveld Method of Mineral Identification by XRD (ME-LR-MIN-MET-MN-D05) method used by SGS Natural Resources is accredited to the requirements of ISO/IEC 17025.

Mineral Identification and Interpretation:

Mineral identification and interpretation involves matching the diffraction pattern of an unknown material to patterns of single-phase reference materials. The reference patterns are compiled by the Joint Committee on Powder Diffraction Standards - International Center for Diffraction Data (JCPDS-ICDD) database and released on software as Powder Diffraction Files (PDF).

Interpretations do not reflect the presence of non-crystalline and/or amorphous compounds, except when internal standards have been added by request. Mineral proportions may be strongly influenced by crystallinity, crystal structure and preferred orientations. Mineral or compound identification and quantitative analysis results should be accompanied by supporting chemical assay data or other additional tests.

Clay Mineral Separation and Identification:

Clay minerals are typically fine-grained (<2 μm) phyllosilicates in sedimentary rock. Due to the poor crystallinity and fine size of clay minerals, separation of the clay fraction from bulk samples by centrifuge is required. A slide of the oriented clay fraction is prepared and scanned followed by a series of procedures (the addition of ethylene glycol and high temperature heating). Clay minerals are identified by their individual diffraction patterns and changes in their diffraction pattern after different treatments. Clay speciation and mineral identification of the bulk sample are performed using DIFFRACplus EVA (Bruker AXS).

Quantitative Rietveld Analysis:

Quantitative Rietveld Analysis is performed by using Topas 4.2 (Bruker AXS), a graphics based profile analysis program built around a non-linear least squares fitting system, to determine the amount of different phases present in a multicomponent sample. Whole pattern analyses are predicated by the fact that the X-ray diffraction pattern is a total sum of both instrumental and specimen factors. Unlike other peak intensity-based methods, the Rietveld method uses a least squares approach to refine a theoretical line profile until it matches the obtained experimental patterns.

Rietveld refinement is completed with a set of minerals specifically identified for the sample. Zero values indicate that the mineral was included in the refinement calculations, but the calculated concentration was less than 0.05wt%. Minerals not identified by the analyst are not included in refinement calculations for specific samples and are indicated with a dash.

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Member of the SGS Group (SGS SA)

Summary of Rietveld Quantitative Analysis X-Ray Diffraction Results

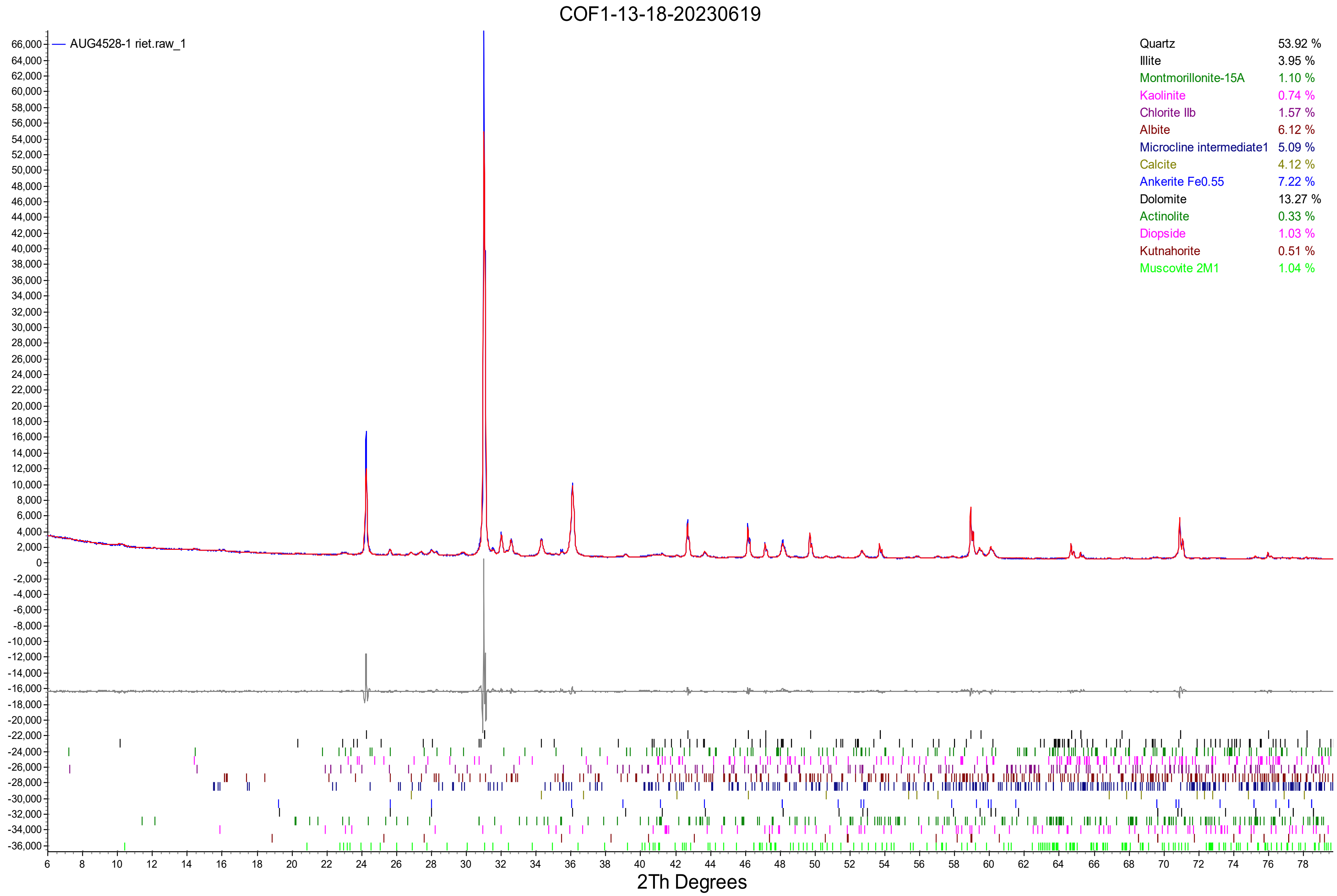
Mineral/Compound	COF1-13-18-20230619 AUG4528-01 (wt %)	COF1-18-23-20230619 AUG4528-02 (wt %)	COF1-38-43-20230619 AUG4528-03 (wt %)	COF2-10-13-20230619 AUG4528-04 (wt %)	COF3-11-12-20230619 AUG4528-05 (wt %)	COF3-12.5-13-20230619 AUG4528-06 (wt %)
Quartz	53.9	67.5	73.5	51.2	50.7	50.5
Chlorite	1.6	1.7	1.5	3.0	3.9	3.2
Albite	6.1	8.3	8.2	6.8	7.4	7.5
Microcline	5.1	9.7	7.8	7.2	5.9	5.8
Calcite	4.1	0.4	-	2.4	2.6	2.8
Ankerite	7.2	1.2	0.5	9.4	8.4	8.1
Dolomite	13.3	0.5	0.0	6.0	7.6	8.1
Actinolite	0.3	0.7	0.8	0.5	0.6	0.6
Diopside	1.0	0.7	0.7	0.4	0.5	0.7
Kutnohorite	0.5	0.3	0.2	0.1	-	0.2
Muscovite	1.0	4.8	3.3	5.5	4.4	4.3
Magnetite	-	0.2	0.0	0.1	0.1	0.2
Clay	-	-	-	-	-	-
Illite	4.0	2.0	1.7	3.3	3.0	2.9
Montmorillonite	1.1	1.0	1.1	3.2	3.2	2.9
Kaolinite	0.7	1.1	0.7	0.9	0.6	0.6
Illite-Montmorillonite	-	-	-	-	1.3	1.7
TOTAL	100	100	100	100	100	100

Zero values indicate that the mineral was included in the refinement, but the calculated concentration is below a measurable value.

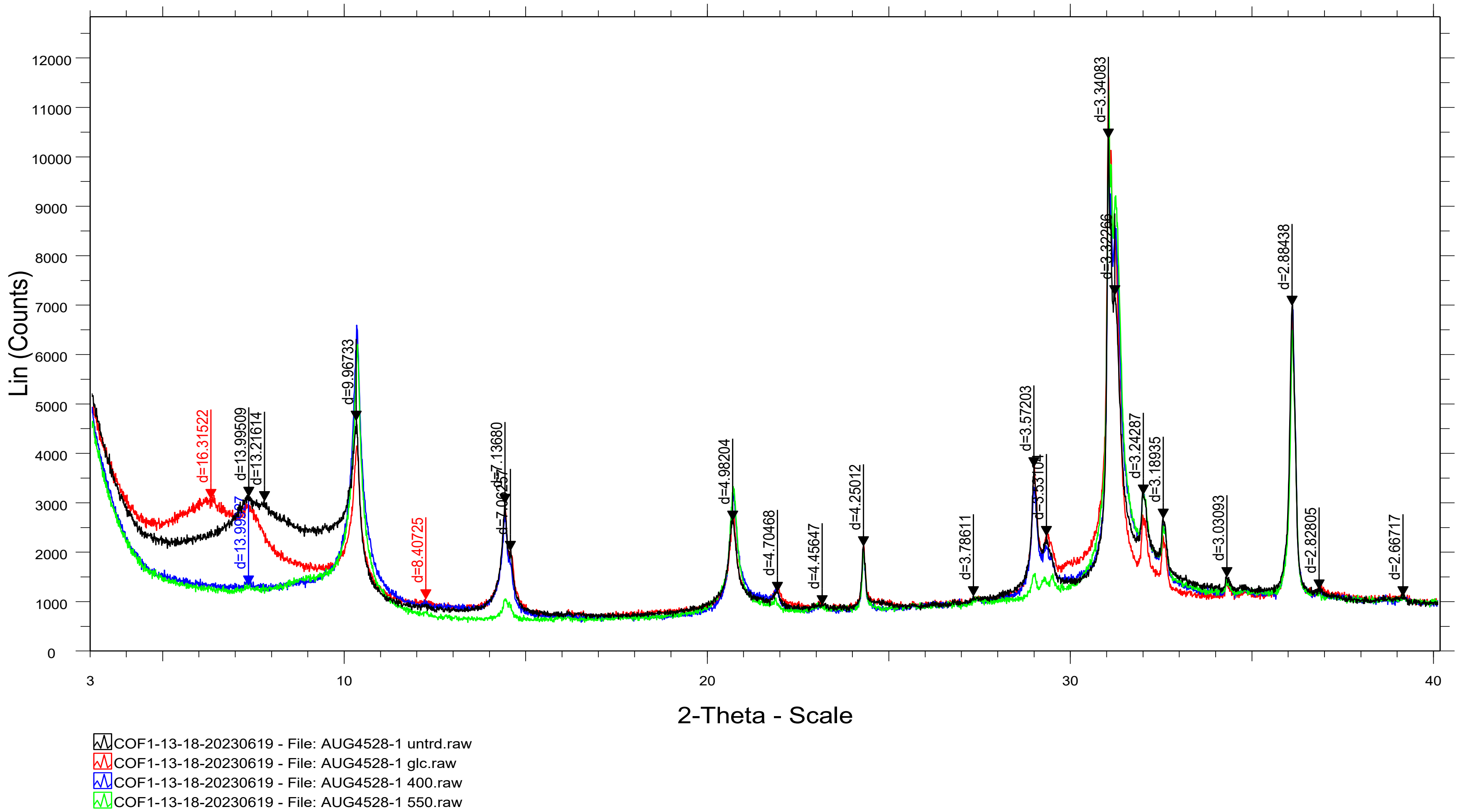
Dashes indicate that the mineral was not identified by the analyst and not included in the refinement calculation for the sample.

The weight percent quantities indicated have been normalized to a sum of 100%. The quantity of amorphous material has not been determined.

Mineral/Compound	Formula
Quartz	SiO_2
Chlorite	$(Fe,(Mg,Mn)_5,Al)(Si_3Al)O_{10}(OH)_8$
Albite	$NaAlSi_3O_8$
Microcline	$KAlSi_3O_8$
Calcite	$CaCO_3$
Ankerite	$CaFe(CO_3)_2$
Dolomite	$CaMg(CO_3)_2$
Actinolite	$Ca_2(Mg,Fe)_5Si_8O_{22}(OH)_2$
Diopside	$CaMgSi_2O_6$
Kutnohorite	$CaMn(CO_3)_2$
Muscovite	$KAl_2(AlSi_3O_{10})(OH)_2$
Magnetite	Fe_3O_4
Illite	$(K,H_3O)(Al,Mg,Fe)_2(Si,Al)_4O_{10}[(OH)_2,(H_2O)]$
Montmorillonite	$(Na,Ca)_{0.3}(Al,Mg)_2Si_4O_{10}(OH)_2\cdot 10H_2O$
Kaolinite	$Al_2Si_2O_5(OH)_4$
Illite-Montmorillonite	$KAl_4(Si,Al)_8O_{20}(OH)_4\cdot 8H_2O$


COF1-13-18-20230619
AUG4528-1 riet.raw_1
Quartz 53.92 %
Illite 3.95 %
Montmorillonite-15A 1.10 %
Kaolinite 0.74 %
Chlorite IIb 1.57 %
Albite 6.12 %
Microcline intermediate1 5.09 %
Calcite 4.12 %
Ankerite Fe0.55 7.22 %
Dolomite 13.27 %
Actinolite 0.33 %
Diopside 1.03 %
Kutnahorite 0.51 %
Muscovite 2M1 1.04 %
2Th Degrees

COF1-13-18-20230619



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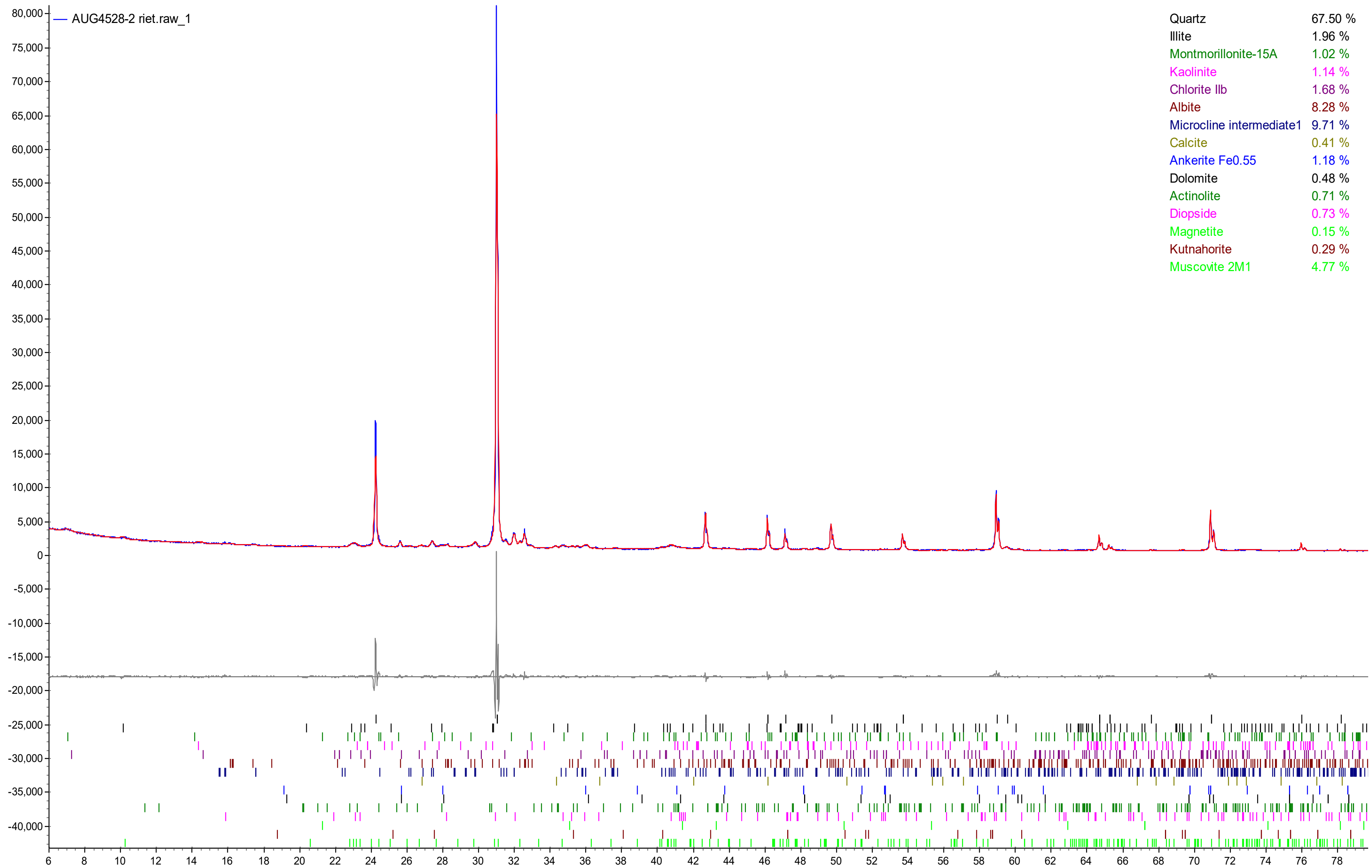
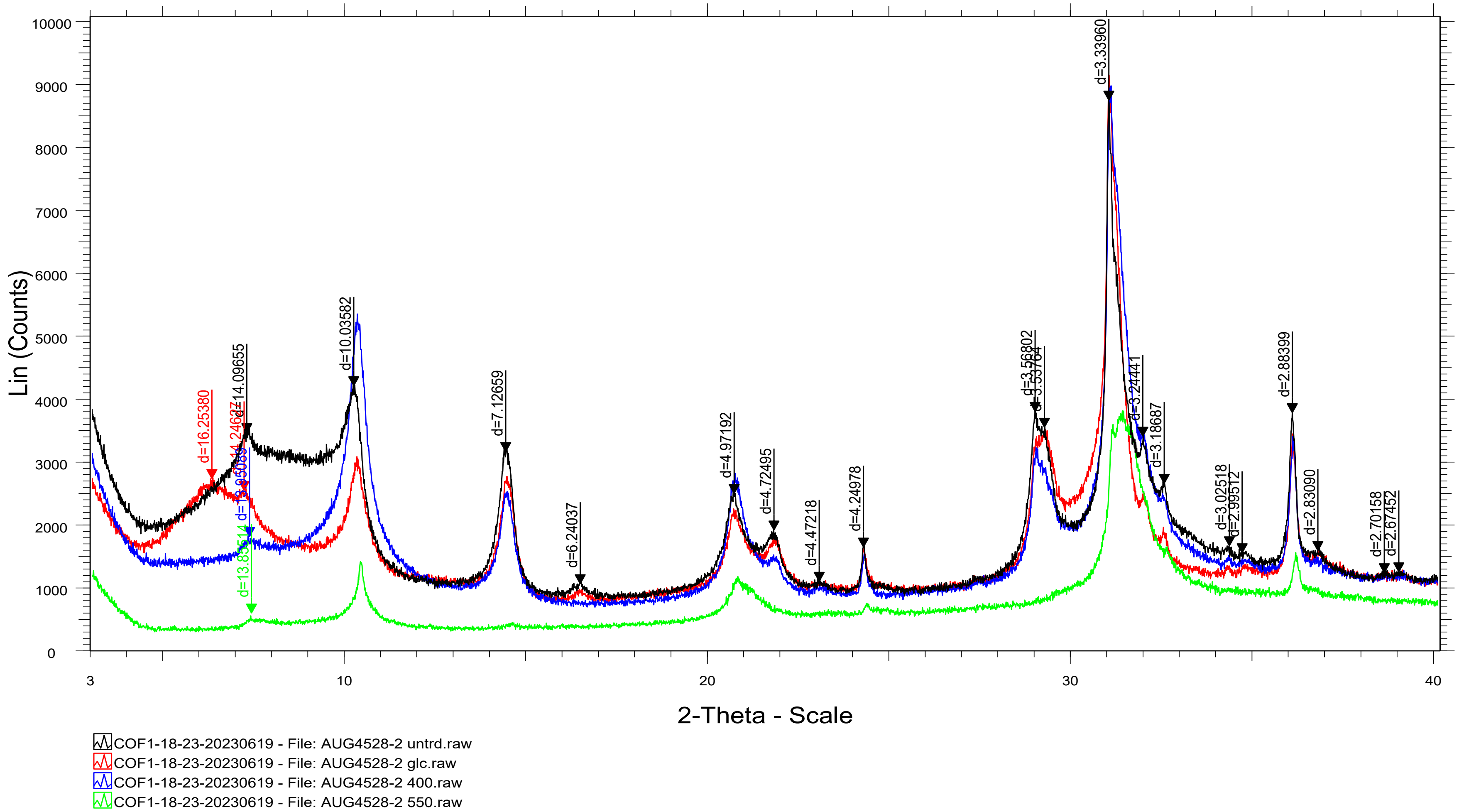


Environmental Services
Custom XRD/MI4528-AUG23
15-Sep-23

COF1-18-23-20230619



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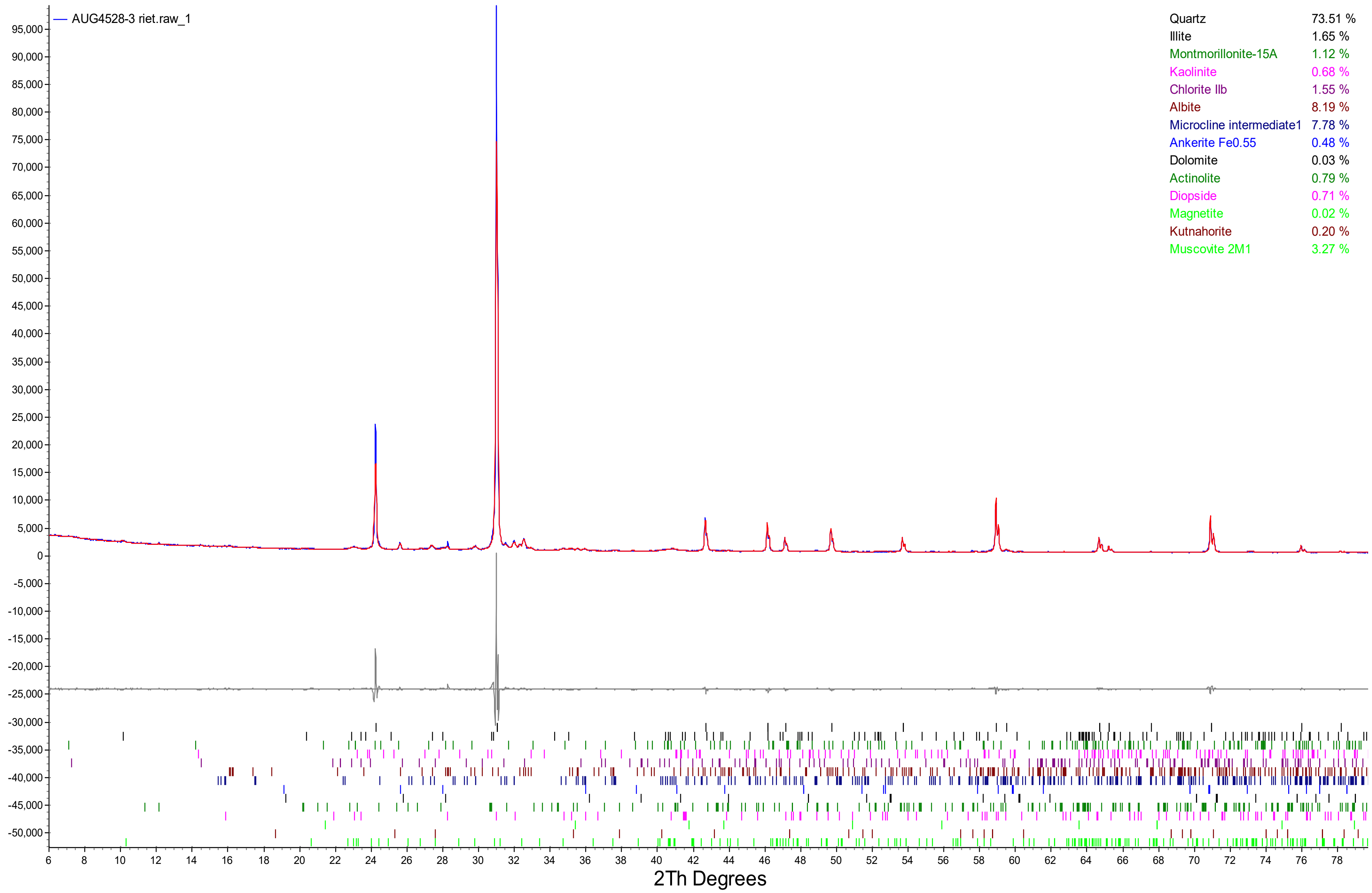

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Custom XRD/MI4528-AUG23
15-Sep-23

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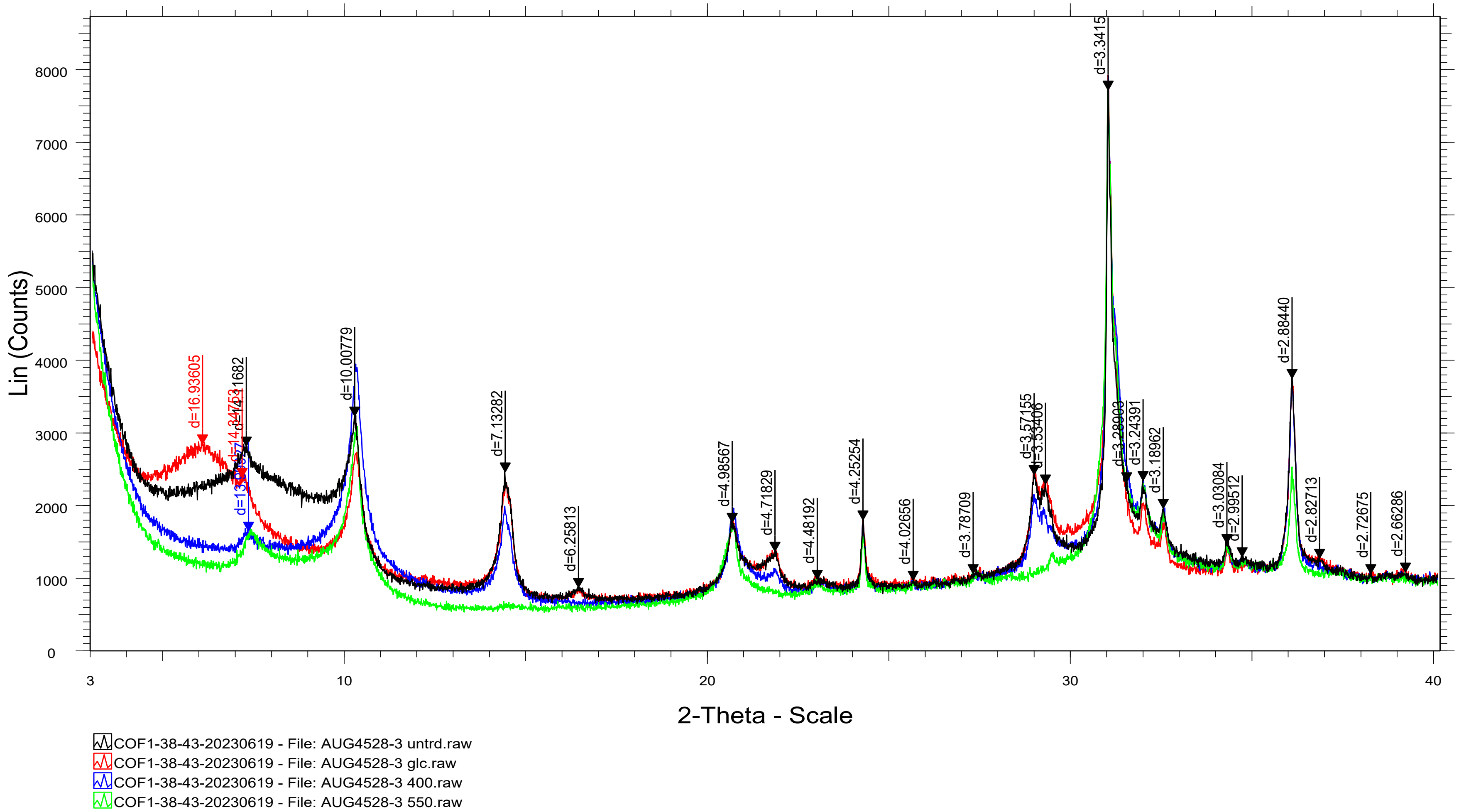

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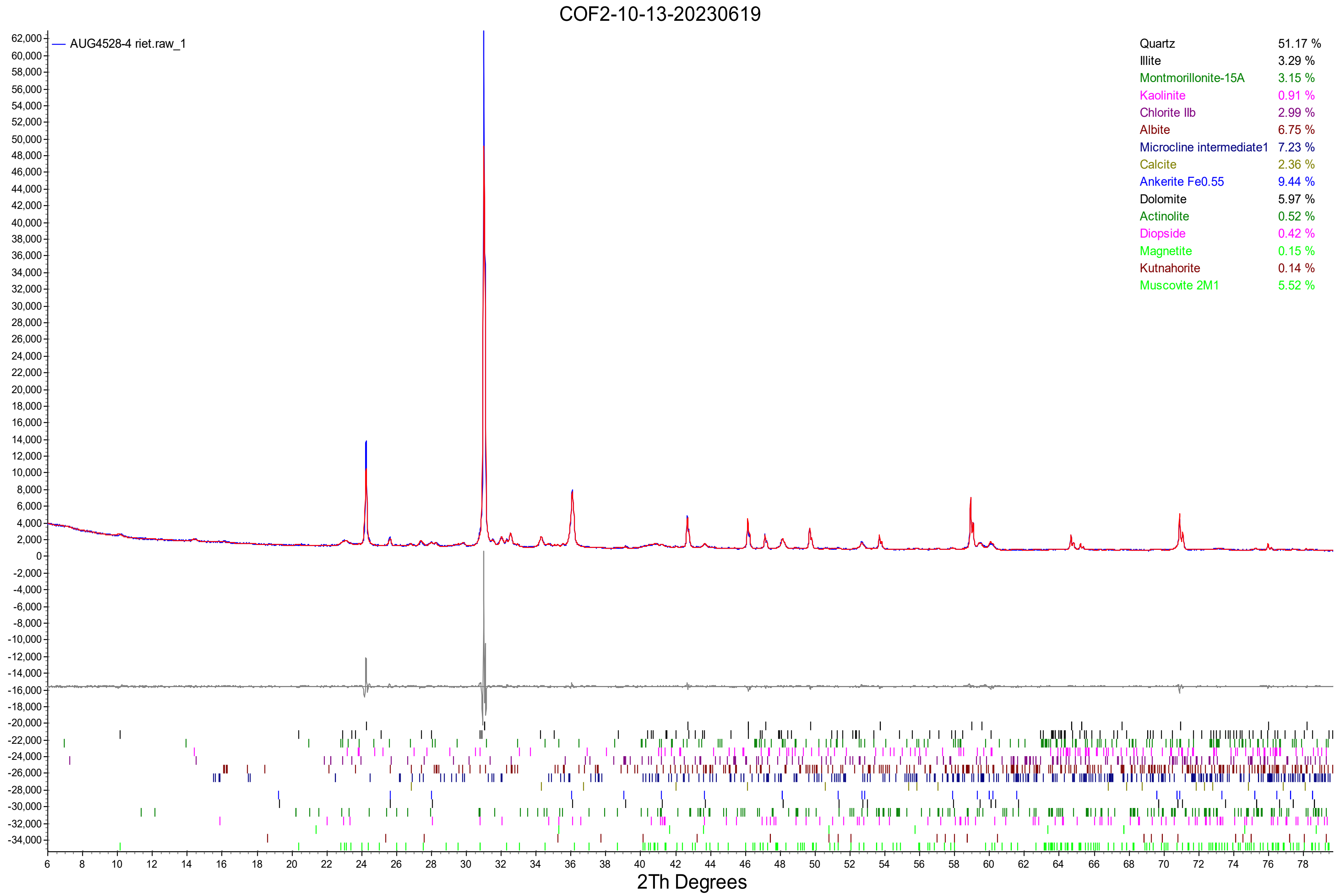
15-Sep-23



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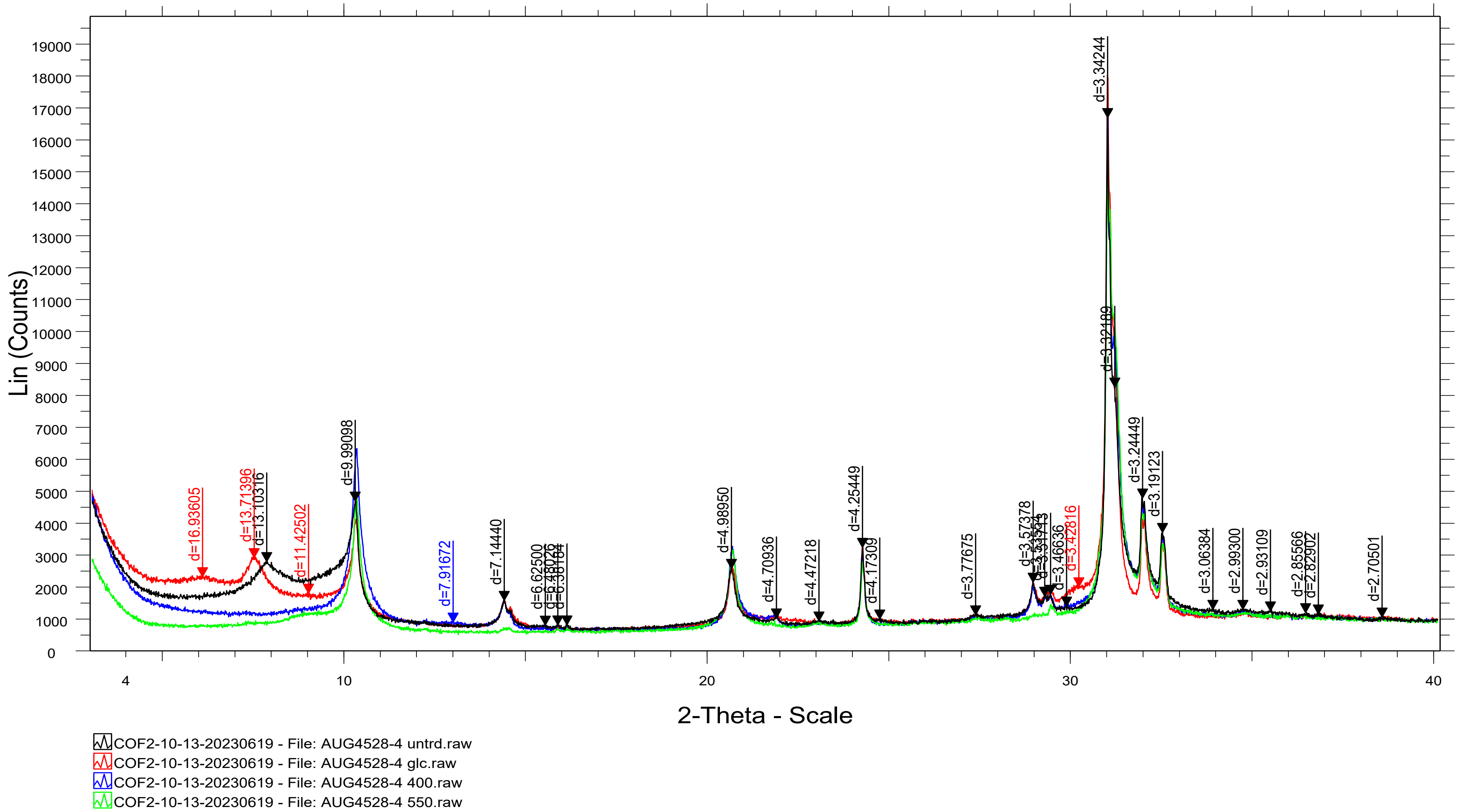

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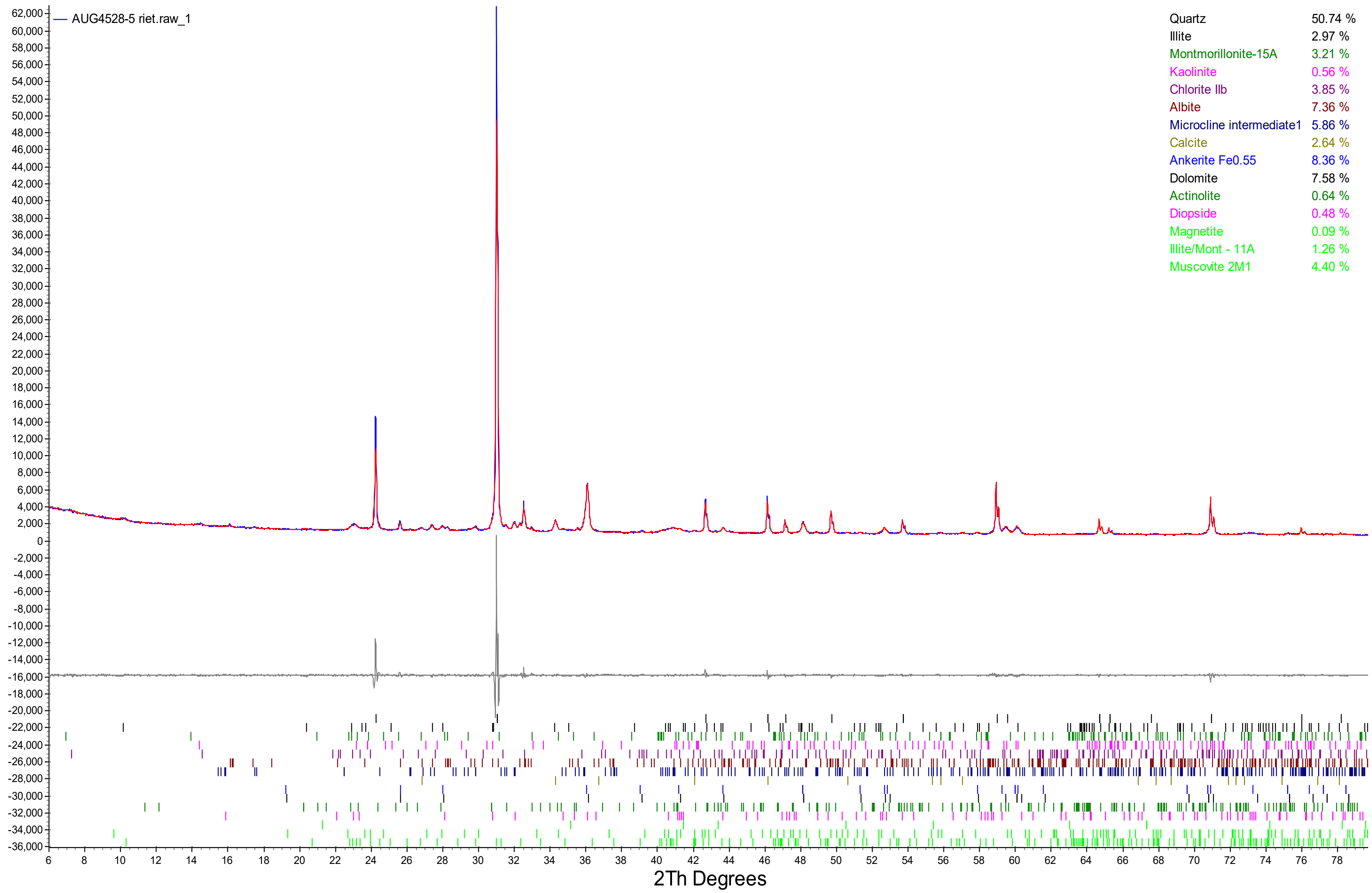

Environmental Services
Custom XRD/MI4528-AUG23
15-Sep-23

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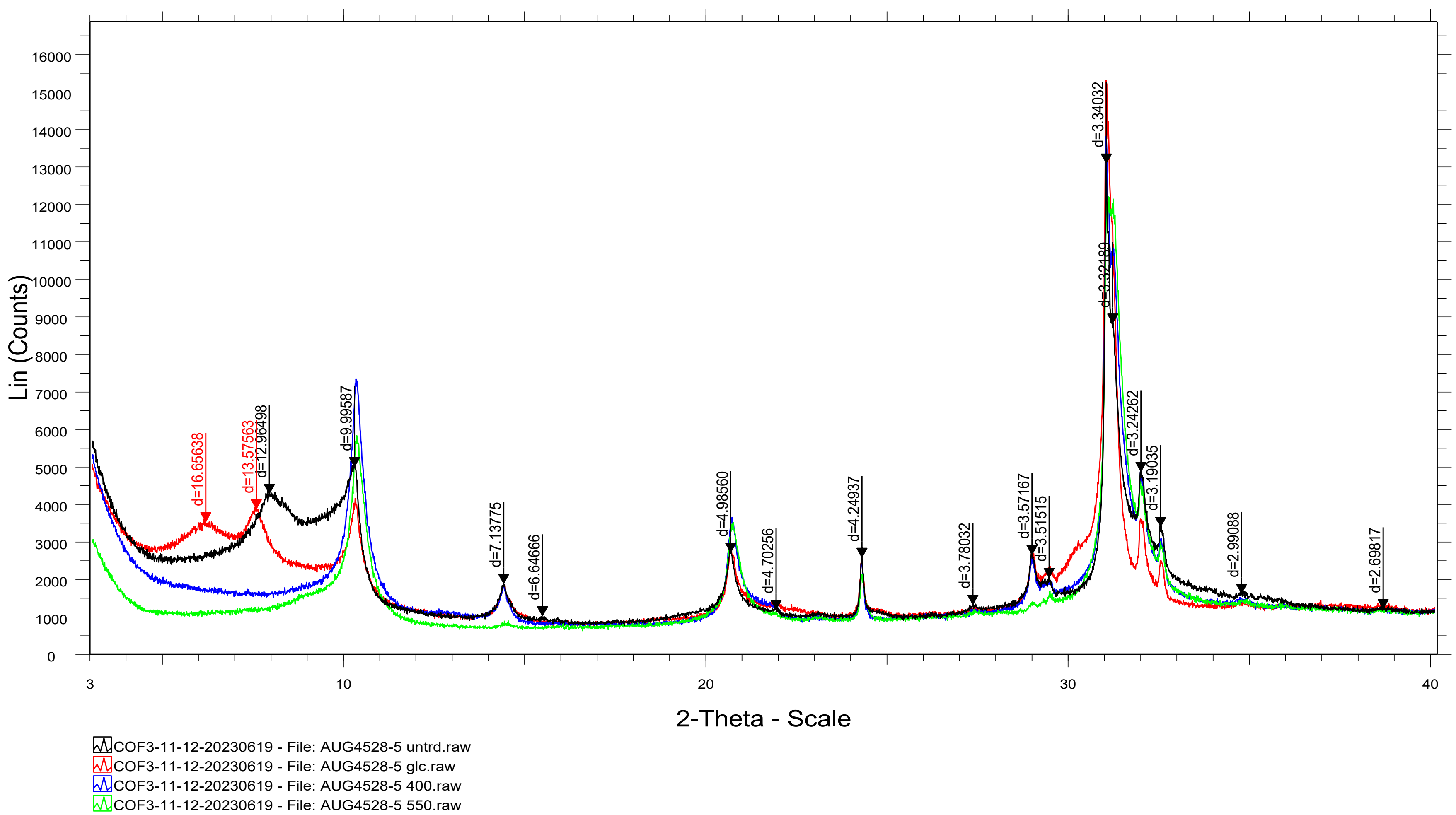

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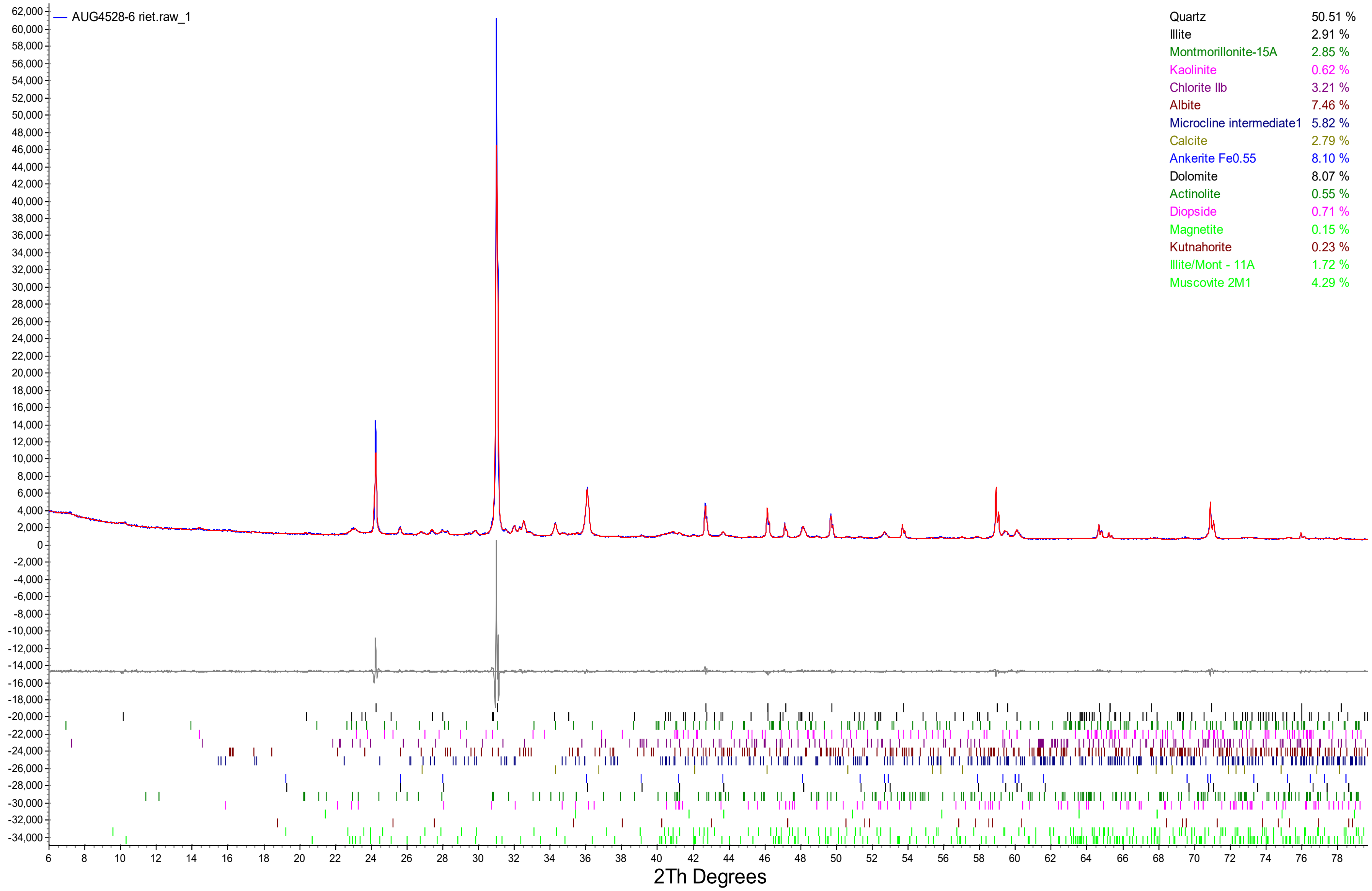

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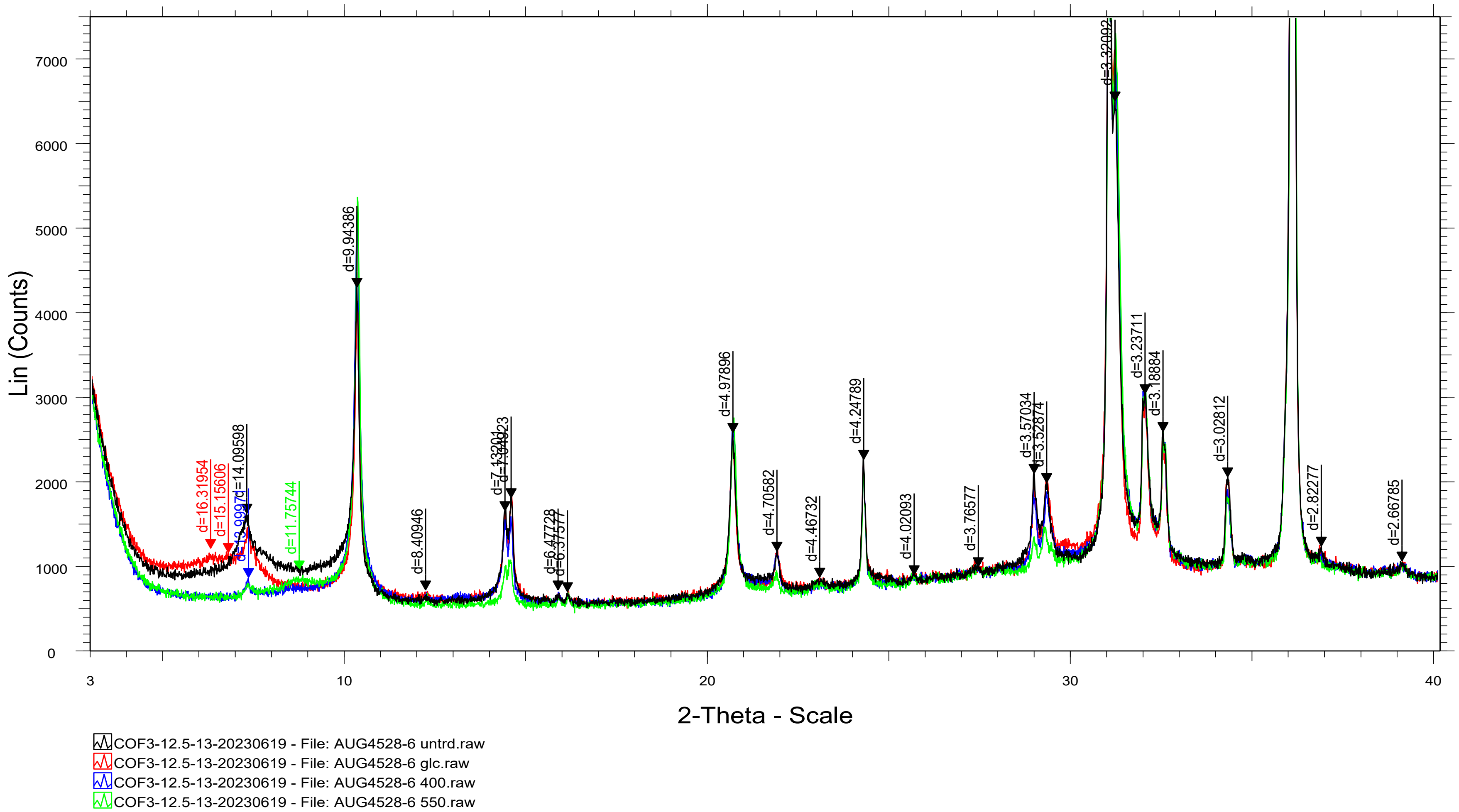

Attachment H

Site Evaluation Aqueous Phase Data

Attachment H. Site Evaluation Groundwater Data
Geochemical Conceptual Site Model
Coffeen Ash Pond No. 1
Coffeen Power Plant
Coffeen, IL

HSU	Location	Well Type	Date	Parameter	Unit	Result
CCR	XPW01	Porewater	2021/03/30	pH (field)	SU	8.0
CCR	XPW01	Porewater	2021/04/22	pH (field)	SU	7.8
CCR	XPW01	Porewater	2021/05/05	pH (field)	SU	8.0
CCR	XPW01	Porewater	2021/05/18	pH (field)	SU	8.0
CCR	XPW01	Porewater	2021/07/27	pH (field)	SU	8.1
CCR	XPW01	Porewater	2022/06/15	pH (field)	SU	8.5
CCR	XPW01	Porewater	2022/08/24	pH (field)	SU	7.7
CCR	XPW01	Porewater	2023/02/15	pH (field)	SU	7.8
CCR	XPW01	Porewater	2023/08/10	pH (field)	SU	7.7
CCR	XPW01	Porewater	2023/11/17	pH (field)	SU	7.1
CCR	XPW01	Porewater	2021/03/30	Oxidation Reduction Potential	mV	-7.20
CCR	XPW01	Porewater	2021/04/22	Oxidation Reduction Potential	mV	-7.80
CCR	XPW01	Porewater	2021/05/05	Oxidation Reduction Potential	mV	147
CCR	XPW01	Porewater	2021/05/18	Oxidation Reduction Potential	mV	-146
CCR	XPW01	Porewater	2021/07/27	Oxidation Reduction Potential	mV	-190
CCR	XPW01	Porewater	2022/06/15	Oxidation Reduction Potential	mV	-35.4
CCR	XPW01	Porewater	2022/08/24	Oxidation Reduction Potential	mV	-72.0
CCR	XPW01	Porewater	2023/02/15	Oxidation Reduction Potential	mV	-35.0
CCR	XPW01	Porewater	2023/08/10	Oxidation Reduction Potential	mV	-104
CCR	XPW01	Porewater	2023/11/17	Oxidation Reduction Potential	mV	-83.0
CCR	XPW01	Porewater	2021/03/30	Eh	V	0.19
CCR	XPW01	Porewater	2021/04/22	Eh	V	0.19
CCR	XPW01	Porewater	2021/05/05	Eh	V	0.34
CCR	XPW01	Porewater	2021/05/18	Eh	V	0.049
CCR	XPW01	Porewater	2021/07/27	Eh	V	-0.00024
CCR	XPW01	Porewater	2022/06/15	Eh	V	0.16
CCR	XPW01	Porewater	2022/08/24	Eh	V	0.12
CCR	XPW01	Porewater	2023/02/15	Eh	V	0.16
CCR	XPW01	Porewater	2023/08/10	Eh	V	0.089
CCR	XPW01	Porewater	2023/11/17	Eh	V	0.11
CCR	XPW01	Porewater	2021/03/30	Alkalinity, bicarbonate	mg/L CaCO3	68.0
CCR	XPW01	Porewater	2021/04/22	Alkalinity, bicarbonate	mg/L CaCO3	75.0
CCR	XPW01	Porewater	2021/05/05	Alkalinity, bicarbonate	mg/L CaCO3	75.0
CCR	XPW01	Porewater	2021/05/18	Alkalinity, bicarbonate	mg/L CaCO3	78.0
CCR	XPW01	Porewater	2021/07/27	Alkalinity, bicarbonate	mg/L CaCO3	100
CCR	XPW01	Porewater	2022/06/15	Alkalinity, bicarbonate	mg/L CaCO3	92.0
CCR	XPW01	Porewater	2022/08/24	Alkalinity, bicarbonate	mg/L CaCO3	100
CCR	XPW01	Porewater	2023/02/15	Alkalinity, bicarbonate	mg/L CaCO3	100
CCR	XPW01	Porewater	2023/08/10	Alkalinity, bicarbonate	mg/L CaCO3	220
CCR	XPW01	Porewater	2023/11/17	Alkalinity, bicarbonate	mg/L CaCO3	270
CCR	XPW01	Porewater	2022/08/24	Alkalinity, carbonate	mg/L CaCO3	10.0
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CCR	XPW01	Porewater	2023/08/10	Barium, total	mg/L	0.0589
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CCR	XPW01	Porewater	2021/04/22	Boron, total	mg/L	2.40
CCR	XPW01	Porewater	2021/05/05	Boron, total	mg/L	2.50
CCR	XPW01	Porewater	2021/05/18	Boron, total	mg/L	2.50
CCR	XPW01	Porewater	2021/07/27	Boron, total	mg/L	2.90
CCR	XPW01	Porewater	2023/08/10	Boron, total	mg/L	3.97
CCR	XPW01	Porewater	2021/03/30	Calcium, total	mg/L	280
CCR	XPW01	Porewater	2021/04/22	Calcium, total	mg/L	270

CCR	XPW01	Porewater	2021/05/05	Calcium, total	mg/L	290
CCR	XPW01	Porewater	2021/05/18	Calcium, total	mg/L	270
CCR	XPW01	Porewater	2021/07/27	Calcium, total	mg/L	250
CCR	XPW01	Porewater	2022/06/15	Calcium, total	mg/L	230
CCR	XPW01	Porewater	2022/08/24	Calcium, total	mg/L	250
CCR	XPW01	Porewater	2023/02/15	Calcium, total	mg/L	240
CCR	XPW01	Porewater	2023/08/10	Calcium, total	mg/L	221
CCR	XPW01	Porewater	2023/11/17	Calcium, total	mg/L	209
CCR	XPW01	Porewater	2021/03/30	Chloride, total	mg/L	13.0
CCR	XPW01	Porewater	2021/04/22	Chloride, total	mg/L	17.0
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CCR	XPW01	Porewater	2021/05/18	Chloride, total	mg/L	15.0
CCR	XPW01	Porewater	2021/07/27	Chloride, total	mg/L	13.0
CCR	XPW01	Porewater	2022/06/15	Chloride, total	mg/L	11.0
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CCR	XPW01	Porewater	2023/08/10	Chloride, total	mg/L	8.00
CCR	XPW01	Porewater	2023/11/17	Chloride, total	mg/L	8.00
CCR	XPW01	Porewater	2023/06/06	Ferrous Iron, dissolved	mg/L	0.690
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CCR	XPW01	Porewater	2023/08/10	Iron, dissolved	mg/L	1.06
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CCR	XPW01	Porewater	2022/06/15	Magnesium, total	mg/L	24.0
CCR	XPW01	Porewater	2022/08/24	Magnesium, total	mg/L	29.0
CCR	XPW01	Porewater	2023/02/15	Magnesium, total	mg/L	20.0
CCR	XPW01	Porewater	2023/08/10	Magnesium, total	mg/L	31.6
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CCR	XPW01	Porewater	2023/08/10	Manganese, dissolved	mg/L	0.115
CCR	XPW01	Porewater	2023/08/10	Phosphate, dissolved	mg/L	0.0310
CCR	XPW01	Porewater	2021/03/30	Potassium, total	mg/L	19.0
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CCR	XPW01	Porewater	2021/05/05	Potassium, total	mg/L	20.0
CCR	XPW01	Porewater	2021/05/18	Potassium, total	mg/L	20.0
CCR	XPW01	Porewater	2021/07/27	Potassium, total	mg/L	21.0
CCR	XPW01	Porewater	2022/06/15	Potassium, total	mg/L	20.0
CCR	XPW01	Porewater	2022/08/24	Potassium, total	mg/L	23.0
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CCR	XPW01	Porewater	2023/08/10	Potassium, total	mg/L	22.7
CCR	XPW01	Porewater	2023/11/17	Potassium, total	mg/L	22.5
CCR	XPW01	Porewater	2023/06/06	Silicon, dissolved	mg/L	5.50
CCR	XPW01	Porewater	2023/08/10	Silicon, dissolved	mg/L	5.47
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CCR	XPW01	Porewater	2021/05/18	Temperature (Celsius)	degrees C	16.3
CCR	XPW01	Porewater	2021/07/27	Temperature (Celsius)	degrees C	23.2
CCR	XPW01	Porewater	2022/06/15	Temperature (Celsius)	degrees C	21.8
CCR	XPW01	Porewater	2022/08/24	Temperature (Celsius)	degrees C	20.0
CCR	XPW01	Porewater	2023/02/15	Temperature (Celsius)	degrees C	13.6
CCR	XPW01	Porewater	2023/08/10	Temperature (Celsius)	degrees C	18.3
CCR	XPW01	Porewater	2023/11/17	Temperature (Celsius)	degrees C	18.4
CCR	XPW01	Porewater	2021/03/30	Total Dissolved Solids	mg/L	1,300
CCR	XPW01	Porewater	2021/04/22	Total Dissolved Solids	mg/L	1,200
CCR	XPW01	Porewater	2021/05/05	Total Dissolved Solids	mg/L	1,300
CCR	XPW01	Porewater	2021/05/18	Total Dissolved Solids	mg/L	1,300
CCR	XPW01	Porewater	2021/07/27	Total Dissolved Solids	mg/L	1,200
CCR	XPW01	Porewater	2022/06/15	Total Dissolved Solids	mg/L	1,200
CCR	XPW01	Porewater	2022/08/24	Total Dissolved Solids	mg/L	1,400
CCR	XPW01	Porewater	2023/02/15	Total Dissolved Solids	mg/L	1,100
CCR	XPW01	Porewater	2023/08/10	Total Dissolved Solids	mg/L	1,080
CCR	XPW01	Porewater	2023/11/17	Total Dissolved Solids	mg/L	1,020
CCR	XPW02	Porewater	2021/03/30	pH (field)	SU	7.9
CCR	XPW02	Porewater	2021/04/22	pH (field)	SU	8.0
CCR	XPW02	Porewater	2021/05/05	pH (field)	SU	7.9
CCR	XPW02	Porewater	2021/05/19	pH (field)	SU	8.1
CCR	XPW02	Porewater	2021/07/27	pH (field)	SU	8.2
CCR	XPW02	Porewater	2022/06/15	pH (field)	SU	8.4
CCR	XPW02	Porewater	2022/08/24	pH (field)	SU	7.0
CCR	XPW02	Porewater	2023/02/15	pH (field)	SU	7.8
CCR	XPW02	Porewater	2023/08/10	pH (field)	SU	7.6
CCR	XPW02	Porewater	2023/11/17	pH (field)	SU	7.6
CCR	XPW02	Porewater	2021/03/30	Oxidation Reduction Potential	mV	-112
CCR	XPW02	Porewater	2021/04/22	Oxidation Reduction Potential	mV	-61.8
CCR	XPW02	Porewater	2021/05/05	Oxidation Reduction Potential	mV	21.1
CCR	XPW02	Porewater	2021/05/19	Oxidation Reduction Potential	mV	-187
CCR	XPW02	Porewater	2021/07/27	Oxidation Reduction Potential	mV	-209
CCR	XPW02	Porewater	2022/06/15	Oxidation Reduction Potential	mV	-160
CCR	XPW02	Porewater	2022/08/24	Oxidation Reduction Potential	mV	-61.0
CCR	XPW02	Porewater	2023/02/15	Oxidation Reduction Potential	mV	-108
CCR	XPW02	Porewater	2023/08/10	Oxidation Reduction Potential	mV	-111
CCR	XPW02	Porewater	2023/11/17	Oxidation Reduction Potential	mV	-107
CCR	XPW02	Porewater	2021/03/30	Eh	V	0.081
CCR	XPW02	Porewater	2021/04/22	Eh	V	0.13
CCR	XPW02	Porewater	2021/05/05	Eh	V	0.21
CCR	XPW02	Porewater	2021/05/19	Eh	V	0.0047
CCR	XPW02	Porewater	2021/07/27	Eh	V	-0.020
CCR	XPW02	Porewater	2022/06/15	Eh	V	0.031
CCR	XPW02	Porewater	2022/08/24	Eh	V	0.13
CCR	XPW02	Porewater	2023/02/15	Eh	V	0.087
CCR	XPW02	Porewater	2023/08/10	Eh	V	0.082
CCR	XPW02	Porewater	2023/11/17	Eh	V	0.085
CCR	XPW02	Porewater	2021/03/30	Alkalinity, bicarbonate	mg/L CaCO3	180
CCR	XPW02	Porewater	2021/04/22	Alkalinity, bicarbonate	mg/L CaCO3	170
CCR	XPW02	Porewater	2021/05/05	Alkalinity, bicarbonate	mg/L CaCO3	180
CCR	XPW02	Porewater	2021/05/19	Alkalinity, bicarbonate	mg/L CaCO3	160
CCR	XPW02	Porewater	2021/07/27	Alkalinity, bicarbonate	mg/L CaCO3	160
CCR	XPW02	Porewater	2022/06/15	Alkalinity, bicarbonate	mg/L CaCO3	140
CCR	XPW02	Porewater	2022/08/24	Alkalinity, bicarbonate	mg/L CaCO3	150
CCR	XPW02	Porewater	2023/02/15	Alkalinity, bicarbonate	mg/L CaCO3	160

CCR	XPW02	Porewater	2023/08/10	Alkalinity, bicarbonate	mg/L CaCO3	216
CCR	XPW02	Porewater	2023/11/17	Alkalinity, bicarbonate	mg/L CaCO3	241
CCR	XPW02	Porewater	2022/08/24	Alkalinity, carbonate	mg/L CaCO3	10.0
CCR	XPW02	Porewater	2021/03/30	Barium, total	mg/L	0.110
CCR	XPW02	Porewater	2021/04/22	Barium, total	mg/L	0.0890
CCR	XPW02	Porewater	2021/05/05	Barium, total	mg/L	0.110
CCR	XPW02	Porewater	2021/05/19	Barium, total	mg/L	0.0890
CCR	XPW02	Porewater	2021/07/27	Barium, total	mg/L	0.0830
CCR	XPW02	Porewater	2023/08/10	Barium, total	mg/L	0.118
CCR	XPW02	Porewater	2021/03/30	Boron, total	mg/L	2.40
CCR	XPW02	Porewater	2021/04/22	Boron, total	mg/L	2.20
CCR	XPW02	Porewater	2021/05/05	Boron, total	mg/L	2.40
CCR	XPW02	Porewater	2021/05/19	Boron, total	mg/L	2.40
CCR	XPW02	Porewater	2021/07/27	Boron, total	mg/L	2.40
CCR	XPW02	Porewater	2023/08/10	Boron, total	mg/L	1.92
CCR	XPW02	Porewater	2021/03/30	Calcium, total	mg/L	210
CCR	XPW02	Porewater	2021/04/22	Calcium, total	mg/L	220
CCR	XPW02	Porewater	2021/05/05	Calcium, total	mg/L	230
CCR	XPW02	Porewater	2021/05/19	Calcium, total	mg/L	220
CCR	XPW02	Porewater	2021/07/27	Calcium, total	mg/L	210
CCR	XPW02	Porewater	2022/06/15	Calcium, total	mg/L	180
CCR	XPW02	Porewater	2022/08/24	Calcium, total	mg/L	140
CCR	XPW02	Porewater	2023/02/15	Calcium, total	mg/L	210
CCR	XPW02	Porewater	2023/08/10	Calcium, total	mg/L	103
CCR	XPW02	Porewater	2023/11/17	Calcium, total	mg/L	104
CCR	XPW02	Porewater	2021/03/30	Chloride, total	mg/L	17.0
CCR	XPW02	Porewater	2021/04/22	Chloride, total	mg/L	17.0
CCR	XPW02	Porewater	2021/05/05	Chloride, total	mg/L	17.0
CCR	XPW02	Porewater	2021/05/19	Chloride, total	mg/L	1.50
CCR	XPW02	Porewater	2021/07/27	Chloride, total	mg/L	14.0
CCR	XPW02	Porewater	2022/06/15	Chloride, total	mg/L	11.0
CCR	XPW02	Porewater	2022/08/24	Chloride, total	mg/L	7.20
CCR	XPW02	Porewater	2023/02/15	Chloride, total	mg/L	11.0
CCR	XPW02	Porewater	2023/08/10	Chloride, total	mg/L	8.00
CCR	XPW02	Porewater	2023/11/17	Chloride, total	mg/L	8.00
CCR	XPW02	Porewater	2023/06/06	Ferrous Iron, dissolved	mg/L	0.970
CCR	XPW02	Porewater	2023/06/06	Iron, dissolved	mg/L	1.30
CCR	XPW02	Porewater	2023/08/10	Iron, dissolved	mg/L	0.742
CCR	XPW02	Porewater	2021/03/30	Magnesium, total	mg/L	27.0
CCR	XPW02	Porewater	2021/04/22	Magnesium, total	mg/L	25.0
CCR	XPW02	Porewater	2021/05/05	Magnesium, total	mg/L	29.0
CCR	XPW02	Porewater	2021/05/19	Magnesium, total	mg/L	32.0
CCR	XPW02	Porewater	2021/07/27	Magnesium, total	mg/L	29.0
CCR	XPW02	Porewater	2022/06/15	Magnesium, total	mg/L	25.0
CCR	XPW02	Porewater	2022/08/24	Magnesium, total	mg/L	19.0
CCR	XPW02	Porewater	2023/02/15	Magnesium, total	mg/L	20.0
CCR	XPW02	Porewater	2023/08/10	Magnesium, total	mg/L	15.5
CCR	XPW02	Porewater	2023/11/17	Magnesium, total	mg/L	16.5
CCR	XPW02	Porewater	2023/06/06	Manganese, dissolved	mg/L	0.120
CCR	XPW02	Porewater	2023/08/10	Manganese, dissolved	mg/L	0.0809
CCR	XPW02	Porewater	2023/08/10	Phosphate, dissolved	mg/L	0.0210
CCR	XPW02	Porewater	2021/03/30	Potassium, total	mg/L	19.0
CCR	XPW02	Porewater	2021/04/22	Potassium, total	mg/L	20.0
CCR	XPW02	Porewater	2021/05/05	Potassium, total	mg/L	20.0
CCR	XPW02	Porewater	2021/05/19	Potassium, total	mg/L	20.0
CCR	XPW02	Porewater	2021/07/27	Potassium, total	mg/L	20.0
CCR	XPW02	Porewater	2022/06/15	Potassium, total	mg/L	19.0
CCR	XPW02	Porewater	2022/08/24	Potassium, total	mg/L	16.0
CCR	XPW02	Porewater	2023/02/15	Potassium, total	mg/L	21.0
CCR	XPW02	Porewater	2023/08/10	Potassium, total	mg/L	16.2
CCR	XPW02	Porewater	2023/11/17	Potassium, total	mg/L	20.0
CCR	XPW02	Porewater	2023/06/06	Silicon, dissolved	mg/L	6.40

CCR	XPW02	Porewater	2023/08/10	Silicon, dissolved	mg/L	8.65
CCR	XPW02	Porewater	2021/03/30	Sodium, total	mg/L	76.0
CCR	XPW02	Porewater	2021/04/22	Sodium, total	mg/L	73.0
CCR	XPW02	Porewater	2021/05/05	Sodium, total	mg/L	75.0
CCR	XPW02	Porewater	2021/05/19	Sodium, total	mg/L	67.0
CCR	XPW02	Porewater	2021/07/27	Sodium, total	mg/L	74.0
CCR	XPW02	Porewater	2022/06/15	Sodium, total	mg/L	64.0
CCR	XPW02	Porewater	2022/08/24	Sodium, total	mg/L	51.0
CCR	XPW02	Porewater	2023/02/15	Sodium, total	mg/L	68.0
CCR	XPW02	Porewater	2023/08/10	Sodium, total	mg/L	42.3
CCR	XPW02	Porewater	2023/11/17	Sodium, total	mg/L	43.7
CCR	XPW02	Porewater	2021/03/30	Sulfate, total	mg/L	570
CCR	XPW02	Porewater	2021/04/22	Sulfate, total	mg/L	620
CCR	XPW02	Porewater	2021/05/05	Sulfate, total	mg/L	610
CCR	XPW02	Porewater	2021/05/19	Sulfate, total	mg/L	650
CCR	XPW02	Porewater	2021/07/27	Sulfate, total	mg/L	600
CCR	XPW02	Porewater	2022/06/15	Sulfate, total	mg/L	580
CCR	XPW02	Porewater	2022/08/24	Sulfate, total	mg/L	340
CCR	XPW02	Porewater	2023/02/15	Sulfate, total	mg/L	530
CCR	XPW02	Porewater	2023/08/10	Sulfate, total	mg/L	201
CCR	XPW02	Porewater	2023/11/17	Sulfate, total	mg/L	175
CCR	XPW02	Porewater	2021/03/30	Temperature (Celsius)	degrees C	18.4
CCR	XPW02	Porewater	2021/04/22	Temperature (Celsius)	degrees C	17.8
CCR	XPW02	Porewater	2021/05/05	Temperature (Celsius)	degrees C	18.9
CCR	XPW02	Porewater	2021/05/19	Temperature (Celsius)	degrees C	20.4
CCR	XPW02	Porewater	2021/07/27	Temperature (Celsius)	degrees C	24.6
CCR	XPW02	Porewater	2022/06/15	Temperature (Celsius)	degrees C	21.6
CCR	XPW02	Porewater	2022/08/24	Temperature (Celsius)	degrees C	19.9
CCR	XPW02	Porewater	2023/02/15	Temperature (Celsius)	degrees C	15.3
CCR	XPW02	Porewater	2023/08/10	Temperature (Celsius)	degrees C	18.7
CCR	XPW02	Porewater	2023/11/17	Temperature (Celsius)	degrees C	19.5
CCR	XPW02	Porewater	2021/03/30	Total Dissolved Solids	mg/L	1,000
CCR	XPW02	Porewater	2021/04/22	Total Dissolved Solids	mg/L	1,000
CCR	XPW02	Porewater	2021/05/05	Total Dissolved Solids	mg/L	1,000
CCR	XPW02	Porewater	2021/05/19	Total Dissolved Solids	mg/L	1,100
CCR	XPW02	Porewater	2021/07/27	Total Dissolved Solids	mg/L	1,100
CCR	XPW02	Porewater	2022/06/15	Total Dissolved Solids	mg/L	1,000
CCR	XPW02	Porewater	2022/08/24	Total Dissolved Solids	mg/L	760
CCR	XPW02	Porewater	2023/02/15	Total Dissolved Solids	mg/L	930
CCR	XPW02	Porewater	2023/08/10	Total Dissolved Solids	mg/L	522
CCR	XPW02	Porewater	2023/11/17	Total Dissolved Solids	mg/L	544
DA	G314D	C	2021/03/30	pH (field)	SU	7.3
DA	G314D	C	2021/04/21	pH (field)	SU	7.2
DA	G314D	C	2021/05/04	pH (field)	SU	7.2
DA	G314D	C	2021/05/19	pH (field)	SU	7.2
DA	G314D	C	2021/07/28	pH (field)	SU	7.2
DA	G314D	C	2023/02/16	pH (field)	SU	6.9
DA	G314D	C	2023/06/01	pH (field)	SU	7.1
DA	G314D	C	2023/08/09	pH (field)	SU	6.8
DA	G314D	C	2023/11/20	pH (field)	SU	6.7
DA	G314D	C	2021/03/30	Oxidation Reduction Potential	mV	-21.8
DA	G314D	C	2021/04/21	Oxidation Reduction Potential	mV	62.7
DA	G314D	C	2021/05/04	Oxidation Reduction Potential	mV	77.7
DA	G314D	C	2021/05/19	Oxidation Reduction Potential	mV	130
DA	G314D	C	2021/07/28	Oxidation Reduction Potential	mV	94.8
DA	G314D	C	2023/02/16	Oxidation Reduction Potential	mV	175
DA	G314D	C	2023/06/01	Oxidation Reduction Potential	mV	-8.30
DA	G314D	C	2023/08/09	Oxidation Reduction Potential	mV	-45.0
DA	G314D	C	2023/11/20	Oxidation Reduction Potential	mV	-54.0
DA	G314D	C	2021/03/30	Eh	V	0.17
DA	G314D	C	2021/04/21	Eh	V	0.26
DA	G314D	C	2021/05/04	Eh	V	0.27

DA	G314D	C	2021/05/19	Eh	V	0.33
DA	G314D	C	2021/07/28	Eh	V	0.29
DA	G314D	C	2023/02/16	Eh	V	0.37
DA	G314D	C	2023/06/01	Eh	V	0.19
DA	G314D	C	2023/08/09	Eh	V	0.15
DA	G314D	C	2023/11/20	Eh	V	0.14
DA	G314D	C	2021/03/30	Alkalinity, bicarbonate	mg/L CaCO3	520
DA	G314D	C	2021/04/21	Alkalinity, bicarbonate	mg/L CaCO3	560
DA	G314D	C	2021/05/19	Alkalinity, bicarbonate	mg/L CaCO3	550
DA	G314D	C	2021/07/28	Alkalinity, bicarbonate	mg/L CaCO3	550
DA	G314D	C	2023/02/16	Alkalinity, bicarbonate	mg/L CaCO3	620
DA	G314D	C	2023/06/01	Alkalinity, bicarbonate	mg/L CaCO3	680
DA	G314D	C	2023/08/09	Alkalinity, bicarbonate	mg/L CaCO3	719
DA	G314D	C	2023/11/20	Alkalinity, bicarbonate	mg/L CaCO3	741
DA	G314D	C	2021/03/30	Barium, total	mg/L	0.0490
DA	G314D	C	2021/04/21	Barium, total	mg/L	0.0480
DA	G314D	C	2021/05/04	Barium, total	mg/L	0.0450
DA	G314D	C	2021/05/19	Barium, total	mg/L	0.0520
DA	G314D	C	2021/07/28	Barium, total	mg/L	0.0460
DA	G314D	C	2023/02/16	Barium, total	mg/L	0.0370
DA	G314D	C	2023/06/01	Barium, total	mg/L	0.0160
DA	G314D	C	2023/08/09	Barium, total	mg/L	0.0351
DA	G314D	C	2023/11/20	Barium, total	mg/L	0.0395
DA	G314D	C	2021/03/30	Boron, total	mg/L	0.180
DA	G314D	C	2021/04/21	Boron, total	mg/L	0.170
DA	G314D	C	2021/05/04	Boron, total	mg/L	0.180
DA	G314D	C	2021/05/19	Boron, total	mg/L	0.160
DA	G314D	C	2021/07/28	Boron, total	mg/L	0.140
DA	G314D	C	2023/02/16	Boron, total	mg/L	0.190
DA	G314D	C	2023/06/01	Boron, total	mg/L	0.130
DA	G314D	C	2023/08/09	Boron, total	mg/L	0.190
DA	G314D	C	2023/11/20	Boron, total	mg/L	0.236
DA	G314D	C	2021/03/30	Calcium, total	mg/L	110
DA	G314D	C	2021/04/21	Calcium, total	mg/L	130
DA	G314D	C	2021/05/04	Calcium, total	mg/L	130
DA	G314D	C	2021/05/19	Calcium, total	mg/L	140
DA	G314D	C	2021/07/28	Calcium, total	mg/L	160
DA	G314D	C	2023/02/16	Calcium, total	mg/L	230
DA	G314D	C	2023/06/01	Calcium, total	mg/L	770
DA	G314D	C	2023/08/09	Calcium, total	mg/L	274
DA	G314D	C	2023/11/20	Calcium, total	mg/L	299
DA	G314D	C	2021/03/30	Chloride, total	mg/L	170
DA	G314D	C	2021/04/21	Chloride, total	mg/L	180
DA	G314D	C	2021/05/19	Chloride, total	mg/L	130
DA	G314D	C	2021/07/28	Chloride, total	mg/L	93.0
DA	G314D	C	2023/02/16	Chloride, total	mg/L	60.0
DA	G314D	C	2023/06/01	Chloride, total	mg/L	59.0
DA	G314D	C	2023/08/09	Chloride, total	mg/L	63.0
DA	G314D	C	2023/11/20	Chloride, total	mg/L	58.0
DA	G314D	C	2023/06/01	Ferrous Iron, dissolved	mg/L	0.420
DA	G314D	C	2023/06/01	Iron, dissolved	mg/L	4.90
DA	G314D	C	2023/08/09	Iron, dissolved	mg/L	0.704
DA	G314D	C	2021/03/30	Magnesium, total	mg/L	32.0
DA	G314D	C	2021/04/21	Magnesium, total	mg/L	37.0
DA	G314D	C	2021/05/04	Magnesium, total	mg/L	36.0
DA	G314D	C	2021/05/19	Magnesium, total	mg/L	43.0
DA	G314D	C	2021/07/28	Magnesium, total	mg/L	50.0
DA	G314D	C	2023/02/16	Magnesium, total	mg/L	79.0
DA	G314D	C	2023/06/01	Magnesium, total	mg/L	260
DA	G314D	C	2023/08/09	Magnesium, total	mg/L	94.3
DA	G314D	C	2023/11/20	Magnesium, total	mg/L	101
DA	G314D	C	2023/06/01	Manganese, dissolved	mg/L	1.40

DA	G314D	C	2023/08/09	Manganese, dissolved	mg/L	1.01
DA	G314D	C	2023/08/09	Phosphate, dissolved	mg/L	<0.005
DA	G314D	C	2021/03/30	Potassium, total	mg/L	4.70
DA	G314D	C	2021/04/21	Potassium, total	mg/L	4.60
DA	G314D	C	2021/05/04	Potassium, total	mg/L	5.00
DA	G314D	C	2021/05/19	Potassium, total	mg/L	3.50
DA	G314D	C	2021/07/28	Potassium, total	mg/L	3.50
DA	G314D	C	2023/02/16	Potassium, total	mg/L	3.10
DA	G314D	C	2023/06/01	Potassium, total	mg/L	3.30
DA	G314D	C	2023/08/09	Potassium, total	mg/L	3.54
DA	G314D	C	2023/11/20	Potassium, total	mg/L	3.76
DA	G314D	C	2023/06/01	Silicon, dissolved	mg/L	6.20
DA	G314D	C	2023/08/09	Silicon, dissolved	mg/L	5.20
DA	G314D	C	2021/03/30	Sodium, total	mg/L	700
DA	G314D	C	2021/04/21	Sodium, total	mg/L	670
DA	G314D	C	2021/05/04	Sodium, total	mg/L	650
DA	G314D	C	2021/05/19	Sodium, total	mg/L	500
DA	G314D	C	2021/07/28	Sodium, total	mg/L	370
DA	G314D	C	2023/02/16	Sodium, total	mg/L	350
DA	G314D	C	2023/06/01	Sodium, total	mg/L	130
DA	G314D	C	2023/08/09	Sodium, total	mg/L	436
DA	G314D	C	2023/11/20	Sodium, total	mg/L	461
DA	G314D	C	2021/03/30	Sulfate, total	mg/L	1,100
DA	G314D	C	2021/04/21	Sulfate, total	mg/L	1,000
DA	G314D	C	2021/05/19	Sulfate, total	mg/L	820
DA	G314D	C	2021/07/28	Sulfate, total	mg/L	670
DA	G314D	C	2023/02/16	Sulfate, total	mg/L	810
DA	G314D	C	2023/06/01	Sulfate, total	mg/L	1,100
DA	G314D	C	2023/08/09	Sulfate, total	mg/L	1,090
DA	G314D	C	2023/11/20	Sulfate, total	mg/L	1,080
DA	G314D	C	2021/03/30	Temperature (Celsius)	degrees C	15.9
DA	G314D	C	2021/04/21	Temperature (Celsius)	degrees C	13.0
DA	G314D	C	2021/05/04	Temperature (Celsius)	degrees C	14.4
DA	G314D	C	2021/05/19	Temperature (Celsius)	degrees C	15.4
DA	G314D	C	2021/07/28	Temperature (Celsius)	degrees C	20.8
DA	G314D	C	2023/02/16	Temperature (Celsius)	degrees C	10.6
DA	G314D	C	2023/06/01	Temperature (Celsius)	degrees C	15.0
DA	G314D	C	2023/08/09	Temperature (Celsius)	degrees C	15.1
DA	G314D	C	2023/11/20	Temperature (Celsius)	degrees C	14.4
DA	G314D	C	2021/03/30	Total Dissolved Solids	mg/L	2,400
DA	G314D	C	2021/04/21	Total Dissolved Solids	mg/L	2,400
DA	G314D	C	2021/05/19	Total Dissolved Solids	mg/L	1,800
DA	G314D	C	2021/07/28	Total Dissolved Solids	mg/L	1,600
DA	G314D	C	2023/02/16	Total Dissolved Solids	mg/L	2,100
DA	G314D	C	2023/06/01	Total Dissolved Solids	mg/L	2,400
DA	G314D	C	2023/08/09	Total Dissolved Solids	mg/L	2,380
DA	G314D	C	2023/11/20	Total Dissolved Solids	mg/L	2,420
LCU	G307D	C	2021/03/29	pH (field)	SU	7.3
LCU	G307D	C	2021/04/21	pH (field)	SU	7.2
LCU	G307D	C	2021/05/04	pH (field)	SU	7.3
LCU	G307D	C	2021/05/18	pH (field)	SU	7.3
LCU	G307D	C	2021/07/27	pH (field)	SU	7.2
LCU	G307D	C	2023/02/15	pH (field)	SU	7.2
LCU	G307D	C	2023/06/05	pH (field)	SU	7.3
LCU	G307D	C	2023/08/10	pH (field)	SU	7.2
LCU	G307D	C	2023/11/17	pH (field)	SU	7.0
LCU	G307D	C	2021/03/29	Oxidation Reduction Potential	mV	186
LCU	G307D	C	2021/04/21	Oxidation Reduction Potential	mV	-15.1
LCU	G307D	C	2021/05/04	Oxidation Reduction Potential	mV	-2.90
LCU	G307D	C	2021/05/18	Oxidation Reduction Potential	mV	-50.3
LCU	G307D	C	2021/07/27	Oxidation Reduction Potential	mV	-62.4
LCU	G307D	C	2023/02/15	Oxidation Reduction Potential	mV	-43.0

LCU	G307D	C	2023/06/05	Oxidation Reduction Potential	mV	-40.5
LCU	G307D	C	2023/08/10	Oxidation Reduction Potential	mV	-70.0
LCU	G307D	C	2023/11/17	Oxidation Reduction Potential	mV	-101
LCU	G307D	C	2021/03/29	Eh	V	0.38
LCU	G307D	C	2021/04/21	Eh	V	0.18
LCU	G307D	C	2021/05/04	Eh	V	0.19
LCU	G307D	C	2021/05/18	Eh	V	0.14
LCU	G307D	C	2021/07/27	Eh	V	0.13
LCU	G307D	C	2023/02/15	Eh	V	0.15
LCU	G307D	C	2023/06/05	Eh	V	0.15
LCU	G307D	C	2023/08/10	Eh	V	0.12
LCU	G307D	C	2023/11/17	Eh	V	0.094
LCU	G307D	C	2021/03/29	Alkalinity, bicarbonate	mg/L CaCO3	200
LCU	G307D	C	2021/05/04	Alkalinity, bicarbonate	mg/L CaCO3	200
LCU	G307D	C	2021/05/18	Alkalinity, bicarbonate	mg/L CaCO3	200
LCU	G307D	C	2021/07/27	Alkalinity, bicarbonate	mg/L CaCO3	200
LCU	G307D	C	2023/02/15	Alkalinity, bicarbonate	mg/L CaCO3	220
LCU	G307D	C	2023/06/05	Alkalinity, bicarbonate	mg/L CaCO3	240
LCU	G307D	C	2023/08/10	Alkalinity, bicarbonate	mg/L CaCO3	186
LCU	G307D	C	2023/11/17	Alkalinity, bicarbonate	mg/L CaCO3	317
LCU	G307D	C	2021/03/29	Barium, total	mg/L	0.0440
LCU	G307D	C	2021/04/21	Barium, total	mg/L	0.0400
LCU	G307D	C	2021/05/04	Barium, total	mg/L	0.0370
LCU	G307D	C	2021/05/18	Barium, total	mg/L	0.0350
LCU	G307D	C	2021/07/27	Barium, total	mg/L	0.0320
LCU	G307D	C	2023/02/15	Barium, total	mg/L	0.0400
LCU	G307D	C	2023/06/05	Barium, total	mg/L	0.0320
LCU	G307D	C	2023/08/10	Barium, total	mg/L	0.0217
LCU	G307D	C	2023/11/17	Barium, total	mg/L	0.0550
LCU	G307D	C	2021/03/29	Boron, total	mg/L	1.40
LCU	G307D	C	2021/04/21	Boron, total	mg/L	1.40
LCU	G307D	C	2021/05/04	Boron, total	mg/L	1.40
LCU	G307D	C	2021/05/18	Boron, total	mg/L	1.40
LCU	G307D	C	2021/07/27	Boron, total	mg/L	1.70
LCU	G307D	C	2023/02/15	Boron, total	mg/L	1.20
LCU	G307D	C	2023/06/05	Boron, total	mg/L	1.50
LCU	G307D	C	2023/08/10	Boron, total	mg/L	2.54
LCU	G307D	C	2023/11/17	Boron, total	mg/L	1.01
LCU	G307D	C	2021/03/29	Calcium, total	mg/L	170
LCU	G307D	C	2021/04/21	Calcium, total	mg/L	180
LCU	G307D	C	2021/05/04	Calcium, total	mg/L	180
LCU	G307D	C	2021/05/18	Calcium, total	mg/L	180
LCU	G307D	C	2021/07/27	Calcium, total	mg/L	160
LCU	G307D	C	2023/02/15	Calcium, total	mg/L	170
LCU	G307D	C	2023/06/05	Calcium, total	mg/L	150
LCU	G307D	C	2023/08/10	Calcium, total	mg/L	136
LCU	G307D	C	2023/11/17	Calcium, total	mg/L	152
LCU	G307D	C	2021/03/29	Chloride, total	mg/L	34.0
LCU	G307D	C	2021/05/04	Chloride, total	mg/L	29.0
LCU	G307D	C	2021/05/18	Chloride, total	mg/L	28.0
LCU	G307D	C	2021/07/27	Chloride, total	mg/L	22.0
LCU	G307D	C	2023/02/15	Chloride, total	mg/L	17.0
LCU	G307D	C	2023/06/05	Chloride, total	mg/L	16.0
LCU	G307D	C	2023/08/10	Chloride, total	mg/L	14.0
LCU	G307D	C	2023/11/17	Chloride, total	mg/L	19.0
LCU	G307D	C	2023/06/05	Ferrous Iron, dissolved	mg/L	0.220
LCU	G307D	C	2023/06/05	Iron, dissolved	mg/L	0.200
LCU	G307D	C	2023/08/10	Iron, dissolved	mg/L	0.990
LCU	G307D	C	2021/03/29	Magnesium, total	mg/L	74.0
LCU	G307D	C	2021/04/21	Magnesium, total	mg/L	66.0
LCU	G307D	C	2021/05/04	Magnesium, total	mg/L	71.0
LCU	G307D	C	2021/05/18	Magnesium, total	mg/L	72.0

LCU	G307D	C	2021/07/27	Magnesium, total	mg/L	66.0
LCU	G307D	C	2023/02/15	Magnesium, total	mg/L	59.0
LCU	G307D	C	2023/06/05	Magnesium, total	mg/L	65.0
LCU	G307D	C	2023/08/10	Magnesium, total	mg/L	61.4
LCU	G307D	C	2023/11/17	Magnesium, total	mg/L	56.2
LCU	G307D	C	2023/06/05	Manganese, dissolved	mg/L	0.580
LCU	G307D	C	2023/08/10	Manganese, dissolved	mg/L	0.417
LCU	G307D	C	2023/08/10	Phosphate, dissolved	mg/L	<0.005
LCU	G307D	C	2021/03/29	Potassium, total	mg/L	1.60
LCU	G307D	C	2021/04/21	Potassium, total	mg/L	1.40
LCU	G307D	C	2021/05/04	Potassium, total	mg/L	1.30
LCU	G307D	C	2021/05/18	Potassium, total	mg/L	1.50
LCU	G307D	C	2021/07/27	Potassium, total	mg/L	1.00
LCU	G307D	C	2023/02/15	Potassium, total	mg/L	1.00
LCU	G307D	C	2023/06/05	Potassium, total	mg/L	0.460
LCU	G307D	C	2023/08/10	Potassium, total	mg/L	0.695
LCU	G307D	C	2023/11/17	Potassium, total	mg/L	1.35
LCU	G307D	C	2023/06/05	Silicon, dissolved	mg/L	6.10
LCU	G307D	C	2023/08/10	Silicon, dissolved	mg/L	4.96
LCU	G307D	C	2021/03/29	Sodium, total	mg/L	150
LCU	G307D	C	2021/04/21	Sodium, total	mg/L	140
LCU	G307D	C	2021/05/04	Sodium, total	mg/L	160
LCU	G307D	C	2021/05/18	Sodium, total	mg/L	150
LCU	G307D	C	2021/07/27	Sodium, total	mg/L	120
LCU	G307D	C	2023/02/15	Sodium, total	mg/L	110
LCU	G307D	C	2023/06/05	Sodium, total	mg/L	94.0
LCU	G307D	C	2023/08/10	Sodium, total	mg/L	99.8
LCU	G307D	C	2023/11/17	Sodium, total	mg/L	126
LCU	G307D	C	2021/03/29	Sulfate, total	mg/L	820
LCU	G307D	C	2021/05/04	Sulfate, total	mg/L	850
LCU	G307D	C	2021/05/18	Sulfate, total	mg/L	840
LCU	G307D	C	2021/07/27	Sulfate, total	mg/L	790
LCU	G307D	C	2023/02/15	Sulfate, total	mg/L	660
LCU	G307D	C	2023/06/05	Sulfate, total	mg/L	610
LCU	G307D	C	2023/08/10	Sulfate, total	mg/L	589
LCU	G307D	C	2023/11/17	Sulfate, total	mg/L	537
LCU	G307D	C	2021/03/29	Temperature (Celsius)	degrees C	14.4
LCU	G307D	C	2021/04/21	Temperature (Celsius)	degrees C	14.0
LCU	G307D	C	2021/05/04	Temperature (Celsius)	degrees C	14.0
LCU	G307D	C	2021/05/18	Temperature (Celsius)	degrees C	15.3
LCU	G307D	C	2021/07/27	Temperature (Celsius)	degrees C	24.1
LCU	G307D	C	2023/02/15	Temperature (Celsius)	degrees C	14.4
LCU	G307D	C	2023/06/05	Temperature (Celsius)	degrees C	19.2
LCU	G307D	C	2023/08/10	Temperature (Celsius)	degrees C	19.8
LCU	G307D	C	2023/11/17	Temperature (Celsius)	degrees C	15.4
LCU	G307D	C	2021/03/29	Total Dissolved Solids	mg/L	1,400
LCU	G307D	C	2021/05/04	Total Dissolved Solids	mg/L	1,300
LCU	G307D	C	2021/05/18	Total Dissolved Solids	mg/L	1,500
LCU	G307D	C	2021/07/27	Total Dissolved Solids	mg/L	1,400
LCU	G307D	C	2023/02/15	Total Dissolved Solids	mg/L	1,200
LCU	G307D	C	2023/06/05	Total Dissolved Solids	mg/L	1,100
LCU	G307D	C	2023/08/10	Total Dissolved Solids	mg/L	1,080
LCU	G307D	C	2023/11/17	Total Dissolved Solids	mg/L	1,040
LCU	G314	C	2021/03/30	pH (field)	SU	6.8
LCU	G314	C	2021/04/21	pH (field)	SU	6.6
LCU	G314	C	2021/05/04	pH (field)	SU	7.1
LCU	G314	C	2021/05/17	pH (field)	SU	6.6
LCU	G314	C	2021/06/14	pH (field)	SU	6.6
LCU	G314	C	2021/06/28	pH (field)	SU	6.6
LCU	G314	C	2021/07/13	pH (field)	SU	6.7
LCU	G314	C	2021/07/27	pH (field)	SU	6.6
LCU	G314	C	2023/02/16	pH (field)	SU	6.5

LCU	G314	C	2023/06/01	pH (field)	SU	6.8
LCU	G314	C	2023/08/09	pH (field)	SU	6.4
LCU	G314	C	2023/11/20	pH (field)	SU	6.5
LCU	G314	C	2021/03/30	Oxidation Reduction Potential	mV	177
LCU	G314	C	2021/04/21	Oxidation Reduction Potential	mV	96.8
LCU	G314	C	2021/05/04	Oxidation Reduction Potential	mV	82.1
LCU	G314	C	2021/05/17	Oxidation Reduction Potential	mV	64.9
LCU	G314	C	2021/06/14	Oxidation Reduction Potential	mV	41.1
LCU	G314	C	2021/06/28	Oxidation Reduction Potential	mV	-14.0
LCU	G314	C	2021/07/13	Oxidation Reduction Potential	mV	-17.9
LCU	G314	C	2021/07/27	Oxidation Reduction Potential	mV	-39.1
LCU	G314	C	2023/02/16	Oxidation Reduction Potential	mV	138
LCU	G314	C	2023/06/01	Oxidation Reduction Potential	mV	-4.40
LCU	G314	C	2023/08/09	Oxidation Reduction Potential	mV	-41.0
LCU	G314	C	2023/11/20	Oxidation Reduction Potential	mV	-34.0
LCU	G314	C	2021/03/30	Eh	V	0.37
LCU	G314	C	2021/04/21	Eh	V	0.29
LCU	G314	C	2021/05/04	Eh	V	0.28
LCU	G314	C	2021/05/17	Eh	V	0.26
LCU	G314	C	2021/06/14	Eh	V	0.23
LCU	G314	C	2021/06/28	Eh	V	0.18
LCU	G314	C	2021/07/13	Eh	V	0.18
LCU	G314	C	2021/07/27	Eh	V	0.15
LCU	G314	C	2023/02/16	Eh	V	0.34
LCU	G314	C	2023/06/01	Eh	V	0.19
LCU	G314	C	2023/08/09	Eh	V	0.15
LCU	G314	C	2023/11/20	Eh	V	0.16
LCU	G314	C	2021/03/30	Alkalinity, bicarbonate	mg/L CaCO3	590
LCU	G314	C	2021/04/21	Alkalinity, bicarbonate	mg/L CaCO3	680
LCU	G314	C	2021/05/04	Alkalinity, bicarbonate	mg/L CaCO3	660
LCU	G314	C	2021/05/17	Alkalinity, bicarbonate	mg/L CaCO3	660
LCU	G314	C	2021/06/14	Alkalinity, bicarbonate	mg/L CaCO3	680
LCU	G314	C	2021/06/28	Alkalinity, bicarbonate	mg/L CaCO3	640
LCU	G314	C	2021/07/13	Alkalinity, bicarbonate	mg/L CaCO3	240
LCU	G314	C	2021/07/27	Alkalinity, bicarbonate	mg/L CaCO3	750
LCU	G314	C	2023/02/16	Alkalinity, bicarbonate	mg/L CaCO3	660
LCU	G314	C	2023/06/01	Alkalinity, bicarbonate	mg/L CaCO3	660
LCU	G314	C	2023/08/09	Alkalinity, bicarbonate	mg/L CaCO3	710
LCU	G314	C	2023/11/20	Alkalinity, bicarbonate	mg/L CaCO3	707
LCU	G314	C	2021/03/30	Barium, total	mg/L	0.0350
LCU	G314	C	2021/04/21	Barium, total	mg/L	0.0260
LCU	G314	C	2021/05/04	Barium, total	mg/L	0.0260
LCU	G314	C	2021/05/17	Barium, total	mg/L	0.0210
LCU	G314	C	2021/06/14	Barium, total	mg/L	0.0210
LCU	G314	C	2021/06/28	Barium, total	mg/L	0.0210
LCU	G314	C	2021/07/13	Barium, total	mg/L	0.0220
LCU	G314	C	2021/07/27	Barium, total	mg/L	0.0200
LCU	G314	C	2023/02/16	Barium, total	mg/L	0.0160
LCU	G314	C	2023/06/01	Barium, total	mg/L	0.0370
LCU	G314	C	2023/08/09	Barium, total	mg/L	0.0183
LCU	G314	C	2023/11/20	Barium, total	mg/L	0.0225
LCU	G314	C	2021/03/30	Boron, total	mg/L	0.240
LCU	G314	C	2021/04/21	Boron, total	mg/L	0.160
LCU	G314	C	2021/05/04	Boron, total	mg/L	0.220
LCU	G314	C	2021/05/17	Boron, total	mg/L	0.420
LCU	G314	C	2021/06/14	Boron, total	mg/L	0.150
LCU	G314	C	2021/06/28	Boron, total	mg/L	0.120
LCU	G314	C	2021/07/13	Boron, total	mg/L	0.140
LCU	G314	C	2021/07/27	Boron, total	mg/L	0.230
LCU	G314	C	2023/02/16	Boron, total	mg/L	0.140
LCU	G314	C	2023/06/01	Boron, total	mg/L	0.190
LCU	G314	C	2023/08/09	Boron, total	mg/L	0.130

LCU	G314	C	2023/11/20	Boron, total	mg/L	0.206
LCU	G314	C	2021/03/30	Calcium, total	mg/L	570
LCU	G314	C	2021/04/21	Calcium, total	mg/L	640
LCU	G314	C	2021/05/04	Calcium, total	mg/L	660
LCU	G314	C	2021/05/17	Calcium, total	mg/L	630
LCU	G314	C	2021/06/14	Calcium, total	mg/L	660
LCU	G314	C	2021/06/28	Calcium, total	mg/L	620
LCU	G314	C	2021/07/13	Calcium, total	mg/L	620
LCU	G314	C	2021/07/27	Calcium, total	mg/L	630
LCU	G314	C	2023/02/16	Calcium, total	mg/L	690
LCU	G314	C	2023/06/01	Calcium, total	mg/L	250
LCU	G314	C	2023/08/09	Calcium, total	mg/L	631
LCU	G314	C	2023/11/20	Calcium, total	mg/L	662
LCU	G314	C	2021/03/30	Chloride, total	mg/L	36.0
LCU	G314	C	2021/04/21	Chloride, total	mg/L	35.0
LCU	G314	C	2021/05/04	Chloride, total	mg/L	34.0
LCU	G314	C	2021/05/17	Chloride, total	mg/L	37.0
LCU	G314	C	2021/06/14	Chloride, total	mg/L	100
LCU	G314	C	2021/06/28	Chloride, total	mg/L	36.0
LCU	G314	C	2021/07/13	Chloride, total	mg/L	30.0
LCU	G314	C	2021/07/27	Chloride, total	mg/L	33.0
LCU	G314	C	2023/02/16	Chloride, total	mg/L	32.0
LCU	G314	C	2023/06/01	Chloride, total	mg/L	30.0
LCU	G314	C	2023/08/09	Chloride, total	mg/L	31.0
LCU	G314	C	2023/11/20	Chloride, total	mg/L	31.0
LCU	G314	C	2023/06/01	Ferrous Iron, dissolved	mg/L	4.00
LCU	G314	C	2023/06/01	Iron, dissolved	mg/L	0.340
LCU	G314	C	2023/08/09	Iron, dissolved	mg/L	6.30
LCU	G314	C	2021/03/30	Magnesium, total	mg/L	250
LCU	G314	C	2021/04/21	Magnesium, total	mg/L	270
LCU	G314	C	2021/05/04	Magnesium, total	mg/L	260
LCU	G314	C	2021/05/17	Magnesium, total	mg/L	260
LCU	G314	C	2021/06/14	Magnesium, total	mg/L	280
LCU	G314	C	2021/06/28	Magnesium, total	mg/L	270
LCU	G314	C	2021/07/13	Magnesium, total	mg/L	260
LCU	G314	C	2021/07/27	Magnesium, total	mg/L	280
LCU	G314	C	2023/02/16	Magnesium, total	mg/L	260
LCU	G314	C	2023/06/01	Magnesium, total	mg/L	83.0
LCU	G314	C	2023/08/09	Magnesium, total	mg/L	295
LCU	G314	C	2023/11/20	Magnesium, total	mg/L	312
LCU	G314	C	2023/06/01	Manganese, dissolved	mg/L	1.10
LCU	G314	C	2023/08/09	Manganese, dissolved	mg/L	2.54
LCU	G314	C	2023/08/09	Phosphate, dissolved	mg/L	<0.005
LCU	G314	C	2021/03/30	Potassium, total	mg/L	8.50
LCU	G314	C	2021/04/21	Potassium, total	mg/L	6.00
LCU	G314	C	2021/05/04	Potassium, total	mg/L	6.30
LCU	G314	C	2021/05/17	Potassium, total	mg/L	5.50
LCU	G314	C	2021/06/14	Potassium, total	mg/L	5.50
LCU	G314	C	2021/06/28	Potassium, total	mg/L	4.30
LCU	G314	C	2021/07/13	Potassium, total	mg/L	4.00
LCU	G314	C	2021/07/27	Potassium, total	mg/L	4.50
LCU	G314	C	2023/02/16	Potassium, total	mg/L	3.30
LCU	G314	C	2023/06/01	Potassium, total	mg/L	3.10
LCU	G314	C	2023/08/09	Potassium, total	mg/L	4.06
LCU	G314	C	2023/11/20	Potassium, total	mg/L	4.44
LCU	G314	C	2023/06/01	Silicon, dissolved	mg/L	5.20
LCU	G314	C	2023/08/09	Silicon, dissolved	mg/L	6.35
LCU	G314	C	2021/03/30	Sodium, total	mg/L	130
LCU	G314	C	2021/04/21	Sodium, total	mg/L	120
LCU	G314	C	2021/05/04	Sodium, total	mg/L	130
LCU	G314	C	2021/05/17	Sodium, total	mg/L	120
LCU	G314	C	2021/06/14	Sodium, total	mg/L	130

LCU	G314	C	2021/06/28	Sodium, total	mg/L	120
LCU	G314	C	2021/07/13	Sodium, total	mg/L	120
LCU	G314	C	2021/07/27	Sodium, total	mg/L	120
LCU	G314	C	2023/02/16	Sodium, total	mg/L	120
LCU	G314	C	2023/06/01	Sodium, total	mg/L	390
LCU	G314	C	2023/08/09	Sodium, total	mg/L	136
LCU	G314	C	2023/11/20	Sodium, total	mg/L	149
LCU	G314	C	2021/03/30	Sulfate, total	mg/L	2,000
LCU	G314	C	2021/04/21	Sulfate, total	mg/L	2,100
LCU	G314	C	2021/05/04	Sulfate, total	mg/L	2,100
LCU	G314	C	2021/05/17	Sulfate, total	mg/L	2,200
LCU	G314	C	2021/06/14	Sulfate, total	mg/L	830
LCU	G314	C	2021/06/28	Sulfate, total	mg/L	2,000
LCU	G314	C	2021/07/13	Sulfate, total	mg/L	2,000
LCU	G314	C	2021/07/27	Sulfate, total	mg/L	2,400
LCU	G314	C	2023/02/16	Sulfate, total	mg/L	2,000
LCU	G314	C	2023/06/01	Sulfate, total	mg/L	2,000
LCU	G314	C	2023/08/09	Sulfate, total	mg/L	2,070
LCU	G314	C	2023/11/20	Sulfate, total	mg/L	2,190
LCU	G314	C	2021/03/30	Temperature (Celsius)	degrees C	14.0
LCU	G314	C	2021/04/21	Temperature (Celsius)	degrees C	11.7
LCU	G314	C	2021/05/04	Temperature (Celsius)	degrees C	14.9
LCU	G314	C	2021/05/17	Temperature (Celsius)	degrees C	14.7
LCU	G314	C	2021/06/14	Temperature (Celsius)	degrees C	17.6
LCU	G314	C	2021/06/28	Temperature (Celsius)	degrees C	20.1
LCU	G314	C	2021/07/13	Temperature (Celsius)	degrees C	16.9
LCU	G314	C	2021/07/27	Temperature (Celsius)	degrees C	20.0
LCU	G314	C	2023/02/16	Temperature (Celsius)	degrees C	9.60
LCU	G314	C	2023/06/01	Temperature (Celsius)	degrees C	16.1
LCU	G314	C	2023/08/09	Temperature (Celsius)	degrees C	16.7
LCU	G314	C	2023/11/20	Temperature (Celsius)	degrees C	15.1
LCU	G314	C	2021/03/30	Total Dissolved Solids	mg/L	3,400
LCU	G314	C	2021/04/21	Total Dissolved Solids	mg/L	3,700
LCU	G314	C	2021/05/04	Total Dissolved Solids	mg/L	3,600
LCU	G314	C	2021/05/17	Total Dissolved Solids	mg/L	3,600
LCU	G314	C	2021/06/14	Total Dissolved Solids	mg/L	1,900
LCU	G314	C	2021/06/28	Total Dissolved Solids	mg/L	3,700
LCU	G314	C	2021/07/13	Total Dissolved Solids	mg/L	4,000
LCU	G314	C	2021/07/27	Total Dissolved Solids	mg/L	3,800
LCU	G314	C	2023/02/16	Total Dissolved Solids	mg/L	3,800
LCU	G314	C	2023/06/01	Total Dissolved Solids	mg/L	3,700
LCU	G314	C	2023/08/09	Total Dissolved Solids	mg/L	3,780
LCU	G314	C	2023/11/20	Total Dissolved Solids	mg/L	3,850
LCU	G316	C	2021/03/30	pH (field)	SU	7.0
LCU	G316	C	2021/04/22	pH (field)	SU	7.0
LCU	G316	C	2021/05/05	pH (field)	SU	6.9
LCU	G316	C	2021/05/17	pH (field)	SU	7.1
LCU	G316	C	2021/06/14	pH (field)	SU	7.1
LCU	G316	C	2021/06/28	pH (field)	SU	7.1
LCU	G316	C	2021/07/13	pH (field)	SU	7.0
LCU	G316	C	2021/07/27	pH (field)	SU	7.0
LCU	G316	C	2023/02/16	pH (field)	SU	7.0
LCU	G316	C	2023/05/31	pH (field)	SU	7.2
LCU	G316	C	2023/08/09	pH (field)	SU	6.7
LCU	G316	C	2023/11/20	pH (field)	SU	6.8
LCU	G316	C	2021/03/30	Oxidation Reduction Potential	mV	-81.7
LCU	G316	C	2021/04/22	Oxidation Reduction Potential	mV	-80.3
LCU	G316	C	2021/05/05	Oxidation Reduction Potential	mV	-71.1
LCU	G316	C	2021/05/17	Oxidation Reduction Potential	mV	-99.4
LCU	G316	C	2021/06/14	Oxidation Reduction Potential	mV	-107
LCU	G316	C	2021/06/28	Oxidation Reduction Potential	mV	-112
LCU	G316	C	2021/07/13	Oxidation Reduction Potential	mV	-108

LCU	G316	C	2021/07/27	Oxidation Reduction Potential	mV	-114
LCU	G316	C	2023/02/16	Oxidation Reduction Potential	mV	-78.2
LCU	G316	C	2023/05/31	Oxidation Reduction Potential	mV	-94.3
LCU	G316	C	2023/08/09	Oxidation Reduction Potential	mV	-114
LCU	G316	C	2023/11/20	Oxidation Reduction Potential	mV	-117
LCU	G316	C	2021/03/30	Eh	V	0.12
LCU	G316	C	2021/04/22	Eh	V	0.12
LCU	G316	C	2021/05/05	Eh	V	0.13
LCU	G316	C	2021/05/17	Eh	V	0.097
LCU	G316	C	2021/06/14	Eh	V	0.087
LCU	G316	C	2021/06/28	Eh	V	0.081
LCU	G316	C	2021/07/13	Eh	V	0.084
LCU	G316	C	2021/07/27	Eh	V	0.079
LCU	G316	C	2023/02/16	Eh	V	0.12
LCU	G316	C	2023/05/31	Eh	V	0.10
LCU	G316	C	2023/08/09	Eh	V	0.081
LCU	G316	C	2023/11/20	Eh	V	0.078
LCU	G316	C	2021/03/30	Alkalinity, bicarbonate	mg/L CaCO3	580
LCU	G316	C	2021/04/22	Alkalinity, bicarbonate	mg/L CaCO3	590
LCU	G316	C	2021/05/05	Alkalinity, bicarbonate	mg/L CaCO3	580
LCU	G316	C	2021/05/17	Alkalinity, bicarbonate	mg/L CaCO3	590
LCU	G316	C	2021/06/14	Alkalinity, bicarbonate	mg/L CaCO3	600
LCU	G316	C	2021/06/28	Alkalinity, bicarbonate	mg/L CaCO3	580
LCU	G316	C	2021/07/13	Alkalinity, bicarbonate	mg/L CaCO3	560
LCU	G316	C	2021/07/27	Alkalinity, bicarbonate	mg/L CaCO3	590
LCU	G316	C	2023/02/16	Alkalinity, bicarbonate	mg/L CaCO3	610
LCU	G316	C	2023/05/31	Alkalinity, bicarbonate	mg/L CaCO3	590
LCU	G316	C	2023/08/09	Alkalinity, bicarbonate	mg/L CaCO3	646
LCU	G316	C	2023/11/20	Alkalinity, bicarbonate	mg/L CaCO3	707
LCU	G316	C	2021/03/30	Barium, total	mg/L	0.0630
LCU	G316	C	2021/04/22	Barium, total	mg/L	0.0640
LCU	G316	C	2021/05/05	Barium, total	mg/L	0.0630
LCU	G316	C	2021/05/17	Barium, total	mg/L	0.0590
LCU	G316	C	2021/06/14	Barium, total	mg/L	0.0620
LCU	G316	C	2021/06/28	Barium, total	mg/L	0.0650
LCU	G316	C	2021/07/13	Barium, total	mg/L	0.0690
LCU	G316	C	2021/07/27	Barium, total	mg/L	0.0620
LCU	G316	C	2023/02/16	Barium, total	mg/L	0.0690
LCU	G316	C	2023/05/31	Barium, total	mg/L	0.0660
LCU	G316	C	2023/08/09	Barium, total	mg/L	0.0743
LCU	G316	C	2023/11/20	Barium, total	mg/L	0.0855
LCU	G316	C	2021/03/30	Boron, total	mg/L	0.350
LCU	G316	C	2021/04/22	Boron, total	mg/L	0.370
LCU	G316	C	2021/05/05	Boron, total	mg/L	0.350
LCU	G316	C	2021/05/17	Boron, total	mg/L	0.550
LCU	G316	C	2021/06/14	Boron, total	mg/L	0.420
LCU	G316	C	2021/06/28	Boron, total	mg/L	0.460
LCU	G316	C	2021/07/13	Boron, total	mg/L	0.490
LCU	G316	C	2021/07/27	Boron, total	mg/L	0.520
LCU	G316	C	2023/02/16	Boron, total	mg/L	0.330
LCU	G316	C	2023/05/31	Boron, total	mg/L	0.390
LCU	G316	C	2023/08/09	Boron, total	mg/L	0.441
LCU	G316	C	2023/11/20	Boron, total	mg/L	0.526
LCU	G316	C	2021/03/30	Calcium, total	mg/L	200
LCU	G316	C	2021/04/22	Calcium, total	mg/L	200
LCU	G316	C	2021/05/05	Calcium, total	mg/L	210
LCU	G316	C	2021/05/17	Calcium, total	mg/L	200
LCU	G316	C	2021/06/14	Calcium, total	mg/L	210
LCU	G316	C	2021/06/28	Calcium, total	mg/L	190
LCU	G316	C	2021/07/13	Calcium, total	mg/L	190
LCU	G316	C	2021/07/27	Calcium, total	mg/L	190
LCU	G316	C	2023/02/16	Calcium, total	mg/L	200

LCU	G316	C	2023/05/31	Calcium, total	mg/L	190
LCU	G316	C	2023/08/09	Calcium, total	mg/L	203
LCU	G316	C	2023/11/20	Calcium, total	mg/L	220
LCU	G316	C	2021/03/30	Chloride, total	mg/L	25.0
LCU	G316	C	2021/04/22	Chloride, total	mg/L	52.0
LCU	G316	C	2021/05/05	Chloride, total	mg/L	26.0
LCU	G316	C	2021/05/17	Chloride, total	mg/L	28.0
LCU	G316	C	2021/06/14	Chloride, total	mg/L	23.0
LCU	G316	C	2021/06/28	Chloride, total	mg/L	22.0
LCU	G316	C	2021/07/13	Chloride, total	mg/L	25.0
LCU	G316	C	2021/07/27	Chloride, total	mg/L	30.0
LCU	G316	C	2023/02/16	Chloride, total	mg/L	25.0
LCU	G316	C	2023/05/31	Chloride, total	mg/L	26.0
LCU	G316	C	2023/08/09	Chloride, total	mg/L	26.0
LCU	G316	C	2023/11/20	Chloride, total	mg/L	26.0
LCU	G316	C	2023/05/31	Ferrous Iron, dissolved	mg/L	0.610
LCU	G316	C	2023/05/31	Iron, dissolved	mg/L	17.0
LCU	G316	C	2023/08/09	Iron, dissolved	mg/L	16.3
LCU	G316	C	2021/03/30	Magnesium, total	mg/L	170
LCU	G316	C	2021/04/22	Magnesium, total	mg/L	160
LCU	G316	C	2021/05/05	Magnesium, total	mg/L	160
LCU	G316	C	2021/05/17	Magnesium, total	mg/L	160
LCU	G316	C	2021/06/14	Magnesium, total	mg/L	160
LCU	G316	C	2021/06/28	Magnesium, total	mg/L	160
LCU	G316	C	2021/07/13	Magnesium, total	mg/L	150
LCU	G316	C	2021/07/27	Magnesium, total	mg/L	160
LCU	G316	C	2023/02/16	Magnesium, total	mg/L	170
LCU	G316	C	2023/05/31	Magnesium, total	mg/L	150
LCU	G316	C	2023/08/09	Magnesium, total	mg/L	165
LCU	G316	C	2023/11/20	Magnesium, total	mg/L	175
LCU	G316	C	2023/05/31	Manganese, dissolved	mg/L	8.70
LCU	G316	C	2023/08/09	Manganese, dissolved	mg/L	9.82
LCU	G316	C	2023/08/09	Phosphate, dissolved	mg/L	0.215
LCU	G316	C	2021/03/30	Potassium, total	mg/L	1.70
LCU	G316	C	2021/04/22	Potassium, total	mg/L	1.60
LCU	G316	C	2021/05/05	Potassium, total	mg/L	1.70
LCU	G316	C	2021/05/17	Potassium, total	mg/L	2.30
LCU	G316	C	2021/06/14	Potassium, total	mg/L	1.90
LCU	G316	C	2021/06/28	Potassium, total	mg/L	1.90
LCU	G316	C	2021/07/13	Potassium, total	mg/L	1.90
LCU	G316	C	2021/07/27	Potassium, total	mg/L	1.90
LCU	G316	C	2023/02/16	Potassium, total	mg/L	1.80
LCU	G316	C	2023/05/31	Potassium, total	mg/L	1.80
LCU	G316	C	2023/08/09	Potassium, total	mg/L	2.41
LCU	G316	C	2023/11/20	Potassium, total	mg/L	2.51
LCU	G316	C	2023/05/31	Silicon, dissolved	mg/L	9.70
LCU	G316	C	2023/08/09	Silicon, dissolved	mg/L	8.92
LCU	G316	C	2021/03/30	Sodium, total	mg/L	100
LCU	G316	C	2021/04/22	Sodium, total	mg/L	99.0
LCU	G316	C	2021/05/05	Sodium, total	mg/L	110
LCU	G316	C	2021/05/17	Sodium, total	mg/L	110
LCU	G316	C	2021/06/14	Sodium, total	mg/L	100
LCU	G316	C	2021/06/28	Sodium, total	mg/L	100
LCU	G316	C	2021/07/13	Sodium, total	mg/L	100
LCU	G316	C	2021/07/27	Sodium, total	mg/L	100
LCU	G316	C	2023/02/16	Sodium, total	mg/L	110
LCU	G316	C	2023/05/31	Sodium, total	mg/L	100
LCU	G316	C	2023/08/09	Sodium, total	mg/L	108
LCU	G316	C	2023/11/20	Sodium, total	mg/L	122
LCU	G316	C	2021/03/30	Sulfate, total	mg/L	840
LCU	G316	C	2021/04/22	Sulfate, total	mg/L	770
LCU	G316	C	2021/05/05	Sulfate, total	mg/L	740

LCU	G316	C	2021/05/17	Sulfate, total	mg/L	760
LCU	G316	C	2021/06/14	Sulfate, total	mg/L	750
LCU	G316	C	2021/06/28	Sulfate, total	mg/L	330
LCU	G316	C	2021/07/13	Sulfate, total	mg/L	680
LCU	G316	C	2021/07/27	Sulfate, total	mg/L	660
LCU	G316	C	2023/02/16	Sulfate, total	mg/L	740
LCU	G316	C	2023/05/31	Sulfate, total	mg/L	760
LCU	G316	C	2023/08/09	Sulfate, total	mg/L	662
LCU	G316	C	2023/11/20	Sulfate, total	mg/L	670
LCU	G316	C	2021/03/30	Temperature (Celsius)	degrees C	11.5
LCU	G316	C	2021/04/22	Temperature (Celsius)	degrees C	10.6
LCU	G316	C	2021/05/05	Temperature (Celsius)	degrees C	12.5
LCU	G316	C	2021/05/17	Temperature (Celsius)	degrees C	14.4
LCU	G316	C	2021/06/14	Temperature (Celsius)	degrees C	17.7
LCU	G316	C	2021/06/28	Temperature (Celsius)	degrees C	18.0
LCU	G316	C	2021/07/13	Temperature (Celsius)	degrees C	19.6
LCU	G316	C	2021/07/27	Temperature (Celsius)	degrees C	18.6
LCU	G316	C	2023/02/16	Temperature (Celsius)	degrees C	9.60
LCU	G316	C	2023/05/31	Temperature (Celsius)	degrees C	14.5
LCU	G316	C	2023/08/09	Temperature (Celsius)	degrees C	16.1
LCU	G316	C	2023/11/20	Temperature (Celsius)	degrees C	15.0
LCU	G316	C	2021/03/30	Total Dissolved Solids	mg/L	1,600
LCU	G316	C	2021/04/22	Total Dissolved Solids	mg/L	1,100
LCU	G316	C	2021/05/05	Total Dissolved Solids	mg/L	1,600
LCU	G316	C	2021/05/17	Total Dissolved Solids	mg/L	1,700
LCU	G316	C	2021/06/14	Total Dissolved Solids	mg/L	1,700
LCU	G316	C	2021/06/28	Total Dissolved Solids	mg/L	1,600
LCU	G316	C	2021/07/13	Total Dissolved Solids	mg/L	1,600
LCU	G316	C	2021/07/27	Total Dissolved Solids	mg/L	1,600
LCU	G316	C	2023/02/16	Total Dissolved Solids	mg/L	1,800
LCU	G316	C	2023/05/31	Total Dissolved Solids	mg/L	1,700
LCU	G316	C	2023/08/09	Total Dissolved Solids	mg/L	1,620
LCU	G316	C	2023/11/20	Total Dissolved Solids	mg/L	1,680
UA	G281	B	2015/11/20	pH (field)	SU	7.0
UA	G281	B	2016/02/11	pH (field)	SU	7.1
UA	G281	B	2016/05/10	pH (field)	SU	7.0
UA	G281	B	2016/08/01	pH (field)	SU	7.0
UA	G281	B	2016/11/16	pH (field)	SU	6.9
UA	G281	B	2017/02/10	pH (field)	SU	6.7
UA	G281	B	2017/05/16	pH (field)	SU	6.9
UA	G281	B	2017/07/12	pH (field)	SU	7.0
UA	G281	B	2017/10/25	pH (field)	SU	7.0
UA	G281	B	2018/05/11	pH (field)	SU	7.1
UA	G281	B	2018/08/03	pH (field)	SU	7.0
UA	G281	B	2019/01/23	pH (field)	SU	7.0
UA	G281	B	2019/08/13	pH (field)	SU	6.9
UA	G281	B	2020/01/24	pH (field)	SU	7.3
UA	G281	B	2020/08/12	pH (field)	SU	6.9
UA	G281	B	2020/10/14	pH (field)	SU	7.0
UA	G281	B	2021/01/29	pH (field)	SU	7.1
UA	G281	B	2021/03/31	pH (field)	SU	7.0
UA	G281	B	2021/04/21	pH (field)	SU	6.9
UA	G281	B	2021/05/05	pH (field)	SU	7.1
UA	G281	B	2021/05/17	pH (field)	SU	7.1
UA	G281	B	2021/06/14	pH (field)	SU	7.1
UA	G281	B	2021/06/28	pH (field)	SU	7.2
UA	G281	B	2021/07/12	pH (field)	SU	7.2
UA	G281	B	2021/07/27	pH (field)	SU	7.1
UA	G281	B	2021/08/17	pH (field)	SU	7.1
UA	G281	B	2021/10/26	pH (field)	SU	7.0
UA	G281	B	2022/02/08	pH (field)	SU	7.0
UA	G281	B	2022/05/10	pH (field)	SU	6.9

UA	G281	B	2022/08/25	pH (field)	SU	6.8
UA	G281	B	2022/11/08	pH (field)	SU	6.8
UA	G281	B	2023/02/16	pH (field)	SU	7.2
UA	G281	B	2023/06/08	pH (field)	SU	6.8
UA	G281	B	2023/08/14	pH (field)	SU	6.8
UA	G281	B	2023/11/20	pH (field)	SU	6.9
UA	G281	B	2015/11/20	Oxidation Reduction Potential	mV	-18.0
UA	G281	B	2016/02/11	Oxidation Reduction Potential	mV	171
UA	G281	B	2016/05/10	Oxidation Reduction Potential	mV	40.0
UA	G281	B	2016/08/01	Oxidation Reduction Potential	mV	56.0
UA	G281	B	2016/11/16	Oxidation Reduction Potential	mV	58.0
UA	G281	B	2017/02/10	Oxidation Reduction Potential	mV	65.0
UA	G281	B	2017/05/16	Oxidation Reduction Potential	mV	63.0
UA	G281	B	2017/07/12	Oxidation Reduction Potential	mV	62.0
UA	G281	B	2017/10/25	Oxidation Reduction Potential	mV	75.0
UA	G281	B	2018/05/11	Oxidation Reduction Potential	mV	45.0
UA	G281	B	2018/08/03	Oxidation Reduction Potential	mV	62.0
UA	G281	B	2019/01/23	Oxidation Reduction Potential	mV	65.0
UA	G281	B	2019/08/13	Oxidation Reduction Potential	mV	65.0
UA	G281	B	2020/01/24	Oxidation Reduction Potential	mV	151
UA	G281	B	2020/08/12	Oxidation Reduction Potential	mV	129
UA	G281	B	2020/10/14	Oxidation Reduction Potential	mV	87.1
UA	G281	B	2021/01/29	Oxidation Reduction Potential	mV	110
UA	G281	B	2021/03/31	Oxidation Reduction Potential	mV	257
UA	G281	B	2021/04/21	Oxidation Reduction Potential	mV	41.7
UA	G281	B	2021/05/05	Oxidation Reduction Potential	mV	189
UA	G281	B	2021/05/17	Oxidation Reduction Potential	mV	181
UA	G281	B	2021/06/14	Oxidation Reduction Potential	mV	54.1
UA	G281	B	2021/06/28	Oxidation Reduction Potential	mV	26.1
UA	G281	B	2021/07/12	Oxidation Reduction Potential	mV	210
UA	G281	B	2021/07/27	Oxidation Reduction Potential	mV	72.7
UA	G281	B	2021/08/17	Oxidation Reduction Potential	mV	105
UA	G281	B	2021/10/26	Oxidation Reduction Potential	mV	24.5
UA	G281	B	2022/02/08	Oxidation Reduction Potential	mV	102
UA	G281	B	2022/05/10	Oxidation Reduction Potential	mV	41.0
UA	G281	B	2022/08/25	Oxidation Reduction Potential	mV	4.00
UA	G281	B	2022/11/08	Oxidation Reduction Potential	mV	57.6
UA	G281	B	2023/02/16	Oxidation Reduction Potential	mV	64.4
UA	G281	B	2023/06/08	Oxidation Reduction Potential	mV	11.0
UA	G281	B	2023/08/14	Oxidation Reduction Potential	mV	102
UA	G281	B	2023/11/20	Oxidation Reduction Potential	mV	112
UA	G281	B	2015/11/20	Eh	V	0.18
UA	G281	B	2016/02/11	Eh	V	0.37
UA	G281	B	2016/05/10	Eh	V	0.24
UA	G281	B	2016/08/01	Eh	V	0.25
UA	G281	B	2016/11/16	Eh	V	0.25
UA	G281	B	2017/02/10	Eh	V	0.26
UA	G281	B	2017/05/16	Eh	V	0.26
UA	G281	B	2017/07/12	Eh	V	0.26
UA	G281	B	2017/10/25	Eh	V	0.27
UA	G281	B	2018/05/11	Eh	V	0.24
UA	G281	B	2018/08/03	Eh	V	0.26
UA	G281	B	2019/01/23	Eh	V	0.26
UA	G281	B	2019/08/13	Eh	V	0.26
UA	G281	B	2020/01/24	Eh	V	0.35
UA	G281	B	2020/08/12	Eh	V	0.32
UA	G281	B	2020/10/14	Eh	V	0.28
UA	G281	B	2021/01/29	Eh	V	0.31
UA	G281	B	2021/03/31	Eh	V	0.46
UA	G281	B	2021/04/21	Eh	V	0.24
UA	G281	B	2021/05/05	Eh	V	0.39
UA	G281	B	2021/05/17	Eh	V	0.38

UA	G281	B	2021/06/14	Eh	V	0.25
UA	G281	B	2021/06/28	Eh	V	0.22
UA	G281	B	2021/07/12	Eh	V	0.40
UA	G281	B	2021/07/27	Eh	V	0.26
UA	G281	B	2021/08/17	Eh	V	0.30
UA	G281	B	2021/10/26	Eh	V	0.22
UA	G281	B	2022/02/08	Eh	V	0.30
UA	G281	B	2022/05/10	Eh	V	0.23
UA	G281	B	2022/08/25	Eh	V	0.20
UA	G281	B	2022/11/08	Eh	V	0.25
UA	G281	B	2023/02/16	Eh	V	0.26
UA	G281	B	2023/06/08	Eh	V	0.20
UA	G281	B	2023/08/14	Eh	V	0.29
UA	G281	B	2023/11/20	Eh	V	0.31
UA	G281	B	2016/11/16	Alkalinity, bicarbonate	mg/L CaCO3	370
UA	G281	B	2017/05/16	Alkalinity, bicarbonate	mg/L CaCO3	380
UA	G281	B	2017/07/12	Alkalinity, bicarbonate	mg/L CaCO3	360
UA	G281	B	2020/01/24	Alkalinity, bicarbonate	mg/L CaCO3	380
UA	G281	B	2020/08/12	Alkalinity, bicarbonate	mg/L CaCO3	380
UA	G281	B	2021/01/29	Alkalinity, bicarbonate	mg/L CaCO3	360
UA	G281	B	2021/03/31	Alkalinity, bicarbonate	mg/L CaCO3	350
UA	G281	B	2021/04/21	Alkalinity, bicarbonate	mg/L CaCO3	380
UA	G281	B	2021/05/05	Alkalinity, bicarbonate	mg/L CaCO3	340
UA	G281	B	2021/05/17	Alkalinity, bicarbonate	mg/L CaCO3	380
UA	G281	B	2021/06/14	Alkalinity, bicarbonate	mg/L CaCO3	380
UA	G281	B	2021/06/28	Alkalinity, bicarbonate	mg/L CaCO3	350
UA	G281	B	2021/07/12	Alkalinity, bicarbonate	mg/L CaCO3	350
UA	G281	B	2021/07/27	Alkalinity, bicarbonate	mg/L CaCO3	360
UA	G281	B	2021/08/17	Alkalinity, bicarbonate	mg/L CaCO3	360
UA	G281	B	2022/02/08	Alkalinity, bicarbonate	mg/L CaCO3	340
UA	G281	B	2022/08/25	Alkalinity, bicarbonate	mg/L CaCO3	390
UA	G281	B	2023/02/16	Alkalinity, bicarbonate	mg/L CaCO3	380
UA	G281	B	2023/06/08	Alkalinity, bicarbonate	mg/L CaCO3	360
UA	G281	B	2023/08/14	Alkalinity, bicarbonate	mg/L CaCO3	357
UA	G281	B	2023/11/20	Alkalinity, bicarbonate	mg/L CaCO3	358
UA	G281	B	2022/08/25	Alkalinity, carbonate	mg/L CaCO3	10.0
UA	G281	B	2015/11/20	Barium, total	mg/L	0.140
UA	G281	B	2016/02/11	Barium, total	mg/L	0.0670
UA	G281	B	2016/05/10	Barium, total	mg/L	0.0720
UA	G281	B	2016/08/01	Barium, total	mg/L	0.0780
UA	G281	B	2016/11/16	Barium, total	mg/L	0.0810
UA	G281	B	2017/02/10	Barium, total	mg/L	0.0800
UA	G281	B	2017/05/16	Barium, total	mg/L	0.0810
UA	G281	B	2017/07/12	Barium, total	mg/L	0.0870
UA	G281	B	2018/05/11	Barium, total	mg/L	0.0810
UA	G281	B	2018/08/03	Barium, total	mg/L	0.100
UA	G281	B	2019/01/23	Barium, total	mg/L	0.0720
UA	G281	B	2019/08/13	Barium, total	mg/L	0.0910
UA	G281	B	2020/01/24	Barium, total	mg/L	0.0700
UA	G281	B	2020/08/12	Barium, total	mg/L	0.0570
UA	G281	B	2020/10/14	Barium, total	mg/L	0.0630
UA	G281	B	2021/01/29	Barium, total	mg/L	0.0640
UA	G281	B	2021/03/31	Barium, total	mg/L	0.0660
UA	G281	B	2021/04/21	Barium, total	mg/L	0.0610
UA	G281	B	2021/05/05	Barium, total	mg/L	0.0650
UA	G281	B	2021/05/17	Barium, total	mg/L	0.0860
UA	G281	B	2021/06/14	Barium, total	mg/L	0.0600
UA	G281	B	2021/06/28	Barium, total	mg/L	0.0620
UA	G281	B	2021/07/12	Barium, total	mg/L	0.0610
UA	G281	B	2021/07/27	Barium, total	mg/L	0.0610
UA	G281	B	2021/08/17	Barium, total	mg/L	0.0650
UA	G281	B	2021/10/26	Barium, total	mg/L	0.0600

UA	G281	B	2022/02/08	Barium, total	mg/L	0.0650
UA	G281	B	2022/05/10	Barium, total	mg/L	0.0630
UA	G281	B	2022/08/25	Barium, total	mg/L	0.0680
UA	G281	B	2022/11/08	Barium, total	mg/L	0.0520
UA	G281	B	2023/02/16	Barium, total	mg/L	0.0650
UA	G281	B	2023/06/08	Barium, total	mg/L	0.0710
UA	G281	B	2023/08/14	Barium, total	mg/L	0.0707
UA	G281	B	2023/11/20	Barium, total	mg/L	0.0651
UA	G281	B	2015/11/20	Boron, total	mg/L	<0.0023
UA	G281	B	2016/02/11	Boron, total	mg/L	0.0100
UA	G281	B	2016/05/10	Boron, total	mg/L	<0.0023
UA	G281	B	2016/08/01	Boron, total	mg/L	0.0120
UA	G281	B	2016/11/16	Boron, total	mg/L	0.0220
UA	G281	B	2017/02/10	Boron, total	mg/L	<0.0023
UA	G281	B	2017/05/16	Boron, total	mg/L	<0.0023
UA	G281	B	2017/07/12	Boron, total	mg/L	<0.0023
UA	G281	B	2017/10/25	Boron, total	mg/L	0.0120
UA	G281	B	2018/05/11	Boron, total	mg/L	<0.0079
UA	G281	B	2018/08/03	Boron, total	mg/L	0.0130
UA	G281	B	2019/01/23	Boron, total	mg/L	0.0130
UA	G281	B	2019/08/13	Boron, total	mg/L	<0.0034
UA	G281	B	2020/01/24	Boron, total	mg/L	0.0110
UA	G281	B	2020/08/12	Boron, total	mg/L	0.0370
UA	G281	B	2020/10/14	Boron, total	mg/L	0.0160
UA	G281	B	2021/01/29	Boron, total	mg/L	<0.008
UA	G281	B	2021/03/31	Boron, total	mg/L	0.110
UA	G281	B	2021/04/21	Boron, total	mg/L	<0.008
UA	G281	B	2021/05/05	Boron, total	mg/L	0.0150
UA	G281	B	2021/05/17	Boron, total	mg/L	0.0430
UA	G281	B	2021/06/14	Boron, total	mg/L	<0.008
UA	G281	B	2021/06/28	Boron, total	mg/L	0.0360
UA	G281	B	2021/07/12	Boron, total	mg/L	<0.008
UA	G281	B	2021/07/27	Boron, total	mg/L	<0.008
UA	G281	B	2021/08/17	Boron, total	mg/L	0.0320
UA	G281	B	2021/10/26	Boron, total	mg/L	<0.01
UA	G281	B	2022/02/08	Boron, total	mg/L	<0.0046
UA	G281	B	2022/05/10	Boron, total	mg/L	<0.0071
UA	G281	B	2022/08/25	Boron, total	mg/L	0.0140
UA	G281	B	2022/11/08	Boron, total	mg/L	<0.0071
UA	G281	B	2023/02/16	Boron, total	mg/L	0.0210
UA	G281	B	2023/06/08	Boron, total	mg/L	<0.0071
UA	G281	B	2023/08/14	Boron, total	mg/L	<0.0092
UA	G281	B	2023/11/20	Boron, total	mg/L	<0.0092
UA	G281	B	2015/11/20	Calcium, total	mg/L	150
UA	G281	B	2016/02/11	Calcium, total	mg/L	120
UA	G281	B	2016/05/10	Calcium, total	mg/L	130
UA	G281	B	2016/08/01	Calcium, total	mg/L	140
UA	G281	B	2016/11/16	Calcium, total	mg/L	110
UA	G281	B	2017/02/10	Calcium, total	mg/L	120
UA	G281	B	2017/05/16	Calcium, total	mg/L	130
UA	G281	B	2017/07/12	Calcium, total	mg/L	130
UA	G281	B	2017/10/25	Calcium, total	mg/L	110
UA	G281	B	2018/05/11	Calcium, total	mg/L	120
UA	G281	B	2018/08/03	Calcium, total	mg/L	130
UA	G281	B	2019/01/23	Calcium, total	mg/L	130
UA	G281	B	2019/08/13	Calcium, total	mg/L	140
UA	G281	B	2020/01/24	Calcium, total	mg/L	140
UA	G281	B	2020/08/12	Calcium, total	mg/L	130
UA	G281	B	2020/10/14	Calcium, total	mg/L	130
UA	G281	B	2021/01/29	Calcium, total	mg/L	130
UA	G281	B	2021/03/31	Calcium, total	mg/L	130
UA	G281	B	2021/04/21	Calcium, total	mg/L	130

UA	G281	B	2021/05/05	Calcium, total	mg/L	130
UA	G281	B	2021/05/17	Calcium, total	mg/L	130
UA	G281	B	2021/06/14	Calcium, total	mg/L	140
UA	G281	B	2021/06/28	Calcium, total	mg/L	130
UA	G281	B	2021/07/12	Calcium, total	mg/L	130
UA	G281	B	2021/07/27	Calcium, total	mg/L	120
UA	G281	B	2021/08/17	Calcium, total	mg/L	140
UA	G281	B	2021/10/26	Calcium, total	mg/L	130
UA	G281	B	2022/02/08	Calcium, total	mg/L	130
UA	G281	B	2022/05/10	Calcium, total	mg/L	140
UA	G281	B	2022/08/25	Calcium, total	mg/L	150
UA	G281	B	2022/11/08	Calcium, total	mg/L	110
UA	G281	B	2023/02/16	Calcium, total	mg/L	130
UA	G281	B	2023/06/08	Calcium, total	mg/L	130
UA	G281	B	2023/08/14	Calcium, total	mg/L	137
UA	G281	B	2023/11/20	Calcium, total	mg/L	152
UA	G281	B	2015/11/20	Chloride, total	mg/L	74.0
UA	G281	B	2016/02/11	Chloride, total	mg/L	55.0
UA	G281	B	2016/05/10	Chloride, total	mg/L	72.0
UA	G281	B	2016/08/01	Chloride, total	mg/L	70.0
UA	G281	B	2016/11/16	Chloride, total	mg/L	68.0
UA	G281	B	2017/02/10	Chloride, total	mg/L	67.0
UA	G281	B	2017/05/16	Chloride, total	mg/L	68.0
UA	G281	B	2017/07/12	Chloride, total	mg/L	75.0
UA	G281	B	2017/10/25	Chloride, total	mg/L	64.0
UA	G281	B	2018/05/11	Chloride, total	mg/L	69.0
UA	G281	B	2018/08/03	Chloride, total	mg/L	66.0
UA	G281	B	2019/01/23	Chloride, total	mg/L	85.0
UA	G281	B	2019/08/13	Chloride, total	mg/L	72.0
UA	G281	B	2020/01/24	Chloride, total	mg/L	75.0
UA	G281	B	2020/08/12	Chloride, total	mg/L	81.0
UA	G281	B	2020/10/14	Chloride, total	mg/L	79.0
UA	G281	B	2021/01/29	Chloride, total	mg/L	100
UA	G281	B	2021/03/31	Chloride, total	mg/L	90.0
UA	G281	B	2021/04/21	Chloride, total	mg/L	120
UA	G281	B	2021/05/05	Chloride, total	mg/L	86.0
UA	G281	B	2021/05/17	Chloride, total	mg/L	85.0
UA	G281	B	2021/06/14	Chloride, total	mg/L	76.0
UA	G281	B	2021/06/28	Chloride, total	mg/L	86.0
UA	G281	B	2021/07/12	Chloride, total	mg/L	73.0
UA	G281	B	2021/07/27	Chloride, total	mg/L	73.0
UA	G281	B	2021/08/17	Chloride, total	mg/L	89.0
UA	G281	B	2021/10/26	Chloride, total	mg/L	160
UA	G281	B	2022/02/08	Chloride, total	mg/L	78.0
UA	G281	B	2022/05/10	Chloride, total	mg/L	85.0
UA	G281	B	2022/08/25	Chloride, total	mg/L	69.0
UA	G281	B	2022/11/08	Chloride, total	mg/L	63.0
UA	G281	B	2023/02/16	Chloride, total	mg/L	76.0
UA	G281	B	2023/06/08	Chloride, total	mg/L	75.0
UA	G281	B	2023/08/14	Chloride, total	mg/L	88.0
UA	G281	B	2023/11/20	Chloride, total	mg/L	74.0
UA	G281	B	2023/06/08	Ferrous Iron, dissolved	mg/L	0.260
UA	G281	B	2020/08/11	Iron, dissolved	mg/L	<0.01
UA	G281	B	2020/10/14	Iron, dissolved	mg/L	<0.01
UA	G281	B	2021/01/29	Iron, dissolved	mg/L	<0.01
UA	G281	B	2021/04/21	Iron, dissolved	mg/L	0.0620
UA	G281	B	2021/08/17	Iron, dissolved	mg/L	<0.01
UA	G281	B	2021/10/26	Iron, dissolved	mg/L	<0.01
UA	G281	B	2022/02/08	Iron, dissolved	mg/L	<0.01
UA	G281	B	2022/05/10	Iron, dissolved	mg/L	0.00350
UA	G281	B	2022/08/25	Iron, dissolved	mg/L	0.00820
UA	G281	B	2022/11/08	Iron, dissolved	mg/L	0.0250

UA	G281	B	2023/02/16	Iron, dissolved	mg/L	1.20
UA	G281	B	2023/06/08	Iron, dissolved	mg/L	0.0160
UA	G281	B	2023/08/14	Iron, dissolved	mg/L	<0.0175
UA	G281	B	2023/11/20	Iron, dissolved	mg/L	<0.0115
UA	G281	B	2016/11/16	Magnesium, total	mg/L	66.0
UA	G281	B	2017/05/16	Magnesium, total	mg/L	59.0
UA	G281	B	2017/07/12	Magnesium, total	mg/L	63.0
UA	G281	B	2020/01/24	Magnesium, total	mg/L	67.0
UA	G281	B	2020/08/12	Magnesium, total	mg/L	60.0
UA	G281	B	2021/01/29	Magnesium, total	mg/L	61.0
UA	G281	B	2021/03/31	Magnesium, total	mg/L	53.0
UA	G281	B	2021/04/21	Magnesium, total	mg/L	58.0
UA	G281	B	2021/05/05	Magnesium, total	mg/L	62.0
UA	G281	B	2021/05/17	Magnesium, total	mg/L	63.0
UA	G281	B	2021/06/14	Magnesium, total	mg/L	61.0
UA	G281	B	2021/06/28	Magnesium, total	mg/L	61.0
UA	G281	B	2021/07/12	Magnesium, total	mg/L	58.0
UA	G281	B	2021/07/27	Magnesium, total	mg/L	59.0
UA	G281	B	2021/08/17	Magnesium, total	mg/L	64.0
UA	G281	B	2022/02/08	Magnesium, total	mg/L	60.0
UA	G281	B	2022/08/25	Magnesium, total	mg/L	67.0
UA	G281	B	2023/02/16	Magnesium, total	mg/L	62.0
UA	G281	B	2023/06/08	Magnesium, total	mg/L	61.0
UA	G281	B	2023/08/14	Magnesium, total	mg/L	61.0
UA	G281	B	2023/11/20	Magnesium, total	mg/L	68.5
UA	G281	B	2018/03/01	Manganese, dissolved	mg/L	0.160
UA	G281	B	2018/05/11	Manganese, dissolved	mg/L	0.0200
UA	G281	B	2018/08/11	Manganese, dissolved	mg/L	0.340
UA	G281	B	2018/11/06	Manganese, dissolved	mg/L	0.360
UA	G281	B	2019/01/23	Manganese, dissolved	mg/L	0.450
UA	G281	B	2019/05/02	Manganese, dissolved	mg/L	0.0590
UA	G281	B	2019/08/13	Manganese, dissolved	mg/L	0.300
UA	G281	B	2019/10/21	Manganese, dissolved	mg/L	0.350
UA	G281	B	2020/01/24	Manganese, dissolved	mg/L	0.0690
UA	G281	B	2020/05/05	Manganese, dissolved	mg/L	0.100
UA	G281	B	2020/08/11	Manganese, dissolved	mg/L	0.170
UA	G281	B	2020/10/14	Manganese, dissolved	mg/L	0.160
UA	G281	B	2021/01/29	Manganese, dissolved	mg/L	0.0390
UA	G281	B	2021/04/21	Manganese, dissolved	mg/L	0.0610
UA	G281	B	2021/08/17	Manganese, dissolved	mg/L	0.110
UA	G281	B	2021/10/26	Manganese, dissolved	mg/L	0.150
UA	G281	B	2022/02/08	Manganese, dissolved	mg/L	0.0300
UA	G281	B	2022/05/10	Manganese, dissolved	mg/L	0.0710
UA	G281	B	2022/08/25	Manganese, dissolved	mg/L	0.180
UA	G281	B	2022/11/08	Manganese, dissolved	mg/L	0.140
UA	G281	B	2023/02/16	Manganese, dissolved	mg/L	0.250
UA	G281	B	2023/06/08	Manganese, dissolved	mg/L	0.310
UA	G281	B	2023/08/14	Manganese, dissolved	mg/L	0.291
UA	G281	B	2023/11/20	Manganese, dissolved	mg/L	0.306
UA	G281	B	2023/08/14	Phosphate, dissolved	mg/L	0.0340
UA	G281	B	2016/11/16	Potassium, total	mg/L	0.880
UA	G281	B	2017/05/16	Potassium, total	mg/L	0.800
UA	G281	B	2017/07/12	Potassium, total	mg/L	1.10
UA	G281	B	2020/01/24	Potassium, total	mg/L	0.620
UA	G281	B	2020/08/12	Potassium, total	mg/L	0.360
UA	G281	B	2021/01/29	Potassium, total	mg/L	0.610
UA	G281	B	2021/03/31	Potassium, total	mg/L	1.40
UA	G281	B	2021/04/21	Potassium, total	mg/L	0.400
UA	G281	B	2021/05/05	Potassium, total	mg/L	1.50
UA	G281	B	2021/05/17	Potassium, total	mg/L	0.840
UA	G281	B	2021/06/14	Potassium, total	mg/L	0.430
UA	G281	B	2021/06/28	Potassium, total	mg/L	0.450

UA	G281	B	2021/07/12	Potassium, total	mg/L	0.440
UA	G281	B	2021/07/27	Potassium, total	mg/L	0.420
UA	G281	B	2021/08/17	Potassium, total	mg/L	0.590
UA	G281	B	2022/02/08	Potassium, total	mg/L	0.510
UA	G281	B	2022/08/25	Potassium, total	mg/L	0.730
UA	G281	B	2023/02/16	Potassium, total	mg/L	0.550
UA	G281	B	2023/06/08	Potassium, total	mg/L	0.530
UA	G281	B	2023/08/14	Potassium, total	mg/L	0.609
UA	G281	B	2023/11/20	Potassium, total	mg/L	0.663
UA	G281	B	2023/06/08	Silicon, dissolved	mg/L	10.0
UA	G281	B	2023/08/14	Silicon, dissolved	mg/L	8.59
UA	G281	B	2016/11/16	Sodium, total	mg/L	86.0
UA	G281	B	2017/05/16	Sodium, total	mg/L	80.0
UA	G281	B	2017/07/12	Sodium, total	mg/L	86.0
UA	G281	B	2020/01/24	Sodium, total	mg/L	90.0
UA	G281	B	2020/08/12	Sodium, total	mg/L	88.0
UA	G281	B	2021/01/29	Sodium, total	mg/L	90.0
UA	G281	B	2021/03/31	Sodium, total	mg/L	79.0
UA	G281	B	2021/04/21	Sodium, total	mg/L	83.0
UA	G281	B	2021/05/05	Sodium, total	mg/L	93.0
UA	G281	B	2021/05/17	Sodium, total	mg/L	88.0
UA	G281	B	2021/06/14	Sodium, total	mg/L	83.0
UA	G281	B	2021/06/28	Sodium, total	mg/L	86.0
UA	G281	B	2021/07/12	Sodium, total	mg/L	78.0
UA	G281	B	2021/07/27	Sodium, total	mg/L	85.0
UA	G281	B	2021/08/17	Sodium, total	mg/L	100
UA	G281	B	2022/02/08	Sodium, total	mg/L	89.0
UA	G281	B	2022/08/25	Sodium, total	mg/L	100
UA	G281	B	2023/02/16	Sodium, total	mg/L	100
UA	G281	B	2023/06/08	Sodium, total	mg/L	89.0
UA	G281	B	2023/08/14	Sodium, total	mg/L	90.7
UA	G281	B	2023/11/20	Sodium, total	mg/L	93.3
UA	G281	B	2015/11/20	Sulfate, total	mg/L	300
UA	G281	B	2016/02/11	Sulfate, total	mg/L	340
UA	G281	B	2016/05/10	Sulfate, total	mg/L	370
UA	G281	B	2016/08/01	Sulfate, total	mg/L	310
UA	G281	B	2016/11/16	Sulfate, total	mg/L	310
UA	G281	B	2017/02/10	Sulfate, total	mg/L	310
UA	G281	B	2017/05/16	Sulfate, total	mg/L	330
UA	G281	B	2017/07/12	Sulfate, total	mg/L	300
UA	G281	B	2017/10/25	Sulfate, total	mg/L	300
UA	G281	B	2018/05/11	Sulfate, total	mg/L	310
UA	G281	B	2018/08/03	Sulfate, total	mg/L	280
UA	G281	B	2019/01/23	Sulfate, total	mg/L	380
UA	G281	B	2019/08/13	Sulfate, total	mg/L	310
UA	G281	B	2020/01/24	Sulfate, total	mg/L	300
UA	G281	B	2020/08/12	Sulfate, total	mg/L	260
UA	G281	B	2020/10/14	Sulfate, total	mg/L	250
UA	G281	B	2021/01/29	Sulfate, total	mg/L	260
UA	G281	B	2021/03/31	Sulfate, total	mg/L	280
UA	G281	B	2021/04/21	Sulfate, total	mg/L	250
UA	G281	B	2021/05/05	Sulfate, total	mg/L	260
UA	G281	B	2021/05/17	Sulfate, total	mg/L	280
UA	G281	B	2021/06/14	Sulfate, total	mg/L	260
UA	G281	B	2021/06/28	Sulfate, total	mg/L	280
UA	G281	B	2021/07/12	Sulfate, total	mg/L	260
UA	G281	B	2021/07/27	Sulfate, total	mg/L	270
UA	G281	B	2021/08/17	Sulfate, total	mg/L	260
UA	G281	B	2021/10/26	Sulfate, total	mg/L	270
UA	G281	B	2022/02/08	Sulfate, total	mg/L	270
UA	G281	B	2022/05/10	Sulfate, total	mg/L	290
UA	G281	B	2022/08/25	Sulfate, total	mg/L	310

UA	G281	B	2022/11/08	Sulfate, total	mg/L	300
UA	G281	B	2023/02/16	Sulfate, total	mg/L	270
UA	G281	B	2023/06/08	Sulfate, total	mg/L	140
UA	G281	B	2023/08/14	Sulfate, total	mg/L	268
UA	G281	B	2023/11/20	Sulfate, total	mg/L	293
UA	G281	B	2015/11/20	Temperature (Celsius)	degrees C	16.8
UA	G281	B	2016/02/11	Temperature (Celsius)	degrees C	8.00
UA	G281	B	2016/05/10	Temperature (Celsius)	degrees C	15.5
UA	G281	B	2016/08/01	Temperature (Celsius)	degrees C	16.7
UA	G281	B	2016/11/16	Temperature (Celsius)	degrees C	13.6
UA	G281	B	2017/02/10	Temperature (Celsius)	degrees C	14.5
UA	G281	B	2017/05/16	Temperature (Celsius)	degrees C	15.4
UA	G281	B	2017/07/12	Temperature (Celsius)	degrees C	16.5
UA	G281	B	2017/10/25	Temperature (Celsius)	degrees C	13.0
UA	G281	B	2018/05/11	Temperature (Celsius)	degrees C	14.3
UA	G281	B	2018/08/03	Temperature (Celsius)	degrees C	16.1
UA	G281	B	2019/01/23	Temperature (Celsius)	degrees C	11.9
UA	G281	B	2019/08/13	Temperature (Celsius)	degrees C	17.4
UA	G281	B	2020/01/24	Temperature (Celsius)	degrees C	9.70
UA	G281	B	2020/08/12	Temperature (Celsius)	degrees C	21.5
UA	G281	B	2020/10/14	Temperature (Celsius)	degrees C	17.9
UA	G281	B	2021/01/29	Temperature (Celsius)	degrees C	9.40
UA	G281	B	2021/03/31	Temperature (Celsius)	degrees C	11.1
UA	G281	B	2021/04/21	Temperature (Celsius)	degrees C	12.0
UA	G281	B	2021/05/05	Temperature (Celsius)	degrees C	14.0
UA	G281	B	2021/05/17	Temperature (Celsius)	degrees C	15.0
UA	G281	B	2021/06/14	Temperature (Celsius)	degrees C	20.8
UA	G281	B	2021/06/28	Temperature (Celsius)	degrees C	20.7
UA	G281	B	2021/07/12	Temperature (Celsius)	degrees C	19.9
UA	G281	B	2021/07/27	Temperature (Celsius)	degrees C	20.4
UA	G281	B	2021/08/17	Temperature (Celsius)	degrees C	20.7
UA	G281	B	2021/10/26	Temperature (Celsius)	degrees C	17.3
UA	G281	B	2022/02/08	Temperature (Celsius)	degrees C	10.6
UA	G281	B	2022/05/10	Temperature (Celsius)	degrees C	17.8
UA	G281	B	2022/08/25	Temperature (Celsius)	degrees C	21.0
UA	G281	B	2022/11/08	Temperature (Celsius)	degrees C	17.9
UA	G281	B	2023/02/16	Temperature (Celsius)	degrees C	9.20
UA	G281	B	2023/06/08	Temperature (Celsius)	degrees C	18.4
UA	G281	B	2023/08/14	Temperature (Celsius)	degrees C	18.6
UA	G281	B	2023/11/20	Temperature (Celsius)	degrees C	16.1
UA	G281	B	2015/11/20	Total Dissolved Solids	mg/L	820
UA	G281	B	2016/02/11	Total Dissolved Solids	mg/L	740
UA	G281	B	2016/05/10	Total Dissolved Solids	mg/L	740
UA	G281	B	2016/08/01	Total Dissolved Solids	mg/L	780
UA	G281	B	2016/11/16	Total Dissolved Solids	mg/L	840
UA	G281	B	2017/02/10	Total Dissolved Solids	mg/L	840
UA	G281	B	2017/05/16	Total Dissolved Solids	mg/L	840
UA	G281	B	2017/07/12	Total Dissolved Solids	mg/L	760
UA	G281	B	2017/10/25	Total Dissolved Solids	mg/L	800
UA	G281	B	2018/05/11	Total Dissolved Solids	mg/L	840
UA	G281	B	2018/08/03	Total Dissolved Solids	mg/L	840
UA	G281	B	2019/01/23	Total Dissolved Solids	mg/L	880
UA	G281	B	2019/08/13	Total Dissolved Solids	mg/L	900
UA	G281	B	2020/01/24	Total Dissolved Solids	mg/L	880
UA	G281	B	2020/08/12	Total Dissolved Solids	mg/L	700
UA	G281	B	2020/10/14	Total Dissolved Solids	mg/L	870
UA	G281	B	2021/01/29	Total Dissolved Solids	mg/L	870
UA	G281	B	2021/03/31	Total Dissolved Solids	mg/L	830
UA	G281	B	2021/04/21	Total Dissolved Solids	mg/L	1,000
UA	G281	B	2021/05/05	Total Dissolved Solids	mg/L	820
UA	G281	B	2021/05/17	Total Dissolved Solids	mg/L	870
UA	G281	B	2021/06/14	Total Dissolved Solids	mg/L	930

UA	G281	B	2021/06/28	Total Dissolved Solids	mg/L	830
UA	G281	B	2021/07/12	Total Dissolved Solids	mg/L	910
UA	G281	B	2021/07/27	Total Dissolved Solids	mg/L	880
UA	G281	B	2021/08/17	Total Dissolved Solids	mg/L	910
UA	G281	B	2021/10/26	Total Dissolved Solids	mg/L	820
UA	G281	B	2022/02/08	Total Dissolved Solids	mg/L	910
UA	G281	B	2022/05/10	Total Dissolved Solids	mg/L	910
UA	G281	B	2022/08/25	Total Dissolved Solids	mg/L	980
UA	G281	B	2022/11/08	Total Dissolved Solids	mg/L	900
UA	G281	B	2023/02/16	Total Dissolved Solids	mg/L	980
UA	G281	B	2023/06/08	Total Dissolved Solids	mg/L	1,000
UA	G281	B	2023/08/14	Total Dissolved Solids	mg/L	930
UA	G281	B	2023/11/20	Total Dissolved Solids	mg/L	958
UA	G306	B	2016/05/19	pH (field)	SU	6.7
UA	G306	B	2016/07/01	pH (field)	SU	6.5
UA	G306	B	2016/08/16	pH (field)	SU	6.9
UA	G306	B	2016/09/29	pH (field)	SU	6.6
UA	G306	B	2016/11/16	pH (field)	SU	7.0
UA	G306	B	2017/02/19	pH (field)	SU	7.0
UA	G306	B	2017/05/17	pH (field)	SU	7.1
UA	G306	B	2017/07/13	pH (field)	SU	7.0
UA	G306	B	2017/10/27	pH (field)	SU	6.9
UA	G306	B	2018/05/14	pH (field)	SU	6.9
UA	G306	B	2018/08/03	pH (field)	SU	7.0
UA	G306	B	2019/01/23	pH (field)	SU	7.0
UA	G306	B	2019/08/19	pH (field)	SU	7.0
UA	G306	B	2020/01/21	pH (field)	SU	7.0
UA	G306	B	2020/08/11	pH (field)	SU	6.9
UA	G306	B	2021/01/26	pH (field)	SU	6.8
UA	G306	B	2021/03/29	pH (field)	SU	6.7
UA	G306	B	2021/04/21	pH (field)	SU	6.8
UA	G306	B	2021/05/05	pH (field)	SU	6.8
UA	G306	B	2021/05/18	pH (field)	SU	6.9
UA	G306	B	2021/06/15	pH (field)	SU	6.8
UA	G306	B	2021/06/28	pH (field)	SU	7.0
UA	G306	B	2021/07/14	pH (field)	SU	6.8
UA	G306	B	2021/07/27	pH (field)	SU	6.8
UA	G306	B	2021/08/17	pH (field)	SU	6.5
UA	G306	B	2022/02/08	pH (field)	SU	6.8
UA	G306	B	2022/08/24	pH (field)	SU	6.6
UA	G306	B	2023/02/16	pH (field)	SU	7.0
UA	G306	B	2023/06/05	pH (field)	SU	6.9
UA	G306	B	2023/08/10	pH (field)	SU	6.2
UA	G306	B	2023/11/17	pH (field)	SU	6.2
UA	G306	B	2016/05/19	Oxidation Reduction Potential	mV	-21.0
UA	G306	B	2016/07/01	Oxidation Reduction Potential	mV	139
UA	G306	B	2016/08/16	Oxidation Reduction Potential	mV	225
UA	G306	B	2016/09/29	Oxidation Reduction Potential	mV	178
UA	G306	B	2016/11/16	Oxidation Reduction Potential	mV	205
UA	G306	B	2017/02/19	Oxidation Reduction Potential	mV	122
UA	G306	B	2017/05/17	Oxidation Reduction Potential	mV	109
UA	G306	B	2017/07/13	Oxidation Reduction Potential	mV	122
UA	G306	B	2017/10/27	Oxidation Reduction Potential	mV	210
UA	G306	B	2018/05/14	Oxidation Reduction Potential	mV	200
UA	G306	B	2018/08/03	Oxidation Reduction Potential	mV	92.0
UA	G306	B	2019/01/23	Oxidation Reduction Potential	mV	95.0
UA	G306	B	2019/08/19	Oxidation Reduction Potential	mV	99.0
UA	G306	B	2020/01/21	Oxidation Reduction Potential	mV	212
UA	G306	B	2020/08/11	Oxidation Reduction Potential	mV	132
UA	G306	B	2021/01/26	Oxidation Reduction Potential	mV	115
UA	G306	B	2021/03/29	Oxidation Reduction Potential	mV	227
UA	G306	B	2021/04/21	Oxidation Reduction Potential	mV	102

UA	G306	B	2021/05/05	Oxidation Reduction Potential	mV	132
UA	G306	B	2021/05/18	Oxidation Reduction Potential	mV	149
UA	G306	B	2021/06/15	Oxidation Reduction Potential	mV	156
UA	G306	B	2021/06/28	Oxidation Reduction Potential	mV	149
UA	G306	B	2021/07/14	Oxidation Reduction Potential	mV	134
UA	G306	B	2021/07/27	Oxidation Reduction Potential	mV	114
UA	G306	B	2021/08/17	Oxidation Reduction Potential	mV	70.7
UA	G306	B	2022/02/08	Oxidation Reduction Potential	mV	11.6
UA	G306	B	2022/08/24	Oxidation Reduction Potential	mV	69.0
UA	G306	B	2023/02/16	Oxidation Reduction Potential	mV	69.6
UA	G306	B	2023/06/05	Oxidation Reduction Potential	mV	115
UA	G306	B	2023/08/10	Oxidation Reduction Potential	mV	143
UA	G306	B	2023/11/17	Oxidation Reduction Potential	mV	64.0
UA	G306	B	2016/05/19	Eh	V	0.17
UA	G306	B	2016/07/01	Eh	V	0.33
UA	G306	B	2016/08/16	Eh	V	0.42
UA	G306	B	2016/09/29	Eh	V	0.37
UA	G306	B	2016/11/16	Eh	V	0.40
UA	G306	B	2017/02/19	Eh	V	0.32
UA	G306	B	2017/05/17	Eh	V	0.30
UA	G306	B	2017/07/13	Eh	V	0.32
UA	G306	B	2017/10/27	Eh	V	0.41
UA	G306	B	2018/05/14	Eh	V	0.40
UA	G306	B	2018/08/03	Eh	V	0.29
UA	G306	B	2019/01/23	Eh	V	0.29
UA	G306	B	2019/08/19	Eh	V	0.29
UA	G306	B	2020/01/21	Eh	V	0.41
UA	G306	B	2020/08/11	Eh	V	0.32
UA	G306	B	2021/01/26	Eh	V	0.31
UA	G306	B	2021/03/29	Eh	V	0.42
UA	G306	B	2021/04/21	Eh	V	0.30
UA	G306	B	2021/05/05	Eh	V	0.33
UA	G306	B	2021/05/18	Eh	V	0.35
UA	G306	B	2021/06/15	Eh	V	0.35
UA	G306	B	2021/06/28	Eh	V	0.34
UA	G306	B	2021/07/14	Eh	V	0.33
UA	G306	B	2021/07/27	Eh	V	0.31
UA	G306	B	2021/08/17	Eh	V	0.26
UA	G306	B	2022/02/08	Eh	V	0.21
UA	G306	B	2022/08/24	Eh	V	0.26
UA	G306	B	2023/02/16	Eh	V	0.27
UA	G306	B	2023/06/05	Eh	V	0.31
UA	G306	B	2023/08/10	Eh	V	0.34
UA	G306	B	2023/11/17	Eh	V	0.26
UA	G306	B	2016/11/16	Alkalinity, bicarbonate	mg/L CaCO3	400
UA	G306	B	2017/05/17	Alkalinity, bicarbonate	mg/L CaCO3	380
UA	G306	B	2017/07/13	Alkalinity, bicarbonate	mg/L CaCO3	420
UA	G306	B	2020/01/21	Alkalinity, bicarbonate	mg/L CaCO3	380
UA	G306	B	2020/08/11	Alkalinity, bicarbonate	mg/L CaCO3	320
UA	G306	B	2021/01/26	Alkalinity, bicarbonate	mg/L CaCO3	290
UA	G306	B	2021/03/29	Alkalinity, bicarbonate	mg/L CaCO3	340
UA	G306	B	2021/04/21	Alkalinity, bicarbonate	mg/L CaCO3	380
UA	G306	B	2021/05/05	Alkalinity, bicarbonate	mg/L CaCO3	340
UA	G306	B	2021/05/18	Alkalinity, bicarbonate	mg/L CaCO3	340
UA	G306	B	2021/06/15	Alkalinity, bicarbonate	mg/L CaCO3	320
UA	G306	B	2021/06/28	Alkalinity, bicarbonate	mg/L CaCO3	200
UA	G306	B	2021/07/14	Alkalinity, bicarbonate	mg/L CaCO3	340
UA	G306	B	2021/07/27	Alkalinity, bicarbonate	mg/L CaCO3	320
UA	G306	B	2021/08/17	Alkalinity, bicarbonate	mg/L CaCO3	290
UA	G306	B	2022/02/08	Alkalinity, bicarbonate	mg/L CaCO3	310
UA	G306	B	2022/08/24	Alkalinity, bicarbonate	mg/L CaCO3	300
UA	G306	B	2023/02/16	Alkalinity, bicarbonate	mg/L CaCO3	380

UA	G306	B	2023/06/05	Alkalinity, bicarbonate	mg/L CaCO3	410
UA	G306	B	2023/08/10	Alkalinity, bicarbonate	mg/L CaCO3	276
UA	G306	B	2023/11/17	Alkalinity, bicarbonate	mg/L CaCO3	285
UA	G306	B	2022/08/24	Alkalinity, carbonate	mg/L CaCO3	10.0
UA	G306	B	2016/05/19	Barium, total	mg/L	0.0880
UA	G306	B	2016/07/01	Barium, total	mg/L	0.0610
UA	G306	B	2016/08/16	Barium, total	mg/L	0.0620
UA	G306	B	2016/09/29	Barium, total	mg/L	0.0590
UA	G306	B	2016/11/16	Barium, total	mg/L	0.0760
UA	G306	B	2017/02/19	Barium, total	mg/L	0.0590
UA	G306	B	2017/05/17	Barium, total	mg/L	0.0660
UA	G306	B	2017/07/13	Barium, total	mg/L	0.0850
UA	G306	B	2018/05/14	Barium, total	mg/L	0.0600
UA	G306	B	2018/08/03	Barium, total	mg/L	0.170
UA	G306	B	2019/01/23	Barium, total	mg/L	0.280
UA	G306	B	2019/08/19	Barium, total	mg/L	0.0880
UA	G306	B	2020/01/21	Barium, total	mg/L	0.0890
UA	G306	B	2020/08/11	Barium, total	mg/L	0.0390
UA	G306	B	2021/01/26	Barium, total	mg/L	0.0300
UA	G306	B	2021/03/29	Barium, total	mg/L	0.0390
UA	G306	B	2021/04/21	Barium, total	mg/L	0.0400
UA	G306	B	2021/05/05	Barium, total	mg/L	0.0390
UA	G306	B	2021/05/18	Barium, total	mg/L	0.0400
UA	G306	B	2021/06/15	Barium, total	mg/L	0.0350
UA	G306	B	2021/06/28	Barium, total	mg/L	0.0420
UA	G306	B	2021/07/14	Barium, total	mg/L	0.0300
UA	G306	B	2021/07/27	Barium, total	mg/L	0.0330
UA	G306	B	2021/08/17	Barium, total	mg/L	0.0300
UA	G306	B	2022/02/08	Barium, total	mg/L	0.0290
UA	G306	B	2022/08/24	Barium, total	mg/L	0.0290
UA	G306	B	2023/02/16	Barium, total	mg/L	0.0770
UA	G306	B	2023/06/05	Barium, total	mg/L	0.0410
UA	G306	B	2023/08/10	Barium, total	mg/L	0.0700
UA	G306	B	2023/11/17	Barium, total	mg/L	0.0532
UA	G306	B	2016/05/19	Boron, total	mg/L	2.30
UA	G306	B	2016/07/01	Boron, total	mg/L	2.70
UA	G306	B	2016/08/16	Boron, total	mg/L	2.40
UA	G306	B	2016/09/29	Boron, total	mg/L	2.60
UA	G306	B	2016/11/16	Boron, total	mg/L	2.70
UA	G306	B	2017/02/19	Boron, total	mg/L	2.70
UA	G306	B	2017/05/17	Boron, total	mg/L	2.50
UA	G306	B	2017/07/13	Boron, total	mg/L	2.90
UA	G306	B	2017/10/27	Boron, total	mg/L	3.10
UA	G306	B	2018/05/14	Boron, total	mg/L	2.80
UA	G306	B	2018/08/03	Boron, total	mg/L	2.70
UA	G306	B	2019/01/23	Boron, total	mg/L	2.40
UA	G306	B	2019/08/19	Boron, total	mg/L	2.50
UA	G306	B	2020/01/21	Boron, total	mg/L	3.50
UA	G306	B	2020/08/11	Boron, total	mg/L	2.60
UA	G306	B	2021/01/26	Boron, total	mg/L	2.40
UA	G306	B	2021/03/29	Boron, total	mg/L	2.50
UA	G306	B	2021/04/21	Boron, total	mg/L	2.60
UA	G306	B	2021/05/05	Boron, total	mg/L	2.90
UA	G306	B	2021/05/18	Boron, total	mg/L	2.90
UA	G306	B	2021/06/15	Boron, total	mg/L	3.20
UA	G306	B	2021/06/28	Boron, total	mg/L	2.50
UA	G306	B	2021/07/14	Boron, total	mg/L	2.90
UA	G306	B	2021/07/27	Boron, total	mg/L	3.10
UA	G306	B	2021/08/17	Boron, total	mg/L	3.00
UA	G306	B	2022/02/08	Boron, total	mg/L	3.50
UA	G306	B	2022/08/24	Boron, total	mg/L	3.00
UA	G306	B	2023/02/16	Boron, total	mg/L	2.40

UA	G306	B	2023/06/05	Boron, total	mg/L	2.40
UA	G306	B	2023/08/10	Boron, total	mg/L	2.74
UA	G306	B	2023/11/17	Boron, total	mg/L	2.22
UA	G306	B	2016/05/19	Calcium, total	mg/L	130
UA	G306	B	2016/07/01	Calcium, total	mg/L	130
UA	G306	B	2016/08/16	Calcium, total	mg/L	110
UA	G306	B	2016/09/29	Calcium, total	mg/L	120
UA	G306	B	2016/11/16	Calcium, total	mg/L	120
UA	G306	B	2017/02/19	Calcium, total	mg/L	130
UA	G306	B	2017/05/17	Calcium, total	mg/L	150
UA	G306	B	2017/07/13	Calcium, total	mg/L	130
UA	G306	B	2017/10/27	Calcium, total	mg/L	120
UA	G306	B	2018/05/14	Calcium, total	mg/L	130
UA	G306	B	2018/08/03	Calcium, total	mg/L	160
UA	G306	B	2019/01/23	Calcium, total	mg/L	170
UA	G306	B	2019/08/19	Calcium, total	mg/L	160
UA	G306	B	2020/01/21	Calcium, total	mg/L	150
UA	G306	B	2020/08/11	Calcium, total	mg/L	140
UA	G306	B	2021/01/26	Calcium, total	mg/L	110
UA	G306	B	2021/03/29	Calcium, total	mg/L	120
UA	G306	B	2021/04/21	Calcium, total	mg/L	130
UA	G306	B	2021/05/05	Calcium, total	mg/L	130
UA	G306	B	2021/05/18	Calcium, total	mg/L	140
UA	G306	B	2021/06/15	Calcium, total	mg/L	140
UA	G306	B	2021/06/28	Calcium, total	mg/L	140
UA	G306	B	2021/07/14	Calcium, total	mg/L	110
UA	G306	B	2021/07/27	Calcium, total	mg/L	110
UA	G306	B	2021/08/17	Calcium, total	mg/L	110
UA	G306	B	2022/02/08	Calcium, total	mg/L	120
UA	G306	B	2022/08/24	Calcium, total	mg/L	100
UA	G306	B	2023/02/16	Calcium, total	mg/L	110
UA	G306	B	2023/06/05	Calcium, total	mg/L	110
UA	G306	B	2023/08/10	Calcium, total	mg/L	81.3
UA	G306	B	2023/11/17	Calcium, total	mg/L	85.5
UA	G306	B	2016/05/19	Chloride, total	mg/L	14.0
UA	G306	B	2016/07/01	Chloride, total	mg/L	8.90
UA	G306	B	2016/08/16	Chloride, total	mg/L	7.20
UA	G306	B	2016/09/29	Chloride, total	mg/L	6.80
UA	G306	B	2016/11/16	Chloride, total	mg/L	6.60
UA	G306	B	2017/02/19	Chloride, total	mg/L	6.20
UA	G306	B	2017/05/17	Chloride, total	mg/L	5.50
UA	G306	B	2017/07/13	Chloride, total	mg/L	8.30
UA	G306	B	2017/10/27	Chloride, total	mg/L	4.70
UA	G306	B	2018/05/14	Chloride, total	mg/L	3.90
UA	G306	B	2018/08/03	Chloride, total	mg/L	3.70
UA	G306	B	2019/01/23	Chloride, total	mg/L	4.10
UA	G306	B	2019/08/19	Chloride, total	mg/L	4.40
UA	G306	B	2020/01/21	Chloride, total	mg/L	2.50
UA	G306	B	2020/08/11	Chloride, total	mg/L	1.50
UA	G306	B	2021/01/26	Chloride, total	mg/L	2.10
UA	G306	B	2021/03/29	Chloride, total	mg/L	1.60
UA	G306	B	2021/04/21	Chloride, total	mg/L	2.00
UA	G306	B	2021/05/05	Chloride, total	mg/L	<0.96
UA	G306	B	2021/05/18	Chloride, total	mg/L	1.10
UA	G306	B	2021/06/15	Chloride, total	mg/L	1.50
UA	G306	B	2021/06/28	Chloride, total	mg/L	2.40
UA	G306	B	2021/07/14	Chloride, total	mg/L	<0.96
UA	G306	B	2021/07/27	Chloride, total	mg/L	<0.96
UA	G306	B	2021/08/17	Chloride, total	mg/L	1.50
UA	G306	B	2022/02/08	Chloride, total	mg/L	1.30
UA	G306	B	2022/08/24	Chloride, total	mg/L	<0.96
UA	G306	B	2023/02/16	Chloride, total	mg/L	1.60

UA	G306	B	2023/06/05	Chloride, total	mg/L	<0.96
UA	G306	B	2023/08/10	Chloride, total	mg/L	1.00
UA	G306	B	2023/11/17	Chloride, total	mg/L	2.00
UA	G306	B	2023/06/05	Ferrous Iron, dissolved	mg/L	0.110
UA	G306	B	2023/06/05	Iron, dissolved	mg/L	0.00940
UA	G306	B	2023/08/10	Iron, dissolved	mg/L	<0.0115
UA	G306	B	2016/11/16	Magnesium, total	mg/L	62.0
UA	G306	B	2017/05/17	Magnesium, total	mg/L	66.0
UA	G306	B	2017/07/13	Magnesium, total	mg/L	66.0
UA	G306	B	2020/01/21	Magnesium, total	mg/L	56.0
UA	G306	B	2020/08/11	Magnesium, total	mg/L	54.0
UA	G306	B	2021/01/26	Magnesium, total	mg/L	47.0
UA	G306	B	2021/03/29	Magnesium, total	mg/L	48.0
UA	G306	B	2021/04/21	Magnesium, total	mg/L	49.0
UA	G306	B	2021/05/05	Magnesium, total	mg/L	50.0
UA	G306	B	2021/05/18	Magnesium, total	mg/L	47.0
UA	G306	B	2021/06/15	Magnesium, total	mg/L	51.0
UA	G306	B	2021/06/28	Magnesium, total	mg/L	51.0
UA	G306	B	2021/07/14	Magnesium, total	mg/L	46.0
UA	G306	B	2021/07/27	Magnesium, total	mg/L	43.0
UA	G306	B	2021/08/17	Magnesium, total	mg/L	42.0
UA	G306	B	2022/02/08	Magnesium, total	mg/L	41.0
UA	G306	B	2022/08/24	Magnesium, total	mg/L	38.0
UA	G306	B	2023/02/16	Magnesium, total	mg/L	43.0
UA	G306	B	2023/06/05	Magnesium, total	mg/L	40.0
UA	G306	B	2023/08/10	Magnesium, total	mg/L	31.2
UA	G306	B	2023/11/17	Magnesium, total	mg/L	31.4
UA	G306	B	2023/06/05	Manganese, dissolved	mg/L	0.00600
UA	G306	B	2023/08/10	Manganese, dissolved	mg/L	0.0833
UA	G306	B	2023/08/10	Phosphate, dissolved	mg/L	0.0430
UA	G306	B	2016/11/16	Potassium, total	mg/L	0.990
UA	G306	B	2017/05/17	Potassium, total	mg/L	0.890
UA	G306	B	2017/07/13	Potassium, total	mg/L	1.20
UA	G306	B	2020/01/21	Potassium, total	mg/L	1.60
UA	G306	B	2020/08/11	Potassium, total	mg/L	0.470
UA	G306	B	2021/01/26	Potassium, total	mg/L	0.300
UA	G306	B	2021/03/29	Potassium, total	mg/L	0.510
UA	G306	B	2021/04/21	Potassium, total	mg/L	0.510
UA	G306	B	2021/05/05	Potassium, total	mg/L	0.420
UA	G306	B	2021/05/18	Potassium, total	mg/L	0.540
UA	G306	B	2021/06/15	Potassium, total	mg/L	0.350
UA	G306	B	2021/06/28	Potassium, total	mg/L	0.670
UA	G306	B	2021/07/14	Potassium, total	mg/L	0.320
UA	G306	B	2021/07/27	Potassium, total	mg/L	0.210
UA	G306	B	2021/08/17	Potassium, total	mg/L	0.240
UA	G306	B	2022/02/08	Potassium, total	mg/L	0.270
UA	G306	B	2022/08/24	Potassium, total	mg/L	0.310
UA	G306	B	2023/02/16	Potassium, total	mg/L	1.30
UA	G306	B	2023/06/05	Potassium, total	mg/L	0.300
UA	G306	B	2023/08/10	Potassium, total	mg/L	1.43
UA	G306	B	2023/11/17	Potassium, total	mg/L	0.420
UA	G306	B	2023/06/05	Silicon, dissolved	mg/L	16.0
UA	G306	B	2023/08/10	Silicon, dissolved	mg/L	14.4
UA	G306	B	2016/11/16	Sodium, total	mg/L	58.0
UA	G306	B	2017/05/17	Sodium, total	mg/L	61.0
UA	G306	B	2017/07/13	Sodium, total	mg/L	55.0
UA	G306	B	2020/01/21	Sodium, total	mg/L	55.0
UA	G306	B	2020/08/11	Sodium, total	mg/L	50.0
UA	G306	B	2021/01/26	Sodium, total	mg/L	48.0
UA	G306	B	2021/03/29	Sodium, total	mg/L	46.0
UA	G306	B	2021/04/21	Sodium, total	mg/L	48.0
UA	G306	B	2021/05/05	Sodium, total	mg/L	49.0

UA	G306	B	2021/05/18	Sodium, total	mg/L	48.0
UA	G306	B	2021/06/15	Sodium, total	mg/L	50.0
UA	G306	B	2021/06/28	Sodium, total	mg/L	48.0
UA	G306	B	2021/07/14	Sodium, total	mg/L	46.0
UA	G306	B	2021/07/27	Sodium, total	mg/L	41.0
UA	G306	B	2021/08/17	Sodium, total	mg/L	50.0
UA	G306	B	2022/02/08	Sodium, total	mg/L	47.0
UA	G306	B	2022/08/24	Sodium, total	mg/L	45.0
UA	G306	B	2023/02/16	Sodium, total	mg/L	47.0
UA	G306	B	2023/06/05	Sodium, total	mg/L	44.0
UA	G306	B	2023/08/10	Sodium, total	mg/L	39.5
UA	G306	B	2023/11/17	Sodium, total	mg/L	36.6
UA	G306	B	2016/05/19	Sulfate, total	mg/L	350
UA	G306	B	2016/07/01	Sulfate, total	mg/L	330
UA	G306	B	2016/08/16	Sulfate, total	mg/L	320
UA	G306	B	2016/09/29	Sulfate, total	mg/L	320
UA	G306	B	2016/11/16	Sulfate, total	mg/L	330
UA	G306	B	2017/02/19	Sulfate, total	mg/L	5.90
UA	G306	B	2017/05/17	Sulfate, total	mg/L	700
UA	G306	B	2017/07/13	Sulfate, total	mg/L	340
UA	G306	B	2017/10/27	Sulfate, total	mg/L	350
UA	G306	B	2018/05/14	Sulfate, total	mg/L	320
UA	G306	B	2018/08/03	Sulfate, total	mg/L	290
UA	G306	B	2019/01/23	Sulfate, total	mg/L	250
UA	G306	B	2019/08/19	Sulfate, total	mg/L	260
UA	G306	B	2020/01/21	Sulfate, total	mg/L	260
UA	G306	B	2020/08/11	Sulfate, total	mg/L	250
UA	G306	B	2021/01/26	Sulfate, total	mg/L	240
UA	G306	B	2021/03/29	Sulfate, total	mg/L	260
UA	G306	B	2021/04/21	Sulfate, total	mg/L	240
UA	G306	B	2021/05/05	Sulfate, total	mg/L	240
UA	G306	B	2021/05/18	Sulfate, total	mg/L	250
UA	G306	B	2021/06/15	Sulfate, total	mg/L	250
UA	G306	B	2021/06/28	Sulfate, total	mg/L	210
UA	G306	B	2021/07/14	Sulfate, total	mg/L	230
UA	G306	B	2021/07/27	Sulfate, total	mg/L	220
UA	G306	B	2021/08/17	Sulfate, total	mg/L	210
UA	G306	B	2022/02/08	Sulfate, total	mg/L	200
UA	G306	B	2022/08/24	Sulfate, total	mg/L	210
UA	G306	B	2023/02/16	Sulfate, total	mg/L	140
UA	G306	B	2023/06/05	Sulfate, total	mg/L	130
UA	G306	B	2023/08/10	Sulfate, total	mg/L	141
UA	G306	B	2023/11/17	Sulfate, total	mg/L	141
UA	G306	B	2016/05/19	Temperature (Celsius)	degrees C	16.6
UA	G306	B	2016/07/01	Temperature (Celsius)	degrees C	20.8
UA	G306	B	2016/08/16	Temperature (Celsius)	degrees C	17.6
UA	G306	B	2016/09/29	Temperature (Celsius)	degrees C	18.1
UA	G306	B	2016/11/16	Temperature (Celsius)	degrees C	13.7
UA	G306	B	2017/02/19	Temperature (Celsius)	degrees C	14.8
UA	G306	B	2017/05/17	Temperature (Celsius)	degrees C	15.8
UA	G306	B	2017/07/13	Temperature (Celsius)	degrees C	17.3
UA	G306	B	2017/10/27	Temperature (Celsius)	degrees C	13.9
UA	G306	B	2018/05/14	Temperature (Celsius)	degrees C	15.6
UA	G306	B	2018/08/03	Temperature (Celsius)	degrees C	15.1
UA	G306	B	2019/01/23	Temperature (Celsius)	degrees C	11.2
UA	G306	B	2019/08/19	Temperature (Celsius)	degrees C	16.8
UA	G306	B	2020/01/21	Temperature (Celsius)	degrees C	9.90
UA	G306	B	2020/08/11	Temperature (Celsius)	degrees C	18.7
UA	G306	B	2021/01/26	Temperature (Celsius)	degrees C	10.4
UA	G306	B	2021/03/29	Temperature (Celsius)	degrees C	14.5
UA	G306	B	2021/04/21	Temperature (Celsius)	degrees C	12.5
UA	G306	B	2021/05/05	Temperature (Celsius)	degrees C	14.7

UA	G306	B	2021/05/18	Temperature (Celsius)	degrees C	14.0
UA	G306	B	2021/06/15	Temperature (Celsius)	degrees C	17.0
UA	G306	B	2021/06/28	Temperature (Celsius)	degrees C	23.4
UA	G306	B	2021/07/14	Temperature (Celsius)	degrees C	18.6
UA	G306	B	2021/07/27	Temperature (Celsius)	degrees C	19.6
UA	G306	B	2021/08/17	Temperature (Celsius)	degrees C	18.6
UA	G306	B	2022/02/08	Temperature (Celsius)	degrees C	12.0
UA	G306	B	2022/08/24	Temperature (Celsius)	degrees C	19.9
UA	G306	B	2023/02/16	Temperature (Celsius)	degrees C	10.8
UA	G306	B	2023/06/05	Temperature (Celsius)	degrees C	16.8
UA	G306	B	2023/08/10	Temperature (Celsius)	degrees C	14.5
UA	G306	B	2023/11/17	Temperature (Celsius)	degrees C	15.3
UA	G306	B	2016/05/19	Total Dissolved Solids	mg/L	720
UA	G306	B	2016/07/01	Total Dissolved Solids	mg/L	720
UA	G306	B	2016/08/16	Total Dissolved Solids	mg/L	680
UA	G306	B	2016/09/29	Total Dissolved Solids	mg/L	660
UA	G306	B	2016/11/16	Total Dissolved Solids	mg/L	820
UA	G306	B	2017/02/19	Total Dissolved Solids	mg/L	820
UA	G306	B	2017/05/17	Total Dissolved Solids	mg/L	800
UA	G306	B	2017/07/13	Total Dissolved Solids	mg/L	720
UA	G306	B	2017/10/27	Total Dissolved Solids	mg/L	720
UA	G306	B	2018/05/14	Total Dissolved Solids	mg/L	720
UA	G306	B	2018/08/03	Total Dissolved Solids	mg/L	820
UA	G306	B	2019/01/23	Total Dissolved Solids	mg/L	900
UA	G306	B	2019/08/19	Total Dissolved Solids	mg/L	780
UA	G306	B	2020/01/21	Total Dissolved Solids	mg/L	830
UA	G306	B	2020/08/11	Total Dissolved Solids	mg/L	700
UA	G306	B	2021/01/26	Total Dissolved Solids	mg/L	700
UA	G306	B	2021/03/29	Total Dissolved Solids	mg/L	690
UA	G306	B	2021/04/21	Total Dissolved Solids	mg/L	830
UA	G306	B	2021/05/05	Total Dissolved Solids	mg/L	670
UA	G306	B	2021/05/18	Total Dissolved Solids	mg/L	680
UA	G306	B	2021/06/15	Total Dissolved Solids	mg/L	670
UA	G306	B	2021/06/28	Total Dissolved Solids	mg/L	700
UA	G306	B	2021/07/14	Total Dissolved Solids	mg/L	730
UA	G306	B	2021/07/27	Total Dissolved Solids	mg/L	650
UA	G306	B	2021/08/17	Total Dissolved Solids	mg/L	640
UA	G306	B	2022/02/08	Total Dissolved Solids	mg/L	640
UA	G306	B	2022/08/24	Total Dissolved Solids	mg/L	610
UA	G306	B	2023/02/16	Total Dissolved Solids	mg/L	560
UA	G306	B	2023/06/05	Total Dissolved Solids	mg/L	520
UA	G306	B	2023/08/10	Total Dissolved Solids	mg/L	455
UA	G306	B	2023/11/17	Total Dissolved Solids	mg/L	550
UA	G301	C	2015/11/20	pH (field)	SU	6.9
UA	G301	C	2016/02/23	pH (field)	SU	6.6
UA	G301	C	2016/05/20	pH (field)	SU	6.4
UA	G301	C	2016/08/15	pH (field)	SU	6.8
UA	G301	C	2016/11/17	pH (field)	SU	6.9
UA	G301	C	2017/02/16	pH (field)	SU	7.0
UA	G301	C	2017/05/17	pH (field)	SU	7.1
UA	G301	C	2017/07/12	pH (field)	SU	6.8
UA	G301	C	2017/10/26	pH (field)	SU	6.8
UA	G301	C	2018/05/11	pH (field)	SU	6.9
UA	G301	C	2018/08/03	pH (field)	SU	6.9
UA	G301	C	2019/01/23	pH (field)	SU	7.0
UA	G301	C	2019/08/19	pH (field)	SU	6.9
UA	G301	C	2020/01/23	pH (field)	SU	6.7
UA	G301	C	2020/08/11	pH (field)	SU	6.6
UA	G301	C	2021/01/27	pH (field)	SU	6.6
UA	G301	C	2021/08/17	pH (field)	SU	6.6
UA	G301	C	2022/02/08	pH (field)	SU	6.5
UA	G301	C	2022/08/23	pH (field)	SU	6.6

UA	G301	C	2023/02/15	pH (field)	SU	7.0
UA	G301	C	2023/06/06	pH (field)	SU	6.8
UA	G301	C	2023/08/09	pH (field)	SU	6.4
UA	G301	C	2023/11/20	pH (field)	SU	6.4
UA	G301	C	2015/11/20	Oxidation Reduction Potential	mV	-37.0
UA	G301	C	2016/02/23	Oxidation Reduction Potential	mV	127
UA	G301	C	2016/05/20	Oxidation Reduction Potential	mV	136
UA	G301	C	2016/08/15	Oxidation Reduction Potential	mV	125
UA	G301	C	2016/11/17	Oxidation Reduction Potential	mV	109
UA	G301	C	2017/02/16	Oxidation Reduction Potential	mV	122
UA	G301	C	2017/05/17	Oxidation Reduction Potential	mV	103
UA	G301	C	2017/07/12	Oxidation Reduction Potential	mV	121
UA	G301	C	2017/10/26	Oxidation Reduction Potential	mV	96.0
UA	G301	C	2018/05/11	Oxidation Reduction Potential	mV	98.0
UA	G301	C	2018/08/03	Oxidation Reduction Potential	mV	109
UA	G301	C	2019/01/23	Oxidation Reduction Potential	mV	112
UA	G301	C	2019/08/19	Oxidation Reduction Potential	mV	101
UA	G301	C	2020/01/23	Oxidation Reduction Potential	mV	147
UA	G301	C	2020/08/11	Oxidation Reduction Potential	mV	-102
UA	G301	C	2021/01/27	Oxidation Reduction Potential	mV	50.6
UA	G301	C	2021/08/17	Oxidation Reduction Potential	mV	-178
UA	G301	C	2022/02/08	Oxidation Reduction Potential	mV	-23.3
UA	G301	C	2022/08/23	Oxidation Reduction Potential	mV	1.40
UA	G301	C	2023/02/15	Oxidation Reduction Potential	mV	151
UA	G301	C	2023/06/06	Oxidation Reduction Potential	mV	-259
UA	G301	C	2023/08/09	Oxidation Reduction Potential	mV	-96.0
UA	G301	C	2023/11/20	Oxidation Reduction Potential	mV	-49.0
UA	G301	C	2015/11/20	Eh	V	0.16
UA	G301	C	2016/02/23	Eh	V	0.33
UA	G301	C	2016/05/20	Eh	V	0.33
UA	G301	C	2016/08/15	Eh	V	0.32
UA	G301	C	2016/11/17	Eh	V	0.30
UA	G301	C	2017/02/16	Eh	V	0.32
UA	G301	C	2017/05/17	Eh	V	0.30
UA	G301	C	2017/07/12	Eh	V	0.31
UA	G301	C	2017/10/26	Eh	V	0.29
UA	G301	C	2018/05/11	Eh	V	0.29
UA	G301	C	2018/08/03	Eh	V	0.30
UA	G301	C	2019/01/23	Eh	V	0.31
UA	G301	C	2019/08/19	Eh	V	0.29
UA	G301	C	2020/01/23	Eh	V	0.35
UA	G301	C	2020/08/11	Eh	V	0.089
UA	G301	C	2021/01/27	Eh	V	0.25
UA	G301	C	2021/08/17	Eh	V	0.014
UA	G301	C	2022/02/08	Eh	V	0.17
UA	G301	C	2022/08/23	Eh	V	0.19
UA	G301	C	2023/02/15	Eh	V	0.35
UA	G301	C	2023/06/06	Eh	V	-0.066
UA	G301	C	2023/08/09	Eh	V	0.098
UA	G301	C	2023/11/20	Eh	V	0.15
UA	G301	C	2016/11/17	Alkalinity, bicarbonate	mg/L CaCO3	180
UA	G301	C	2017/05/17	Alkalinity, bicarbonate	mg/L CaCO3	130
UA	G301	C	2017/07/12	Alkalinity, bicarbonate	mg/L CaCO3	160
UA	G301	C	2020/01/23	Alkalinity, bicarbonate	mg/L CaCO3	140
UA	G301	C	2020/08/11	Alkalinity, bicarbonate	mg/L CaCO3	140
UA	G301	C	2021/01/27	Alkalinity, bicarbonate	mg/L CaCO3	120
UA	G301	C	2021/08/17	Alkalinity, bicarbonate	mg/L CaCO3	140
UA	G301	C	2022/02/08	Alkalinity, bicarbonate	mg/L CaCO3	150
UA	G301	C	2022/08/23	Alkalinity, bicarbonate	mg/L CaCO3	140
UA	G301	C	2023/02/15	Alkalinity, bicarbonate	mg/L CaCO3	160
UA	G301	C	2023/06/06	Alkalinity, bicarbonate	mg/L CaCO3	160
UA	G301	C	2023/08/09	Alkalinity, bicarbonate	mg/L CaCO3	141

UA	G301	C	2023/11/20	Alkalinity, bicarbonate	mg/L CaCO3	163
UA	G301	C	2022/08/23	Alkalinity, carbonate	mg/L CaCO3	10.0
UA	G301	C	2015/11/20	Barium, total	mg/L	0.0790
UA	G301	C	2016/02/23	Barium, total	mg/L	0.0410
UA	G301	C	2016/05/20	Barium, total	mg/L	0.0310
UA	G301	C	2016/08/15	Barium, total	mg/L	0.0320
UA	G301	C	2016/11/17	Barium, total	mg/L	0.0360
UA	G301	C	2017/02/16	Barium, total	mg/L	0.0630
UA	G301	C	2017/05/17	Barium, total	mg/L	0.0290
UA	G301	C	2017/07/12	Barium, total	mg/L	0.0580
UA	G301	C	2018/05/11	Barium, total	mg/L	0.0600
UA	G301	C	2018/08/03	Barium, total	mg/L	0.0840
UA	G301	C	2019/01/23	Barium, total	mg/L	0.110
UA	G301	C	2019/08/19	Barium, total	mg/L	0.0200
UA	G301	C	2020/01/23	Barium, total	mg/L	0.0340
UA	G301	C	2020/08/11	Barium, total	mg/L	0.0160
UA	G301	C	2021/01/27	Barium, total	mg/L	0.0170
UA	G301	C	2021/08/17	Barium, total	mg/L	0.0160
UA	G301	C	2022/02/08	Barium, total	mg/L	0.0130
UA	G301	C	2022/08/23	Barium, total	mg/L	0.0250
UA	G301	C	2023/02/15	Barium, total	mg/L	0.0220
UA	G301	C	2023/06/06	Barium, total	mg/L	0.0180
UA	G301	C	2023/08/09	Barium, total	mg/L	0.0152
UA	G301	C	2023/11/20	Barium, total	mg/L	0.0168
UA	G301	C	2015/11/20	Boron, total	mg/L	2.30
UA	G301	C	2016/02/23	Boron, total	mg/L	2.40
UA	G301	C	2016/05/20	Boron, total	mg/L	2.60
UA	G301	C	2016/08/15	Boron, total	mg/L	2.90
UA	G301	C	2016/11/17	Boron, total	mg/L	2.40
UA	G301	C	2017/02/16	Boron, total	mg/L	2.40
UA	G301	C	2017/05/17	Boron, total	mg/L	2.10
UA	G301	C	2017/07/12	Boron, total	mg/L	2.30
UA	G301	C	2017/10/26	Boron, total	mg/L	2.30
UA	G301	C	2018/05/11	Boron, total	mg/L	2.10
UA	G301	C	2018/08/03	Boron, total	mg/L	2.40
UA	G301	C	2019/01/23	Boron, total	mg/L	2.10
UA	G301	C	2019/08/19	Boron, total	mg/L	2.00
UA	G301	C	2020/01/23	Boron, total	mg/L	2.10
UA	G301	C	2020/08/11	Boron, total	mg/L	2.10
UA	G301	C	2021/01/27	Boron, total	mg/L	2.00
UA	G301	C	2021/08/17	Boron, total	mg/L	2.20
UA	G301	C	2022/02/08	Boron, total	mg/L	2.20
UA	G301	C	2022/08/23	Boron, total	mg/L	2.20
UA	G301	C	2023/02/15	Boron, total	mg/L	1.90
UA	G301	C	2023/06/06	Boron, total	mg/L	2.50
UA	G301	C	2023/08/09	Boron, total	mg/L	2.08
UA	G301	C	2023/11/20	Boron, total	mg/L	2.80
UA	G301	C	2015/11/20	Calcium, total	mg/L	140
UA	G301	C	2016/02/23	Calcium, total	mg/L	140
UA	G301	C	2016/05/20	Calcium, total	mg/L	130
UA	G301	C	2016/08/15	Calcium, total	mg/L	140
UA	G301	C	2016/11/17	Calcium, total	mg/L	120
UA	G301	C	2017/02/16	Calcium, total	mg/L	150
UA	G301	C	2017/05/17	Calcium, total	mg/L	120
UA	G301	C	2017/07/12	Calcium, total	mg/L	120
UA	G301	C	2017/10/26	Calcium, total	mg/L	110
UA	G301	C	2018/05/11	Calcium, total	mg/L	130
UA	G301	C	2018/08/03	Calcium, total	mg/L	150
UA	G301	C	2019/01/23	Calcium, total	mg/L	170
UA	G301	C	2019/08/19	Calcium, total	mg/L	110
UA	G301	C	2020/01/23	Calcium, total	mg/L	160
UA	G301	C	2020/08/11	Calcium, total	mg/L	150

UA	G301	C	2021/01/27	Calcium, total	mg/L	160
UA	G301	C	2021/08/17	Calcium, total	mg/L	150
UA	G301	C	2022/02/08	Calcium, total	mg/L	140
UA	G301	C	2022/08/23	Calcium, total	mg/L	130
UA	G301	C	2023/02/15	Calcium, total	mg/L	120
UA	G301	C	2023/06/06	Calcium, total	mg/L	110
UA	G301	C	2023/08/09	Calcium, total	mg/L	113
UA	G301	C	2023/11/20	Calcium, total	mg/L	123
UA	G301	C	2015/11/20	Chloride, total	mg/L	33.0
UA	G301	C	2016/02/23	Chloride, total	mg/L	25.0
UA	G301	C	2016/05/20	Chloride, total	mg/L	24.0
UA	G301	C	2016/08/15	Chloride, total	mg/L	24.0
UA	G301	C	2016/11/17	Chloride, total	mg/L	25.0
UA	G301	C	2017/02/16	Chloride, total	mg/L	23.0
UA	G301	C	2017/05/17	Chloride, total	mg/L	21.0
UA	G301	C	2017/07/12	Chloride, total	mg/L	23.0
UA	G301	C	2017/10/26	Chloride, total	mg/L	22.0
UA	G301	C	2018/05/11	Chloride, total	mg/L	22.0
UA	G301	C	2018/08/03	Chloride, total	mg/L	20.0
UA	G301	C	2019/01/23	Chloride, total	mg/L	21.0
UA	G301	C	2019/08/19	Chloride, total	mg/L	12.0
UA	G301	C	2020/01/23	Chloride, total	mg/L	16.0
UA	G301	C	2020/08/11	Chloride, total	mg/L	14.0
UA	G301	C	2021/01/27	Chloride, total	mg/L	17.0
UA	G301	C	2021/08/17	Chloride, total	mg/L	18.0
UA	G301	C	2022/02/08	Chloride, total	mg/L	15.0
UA	G301	C	2022/08/23	Chloride, total	mg/L	15.0
UA	G301	C	2023/02/15	Chloride, total	mg/L	13.0
UA	G301	C	2023/06/06	Chloride, total	mg/L	13.0
UA	G301	C	2023/08/09	Chloride, total	mg/L	12.0
UA	G301	C	2023/11/20	Chloride, total	mg/L	12.0
UA	G301	C	2023/06/06	Ferrous Iron, dissolved	mg/L	0.200
UA	G301	C	2023/06/06	Iron, dissolved	mg/L	0.170
UA	G301	C	2023/08/09	Iron, dissolved	mg/L	0.0697
UA	G301	C	2016/11/17	Magnesium, total	mg/L	56.0
UA	G301	C	2017/05/17	Magnesium, total	mg/L	52.0
UA	G301	C	2017/07/12	Magnesium, total	mg/L	55.0
UA	G301	C	2020/01/23	Magnesium, total	mg/L	61.0
UA	G301	C	2020/08/11	Magnesium, total	mg/L	59.0
UA	G301	C	2021/01/27	Magnesium, total	mg/L	61.0
UA	G301	C	2021/08/17	Magnesium, total	mg/L	57.0
UA	G301	C	2022/02/08	Magnesium, total	mg/L	49.0
UA	G301	C	2022/08/23	Magnesium, total	mg/L	51.0
UA	G301	C	2023/02/15	Magnesium, total	mg/L	43.0
UA	G301	C	2023/06/06	Magnesium, total	mg/L	42.0
UA	G301	C	2023/08/09	Magnesium, total	mg/L	42.6
UA	G301	C	2023/11/20	Magnesium, total	mg/L	46.6
UA	G301	C	2023/06/06	Manganese, dissolved	mg/L	2.30
UA	G301	C	2023/08/09	Manganese, dissolved	mg/L	2.04
UA	G301	C	2023/08/09	Phosphate, dissolved	mg/L	0.0250
UA	G301	C	2016/11/17	Potassium, total	mg/L	1.40
UA	G301	C	2017/05/17	Potassium, total	mg/L	1.50
UA	G301	C	2017/07/12	Potassium, total	mg/L	2.30
UA	G301	C	2020/01/23	Potassium, total	mg/L	1.90
UA	G301	C	2020/08/11	Potassium, total	mg/L	1.30
UA	G301	C	2021/01/27	Potassium, total	mg/L	1.60
UA	G301	C	2021/08/17	Potassium, total	mg/L	1.70
UA	G301	C	2022/02/08	Potassium, total	mg/L	1.40
UA	G301	C	2022/08/23	Potassium, total	mg/L	1.90
UA	G301	C	2023/02/15	Potassium, total	mg/L	1.70
UA	G301	C	2023/06/06	Potassium, total	mg/L	1.60
UA	G301	C	2023/08/09	Potassium, total	mg/L	1.77

UA	G301	C	2023/11/20	Potassium, total	mg/L	1.97
UA	G301	C	2023/06/06	Silicon, dissolved	mg/L	10.0
UA	G301	C	2023/08/09	Silicon, dissolved	mg/L	9.55
UA	G301	C	2016/11/17	Sodium, total	mg/L	180
UA	G301	C	2017/05/17	Sodium, total	mg/L	160
UA	G301	C	2017/07/12	Sodium, total	mg/L	170
UA	G301	C	2020/01/23	Sodium, total	mg/L	150
UA	G301	C	2020/08/11	Sodium, total	mg/L	150
UA	G301	C	2021/01/27	Sodium, total	mg/L	160
UA	G301	C	2021/08/17	Sodium, total	mg/L	160
UA	G301	C	2022/02/08	Sodium, total	mg/L	140
UA	G301	C	2022/08/23	Sodium, total	mg/L	140
UA	G301	C	2023/02/15	Sodium, total	mg/L	110
UA	G301	C	2023/06/06	Sodium, total	mg/L	120
UA	G301	C	2023/08/09	Sodium, total	mg/L	113
UA	G301	C	2023/11/20	Sodium, total	mg/L	122
UA	G301	C	2015/11/20	Sulfate, total	mg/L	700
UA	G301	C	2016/02/23	Sulfate, total	mg/L	740
UA	G301	C	2016/05/20	Sulfate, total	mg/L	710
UA	G301	C	2016/08/15	Sulfate, total	mg/L	740
UA	G301	C	2016/11/17	Sulfate, total	mg/L	800
UA	G301	C	2017/02/16	Sulfate, total	mg/L	790
UA	G301	C	2017/05/17	Sulfate, total	mg/L	650
UA	G301	C	2017/07/12	Sulfate, total	mg/L	760
UA	G301	C	2017/10/26	Sulfate, total	mg/L	680
UA	G301	C	2018/05/11	Sulfate, total	mg/L	810
UA	G301	C	2018/08/03	Sulfate, total	mg/L	860
UA	G301	C	2019/01/23	Sulfate, total	mg/L	850
UA	G301	C	2019/08/19	Sulfate, total	mg/L	570
UA	G301	C	2020/01/23	Sulfate, total	mg/L	820
UA	G301	C	2020/08/11	Sulfate, total	mg/L	750
UA	G301	C	2021/01/27	Sulfate, total	mg/L	650
UA	G301	C	2021/08/17	Sulfate, total	mg/L	810
UA	G301	C	2022/02/08	Sulfate, total	mg/L	620
UA	G301	C	2022/08/23	Sulfate, total	mg/L	650
UA	G301	C	2023/02/15	Sulfate, total	mg/L	560
UA	G301	C	2023/06/06	Sulfate, total	mg/L	540
UA	G301	C	2023/08/09	Sulfate, total	mg/L	513
UA	G301	C	2023/11/20	Sulfate, total	mg/L	535
UA	G301	C	2015/11/20	Temperature (Celsius)	degrees C	16.5
UA	G301	C	2016/02/23	Temperature (Celsius)	degrees C	11.3
UA	G301	C	2016/05/20	Temperature (Celsius)	degrees C	15.7
UA	G301	C	2016/08/15	Temperature (Celsius)	degrees C	18.3
UA	G301	C	2016/11/17	Temperature (Celsius)	degrees C	14.4
UA	G301	C	2017/02/16	Temperature (Celsius)	degrees C	15.8
UA	G301	C	2017/05/17	Temperature (Celsius)	degrees C	15.4
UA	G301	C	2017/07/12	Temperature (Celsius)	degrees C	17.2
UA	G301	C	2017/10/26	Temperature (Celsius)	degrees C	13.0
UA	G301	C	2018/05/11	Temperature (Celsius)	degrees C	13.7
UA	G301	C	2018/08/03	Temperature (Celsius)	degrees C	15.6
UA	G301	C	2019/01/23	Temperature (Celsius)	degrees C	12.0
UA	G301	C	2019/08/19	Temperature (Celsius)	degrees C	17.4
UA	G301	C	2020/01/23	Temperature (Celsius)	degrees C	8.60
UA	G301	C	2020/08/11	Temperature (Celsius)	degrees C	21.1
UA	G301	C	2021/01/27	Temperature (Celsius)	degrees C	9.10
UA	G301	C	2021/08/17	Temperature (Celsius)	degrees C	20.6
UA	G301	C	2022/02/08	Temperature (Celsius)	degrees C	12.6
UA	G301	C	2022/08/23	Temperature (Celsius)	degrees C	18.9
UA	G301	C	2023/02/15	Temperature (Celsius)	degrees C	12.6
UA	G301	C	2023/06/06	Temperature (Celsius)	degrees C	18.1
UA	G301	C	2023/08/09	Temperature (Celsius)	degrees C	16.5
UA	G301	C	2023/11/20	Temperature (Celsius)	degrees C	15.5

UA	G301	C	2015/11/20	Total Dissolved Solids	mg/L	1,200
UA	G301	C	2016/02/23	Total Dissolved Solids	mg/L	1,000
UA	G301	C	2016/05/20	Total Dissolved Solids	mg/L	1,100
UA	G301	C	2016/08/15	Total Dissolved Solids	mg/L	1,200
UA	G301	C	2016/11/17	Total Dissolved Solids	mg/L	1,400
UA	G301	C	2017/02/16	Total Dissolved Solids	mg/L	1,200
UA	G301	C	2017/05/17	Total Dissolved Solids	mg/L	1,100
UA	G301	C	2017/07/12	Total Dissolved Solids	mg/L	1,100
UA	G301	C	2017/10/26	Total Dissolved Solids	mg/L	1,100
UA	G301	C	2018/05/11	Total Dissolved Solids	mg/L	1,200
UA	G301	C	2018/08/03	Total Dissolved Solids	mg/L	1,200
UA	G301	C	2019/01/23	Total Dissolved Solids	mg/L	1,500
UA	G301	C	2019/08/19	Total Dissolved Solids	mg/L	950
UA	G301	C	2020/01/23	Total Dissolved Solids	mg/L	1,400
UA	G301	C	2020/08/11	Total Dissolved Solids	mg/L	1,200
UA	G301	C	2021/01/27	Total Dissolved Solids	mg/L	1,300
UA	G301	C	2021/08/17	Total Dissolved Solids	mg/L	1,200
UA	G301	C	2022/02/08	Total Dissolved Solids	mg/L	1,100
UA	G301	C	2022/08/23	Total Dissolved Solids	mg/L	1,100
UA	G301	C	2023/02/15	Total Dissolved Solids	mg/L	1,100
UA	G301	C	2023/06/06	Total Dissolved Solids	mg/L	900
UA	G301	C	2023/08/09	Total Dissolved Solids	mg/L	1,000
UA	G301	C	2023/11/20	Total Dissolved Solids	mg/L	1,020
UA	G302	C	2015/11/20	pH (field)	SU	6.9
UA	G302	C	2016/02/23	pH (field)	SU	6.8
UA	G302	C	2016/05/20	pH (field)	SU	6.8
UA	G302	C	2016/08/15	pH (field)	SU	7.0
UA	G302	C	2016/11/17	pH (field)	SU	7.1
UA	G302	C	2017/02/16	pH (field)	SU	7.1
UA	G302	C	2017/05/17	pH (field)	SU	7.0
UA	G302	C	2017/07/12	pH (field)	SU	7.0
UA	G302	C	2017/10/26	pH (field)	SU	7.1
UA	G302	C	2018/05/11	pH (field)	SU	7.1
UA	G302	C	2018/08/03	pH (field)	SU	7.0
UA	G302	C	2019/01/23	pH (field)	SU	7.0
UA	G302	C	2019/08/19	pH (field)	SU	7.0
UA	G302	C	2020/01/23	pH (field)	SU	7.1
UA	G302	C	2020/08/11	pH (field)	SU	6.9
UA	G302	C	2021/01/27	pH (field)	SU	6.6
UA	G302	C	2021/08/17	pH (field)	SU	6.6
UA	G302	C	2022/02/08	pH (field)	SU	6.7
UA	G302	C	2022/08/23	pH (field)	SU	6.9
UA	G302	C	2023/02/15	pH (field)	SU	6.8
UA	G302	C	2023/05/31	pH (field)	SU	7.0
UA	G302	C	2023/08/09	pH (field)	SU	6.5
UA	G302	C	2023/11/20	pH (field)	SU	6.5
UA	G302	C	2015/11/20	Oxidation Reduction Potential	mV	-120
UA	G302	C	2016/02/23	Oxidation Reduction Potential	mV	27.0
UA	G302	C	2016/05/20	Oxidation Reduction Potential	mV	-118
UA	G302	C	2016/08/15	Oxidation Reduction Potential	mV	95.0
UA	G302	C	2016/11/17	Oxidation Reduction Potential	mV	71.0
UA	G302	C	2017/02/16	Oxidation Reduction Potential	mV	71.0
UA	G302	C	2017/05/17	Oxidation Reduction Potential	mV	70.0
UA	G302	C	2017/07/12	Oxidation Reduction Potential	mV	112
UA	G302	C	2017/10/26	Oxidation Reduction Potential	mV	78.0
UA	G302	C	2018/05/11	Oxidation Reduction Potential	mV	87.0
UA	G302	C	2018/08/03	Oxidation Reduction Potential	mV	93.0
UA	G302	C	2019/01/23	Oxidation Reduction Potential	mV	94.0
UA	G302	C	2019/08/19	Oxidation Reduction Potential	mV	87.0
UA	G302	C	2020/01/23	Oxidation Reduction Potential	mV	44.7
UA	G302	C	2020/08/11	Oxidation Reduction Potential	mV	5.60
UA	G302	C	2021/01/27	Oxidation Reduction Potential	mV	63.0

UA	G302	C	2021/08/17	Oxidation Reduction Potential	mV	-1.10
UA	G302	C	2022/02/08	Oxidation Reduction Potential	mV	-13.9
UA	G302	C	2022/08/23	Oxidation Reduction Potential	mV	-133
UA	G302	C	2023/02/15	Oxidation Reduction Potential	mV	64.4
UA	G302	C	2023/05/31	Oxidation Reduction Potential	mV	-79.9
UA	G302	C	2023/08/09	Oxidation Reduction Potential	mV	-80.0
UA	G302	C	2023/11/20	Oxidation Reduction Potential	mV	-81.0
UA	G302	C	2015/11/20	Eh	V	0.075
UA	G302	C	2016/02/23	Eh	V	0.22
UA	G302	C	2016/05/20	Eh	V	0.077
UA	G302	C	2016/08/15	Eh	V	0.29
UA	G302	C	2016/11/17	Eh	V	0.27
UA	G302	C	2017/02/16	Eh	V	0.27
UA	G302	C	2017/05/17	Eh	V	0.27
UA	G302	C	2017/07/12	Eh	V	0.31
UA	G302	C	2017/10/26	Eh	V	0.27
UA	G302	C	2018/05/11	Eh	V	0.28
UA	G302	C	2018/08/03	Eh	V	0.29
UA	G302	C	2019/01/23	Eh	V	0.29
UA	G302	C	2019/08/19	Eh	V	0.28
UA	G302	C	2020/01/23	Eh	V	0.24
UA	G302	C	2020/08/11	Eh	V	0.20
UA	G302	C	2021/01/27	Eh	V	0.26
UA	G302	C	2021/08/17	Eh	V	0.19
UA	G302	C	2022/02/08	Eh	V	0.18
UA	G302	C	2022/08/23	Eh	V	0.060
UA	G302	C	2023/02/15	Eh	V	0.26
UA	G302	C	2023/05/31	Eh	V	0.11
UA	G302	C	2023/08/09	Eh	V	0.11
UA	G302	C	2023/11/20	Eh	V	0.11
UA	G302	C	2016/11/17	Alkalinity, bicarbonate	mg/L CaCO3	490
UA	G302	C	2017/05/17	Alkalinity, bicarbonate	mg/L CaCO3	490
UA	G302	C	2017/07/12	Alkalinity, bicarbonate	mg/L CaCO3	540
UA	G302	C	2020/01/23	Alkalinity, bicarbonate	mg/L CaCO3	500
UA	G302	C	2020/08/11	Alkalinity, bicarbonate	mg/L CaCO3	440
UA	G302	C	2021/01/27	Alkalinity, bicarbonate	mg/L CaCO3	440
UA	G302	C	2021/08/17	Alkalinity, bicarbonate	mg/L CaCO3	450
UA	G302	C	2022/02/08	Alkalinity, bicarbonate	mg/L CaCO3	450
UA	G302	C	2022/08/23	Alkalinity, bicarbonate	mg/L CaCO3	400
UA	G302	C	2023/02/15	Alkalinity, bicarbonate	mg/L CaCO3	450
UA	G302	C	2023/05/31	Alkalinity, bicarbonate	mg/L CaCO3	450
UA	G302	C	2023/08/09	Alkalinity, bicarbonate	mg/L CaCO3	474
UA	G302	C	2023/11/20	Alkalinity, bicarbonate	mg/L CaCO3	472
UA	G302	C	2022/08/23	Alkalinity, carbonate	mg/L CaCO3	10.0
UA	G302	C	2015/11/20	Barium, total	mg/L	0.0670
UA	G302	C	2016/02/23	Barium, total	mg/L	0.0290
UA	G302	C	2016/05/20	Barium, total	mg/L	0.0240
UA	G302	C	2016/08/15	Barium, total	mg/L	0.0280
UA	G302	C	2016/11/17	Barium, total	mg/L	0.0370
UA	G302	C	2017/02/16	Barium, total	mg/L	0.0300
UA	G302	C	2017/05/17	Barium, total	mg/L	0.0200
UA	G302	C	2017/07/12	Barium, total	mg/L	0.0600
UA	G302	C	2018/05/11	Barium, total	mg/L	0.0390
UA	G302	C	2018/08/03	Barium, total	mg/L	0.0540
UA	G302	C	2019/01/23	Barium, total	mg/L	0.0950
UA	G302	C	2019/08/19	Barium, total	mg/L	0.0280
UA	G302	C	2020/01/23	Barium, total	mg/L	0.0450
UA	G302	C	2020/08/11	Barium, total	mg/L	0.0220
UA	G302	C	2021/01/27	Barium, total	mg/L	0.0270
UA	G302	C	2021/08/17	Barium, total	mg/L	0.0290
UA	G302	C	2022/02/08	Barium, total	mg/L	0.0250
UA	G302	C	2022/08/23	Barium, total	mg/L	0.0240

UA	G302	C	2023/02/15	Barium, total	mg/L	0.0490
UA	G302	C	2023/05/31	Barium, total	mg/L	0.0420
UA	G302	C	2023/08/09	Barium, total	mg/L	0.0259
UA	G302	C	2023/11/20	Barium, total	mg/L	0.0435
UA	G302	C	2015/11/20	Boron, total	mg/L	2.00
UA	G302	C	2016/02/23	Boron, total	mg/L	2.10
UA	G302	C	2016/05/20	Boron, total	mg/L	2.50
UA	G302	C	2016/08/15	Boron, total	mg/L	1.90
UA	G302	C	2016/11/17	Boron, total	mg/L	1.90
UA	G302	C	2017/02/16	Boron, total	mg/L	1.40
UA	G302	C	2017/05/17	Boron, total	mg/L	1.10
UA	G302	C	2017/07/12	Boron, total	mg/L	2.00
UA	G302	C	2017/10/26	Boron, total	mg/L	1.10
UA	G302	C	2018/05/11	Boron, total	mg/L	2.10
UA	G302	C	2018/08/03	Boron, total	mg/L	2.30
UA	G302	C	2019/01/23	Boron, total	mg/L	1.90
UA	G302	C	2019/08/19	Boron, total	mg/L	1.80
UA	G302	C	2020/01/23	Boron, total	mg/L	1.70
UA	G302	C	2020/08/11	Boron, total	mg/L	1.20
UA	G302	C	2021/01/27	Boron, total	mg/L	1.20
UA	G302	C	2021/08/17	Boron, total	mg/L	1.80
UA	G302	C	2022/02/08	Boron, total	mg/L	2.20
UA	G302	C	2022/08/23	Boron, total	mg/L	1.70
UA	G302	C	2023/02/15	Boron, total	mg/L	1.90
UA	G302	C	2023/05/31	Boron, total	mg/L	2.10
UA	G302	C	2023/08/09	Boron, total	mg/L	1.93
UA	G302	C	2023/11/20	Boron, total	mg/L	2.96
UA	G302	C	2015/11/20	Calcium, total	mg/L	180
UA	G302	C	2016/02/23	Calcium, total	mg/L	170
UA	G302	C	2016/05/20	Calcium, total	mg/L	140
UA	G302	C	2016/08/15	Calcium, total	mg/L	130
UA	G302	C	2016/11/17	Calcium, total	mg/L	140
UA	G302	C	2017/02/16	Calcium, total	mg/L	160
UA	G302	C	2017/05/17	Calcium, total	mg/L	130
UA	G302	C	2017/07/12	Calcium, total	mg/L	160
UA	G302	C	2017/10/26	Calcium, total	mg/L	180
UA	G302	C	2018/05/11	Calcium, total	mg/L	170
UA	G302	C	2018/08/03	Calcium, total	mg/L	180
UA	G302	C	2019/01/23	Calcium, total	mg/L	210
UA	G302	C	2019/08/19	Calcium, total	mg/L	120
UA	G302	C	2020/01/23	Calcium, total	mg/L	150
UA	G302	C	2020/08/11	Calcium, total	mg/L	140
UA	G302	C	2021/01/27	Calcium, total	mg/L	180
UA	G302	C	2021/08/17	Calcium, total	mg/L	200
UA	G302	C	2022/02/08	Calcium, total	mg/L	170
UA	G302	C	2022/08/23	Calcium, total	mg/L	140
UA	G302	C	2023/02/15	Calcium, total	mg/L	180
UA	G302	C	2023/05/31	Calcium, total	mg/L	160
UA	G302	C	2023/08/09	Calcium, total	mg/L	157
UA	G302	C	2023/11/20	Calcium, total	mg/L	182
UA	G302	C	2015/11/20	Chloride, total	mg/L	22.0
UA	G302	C	2016/02/23	Chloride, total	mg/L	21.0
UA	G302	C	2016/05/20	Chloride, total	mg/L	12.0
UA	G302	C	2016/08/15	Chloride, total	mg/L	9.70
UA	G302	C	2016/11/17	Chloride, total	mg/L	14.0
UA	G302	C	2017/02/16	Chloride, total	mg/L	14.0
UA	G302	C	2017/05/17	Chloride, total	mg/L	6.50
UA	G302	C	2017/07/12	Chloride, total	mg/L	14.0
UA	G302	C	2017/10/26	Chloride, total	mg/L	8.30
UA	G302	C	2018/05/11	Chloride, total	mg/L	17.0
UA	G302	C	2018/08/03	Chloride, total	mg/L	17.0
UA	G302	C	2019/01/23	Chloride, total	mg/L	20.0

UA	G302	C	2019/08/19	Chloride, total	mg/L	5.90
UA	G302	C	2020/01/23	Chloride, total	mg/L	14.0
UA	G302	C	2020/08/11	Chloride, total	mg/L	5.90
UA	G302	C	2021/01/27	Chloride, total	mg/L	22.0
UA	G302	C	2021/08/17	Chloride, total	mg/L	21.0
UA	G302	C	2022/02/08	Chloride, total	mg/L	15.0
UA	G302	C	2022/08/23	Chloride, total	mg/L	<9.6
UA	G302	C	2023/02/15	Chloride, total	mg/L	23.0
UA	G302	C	2023/05/31	Chloride, total	mg/L	18.0
UA	G302	C	2023/08/09	Chloride, total	mg/L	9.00
UA	G302	C	2023/11/20	Chloride, total	mg/L	18.0
UA	G302	C	2023/05/31	Ferrous Iron, dissolved	mg/L	0.600
UA	G302	C	2023/05/31	Iron, dissolved	mg/L	0.660
UA	G302	C	2023/08/09	Iron, dissolved	mg/L	0.284
UA	G302	C	2016/11/17	Magnesium, total	mg/L	82.0
UA	G302	C	2017/05/17	Magnesium, total	mg/L	68.0
UA	G302	C	2017/07/12	Magnesium, total	mg/L	93.0
UA	G302	C	2020/01/23	Magnesium, total	mg/L	70.0
UA	G302	C	2020/08/11	Magnesium, total	mg/L	61.0
UA	G302	C	2021/01/27	Magnesium, total	mg/L	76.0
UA	G302	C	2021/08/17	Magnesium, total	mg/L	82.0
UA	G302	C	2022/02/08	Magnesium, total	mg/L	68.0
UA	G302	C	2022/08/23	Magnesium, total	mg/L	62.0
UA	G302	C	2023/02/15	Magnesium, total	mg/L	71.0
UA	G302	C	2023/05/31	Magnesium, total	mg/L	67.0
UA	G302	C	2023/08/09	Magnesium, total	mg/L	65.8
UA	G302	C	2023/11/20	Magnesium, total	mg/L	75.4
UA	G302	C	2023/05/31	Manganese, dissolved	mg/L	1.00
UA	G302	C	2023/08/09	Manganese, dissolved	mg/L	0.424
UA	G302	C	2023/08/09	Phosphate, dissolved	mg/L	0.123
UA	G302	C	2016/11/17	Potassium, total	mg/L	1.70
UA	G302	C	2017/05/17	Potassium, total	mg/L	0.400
UA	G302	C	2017/07/12	Potassium, total	mg/L	3.40
UA	G302	C	2020/01/23	Potassium, total	mg/L	1.50
UA	G302	C	2020/08/11	Potassium, total	mg/L	0.670
UA	G302	C	2021/01/27	Potassium, total	mg/L	0.500
UA	G302	C	2021/08/17	Potassium, total	mg/L	0.560
UA	G302	C	2022/02/08	Potassium, total	mg/L	0.680
UA	G302	C	2022/08/23	Potassium, total	mg/L	1.10
UA	G302	C	2023/02/15	Potassium, total	mg/L	1.50
UA	G302	C	2023/05/31	Potassium, total	mg/L	0.870
UA	G302	C	2023/08/09	Potassium, total	mg/L	1.58
UA	G302	C	2023/11/20	Potassium, total	mg/L	0.644
UA	G302	C	2023/05/31	Silicon, dissolved	mg/L	14.0
UA	G302	C	2023/08/09	Silicon, dissolved	mg/L	11.6
UA	G302	C	2016/11/17	Sodium, total	mg/L	110
UA	G302	C	2017/05/17	Sodium, total	mg/L	76.0
UA	G302	C	2017/07/12	Sodium, total	mg/L	110
UA	G302	C	2020/01/23	Sodium, total	mg/L	120
UA	G302	C	2020/08/11	Sodium, total	mg/L	74.0
UA	G302	C	2021/01/27	Sodium, total	mg/L	81.0
UA	G302	C	2021/08/17	Sodium, total	mg/L	100
UA	G302	C	2022/02/08	Sodium, total	mg/L	120
UA	G302	C	2022/08/23	Sodium, total	mg/L	110
UA	G302	C	2023/02/15	Sodium, total	mg/L	110
UA	G302	C	2023/05/31	Sodium, total	mg/L	120
UA	G302	C	2023/08/09	Sodium, total	mg/L	110
UA	G302	C	2023/11/20	Sodium, total	mg/L	119
UA	G302	C	2015/11/20	Sulfate, total	mg/L	480
UA	G302	C	2016/02/23	Sulfate, total	mg/L	530
UA	G302	C	2016/05/20	Sulfate, total	mg/L	440
UA	G302	C	2016/08/15	Sulfate, total	mg/L	360

UA	G302	C	2016/11/17	Sulfate, total	mg/L	450
UA	G302	C	2017/02/16	Sulfate, total	mg/L	430
UA	G302	C	2017/05/17	Sulfate, total	mg/L	330
UA	G302	C	2017/07/12	Sulfate, total	mg/L	460
UA	G302	C	2017/10/26	Sulfate, total	mg/L	320
UA	G302	C	2018/05/11	Sulfate, total	mg/L	510
UA	G302	C	2018/08/03	Sulfate, total	mg/L	500
UA	G302	C	2019/01/23	Sulfate, total	mg/L	500
UA	G302	C	2019/08/19	Sulfate, total	mg/L	280
UA	G302	C	2020/01/23	Sulfate, total	mg/L	350
UA	G302	C	2020/08/11	Sulfate, total	mg/L	260
UA	G302	C	2021/01/27	Sulfate, total	mg/L	430
UA	G302	C	2021/08/17	Sulfate, total	mg/L	480
UA	G302	C	2022/02/08	Sulfate, total	mg/L	410
UA	G302	C	2022/08/23	Sulfate, total	mg/L	290
UA	G302	C	2023/02/15	Sulfate, total	mg/L	440
UA	G302	C	2023/05/31	Sulfate, total	mg/L	450
UA	G302	C	2023/08/09	Sulfate, total	mg/L	356
UA	G302	C	2023/11/20	Sulfate, total	mg/L	423
UA	G302	C	2015/11/20	Temperature (Celsius)	degrees C	16.4
UA	G302	C	2016/02/23	Temperature (Celsius)	degrees C	11.6
UA	G302	C	2016/05/20	Temperature (Celsius)	degrees C	15.9
UA	G302	C	2016/08/15	Temperature (Celsius)	degrees C	17.7
UA	G302	C	2016/11/17	Temperature (Celsius)	degrees C	15.1
UA	G302	C	2017/02/16	Temperature (Celsius)	degrees C	15.3
UA	G302	C	2017/05/17	Temperature (Celsius)	degrees C	15.5
UA	G302	C	2017/07/12	Temperature (Celsius)	degrees C	17.1
UA	G302	C	2017/10/26	Temperature (Celsius)	degrees C	13.3
UA	G302	C	2018/05/11	Temperature (Celsius)	degrees C	15.0
UA	G302	C	2018/08/03	Temperature (Celsius)	degrees C	15.2
UA	G302	C	2019/01/23	Temperature (Celsius)	degrees C	12.2
UA	G302	C	2019/08/19	Temperature (Celsius)	degrees C	17.0
UA	G302	C	2020/01/23	Temperature (Celsius)	degrees C	9.20
UA	G302	C	2020/08/11	Temperature (Celsius)	degrees C	20.1
UA	G302	C	2021/01/27	Temperature (Celsius)	degrees C	9.80
UA	G302	C	2021/08/17	Temperature (Celsius)	degrees C	18.9
UA	G302	C	2022/02/08	Temperature (Celsius)	degrees C	11.8
UA	G302	C	2022/08/23	Temperature (Celsius)	degrees C	18.9
UA	G302	C	2023/02/15	Temperature (Celsius)	degrees C	12.7
UA	G302	C	2023/05/31	Temperature (Celsius)	degrees C	17.6
UA	G302	C	2023/08/09	Temperature (Celsius)	degrees C	16.0
UA	G302	C	2023/11/20	Temperature (Celsius)	degrees C	15.4
UA	G302	C	2015/11/20	Total Dissolved Solids	mg/L	1,200
UA	G302	C	2016/02/23	Total Dissolved Solids	mg/L	1,000
UA	G302	C	2016/05/20	Total Dissolved Solids	mg/L	1,000
UA	G302	C	2016/08/15	Total Dissolved Solids	mg/L	910
UA	G302	C	2016/11/17	Total Dissolved Solids	mg/L	1,100
UA	G302	C	2017/02/16	Total Dissolved Solids	mg/L	1,100
UA	G302	C	2017/05/17	Total Dissolved Solids	mg/L	820
UA	G302	C	2017/07/12	Total Dissolved Solids	mg/L	1,000
UA	G302	C	2017/10/26	Total Dissolved Solids	mg/L	840
UA	G302	C	2018/05/11	Total Dissolved Solids	mg/L	1,100
UA	G302	C	2018/08/03	Total Dissolved Solids	mg/L	1,200
UA	G302	C	2019/01/23	Total Dissolved Solids	mg/L	1,400
UA	G302	C	2019/08/19	Total Dissolved Solids	mg/L	800
UA	G302	C	2020/01/23	Total Dissolved Solids	mg/L	960
UA	G302	C	2020/08/11	Total Dissolved Solids	mg/L	780
UA	G302	C	2021/01/27	Total Dissolved Solids	mg/L	1,100
UA	G302	C	2021/08/17	Total Dissolved Solids	mg/L	1,200
UA	G302	C	2022/02/08	Total Dissolved Solids	mg/L	1,100
UA	G302	C	2022/08/23	Total Dissolved Solids	mg/L	860
UA	G302	C	2023/02/15	Total Dissolved Solids	mg/L	1,200

UA	G302	C	2023/05/31	Total Dissolved Solids	mg/L	1,200
UA	G302	C	2023/08/09	Total Dissolved Solids	mg/L	998
UA	G302	C	2023/11/20	Total Dissolved Solids	mg/L	1,190
UA	G303	C	2015/11/20	pH (field)	SU	6.9
UA	G303	C	2016/02/23	pH (field)	SU	7.0
UA	G303	C	2016/05/20	pH (field)	SU	6.9
UA	G303	C	2016/08/15	pH (field)	SU	6.9
UA	G303	C	2016/11/17	pH (field)	SU	6.9
UA	G303	C	2017/02/19	pH (field)	SU	6.9
UA	G303	C	2017/05/17	pH (field)	SU	7.1
UA	G303	C	2017/07/13	pH (field)	SU	7.0
UA	G303	C	2017/10/26	pH (field)	SU	7.0
UA	G303	C	2018/05/14	pH (field)	SU	7.0
UA	G303	C	2018/08/03	pH (field)	SU	7.0
UA	G303	C	2019/01/23	pH (field)	SU	7.0
UA	G303	C	2019/08/19	pH (field)	SU	7.0
UA	G303	C	2020/01/23	pH (field)	SU	7.0
UA	G303	C	2020/08/11	pH (field)	SU	6.9
UA	G303	C	2021/01/26	pH (field)	SU	6.8
UA	G303	C	2021/08/17	pH (field)	SU	6.8
UA	G303	C	2022/02/08	pH (field)	SU	6.8
UA	G303	C	2022/08/24	pH (field)	SU	6.7
UA	G303	C	2023/02/15	pH (field)	SU	6.5
UA	G303	C	2023/05/31	pH (field)	SU	7.1
UA	G303	C	2023/08/09	pH (field)	SU	6.8
UA	G303	C	2023/11/21	pH (field)	SU	6.6
UA	G303	C	2015/11/20	Oxidation Reduction Potential	mV	-29.0
UA	G303	C	2016/02/23	Oxidation Reduction Potential	mV	121
UA	G303	C	2016/05/20	Oxidation Reduction Potential	mV	-77.0
UA	G303	C	2016/08/15	Oxidation Reduction Potential	mV	-2.00
UA	G303	C	2016/11/17	Oxidation Reduction Potential	mV	-2.00
UA	G303	C	2017/02/19	Oxidation Reduction Potential	mV	-31.0
UA	G303	C	2017/05/17	Oxidation Reduction Potential	mV	-26.0
UA	G303	C	2017/07/13	Oxidation Reduction Potential	mV	59.0
UA	G303	C	2017/10/26	Oxidation Reduction Potential	mV	-3.00
UA	G303	C	2018/05/14	Oxidation Reduction Potential	mV	-1.00
UA	G303	C	2018/08/03	Oxidation Reduction Potential	mV	-60.0
UA	G303	C	2019/01/23	Oxidation Reduction Potential	mV	-69.0
UA	G303	C	2019/08/19	Oxidation Reduction Potential	mV	-59.0
UA	G303	C	2020/01/23	Oxidation Reduction Potential	mV	33.8
UA	G303	C	2020/08/11	Oxidation Reduction Potential	mV	-69.9
UA	G303	C	2021/01/26	Oxidation Reduction Potential	mV	55.5
UA	G303	C	2021/08/17	Oxidation Reduction Potential	mV	-107
UA	G303	C	2022/02/08	Oxidation Reduction Potential	mV	5.70
UA	G303	C	2022/08/24	Oxidation Reduction Potential	mV	-43.0
UA	G303	C	2023/02/15	Oxidation Reduction Potential	mV	89.7
UA	G303	C	2023/05/31	Oxidation Reduction Potential	mV	-70.2
UA	G303	C	2023/08/09	Oxidation Reduction Potential	mV	-91.0
UA	G303	C	2023/11/21	Oxidation Reduction Potential	mV	-28.0
UA	G303	C	2015/11/20	Eh	V	0.17
UA	G303	C	2016/02/23	Eh	V	0.32
UA	G303	C	2016/05/20	Eh	V	0.11
UA	G303	C	2016/08/15	Eh	V	0.19
UA	G303	C	2016/11/17	Eh	V	0.19
UA	G303	C	2017/02/19	Eh	V	0.16
UA	G303	C	2017/05/17	Eh	V	0.17
UA	G303	C	2017/07/13	Eh	V	0.25
UA	G303	C	2017/10/26	Eh	V	0.19
UA	G303	C	2018/05/14	Eh	V	0.20
UA	G303	C	2018/08/03	Eh	V	0.14
UA	G303	C	2019/01/23	Eh	V	0.13
UA	G303	C	2019/08/19	Eh	V	0.13

UA	G303	C	2020/01/23	Eh	V	0.23
UA	G303	C	2020/08/11	Eh	V	0.12
UA	G303	C	2021/01/26	Eh	V	0.26
UA	G303	C	2021/08/17	Eh	V	0.085
UA	G303	C	2022/02/08	Eh	V	0.20
UA	G303	C	2022/08/24	Eh	V	0.15
UA	G303	C	2023/02/15	Eh	V	0.29
UA	G303	C	2023/05/31	Eh	V	0.12
UA	G303	C	2023/08/09	Eh	V	0.10
UA	G303	C	2023/11/21	Eh	V	0.17
UA	G303	C	2016/11/17	Alkalinity, bicarbonate	mg/L CaCO3	620
UA	G303	C	2017/05/17	Alkalinity, bicarbonate	mg/L CaCO3	680
UA	G303	C	2017/07/13	Alkalinity, bicarbonate	mg/L CaCO3	680
UA	G303	C	2020/01/23	Alkalinity, bicarbonate	mg/L CaCO3	640
UA	G303	C	2020/08/11	Alkalinity, bicarbonate	mg/L CaCO3	450
UA	G303	C	2021/01/26	Alkalinity, bicarbonate	mg/L CaCO3	620
UA	G303	C	2021/08/17	Alkalinity, bicarbonate	mg/L CaCO3	640
UA	G303	C	2022/02/08	Alkalinity, bicarbonate	mg/L CaCO3	590
UA	G303	C	2022/08/24	Alkalinity, bicarbonate	mg/L CaCO3	610
UA	G303	C	2023/02/15	Alkalinity, bicarbonate	mg/L CaCO3	620
UA	G303	C	2023/05/31	Alkalinity, bicarbonate	mg/L CaCO3	620
UA	G303	C	2023/08/09	Alkalinity, bicarbonate	mg/L CaCO3	634
UA	G303	C	2023/11/21	Alkalinity, bicarbonate	mg/L CaCO3	646
UA	G303	C	2022/08/24	Alkalinity, carbonate	mg/L CaCO3	10.0
UA	G303	C	2015/11/20	Barium, total	mg/L	0.0460
UA	G303	C	2016/02/23	Barium, total	mg/L	0.0140
UA	G303	C	2016/05/20	Barium, total	mg/L	0.0160
UA	G303	C	2016/08/15	Barium, total	mg/L	0.0160
UA	G303	C	2016/11/17	Barium, total	mg/L	0.0160
UA	G303	C	2017/02/19	Barium, total	mg/L	0.0160
UA	G303	C	2017/05/17	Barium, total	mg/L	0.0170
UA	G303	C	2017/07/13	Barium, total	mg/L	0.0160
UA	G303	C	2018/05/14	Barium, total	mg/L	0.0180
UA	G303	C	2018/08/03	Barium, total	mg/L	0.0190
UA	G303	C	2019/01/23	Barium, total	mg/L	0.0150
UA	G303	C	2019/08/19	Barium, total	mg/L	0.0160
UA	G303	C	2020/01/23	Barium, total	mg/L	0.0150
UA	G303	C	2020/08/11	Barium, total	mg/L	0.0330
UA	G303	C	2021/01/26	Barium, total	mg/L	0.0130
UA	G303	C	2021/08/17	Barium, total	mg/L	0.0170
UA	G303	C	2022/02/08	Barium, total	mg/L	0.0130
UA	G303	C	2022/08/24	Barium, total	mg/L	0.0200
UA	G303	C	2023/02/15	Barium, total	mg/L	0.0210
UA	G303	C	2023/05/31	Barium, total	mg/L	0.0150
UA	G303	C	2023/08/09	Barium, total	mg/L	0.0183
UA	G303	C	2023/11/21	Barium, total	mg/L	0.0300
UA	G303	C	2015/11/20	Boron, total	mg/L	1.50
UA	G303	C	2016/02/23	Boron, total	mg/L	2.50
UA	G303	C	2016/05/20	Boron, total	mg/L	2.40
UA	G303	C	2016/08/15	Boron, total	mg/L	1.80
UA	G303	C	2016/11/17	Boron, total	mg/L	1.60
UA	G303	C	2017/02/19	Boron, total	mg/L	1.70
UA	G303	C	2017/05/17	Boron, total	mg/L	1.40
UA	G303	C	2017/07/13	Boron, total	mg/L	1.70
UA	G303	C	2017/10/26	Boron, total	mg/L	2.50
UA	G303	C	2018/05/14	Boron, total	mg/L	1.50
UA	G303	C	2018/08/03	Boron, total	mg/L	1.60
UA	G303	C	2019/01/23	Boron, total	mg/L	1.80
UA	G303	C	2019/08/19	Boron, total	mg/L	1.80
UA	G303	C	2020/01/23	Boron, total	mg/L	2.30
UA	G303	C	2020/08/11	Boron, total	mg/L	1.70
UA	G303	C	2021/01/26	Boron, total	mg/L	2.00

UA	G303	C	2021/08/17	Boron, total	mg/L	2.10
UA	G303	C	2022/02/08	Boron, total	mg/L	2.50
UA	G303	C	2022/08/24	Boron, total	mg/L	1.90
UA	G303	C	2023/02/15	Boron, total	mg/L	2.10
UA	G303	C	2023/05/31	Boron, total	mg/L	1.80
UA	G303	C	2023/08/09	Boron, total	mg/L	1.95
UA	G303	C	2023/11/21	Boron, total	mg/L	2.98
UA	G303	C	2015/11/20	Calcium, total	mg/L	170
UA	G303	C	2016/02/23	Calcium, total	mg/L	170
UA	G303	C	2016/05/20	Calcium, total	mg/L	160
UA	G303	C	2016/08/15	Calcium, total	mg/L	170
UA	G303	C	2016/11/17	Calcium, total	mg/L	180
UA	G303	C	2017/02/19	Calcium, total	mg/L	170
UA	G303	C	2017/05/17	Calcium, total	mg/L	210
UA	G303	C	2017/07/13	Calcium, total	mg/L	170
UA	G303	C	2017/10/26	Calcium, total	mg/L	130
UA	G303	C	2018/05/14	Calcium, total	mg/L	170
UA	G303	C	2018/08/03	Calcium, total	mg/L	200
UA	G303	C	2019/01/23	Calcium, total	mg/L	190
UA	G303	C	2019/08/19	Calcium, total	mg/L	190
UA	G303	C	2020/01/23	Calcium, total	mg/L	160
UA	G303	C	2020/08/11	Calcium, total	mg/L	210
UA	G303	C	2021/01/26	Calcium, total	mg/L	170
UA	G303	C	2021/08/17	Calcium, total	mg/L	190
UA	G303	C	2022/02/08	Calcium, total	mg/L	170
UA	G303	C	2022/08/24	Calcium, total	mg/L	200
UA	G303	C	2023/02/15	Calcium, total	mg/L	170
UA	G303	C	2023/05/31	Calcium, total	mg/L	180
UA	G303	C	2023/08/09	Calcium, total	mg/L	190
UA	G303	C	2023/11/21	Calcium, total	mg/L	207
UA	G303	C	2015/11/20	Chloride, total	mg/L	32.0
UA	G303	C	2016/02/23	Chloride, total	mg/L	32.0
UA	G303	C	2016/05/20	Chloride, total	mg/L	29.0
UA	G303	C	2016/08/15	Chloride, total	mg/L	30.0
UA	G303	C	2016/11/17	Chloride, total	mg/L	30.0
UA	G303	C	2017/02/19	Chloride, total	mg/L	28.0
UA	G303	C	2017/05/17	Chloride, total	mg/L	28.0
UA	G303	C	2017/07/13	Chloride, total	mg/L	31.0
UA	G303	C	2017/10/26	Chloride, total	mg/L	28.0
UA	G303	C	2018/05/14	Chloride, total	mg/L	30.0
UA	G303	C	2018/08/03	Chloride, total	mg/L	28.0
UA	G303	C	2019/01/23	Chloride, total	mg/L	30.0
UA	G303	C	2019/08/19	Chloride, total	mg/L	32.0
UA	G303	C	2020/01/23	Chloride, total	mg/L	29.0
UA	G303	C	2020/08/11	Chloride, total	mg/L	24.0
UA	G303	C	2021/01/26	Chloride, total	mg/L	32.0
UA	G303	C	2021/08/17	Chloride, total	mg/L	30.0
UA	G303	C	2022/02/08	Chloride, total	mg/L	29.0
UA	G303	C	2022/08/24	Chloride, total	mg/L	28.0
UA	G303	C	2023/02/15	Chloride, total	mg/L	28.0
UA	G303	C	2023/05/31	Chloride, total	mg/L	25.0
UA	G303	C	2023/08/09	Chloride, total	mg/L	27.0
UA	G303	C	2023/11/21	Chloride, total	mg/L	27.0
UA	G303	C	2023/05/31	Ferrous Iron, dissolved	mg/L	1.10
UA	G303	C	2023/05/31	Iron, dissolved	mg/L	1.10
UA	G303	C	2023/08/09	Iron, dissolved	mg/L	0.612
UA	G303	C	2016/11/17	Magnesium, total	mg/L	180
UA	G303	C	2017/05/17	Magnesium, total	mg/L	170
UA	G303	C	2017/07/13	Magnesium, total	mg/L	160
UA	G303	C	2020/01/23	Magnesium, total	mg/L	140
UA	G303	C	2020/08/11	Magnesium, total	mg/L	170
UA	G303	C	2021/01/26	Magnesium, total	mg/L	150

UA	G303	C	2021/08/17	Magnesium, total	mg/L	160
UA	G303	C	2022/02/08	Magnesium, total	mg/L	130
UA	G303	C	2022/08/24	Magnesium, total	mg/L	150
UA	G303	C	2023/02/15	Magnesium, total	mg/L	120
UA	G303	C	2023/05/31	Magnesium, total	mg/L	140
UA	G303	C	2023/08/09	Magnesium, total	mg/L	159
UA	G303	C	2023/11/21	Magnesium, total	mg/L	168
UA	G303	C	2023/05/31	Manganese, dissolved	mg/L	0.400
UA	G303	C	2023/08/09	Manganese, dissolved	mg/L	0.323
UA	G303	C	2023/08/09	Phosphate, dissolved	mg/L	0.111
UA	G303	C	2016/11/17	Potassium, total	mg/L	3.00
UA	G303	C	2017/05/17	Potassium, total	mg/L	2.70
UA	G303	C	2017/07/13	Potassium, total	mg/L	2.70
UA	G303	C	2020/01/23	Potassium, total	mg/L	0.960
UA	G303	C	2020/08/11	Potassium, total	mg/L	3.00
UA	G303	C	2021/01/26	Potassium, total	mg/L	1.80
UA	G303	C	2021/08/17	Potassium, total	mg/L	1.90
UA	G303	C	2022/02/08	Potassium, total	mg/L	1.10
UA	G303	C	2022/08/24	Potassium, total	mg/L	2.30
UA	G303	C	2023/02/15	Potassium, total	mg/L	1.70
UA	G303	C	2023/05/31	Potassium, total	mg/L	2.20
UA	G303	C	2023/08/09	Potassium, total	mg/L	3.11
UA	G303	C	2023/11/21	Potassium, total	mg/L	3.26
UA	G303	C	2023/05/31	Silicon, dissolved	mg/L	12.0
UA	G303	C	2023/08/09	Silicon, dissolved	mg/L	9.85
UA	G303	C	2016/11/17	Sodium, total	mg/L	180
UA	G303	C	2017/05/17	Sodium, total	mg/L	170
UA	G303	C	2017/07/13	Sodium, total	mg/L	180
UA	G303	C	2020/01/23	Sodium, total	mg/L	180
UA	G303	C	2020/08/11	Sodium, total	mg/L	170
UA	G303	C	2021/01/26	Sodium, total	mg/L	170
UA	G303	C	2021/08/17	Sodium, total	mg/L	190
UA	G303	C	2022/02/08	Sodium, total	mg/L	180
UA	G303	C	2022/08/24	Sodium, total	mg/L	170
UA	G303	C	2023/02/15	Sodium, total	mg/L	160
UA	G303	C	2023/05/31	Sodium, total	mg/L	160
UA	G303	C	2023/08/09	Sodium, total	mg/L	168
UA	G303	C	2023/11/21	Sodium, total	mg/L	180
UA	G303	C	2015/11/20	Sulfate, total	mg/L	860
UA	G303	C	2016/02/23	Sulfate, total	mg/L	700
UA	G303	C	2016/05/20	Sulfate, total	mg/L	700
UA	G303	C	2016/08/15	Sulfate, total	mg/L	830
UA	G303	C	2016/11/17	Sulfate, total	mg/L	870
UA	G303	C	2017/02/19	Sulfate, total	mg/L	860
UA	G303	C	2017/05/17	Sulfate, total	mg/L	780
UA	G303	C	2017/07/13	Sulfate, total	mg/L	860
UA	G303	C	2017/10/26	Sulfate, total	mg/L	600
UA	G303	C	2018/05/14	Sulfate, total	mg/L	780
UA	G303	C	2018/08/03	Sulfate, total	mg/L	780
UA	G303	C	2019/01/23	Sulfate, total	mg/L	760
UA	G303	C	2019/08/19	Sulfate, total	mg/L	730
UA	G303	C	2020/01/23	Sulfate, total	mg/L	690
UA	G303	C	2020/08/11	Sulfate, total	mg/L	790
UA	G303	C	2021/01/26	Sulfate, total	mg/L	730
UA	G303	C	2021/08/17	Sulfate, total	mg/L	730
UA	G303	C	2022/02/08	Sulfate, total	mg/L	650
UA	G303	C	2022/08/24	Sulfate, total	mg/L	760
UA	G303	C	2023/02/15	Sulfate, total	mg/L	590
UA	G303	C	2023/05/31	Sulfate, total	mg/L	740
UA	G303	C	2023/08/09	Sulfate, total	mg/L	723
UA	G303	C	2023/11/21	Sulfate, total	mg/L	721
UA	G303	C	2015/11/20	Temperature (Celsius)	degrees C	16.4

UA	G303	C	2016/02/23	Temperature (Celsius)	degrees C	11.0
UA	G303	C	2016/05/20	Temperature (Celsius)	degrees C	20.2
UA	G303	C	2016/08/15	Temperature (Celsius)	degrees C	17.9
UA	G303	C	2016/11/17	Temperature (Celsius)	degrees C	15.0
UA	G303	C	2017/02/19	Temperature (Celsius)	degrees C	16.0
UA	G303	C	2017/05/17	Temperature (Celsius)	degrees C	15.7
UA	G303	C	2017/07/13	Temperature (Celsius)	degrees C	17.4
UA	G303	C	2017/10/26	Temperature (Celsius)	degrees C	13.3
UA	G303	C	2018/05/14	Temperature (Celsius)	degrees C	13.4
UA	G303	C	2018/08/03	Temperature (Celsius)	degrees C	15.3
UA	G303	C	2019/01/23	Temperature (Celsius)	degrees C	11.5
UA	G303	C	2019/08/19	Temperature (Celsius)	degrees C	17.3
UA	G303	C	2020/01/23	Temperature (Celsius)	degrees C	9.40
UA	G303	C	2020/08/11	Temperature (Celsius)	degrees C	19.9
UA	G303	C	2021/01/26	Temperature (Celsius)	degrees C	8.90
UA	G303	C	2021/08/17	Temperature (Celsius)	degrees C	19.7
UA	G303	C	2022/02/08	Temperature (Celsius)	degrees C	11.7
UA	G303	C	2022/08/24	Temperature (Celsius)	degrees C	19.2
UA	G303	C	2023/02/15	Temperature (Celsius)	degrees C	13.0
UA	G303	C	2023/05/31	Temperature (Celsius)	degrees C	17.8
UA	G303	C	2023/08/09	Temperature (Celsius)	degrees C	15.4
UA	G303	C	2023/11/21	Temperature (Celsius)	degrees C	14.0
UA	G303	C	2015/11/20	Total Dissolved Solids	mg/L	1,700
UA	G303	C	2016/02/23	Total Dissolved Solids	mg/L	1,400
UA	G303	C	2016/05/20	Total Dissolved Solids	mg/L	1,400
UA	G303	C	2016/08/15	Total Dissolved Solids	mg/L	1,600
UA	G303	C	2016/11/17	Total Dissolved Solids	mg/L	1,900
UA	G303	C	2017/02/19	Total Dissolved Solids	mg/L	1,700
UA	G303	C	2017/05/17	Total Dissolved Solids	mg/L	1,900
UA	G303	C	2017/07/13	Total Dissolved Solids	mg/L	1,500
UA	G303	C	2017/10/26	Total Dissolved Solids	mg/L	1,300
UA	G303	C	2018/05/14	Total Dissolved Solids	mg/L	1,500
UA	G303	C	2018/08/03	Total Dissolved Solids	mg/L	1,600
UA	G303	C	2019/01/23	Total Dissolved Solids	mg/L	1,800
UA	G303	C	2019/08/19	Total Dissolved Solids	mg/L	1,700
UA	G303	C	2020/01/23	Total Dissolved Solids	mg/L	1,200
UA	G303	C	2020/08/11	Total Dissolved Solids	mg/L	1,700
UA	G303	C	2021/01/26	Total Dissolved Solids	mg/L	1,600
UA	G303	C	2021/08/17	Total Dissolved Solids	mg/L	1,700
UA	G303	C	2022/02/08	Total Dissolved Solids	mg/L	1,500
UA	G303	C	2022/08/24	Total Dissolved Solids	mg/L	1,900
UA	G303	C	2023/02/15	Total Dissolved Solids	mg/L	1,500
UA	G303	C	2023/05/31	Total Dissolved Solids	mg/L	1,800
UA	G303	C	2023/08/09	Total Dissolved Solids	mg/L	1,620
UA	G303	C	2023/11/21	Total Dissolved Solids	mg/L	1,520
UA	G305	C	2016/05/19	pH (field)	SU	7.1
UA	G305	C	2016/07/01	pH (field)	SU	7.2
UA	G305	C	2016/08/16	pH (field)	SU	7.3
UA	G305	C	2016/09/29	pH (field)	SU	6.9
UA	G305	C	2016/11/17	pH (field)	SU	7.1
UA	G305	C	2023/02/15	pH (field)	SU	7.3
UA	G305	C	2023/06/06	pH (field)	SU	7.3
UA	G305	C	2023/08/10	pH (field)	SU	7.3
UA	G305	C	2023/11/17	pH (field)	SU	6.9
UA	G305	C	2016/05/19	Oxidation Reduction Potential	mV	-29.0
UA	G305	C	2016/07/01	Oxidation Reduction Potential	mV	108
UA	G305	C	2016/08/16	Oxidation Reduction Potential	mV	161
UA	G305	C	2016/09/29	Oxidation Reduction Potential	mV	27.0
UA	G305	C	2016/11/17	Oxidation Reduction Potential	mV	169
UA	G305	C	2023/02/15	Oxidation Reduction Potential	mV	57.9
UA	G305	C	2023/06/06	Oxidation Reduction Potential	mV	-26.5
UA	G305	C	2023/08/10	Oxidation Reduction Potential	mV	-41.0

UA	G305	C	2023/11/17	Oxidation Reduction Potential	mV	12.0
UA	G305	C	2016/05/19	Eh	V	0.16
UA	G305	C	2016/07/01	Eh	V	0.30
UA	G305	C	2016/08/16	Eh	V	0.35
UA	G305	C	2016/09/29	Eh	V	0.22
UA	G305	C	2016/11/17	Eh	V	0.36
UA	G305	C	2023/02/15	Eh	V	0.25
UA	G305	C	2023/06/06	Eh	V	0.17
UA	G305	C	2023/08/10	Eh	V	0.15
UA	G305	C	2023/11/17	Eh	V	0.21
UA	G305	C	2016/11/17	Alkalinity, bicarbonate	mg/L CaCO3	300
UA	G305	C	2023/02/15	Alkalinity, bicarbonate	mg/L CaCO3	200
UA	G305	C	2023/06/06	Alkalinity, bicarbonate	mg/L CaCO3	200
UA	G305	C	2023/08/10	Alkalinity, bicarbonate	mg/L CaCO3	216
UA	G305	C	2023/11/17	Alkalinity, bicarbonate	mg/L CaCO3	237
UA	G305	C	2016/05/19	Barium, total	mg/L	0.0930
UA	G305	C	2016/07/01	Barium, total	mg/L	0.0430
UA	G305	C	2016/08/16	Barium, total	mg/L	0.0350
UA	G305	C	2016/09/29	Barium, total	mg/L	0.0360
UA	G305	C	2016/11/17	Barium, total	mg/L	0.0390
UA	G305	C	2023/02/15	Barium, total	mg/L	0.0690
UA	G305	C	2023/06/06	Barium, total	mg/L	0.0380
UA	G305	C	2023/08/10	Barium, total	mg/L	0.0254
UA	G305	C	2023/11/17	Barium, total	mg/L	0.0289
UA	G305	C	2016/05/19	Boron, total	mg/L	2.60
UA	G305	C	2016/07/01	Boron, total	mg/L	2.50
UA	G305	C	2016/08/16	Boron, total	mg/L	2.40
UA	G305	C	2016/09/29	Boron, total	mg/L	2.70
UA	G305	C	2016/11/17	Boron, total	mg/L	1.80
UA	G305	C	2023/02/15	Boron, total	mg/L	2.00
UA	G305	C	2023/06/06	Boron, total	mg/L	1.90
UA	G305	C	2023/08/10	Boron, total	mg/L	2.66
UA	G305	C	2023/11/17	Boron, total	mg/L	2.44
UA	G305	C	2016/05/19	Calcium, total	mg/L	180
UA	G305	C	2016/07/01	Calcium, total	mg/L	190
UA	G305	C	2016/08/16	Calcium, total	mg/L	150
UA	G305	C	2016/09/29	Calcium, total	mg/L	190
UA	G305	C	2016/11/17	Calcium, total	mg/L	100
UA	G305	C	2023/02/15	Calcium, total	mg/L	200
UA	G305	C	2023/06/06	Calcium, total	mg/L	180
UA	G305	C	2023/08/10	Calcium, total	mg/L	188
UA	G305	C	2023/11/17	Calcium, total	mg/L	177
UA	G305	C	2016/05/19	Chloride, total	mg/L	27.0
UA	G305	C	2016/07/01	Chloride, total	mg/L	28.0
UA	G305	C	2016/08/16	Chloride, total	mg/L	27.0
UA	G305	C	2016/09/29	Chloride, total	mg/L	30.0
UA	G305	C	2016/11/17	Chloride, total	mg/L	60.0
UA	G305	C	2023/02/15	Chloride, total	mg/L	22.0
UA	G305	C	2023/06/06	Chloride, total	mg/L	23.0
UA	G305	C	2023/08/10	Chloride, total	mg/L	21.0
UA	G305	C	2023/11/17	Chloride, total	mg/L	17.0
UA	G305	C	2023/06/06	Ferrous Iron, dissolved	mg/L	<0.02
UA	G305	C	2023/06/06	Iron, dissolved	mg/L	0.0110
UA	G305	C	2023/08/10	Iron, dissolved	mg/L	0.0220
UA	G305	C	2016/11/17	Magnesium, total	mg/L	130
UA	G305	C	2023/02/15	Magnesium, total	mg/L	100
UA	G305	C	2023/06/06	Magnesium, total	mg/L	100
UA	G305	C	2023/08/10	Magnesium, total	mg/L	96.5
UA	G305	C	2023/11/17	Magnesium, total	mg/L	93.6
UA	G305	C	2023/06/06	Manganese, dissolved	mg/L	0.240
UA	G305	C	2023/08/10	Manganese, dissolved	mg/L	0.0984
UA	G305	C	2023/08/10	Phosphate, dissolved	mg/L	0.0550

UA	G305	C	2016/11/17	Potassium, total	mg/L	1.10
UA	G305	C	2023/02/15	Potassium, total	mg/L	2.70
UA	G305	C	2023/06/06	Potassium, total	mg/L	1.10
UA	G305	C	2023/08/10	Potassium, total	mg/L	0.549
UA	G305	C	2023/11/17	Potassium, total	mg/L	0.560
UA	G305	C	2023/06/06	Silicon, dissolved	mg/L	11.0
UA	G305	C	2023/08/10	Silicon, dissolved	mg/L	11.0
UA	G305	C	2016/11/17	Sodium, total	mg/L	140
UA	G305	C	2023/02/15	Sodium, total	mg/L	120
UA	G305	C	2023/06/06	Sodium, total	mg/L	130
UA	G305	C	2023/08/10	Sodium, total	mg/L	135
UA	G305	C	2023/11/17	Sodium, total	mg/L	125
UA	G305	C	2016/05/19	Sulfate, total	mg/L	890
UA	G305	C	2016/07/01	Sulfate, total	mg/L	900
UA	G305	C	2016/08/16	Sulfate, total	mg/L	930
UA	G305	C	2016/09/29	Sulfate, total	mg/L	890
UA	G305	C	2016/11/17	Sulfate, total	mg/L	710
UA	G305	C	2023/02/15	Sulfate, total	mg/L	980
UA	G305	C	2023/06/06	Sulfate, total	mg/L	910
UA	G305	C	2023/08/10	Sulfate, total	mg/L	863
UA	G305	C	2023/11/17	Sulfate, total	mg/L	843
UA	G305	C	2016/05/19	Temperature (Celsius)	degrees C	18.1
UA	G305	C	2016/07/01	Temperature (Celsius)	degrees C	24.4
UA	G305	C	2016/08/16	Temperature (Celsius)	degrees C	19.6
UA	G305	C	2016/09/29	Temperature (Celsius)	degrees C	18.5
UA	G305	C	2016/11/17	Temperature (Celsius)	degrees C	14.4
UA	G305	C	2023/02/15	Temperature (Celsius)	degrees C	14.6
UA	G305	C	2023/06/06	Temperature (Celsius)	degrees C	15.8
UA	G305	C	2023/08/10	Temperature (Celsius)	degrees C	15.4
UA	G305	C	2023/11/17	Temperature (Celsius)	degrees C	15.1
UA	G305	C	2016/05/19	Total Dissolved Solids	mg/L	1,300
UA	G305	C	2016/07/01	Total Dissolved Solids	mg/L	1,500
UA	G305	C	2016/08/16	Total Dissolved Solids	mg/L	1,400
UA	G305	C	2016/09/29	Total Dissolved Solids	mg/L	1,400
UA	G305	C	2016/11/17	Total Dissolved Solids	mg/L	1,400
UA	G305	C	2023/02/15	Total Dissolved Solids	mg/L	1,800
UA	G305	C	2023/06/06	Total Dissolved Solids	mg/L	1,500
UA	G305	C	2023/08/10	Total Dissolved Solids	mg/L	1,580
UA	G305	C	2023/11/17	Total Dissolved Solids	mg/L	1,530
UA	G307	C	2016/08/16	pH (field)	SU	7.0
UA	G307	C	2016/09/29	pH (field)	SU	6.9
UA	G307	C	2016/11/16	pH (field)	SU	6.9
UA	G307	C	2017/02/19	pH (field)	SU	7.0
UA	G307	C	2017/05/17	pH (field)	SU	7.2
UA	G307	C	2017/07/13	pH (field)	SU	7.0
UA	G307	C	2017/10/27	pH (field)	SU	7.0
UA	G307	C	2018/05/14	pH (field)	SU	7.0
UA	G307	C	2018/08/03	pH (field)	SU	7.0
UA	G307	C	2019/08/19	pH (field)	SU	7.0
UA	G307	C	2020/02/26	pH (field)	SU	7.0
UA	G307	C	2020/05/06	pH (field)	SU	7.3
UA	G307	C	2020/08/11	pH (field)	SU	7.3
UA	G307	C	2021/01/27	pH (field)	SU	7.4
UA	G307	C	2021/08/17	pH (field)	SU	7.3
UA	G307	C	2022/02/11	pH (field)	SU	7.3
UA	G307	C	2022/08/24	pH (field)	SU	7.0
UA	G307	C	2023/02/15	pH (field)	SU	7.2
UA	G307	C	2023/06/05	pH (field)	SU	7.3
UA	G307	C	2023/11/21	pH (field)	SU	6.8
UA	G307	C	2016/08/16	Oxidation Reduction Potential	mV	167
UA	G307	C	2016/09/29	Oxidation Reduction Potential	mV	-7.00
UA	G307	C	2016/11/16	Oxidation Reduction Potential	mV	174

UA	G307	C	2017/02/19	Oxidation Reduction Potential	mV	162
UA	G307	C	2017/05/17	Oxidation Reduction Potential	mV	140
UA	G307	C	2017/07/13	Oxidation Reduction Potential	mV	170
UA	G307	C	2017/10/27	Oxidation Reduction Potential	mV	175
UA	G307	C	2018/05/14	Oxidation Reduction Potential	mV	105
UA	G307	C	2018/08/03	Oxidation Reduction Potential	mV	161
UA	G307	C	2019/08/19	Oxidation Reduction Potential	mV	155
UA	G307	C	2020/02/26	Oxidation Reduction Potential	mV	128
UA	G307	C	2020/05/06	Oxidation Reduction Potential	mV	87.6
UA	G307	C	2020/08/11	Oxidation Reduction Potential	mV	50.1
UA	G307	C	2021/01/27	Oxidation Reduction Potential	mV	65.7
UA	G307	C	2021/08/17	Oxidation Reduction Potential	mV	10.6
UA	G307	C	2022/02/11	Oxidation Reduction Potential	mV	144
UA	G307	C	2022/08/24	Oxidation Reduction Potential	mV	-79.0
UA	G307	C	2023/02/15	Oxidation Reduction Potential	mV	350
UA	G307	C	2023/06/05	Oxidation Reduction Potential	mV	40.1
UA	G307	C	2023/11/21	Oxidation Reduction Potential	mV	101
UA	G307	C	2016/08/16	Eh	V	0.36
UA	G307	C	2016/09/29	Eh	V	0.19
UA	G307	C	2016/11/16	Eh	V	0.37
UA	G307	C	2017/02/19	Eh	V	0.36
UA	G307	C	2017/05/17	Eh	V	0.34
UA	G307	C	2017/07/13	Eh	V	0.36
UA	G307	C	2017/10/27	Eh	V	0.37
UA	G307	C	2018/05/14	Eh	V	0.30
UA	G307	C	2018/08/03	Eh	V	0.36
UA	G307	C	2019/08/19	Eh	V	0.35
UA	G307	C	2020/02/26	Eh	V	0.33
UA	G307	C	2020/05/06	Eh	V	0.28
UA	G307	C	2020/08/11	Eh	V	0.24
UA	G307	C	2021/01/27	Eh	V	0.27
UA	G307	C	2021/08/17	Eh	V	0.20
UA	G307	C	2022/02/11	Eh	V	0.34
UA	G307	C	2022/08/24	Eh	V	0.11
UA	G307	C	2023/02/15	Eh	V	0.55
UA	G307	C	2023/06/05	Eh	V	0.23
UA	G307	C	2023/11/21	Eh	V	0.30
UA	G307	C	2016/11/16	Alkalinity, bicarbonate	mg/L CaCO3	120
UA	G307	C	2017/05/17	Alkalinity, bicarbonate	mg/L CaCO3	97.0
UA	G307	C	2017/07/13	Alkalinity, bicarbonate	mg/L CaCO3	120
UA	G307	C	2020/02/26	Alkalinity, bicarbonate	mg/L CaCO3	100
UA	G307	C	2020/08/11	Alkalinity, bicarbonate	mg/L CaCO3	140
UA	G307	C	2021/01/27	Alkalinity, bicarbonate	mg/L CaCO3	120
UA	G307	C	2021/08/17	Alkalinity, bicarbonate	mg/L CaCO3	140
UA	G307	C	2022/02/11	Alkalinity, bicarbonate	mg/L CaCO3	120
UA	G307	C	2022/08/24	Alkalinity, bicarbonate	mg/L CaCO3	120
UA	G307	C	2023/02/15	Alkalinity, bicarbonate	mg/L CaCO3	160
UA	G307	C	2023/06/05	Alkalinity, bicarbonate	mg/L CaCO3	160
UA	G307	C	2023/11/21	Alkalinity, bicarbonate	mg/L CaCO3	183
UA	G307	C	2022/08/24	Alkalinity, carbonate	mg/L CaCO3	10.0
UA	G307	C	2016/08/16	Barium, total	mg/L	0.0310
UA	G307	C	2016/09/29	Barium, total	mg/L	0.0290
UA	G307	C	2016/11/16	Barium, total	mg/L	0.0340
UA	G307	C	2017/02/19	Barium, total	mg/L	0.0330
UA	G307	C	2017/05/17	Barium, total	mg/L	0.380
UA	G307	C	2017/07/13	Barium, total	mg/L	0.130
UA	G307	C	2018/05/14	Barium, total	mg/L	0.0710
UA	G307	C	2018/08/03	Barium, total	mg/L	0.100
UA	G307	C	2019/08/19	Barium, total	mg/L	0.110
UA	G307	C	2020/02/26	Barium, total	mg/L	0.0330
UA	G307	C	2020/08/11	Barium, total	mg/L	0.0210
UA	G307	C	2021/01/27	Barium, total	mg/L	0.0200

UA	G307	C	2021/08/17	Barium, total	mg/L	0.0300
UA	G307	C	2022/02/11	Barium, total	mg/L	0.0210
UA	G307	C	2022/08/24	Barium, total	mg/L	0.0550
UA	G307	C	2023/02/15	Barium, total	mg/L	0.0650
UA	G307	C	2023/06/05	Barium, total	mg/L	0.0250
UA	G307	C	2023/11/21	Barium, total	mg/L	0.0234
UA	G307	C	2016/08/16	Boron, total	mg/L	2.10
UA	G307	C	2016/09/29	Boron, total	mg/L	2.20
UA	G307	C	2016/11/16	Boron, total	mg/L	2.10
UA	G307	C	2017/02/19	Boron, total	mg/L	2.00
UA	G307	C	2017/05/17	Boron, total	mg/L	1.80
UA	G307	C	2017/07/13	Boron, total	mg/L	2.20
UA	G307	C	2017/10/27	Boron, total	mg/L	2.10
UA	G307	C	2018/05/14	Boron, total	mg/L	2.20
UA	G307	C	2018/08/03	Boron, total	mg/L	2.00
UA	G307	C	2019/08/19	Boron, total	mg/L	2.10
UA	G307	C	2020/02/26	Boron, total	mg/L	2.10
UA	G307	C	2020/08/11	Boron, total	mg/L	2.10
UA	G307	C	2021/01/27	Boron, total	mg/L	1.90
UA	G307	C	2021/08/17	Boron, total	mg/L	2.10
UA	G307	C	2022/02/11	Boron, total	mg/L	2.00
UA	G307	C	2022/08/24	Boron, total	mg/L	2.00
UA	G307	C	2023/02/15	Boron, total	mg/L	2.00
UA	G307	C	2023/06/05	Boron, total	mg/L	2.00
UA	G307	C	2023/11/21	Boron, total	mg/L	2.35
UA	G307	C	2016/08/16	Calcium, total	mg/L	210
UA	G307	C	2016/09/29	Calcium, total	mg/L	250
UA	G307	C	2016/11/16	Calcium, total	mg/L	190
UA	G307	C	2017/02/19	Calcium, total	mg/L	200
UA	G307	C	2017/05/17	Calcium, total	mg/L	400
UA	G307	C	2017/07/13	Calcium, total	mg/L	220
UA	G307	C	2017/10/27	Calcium, total	mg/L	230
UA	G307	C	2018/05/14	Calcium, total	mg/L	220
UA	G307	C	2018/08/03	Calcium, total	mg/L	270
UA	G307	C	2019/08/19	Calcium, total	mg/L	280
UA	G307	C	2020/02/26	Calcium, total	mg/L	250
UA	G307	C	2020/08/11	Calcium, total	mg/L	230
UA	G307	C	2021/01/27	Calcium, total	mg/L	200
UA	G307	C	2021/08/17	Calcium, total	mg/L	210
UA	G307	C	2022/02/11	Calcium, total	mg/L	190
UA	G307	C	2022/08/24	Calcium, total	mg/L	210
UA	G307	C	2023/02/15	Calcium, total	mg/L	170
UA	G307	C	2023/06/05	Calcium, total	mg/L	150
UA	G307	C	2023/11/21	Calcium, total	mg/L	168
UA	G307	C	2016/08/16	Chloride, total	mg/L	26.0
UA	G307	C	2016/09/29	Chloride, total	mg/L	26.0
UA	G307	C	2016/11/16	Chloride, total	mg/L	24.0
UA	G307	C	2017/02/19	Chloride, total	mg/L	22.0
UA	G307	C	2017/05/17	Chloride, total	mg/L	19.0
UA	G307	C	2017/07/13	Chloride, total	mg/L	21.0
UA	G307	C	2017/10/27	Chloride, total	mg/L	18.0
UA	G307	C	2018/05/14	Chloride, total	mg/L	17.0
UA	G307	C	2018/08/03	Chloride, total	mg/L	17.0
UA	G307	C	2019/08/19	Chloride, total	mg/L	18.0
UA	G307	C	2020/02/26	Chloride, total	mg/L	18.0
UA	G307	C	2020/08/11	Chloride, total	mg/L	15.0
UA	G307	C	2021/01/27	Chloride, total	mg/L	14.0
UA	G307	C	2021/08/17	Chloride, total	mg/L	16.0
UA	G307	C	2022/02/11	Chloride, total	mg/L	16.0
UA	G307	C	2022/08/24	Chloride, total	mg/L	14.0
UA	G307	C	2023/02/15	Chloride, total	mg/L	12.0
UA	G307	C	2023/06/05	Chloride, total	mg/L	9.20

UA	G307	C	2023/11/21	Chloride, total	mg/L	11.0
UA	G307	C	2023/06/05	Ferrous Iron, dissolved	mg/L	<0.02
UA	G307	C	2023/06/05	Iron, dissolved	mg/L	0.0150
UA	G307	C	2016/11/16	Magnesium, total	mg/L	89.0
UA	G307	C	2017/05/17	Magnesium, total	mg/L	140
UA	G307	C	2017/07/13	Magnesium, total	mg/L	97.0
UA	G307	C	2020/02/26	Magnesium, total	mg/L	76.0
UA	G307	C	2020/08/11	Magnesium, total	mg/L	77.0
UA	G307	C	2021/01/27	Magnesium, total	mg/L	69.0
UA	G307	C	2021/08/17	Magnesium, total	mg/L	69.0
UA	G307	C	2022/02/11	Magnesium, total	mg/L	65.0
UA	G307	C	2022/08/24	Magnesium, total	mg/L	72.0
UA	G307	C	2023/02/15	Magnesium, total	mg/L	54.0
UA	G307	C	2023/06/05	Magnesium, total	mg/L	49.0
UA	G307	C	2023/11/21	Magnesium, total	mg/L	53.7
UA	G307	C	2023/06/05	Manganese, dissolved	mg/L	1.80
UA	G307	C	2016/11/16	Potassium, total	mg/L	2.40
UA	G307	C	2017/05/17	Potassium, total	mg/L	10.0
UA	G307	C	2017/07/13	Potassium, total	mg/L	4.60
UA	G307	C	2020/02/26	Potassium, total	mg/L	3.90
UA	G307	C	2020/08/11	Potassium, total	mg/L	3.60
UA	G307	C	2021/01/27	Potassium, total	mg/L	4.00
UA	G307	C	2021/08/17	Potassium, total	mg/L	4.70
UA	G307	C	2022/02/11	Potassium, total	mg/L	4.20
UA	G307	C	2022/08/24	Potassium, total	mg/L	5.10
UA	G307	C	2023/02/15	Potassium, total	mg/L	5.30
UA	G307	C	2023/06/05	Potassium, total	mg/L	4.00
UA	G307	C	2023/11/21	Potassium, total	mg/L	4.89
UA	G307	C	2023/06/05	Silicon, dissolved	mg/L	11.0
UA	G307	C	2016/11/16	Sodium, total	mg/L	120
UA	G307	C	2017/05/17	Sodium, total	mg/L	110
UA	G307	C	2017/07/13	Sodium, total	mg/L	100
UA	G307	C	2020/02/26	Sodium, total	mg/L	110
UA	G307	C	2020/08/11	Sodium, total	mg/L	99.0
UA	G307	C	2021/01/27	Sodium, total	mg/L	99.0
UA	G307	C	2021/08/17	Sodium, total	mg/L	100
UA	G307	C	2022/02/11	Sodium, total	mg/L	97.0
UA	G307	C	2022/08/24	Sodium, total	mg/L	94.0
UA	G307	C	2023/02/15	Sodium, total	mg/L	77.0
UA	G307	C	2023/06/05	Sodium, total	mg/L	77.0
UA	G307	C	2023/11/21	Sodium, total	mg/L	87.1
UA	G307	C	2016/08/16	Sulfate, total	mg/L	1,000
UA	G307	C	2016/09/29	Sulfate, total	mg/L	1,000
UA	G307	C	2016/11/16	Sulfate, total	mg/L	1,000
UA	G307	C	2017/02/19	Sulfate, total	mg/L	1,100
UA	G307	C	2017/05/17	Sulfate, total	mg/L	940
UA	G307	C	2017/07/13	Sulfate, total	mg/L	1,300
UA	G307	C	2017/10/27	Sulfate, total	mg/L	980
UA	G307	C	2018/05/14	Sulfate, total	mg/L	1,100
UA	G307	C	2018/08/03	Sulfate, total	mg/L	1,100
UA	G307	C	2019/08/19	Sulfate, total	mg/L	1,100
UA	G307	C	2020/02/26	Sulfate, total	mg/L	1,000
UA	G307	C	2020/08/11	Sulfate, total	mg/L	910
UA	G307	C	2021/01/27	Sulfate, total	mg/L	850
UA	G307	C	2021/08/17	Sulfate, total	mg/L	750
UA	G307	C	2022/02/11	Sulfate, total	mg/L	780
UA	G307	C	2022/08/24	Sulfate, total	mg/L	730
UA	G307	C	2023/02/15	Sulfate, total	mg/L	600
UA	G307	C	2023/06/05	Sulfate, total	mg/L	530
UA	G307	C	2023/11/21	Sulfate, total	mg/L	490
UA	G307	C	2016/08/16	Temperature (Celsius)	degrees C	19.0
UA	G307	C	2016/09/29	Temperature (Celsius)	degrees C	18.8

UA	G307	C	2016/11/16	Temperature (Celsius)	degrees C	15.8
UA	G307	C	2017/02/19	Temperature (Celsius)	degrees C	16.5
UA	G307	C	2017/05/17	Temperature (Celsius)	degrees C	15.7
UA	G307	C	2017/07/13	Temperature (Celsius)	degrees C	17.9
UA	G307	C	2017/10/27	Temperature (Celsius)	degrees C	13.4
UA	G307	C	2018/05/14	Temperature (Celsius)	degrees C	16.0
UA	G307	C	2018/08/03	Temperature (Celsius)	degrees C	16.1
UA	G307	C	2019/08/19	Temperature (Celsius)	degrees C	17.1
UA	G307	C	2020/02/26	Temperature (Celsius)	degrees C	10.4
UA	G307	C	2020/05/06	Temperature (Celsius)	degrees C	14.4
UA	G307	C	2020/08/11	Temperature (Celsius)	degrees C	19.0
UA	G307	C	2021/01/27	Temperature (Celsius)	degrees C	5.70
UA	G307	C	2021/08/17	Temperature (Celsius)	degrees C	20.9
UA	G307	C	2022/02/11	Temperature (Celsius)	degrees C	9.10
UA	G307	C	2022/08/24	Temperature (Celsius)	degrees C	19.5
UA	G307	C	2023/02/15	Temperature (Celsius)	degrees C	14.0
UA	G307	C	2023/06/05	Temperature (Celsius)	degrees C	17.0
UA	G307	C	2023/11/21	Temperature (Celsius)	degrees C	13.2
UA	G307	C	2016/08/16	Total Dissolved Solids	mg/L	1,500
UA	G307	C	2016/09/29	Total Dissolved Solids	mg/L	1,300
UA	G307	C	2016/11/16	Total Dissolved Solids	mg/L	1,600
UA	G307	C	2017/02/19	Total Dissolved Solids	mg/L	1,500
UA	G307	C	2017/05/17	Total Dissolved Solids	mg/L	1,500
UA	G307	C	2017/07/13	Total Dissolved Solids	mg/L	1,300
UA	G307	C	2017/10/27	Total Dissolved Solids	mg/L	1,400
UA	G307	C	2018/05/14	Total Dissolved Solids	mg/L	1,400
UA	G307	C	2018/08/03	Total Dissolved Solids	mg/L	1,500
UA	G307	C	2019/08/19	Total Dissolved Solids	mg/L	1,600
UA	G307	C	2020/02/26	Total Dissolved Solids	mg/L	1,500
UA	G307	C	2020/08/11	Total Dissolved Solids	mg/L	1,200
UA	G307	C	2021/01/27	Total Dissolved Solids	mg/L	1,400
UA	G307	C	2021/08/17	Total Dissolved Solids	mg/L	1,300
UA	G307	C	2022/02/11	Total Dissolved Solids	mg/L	1,200
UA	G307	C	2022/08/24	Total Dissolved Solids	mg/L	1,400
UA	G307	C	2023/02/15	Total Dissolved Solids	mg/L	1,200
UA	G307	C	2023/06/05	Total Dissolved Solids	mg/L	980
UA	G307	C	2023/11/21	Total Dissolved Solids	mg/L	915
UA	G308	C	2021/03/29	pH (field)	SU	7.3
UA	G308	C	2021/04/21	pH (field)	SU	7.2
UA	G308	C	2021/05/05	pH (field)	SU	7.2
UA	G308	C	2021/05/17	pH (field)	SU	7.2
UA	G308	C	2021/06/14	pH (field)	SU	7.2
UA	G308	C	2021/06/28	pH (field)	SU	7.2
UA	G308	C	2021/07/14	pH (field)	SU	7.3
UA	G308	C	2021/07/27	pH (field)	SU	7.3
UA	G308	C	2023/02/16	pH (field)	SU	7.2
UA	G308	C	2023/06/01	pH (field)	SU	7.3
UA	G308	C	2023/08/10	pH (field)	SU	7.3
UA	G308	C	2023/11/17	pH (field)	SU	6.9
UA	G308	C	2021/03/29	Oxidation Reduction Potential	mV	213
UA	G308	C	2021/04/21	Oxidation Reduction Potential	mV	32.1
UA	G308	C	2021/05/05	Oxidation Reduction Potential	mV	103
UA	G308	C	2021/05/17	Oxidation Reduction Potential	mV	42.7
UA	G308	C	2021/06/14	Oxidation Reduction Potential	mV	-8.30
UA	G308	C	2021/06/28	Oxidation Reduction Potential	mV	26.1
UA	G308	C	2021/07/14	Oxidation Reduction Potential	mV	118
UA	G308	C	2021/07/27	Oxidation Reduction Potential	mV	37.2
UA	G308	C	2023/02/16	Oxidation Reduction Potential	mV	278
UA	G308	C	2023/06/01	Oxidation Reduction Potential	mV	98.2
UA	G308	C	2023/08/10	Oxidation Reduction Potential	mV	-3.00
UA	G308	C	2023/11/17	Oxidation Reduction Potential	mV	5.00
UA	G308	C	2021/03/29	Eh	V	0.41

UA	G308	C	2021/04/21	Eh	V	0.23
UA	G308	C	2021/05/05	Eh	V	0.30
UA	G308	C	2021/05/17	Eh	V	0.24
UA	G308	C	2021/06/14	Eh	V	0.18
UA	G308	C	2021/06/28	Eh	V	0.22
UA	G308	C	2021/07/14	Eh	V	0.31
UA	G308	C	2021/07/27	Eh	V	0.23
UA	G308	C	2023/02/16	Eh	V	0.48
UA	G308	C	2023/06/01	Eh	V	0.29
UA	G308	C	2023/08/10	Eh	V	0.19
UA	G308	C	2023/11/17	Eh	V	0.20
UA	G308	C	2021/03/29	Alkalinity, bicarbonate	mg/L CaCO3	210
UA	G308	C	2021/04/21	Alkalinity, bicarbonate	mg/L CaCO3	210
UA	G308	C	2021/05/05	Alkalinity, bicarbonate	mg/L CaCO3	200
UA	G308	C	2021/05/17	Alkalinity, bicarbonate	mg/L CaCO3	200
UA	G308	C	2021/06/14	Alkalinity, bicarbonate	mg/L CaCO3	200
UA	G308	C	2021/06/28	Alkalinity, bicarbonate	mg/L CaCO3	210
UA	G308	C	2021/07/14	Alkalinity, bicarbonate	mg/L CaCO3	200
UA	G308	C	2021/07/27	Alkalinity, bicarbonate	mg/L CaCO3	220
UA	G308	C	2023/02/16	Alkalinity, bicarbonate	mg/L CaCO3	210
UA	G308	C	2023/06/01	Alkalinity, bicarbonate	mg/L CaCO3	220
UA	G308	C	2023/08/10	Alkalinity, bicarbonate	mg/L CaCO3	252
UA	G308	C	2023/11/17	Alkalinity, bicarbonate	mg/L CaCO3	246
UA	G308	C	2021/03/29	Barium, total	mg/L	0.0240
UA	G308	C	2021/04/21	Barium, total	mg/L	0.0220
UA	G308	C	2021/05/05	Barium, total	mg/L	0.0230
UA	G308	C	2021/05/17	Barium, total	mg/L	0.0210
UA	G308	C	2021/06/14	Barium, total	mg/L	0.0220
UA	G308	C	2021/06/28	Barium, total	mg/L	0.0250
UA	G308	C	2021/07/14	Barium, total	mg/L	0.0210
UA	G308	C	2021/07/27	Barium, total	mg/L	0.0220
UA	G308	C	2023/02/16	Barium, total	mg/L	0.0180
UA	G308	C	2023/06/01	Barium, total	mg/L	0.0210
UA	G308	C	2023/08/10	Barium, total	mg/L	0.0222
UA	G308	C	2023/11/17	Barium, total	mg/L	0.0270
UA	G308	C	2021/03/29	Boron, total	mg/L	2.40
UA	G308	C	2021/04/21	Boron, total	mg/L	2.50
UA	G308	C	2021/05/05	Boron, total	mg/L	2.80
UA	G308	C	2021/05/17	Boron, total	mg/L	2.50
UA	G308	C	2021/06/14	Boron, total	mg/L	2.40
UA	G308	C	2021/06/28	Boron, total	mg/L	2.50
UA	G308	C	2021/07/14	Boron, total	mg/L	2.60
UA	G308	C	2021/07/27	Boron, total	mg/L	2.70
UA	G308	C	2023/02/16	Boron, total	mg/L	2.40
UA	G308	C	2023/06/01	Boron, total	mg/L	2.70
UA	G308	C	2023/08/10	Boron, total	mg/L	2.64
UA	G308	C	2023/11/17	Boron, total	mg/L	2.88
UA	G308	C	2021/03/29	Calcium, total	mg/L	210
UA	G308	C	2021/04/21	Calcium, total	mg/L	210
UA	G308	C	2021/05/05	Calcium, total	mg/L	220
UA	G308	C	2021/05/17	Calcium, total	mg/L	220
UA	G308	C	2021/06/14	Calcium, total	mg/L	230
UA	G308	C	2021/06/28	Calcium, total	mg/L	220
UA	G308	C	2021/07/14	Calcium, total	mg/L	210
UA	G308	C	2021/07/27	Calcium, total	mg/L	190
UA	G308	C	2023/02/16	Calcium, total	mg/L	190
UA	G308	C	2023/06/01	Calcium, total	mg/L	200
UA	G308	C	2023/08/10	Calcium, total	mg/L	196
UA	G308	C	2023/11/17	Calcium, total	mg/L	189
UA	G308	C	2021/03/29	Chloride, total	mg/L	17.0
UA	G308	C	2021/04/21	Chloride, total	mg/L	19.0
UA	G308	C	2021/05/05	Chloride, total	mg/L	19.0

UA	G308	C	2021/05/17	Chloride, total	mg/L	20.0
UA	G308	C	2021/06/14	Chloride, total	mg/L	18.0
UA	G308	C	2021/06/28	Chloride, total	mg/L	18.0
UA	G308	C	2021/07/14	Chloride, total	mg/L	17.0
UA	G308	C	2021/07/27	Chloride, total	mg/L	17.0
UA	G308	C	2023/02/16	Chloride, total	mg/L	<240
UA	G308	C	2023/06/01	Chloride, total	mg/L	14.0
UA	G308	C	2023/08/10	Chloride, total	mg/L	10.0
UA	G308	C	2023/11/17	Chloride, total	mg/L	10.0
UA	G308	C	2023/06/01	Ferrous Iron, dissolved	mg/L	0.0850
UA	G308	C	2023/06/01	Iron, dissolved	mg/L	0.00570
UA	G308	C	2023/08/10	Iron, dissolved	mg/L	0.0120
UA	G308	C	2021/03/29	Magnesium, total	mg/L	130
UA	G308	C	2021/04/21	Magnesium, total	mg/L	130
UA	G308	C	2021/05/05	Magnesium, total	mg/L	140
UA	G308	C	2021/05/17	Magnesium, total	mg/L	130
UA	G308	C	2021/06/14	Magnesium, total	mg/L	140
UA	G308	C	2021/06/28	Magnesium, total	mg/L	130
UA	G308	C	2021/07/14	Magnesium, total	mg/L	130
UA	G308	C	2021/07/27	Magnesium, total	mg/L	120
UA	G308	C	2023/02/16	Magnesium, total	mg/L	120
UA	G308	C	2023/06/01	Magnesium, total	mg/L	120
UA	G308	C	2023/08/10	Magnesium, total	mg/L	115
UA	G308	C	2023/11/17	Magnesium, total	mg/L	109
UA	G308	C	2023/06/01	Manganese, dissolved	mg/L	0.320
UA	G308	C	2023/08/10	Manganese, dissolved	mg/L	0.353
UA	G308	C	2023/08/10	Phosphate, dissolved	mg/L	0.0210
UA	G308	C	2021/03/29	Potassium, total	mg/L	0.400
UA	G308	C	2021/04/21	Potassium, total	mg/L	0.310
UA	G308	C	2021/05/05	Potassium, total	mg/L	0.950
UA	G308	C	2021/05/17	Potassium, total	mg/L	0.320
UA	G308	C	2021/06/14	Potassium, total	mg/L	0.370
UA	G308	C	2021/06/28	Potassium, total	mg/L	3.40
UA	G308	C	2021/07/14	Potassium, total	mg/L	0.320
UA	G308	C	2021/07/27	Potassium, total	mg/L	0.250
UA	G308	C	2023/02/16	Potassium, total	mg/L	0.350
UA	G308	C	2023/06/01	Potassium, total	mg/L	0.360
UA	G308	C	2023/08/10	Potassium, total	mg/L	0.460
UA	G308	C	2023/11/17	Potassium, total	mg/L	0.495
UA	G308	C	2023/06/01	Silicon, dissolved	mg/L	11.0
UA	G308	C	2023/08/10	Silicon, dissolved	mg/L	11.2
UA	G308	C	2021/03/29	Sodium, total	mg/L	160
UA	G308	C	2021/04/21	Sodium, total	mg/L	160
UA	G308	C	2021/05/05	Sodium, total	mg/L	180
UA	G308	C	2021/05/17	Sodium, total	mg/L	160
UA	G308	C	2021/06/14	Sodium, total	mg/L	180
UA	G308	C	2021/06/28	Sodium, total	mg/L	160
UA	G308	C	2021/07/14	Sodium, total	mg/L	170
UA	G308	C	2021/07/27	Sodium, total	mg/L	150
UA	G308	C	2023/02/16	Sodium, total	mg/L	150
UA	G308	C	2023/06/01	Sodium, total	mg/L	150
UA	G308	C	2023/08/10	Sodium, total	mg/L	152
UA	G308	C	2023/11/17	Sodium, total	mg/L	134
UA	G308	C	2021/03/29	Sulfate, total	mg/L	1,100
UA	G308	C	2021/04/21	Sulfate, total	mg/L	1,100
UA	G308	C	2021/05/05	Sulfate, total	mg/L	1,200
UA	G308	C	2021/05/17	Sulfate, total	mg/L	1,200
UA	G308	C	2021/06/14	Sulfate, total	mg/L	1,100
UA	G308	C	2021/06/28	Sulfate, total	mg/L	1,100
UA	G308	C	2021/07/14	Sulfate, total	mg/L	1,100
UA	G308	C	2021/07/27	Sulfate, total	mg/L	1,100
UA	G308	C	2023/02/16	Sulfate, total	mg/L	960

UA	G308	C	2023/06/01	Sulfate, total	mg/L	1,000
UA	G308	C	2023/08/10	Sulfate, total	mg/L	996
UA	G308	C	2023/11/17	Sulfate, total	mg/L	936
UA	G308	C	2021/03/29	Temperature (Celsius)	degrees C	13.5
UA	G308	C	2021/04/21	Temperature (Celsius)	degrees C	11.6
UA	G308	C	2021/05/05	Temperature (Celsius)	degrees C	13.6
UA	G308	C	2021/05/17	Temperature (Celsius)	degrees C	13.9
UA	G308	C	2021/06/14	Temperature (Celsius)	degrees C	19.0
UA	G308	C	2021/06/28	Temperature (Celsius)	degrees C	20.3
UA	G308	C	2021/07/14	Temperature (Celsius)	degrees C	17.3
UA	G308	C	2021/07/27	Temperature (Celsius)	degrees C	22.6
UA	G308	C	2023/02/16	Temperature (Celsius)	degrees C	9.50
UA	G308	C	2023/06/01	Temperature (Celsius)	degrees C	16.8
UA	G308	C	2023/08/10	Temperature (Celsius)	degrees C	16.2
UA	G308	C	2023/11/17	Temperature (Celsius)	degrees C	16.0
UA	G308	C	2021/03/29	Total Dissolved Solids	mg/L	1,900
UA	G308	C	2021/04/21	Total Dissolved Solids	mg/L	2,000
UA	G308	C	2021/05/05	Total Dissolved Solids	mg/L	1,800
UA	G308	C	2021/05/17	Total Dissolved Solids	mg/L	1,900
UA	G308	C	2021/06/14	Total Dissolved Solids	mg/L	1,900
UA	G308	C	2021/06/28	Total Dissolved Solids	mg/L	1,800
UA	G308	C	2021/07/14	Total Dissolved Solids	mg/L	1,900
UA	G308	C	2021/07/27	Total Dissolved Solids	mg/L	1,900
UA	G308	C	2023/02/16	Total Dissolved Solids	mg/L	1,800
UA	G308	C	2023/06/01	Total Dissolved Solids	mg/L	1,800
UA	G308	C	2023/08/10	Total Dissolved Solids	mg/L	1,760
UA	G308	C	2023/11/17	Total Dissolved Solids	mg/L	1,640
UA	G310	C	2021/03/29	pH (field)	SU	7.1
UA	G310	C	2021/04/22	pH (field)	SU	7.0
UA	G310	C	2021/05/04	pH (field)	SU	7.2
UA	G310	C	2021/05/19	pH (field)	SU	7.2
UA	G310	C	2021/06/15	pH (field)	SU	7.2
UA	G310	C	2021/06/28	pH (field)	SU	7.1
UA	G310	C	2021/07/13	pH (field)	SU	7.2
UA	G310	C	2021/07/28	pH (field)	SU	7.2
UA	G310	C	2023/02/16	pH (field)	SU	7.2
UA	G310	C	2023/06/01	pH (field)	SU	7.2
UA	G310	C	2023/08/09	pH (field)	SU	6.8
UA	G310	C	2023/11/20	pH (field)	SU	6.8
UA	G310	C	2021/03/29	Oxidation Reduction Potential	mV	214
UA	G310	C	2021/04/22	Oxidation Reduction Potential	mV	102
UA	G310	C	2021/05/04	Oxidation Reduction Potential	mV	153
UA	G310	C	2021/05/19	Oxidation Reduction Potential	mV	100
UA	G310	C	2021/06/15	Oxidation Reduction Potential	mV	181
UA	G310	C	2021/06/28	Oxidation Reduction Potential	mV	44.5
UA	G310	C	2021/07/13	Oxidation Reduction Potential	mV	65.5
UA	G310	C	2021/07/28	Oxidation Reduction Potential	mV	51.3
UA	G310	C	2023/02/16	Oxidation Reduction Potential	mV	305
UA	G310	C	2023/06/01	Oxidation Reduction Potential	mV	114
UA	G310	C	2023/08/09	Oxidation Reduction Potential	mV	99.0
UA	G310	C	2023/11/20	Oxidation Reduction Potential	mV	86.0
UA	G310	C	2021/03/29	Eh	V	0.41
UA	G310	C	2021/04/22	Eh	V	0.30
UA	G310	C	2021/05/04	Eh	V	0.35
UA	G310	C	2021/05/19	Eh	V	0.30
UA	G310	C	2021/06/15	Eh	V	0.38
UA	G310	C	2021/06/28	Eh	V	0.24
UA	G310	C	2021/07/13	Eh	V	0.26
UA	G310	C	2021/07/28	Eh	V	0.24
UA	G310	C	2023/02/16	Eh	V	0.50
UA	G310	C	2023/06/01	Eh	V	0.31
UA	G310	C	2023/08/09	Eh	V	0.29

UA	G310	C	2023/11/20	Eh	V	0.28
UA	G310	C	2021/03/29	Alkalinity, bicarbonate	mg/L CaCO3	220
UA	G310	C	2021/04/22	Alkalinity, bicarbonate	mg/L CaCO3	210
UA	G310	C	2021/05/04	Alkalinity, bicarbonate	mg/L CaCO3	220
UA	G310	C	2021/05/19	Alkalinity, bicarbonate	mg/L CaCO3	210
UA	G310	C	2021/06/15	Alkalinity, bicarbonate	mg/L CaCO3	200
UA	G310	C	2021/06/28	Alkalinity, bicarbonate	mg/L CaCO3	210
UA	G310	C	2021/07/13	Alkalinity, bicarbonate	mg/L CaCO3	210
UA	G310	C	2021/07/28	Alkalinity, bicarbonate	mg/L CaCO3	220
UA	G310	C	2023/02/16	Alkalinity, bicarbonate	mg/L CaCO3	250
UA	G310	C	2023/06/01	Alkalinity, bicarbonate	mg/L CaCO3	240
UA	G310	C	2023/08/09	Alkalinity, bicarbonate	mg/L CaCO3	244
UA	G310	C	2023/11/20	Alkalinity, bicarbonate	mg/L CaCO3	253
UA	G310	C	2021/03/29	Barium, total	mg/L	0.0160
UA	G310	C	2021/04/22	Barium, total	mg/L	0.0220
UA	G310	C	2021/05/04	Barium, total	mg/L	0.0190
UA	G310	C	2021/05/19	Barium, total	mg/L	0.0160
UA	G310	C	2021/06/15	Barium, total	mg/L	0.0180
UA	G310	C	2021/06/28	Barium, total	mg/L	0.0180
UA	G310	C	2021/07/13	Barium, total	mg/L	0.0180
UA	G310	C	2021/07/28	Barium, total	mg/L	0.0170
UA	G310	C	2023/02/16	Barium, total	mg/L	0.0130
UA	G310	C	2023/06/01	Barium, total	mg/L	0.0140
UA	G310	C	2023/08/09	Barium, total	mg/L	0.0147
UA	G310	C	2023/11/20	Barium, total	mg/L	0.0148
UA	G310	C	2021/03/29	Boron, total	mg/L	1.60
UA	G310	C	2021/04/22	Boron, total	mg/L	1.70
UA	G310	C	2021/05/04	Boron, total	mg/L	1.80
UA	G310	C	2021/05/19	Boron, total	mg/L	1.70
UA	G310	C	2021/06/15	Boron, total	mg/L	2.00
UA	G310	C	2021/06/28	Boron, total	mg/L	1.80
UA	G310	C	2021/07/13	Boron, total	mg/L	2.00
UA	G310	C	2021/07/28	Boron, total	mg/L	1.80
UA	G310	C	2023/02/16	Boron, total	mg/L	1.70
UA	G310	C	2023/06/01	Boron, total	mg/L	1.70
UA	G310	C	2023/08/09	Boron, total	mg/L	1.95
UA	G310	C	2023/11/20	Boron, total	mg/L	2.08
UA	G310	C	2021/03/29	Calcium, total	mg/L	170
UA	G310	C	2021/04/22	Calcium, total	mg/L	190
UA	G310	C	2021/05/04	Calcium, total	mg/L	190
UA	G310	C	2021/05/19	Calcium, total	mg/L	180
UA	G310	C	2021/06/15	Calcium, total	mg/L	200
UA	G310	C	2021/06/28	Calcium, total	mg/L	190
UA	G310	C	2021/07/13	Calcium, total	mg/L	180
UA	G310	C	2021/07/28	Calcium, total	mg/L	190
UA	G310	C	2023/02/16	Calcium, total	mg/L	130
UA	G310	C	2023/06/01	Calcium, total	mg/L	150
UA	G310	C	2023/08/09	Calcium, total	mg/L	158
UA	G310	C	2023/11/20	Calcium, total	mg/L	159
UA	G310	C	2021/03/29	Chloride, total	mg/L	20.0
UA	G310	C	2021/04/22	Chloride, total	mg/L	22.0
UA	G310	C	2021/05/04	Chloride, total	mg/L	20.0
UA	G310	C	2021/05/19	Chloride, total	mg/L	22.0
UA	G310	C	2021/06/15	Chloride, total	mg/L	21.0
UA	G310	C	2021/06/28	Chloride, total	mg/L	21.0
UA	G310	C	2021/07/13	Chloride, total	mg/L	24.0
UA	G310	C	2021/07/28	Chloride, total	mg/L	21.0
UA	G310	C	2023/02/16	Chloride, total	mg/L	13.0
UA	G310	C	2023/06/01	Chloride, total	mg/L	14.0
UA	G310	C	2023/08/09	Chloride, total	mg/L	14.0
UA	G310	C	2023/11/20	Chloride, total	mg/L	13.0
UA	G310	C	2023/06/01	Ferrous Iron, dissolved	mg/L	<0.02

UA	G310	C	2023/06/01	Iron, dissolved	mg/L	0.00210
UA	G310	C	2023/08/09	Iron, dissolved	mg/L	<0.0115
UA	G310	C	2021/03/29	Magnesium, total	mg/L	59.0
UA	G310	C	2021/04/22	Magnesium, total	mg/L	68.0
UA	G310	C	2021/05/04	Magnesium, total	mg/L	64.0
UA	G310	C	2021/05/19	Magnesium, total	mg/L	63.0
UA	G310	C	2021/06/15	Magnesium, total	mg/L	68.0
UA	G310	C	2021/06/28	Magnesium, total	mg/L	66.0
UA	G310	C	2021/07/13	Magnesium, total	mg/L	64.0
UA	G310	C	2021/07/28	Magnesium, total	mg/L	69.0
UA	G310	C	2023/02/16	Magnesium, total	mg/L	47.0
UA	G310	C	2023/06/01	Magnesium, total	mg/L	49.0
UA	G310	C	2023/08/09	Magnesium, total	mg/L	52.6
UA	G310	C	2023/11/20	Magnesium, total	mg/L	51.9
UA	G310	C	2023/06/01	Manganese, dissolved	mg/L	0.310
UA	G310	C	2023/08/09	Manganese, dissolved	mg/L	0.336
UA	G310	C	2023/08/09	Phosphate, dissolved	mg/L	0.0180
UA	G310	C	2021/03/29	Potassium, total	mg/L	0.310
UA	G310	C	2021/04/22	Potassium, total	mg/L	0.350
UA	G310	C	2021/05/04	Potassium, total	mg/L	0.360
UA	G310	C	2021/05/19	Potassium, total	mg/L	0.190
UA	G310	C	2021/06/15	Potassium, total	mg/L	0.330
UA	G310	C	2021/06/28	Potassium, total	mg/L	0.300
UA	G310	C	2021/07/13	Potassium, total	mg/L	0.300
UA	G310	C	2021/07/28	Potassium, total	mg/L	0.340
UA	G310	C	2023/02/16	Potassium, total	mg/L	0.280
UA	G310	C	2023/06/01	Potassium, total	mg/L	0.260
UA	G310	C	2023/08/09	Potassium, total	mg/L	0.342
UA	G310	C	2023/11/20	Potassium, total	mg/L	0.356
UA	G310	C	2023/06/01	Silicon, dissolved	mg/L	9.60
UA	G310	C	2023/08/09	Silicon, dissolved	mg/L	9.76
UA	G310	C	2021/03/29	Sodium, total	mg/L	170
UA	G310	C	2021/04/22	Sodium, total	mg/L	180
UA	G310	C	2021/05/04	Sodium, total	mg/L	170
UA	G310	C	2021/05/19	Sodium, total	mg/L	180
UA	G310	C	2021/06/15	Sodium, total	mg/L	190
UA	G310	C	2021/06/28	Sodium, total	mg/L	170
UA	G310	C	2021/07/13	Sodium, total	mg/L	170
UA	G310	C	2021/07/28	Sodium, total	mg/L	170
UA	G310	C	2023/02/16	Sodium, total	mg/L	150
UA	G310	C	2023/06/01	Sodium, total	mg/L	150
UA	G310	C	2023/08/09	Sodium, total	mg/L	144
UA	G310	C	2023/11/20	Sodium, total	mg/L	149
UA	G310	C	2021/03/29	Sulfate, total	mg/L	910
UA	G310	C	2021/04/22	Sulfate, total	mg/L	2,300
UA	G310	C	2021/05/04	Sulfate, total	mg/L	870
UA	G310	C	2021/05/19	Sulfate, total	mg/L	860
UA	G310	C	2021/06/15	Sulfate, total	mg/L	860
UA	G310	C	2021/06/28	Sulfate, total	mg/L	820
UA	G310	C	2021/07/13	Sulfate, total	mg/L	420
UA	G310	C	2021/07/28	Sulfate, total	mg/L	880
UA	G310	C	2023/02/16	Sulfate, total	mg/L	550
UA	G310	C	2023/06/01	Sulfate, total	mg/L	620
UA	G310	C	2023/08/09	Sulfate, total	mg/L	611
UA	G310	C	2023/11/20	Sulfate, total	mg/L	636
UA	G310	C	2021/03/29	Temperature (Celsius)	degrees C	14.0
UA	G310	C	2021/04/22	Temperature (Celsius)	degrees C	13.2
UA	G310	C	2021/05/04	Temperature (Celsius)	degrees C	12.9
UA	G310	C	2021/05/19	Temperature (Celsius)	degrees C	14.9
UA	G310	C	2021/06/15	Temperature (Celsius)	degrees C	15.8
UA	G310	C	2021/06/28	Temperature (Celsius)	degrees C	17.3
UA	G310	C	2021/07/13	Temperature (Celsius)	degrees C	18.8

UA	G310	C	2021/07/28	Temperature (Celsius)	degrees C	18.9
UA	G310	C	2023/02/16	Temperature (Celsius)	degrees C	9.90
UA	G310	C	2023/06/01	Temperature (Celsius)	degrees C	17.1
UA	G310	C	2023/08/09	Temperature (Celsius)	degrees C	15.5
UA	G310	C	2023/11/20	Temperature (Celsius)	degrees C	15.7
UA	G310	C	2021/03/29	Total Dissolved Solids	mg/L	1,400
UA	G310	C	2021/04/22	Total Dissolved Solids	mg/L	1,500
UA	G310	C	2021/05/04	Total Dissolved Solids	mg/L	1,600
UA	G310	C	2021/05/19	Total Dissolved Solids	mg/L	1,500
UA	G310	C	2021/06/15	Total Dissolved Solids	mg/L	1,500
UA	G310	C	2021/06/28	Total Dissolved Solids	mg/L	1,500
UA	G310	C	2021/07/13	Total Dissolved Solids	mg/L	1,600
UA	G310	C	2021/07/28	Total Dissolved Solids	mg/L	1,600
UA	G310	C	2023/02/16	Total Dissolved Solids	mg/L	1,100
UA	G310	C	2023/06/01	Total Dissolved Solids	mg/L	1,100
UA	G310	C	2023/08/09	Total Dissolved Solids	mg/L	1,160
UA	G310	C	2023/11/20	Total Dissolved Solids	mg/L	1,210
UA	G312	C	2021/03/30	pH (field)	SU	6.5
UA	G312	C	2021/04/22	pH (field)	SU	6.4
UA	G312	C	2021/05/04	pH (field)	SU	6.5
UA	G312	C	2021/05/19	pH (field)	SU	6.4
UA	G312	C	2021/06/15	pH (field)	SU	6.5
UA	G312	C	2021/06/29	pH (field)	SU	6.5
UA	G312	C	2021/07/13	pH (field)	SU	6.3
UA	G312	C	2021/07/27	pH (field)	SU	6.5
UA	G312	C	2023/06/01	pH (field)	SU	6.5
UA	G312	C	2023/08/09	pH (field)	SU	6.1
UA	G312	C	2021/03/30	Oxidation Reduction Potential	mV	421
UA	G312	C	2021/04/22	Oxidation Reduction Potential	mV	114
UA	G312	C	2021/05/04	Oxidation Reduction Potential	mV	136
UA	G312	C	2021/05/19	Oxidation Reduction Potential	mV	142
UA	G312	C	2021/06/15	Oxidation Reduction Potential	mV	130
UA	G312	C	2021/06/29	Oxidation Reduction Potential	mV	138
UA	G312	C	2021/07/13	Oxidation Reduction Potential	mV	112
UA	G312	C	2021/07/27	Oxidation Reduction Potential	mV	85.5
UA	G312	C	2023/06/01	Oxidation Reduction Potential	mV	150
UA	G312	C	2023/08/09	Oxidation Reduction Potential	mV	3.00
UA	G312	C	2021/03/30	Eh	V	0.62
UA	G312	C	2021/04/22	Eh	V	0.31
UA	G312	C	2021/05/04	Eh	V	0.33
UA	G312	C	2021/05/19	Eh	V	0.34
UA	G312	C	2021/06/15	Eh	V	0.32
UA	G312	C	2021/06/29	Eh	V	0.33
UA	G312	C	2021/07/13	Eh	V	0.30
UA	G312	C	2021/07/27	Eh	V	0.28
UA	G312	C	2023/06/01	Eh	V	0.34
UA	G312	C	2023/08/09	Eh	V	0.20
UA	G312	C	2021/03/30	Alkalinity, bicarbonate	mg/L CaCO3	410
UA	G312	C	2021/04/22	Alkalinity, bicarbonate	mg/L CaCO3	420
UA	G312	C	2021/05/04	Alkalinity, bicarbonate	mg/L CaCO3	490
UA	G312	C	2021/05/19	Alkalinity, bicarbonate	mg/L CaCO3	460
UA	G312	C	2021/06/15	Alkalinity, bicarbonate	mg/L CaCO3	490
UA	G312	C	2021/06/29	Alkalinity, bicarbonate	mg/L CaCO3	460
UA	G312	C	2021/07/13	Alkalinity, bicarbonate	mg/L CaCO3	480
UA	G312	C	2021/07/27	Alkalinity, bicarbonate	mg/L CaCO3	350
UA	G312	C	2023/06/01	Alkalinity, bicarbonate	mg/L CaCO3	450
UA	G312	C	2023/08/09	Alkalinity, bicarbonate	mg/L CaCO3	566
UA	G312	C	2021/03/30	Barium, total	mg/L	0.0230
UA	G312	C	2021/04/22	Barium, total	mg/L	0.0250
UA	G312	C	2021/05/04	Barium, total	mg/L	0.0300
UA	G312	C	2021/05/19	Barium, total	mg/L	0.0250
UA	G312	C	2021/06/15	Barium, total	mg/L	0.0260

UA	G312	C	2021/06/29	Barium, total	mg/L	0.0290
UA	G312	C	2021/07/13	Barium, total	mg/L	0.0280
UA	G312	C	2021/07/27	Barium, total	mg/L	0.0230
UA	G312	C	2023/06/01	Barium, total	mg/L	0.0290
UA	G312	C	2023/08/09	Barium, total	mg/L	0.0306
UA	G312	C	2021/03/30	Boron, total	mg/L	1.50
UA	G312	C	2021/04/22	Boron, total	mg/L	1.60
UA	G312	C	2021/05/04	Boron, total	mg/L	1.70
UA	G312	C	2021/05/19	Boron, total	mg/L	1.40
UA	G312	C	2021/06/15	Boron, total	mg/L	1.60
UA	G312	C	2021/06/29	Boron, total	mg/L	1.80
UA	G312	C	2021/07/13	Boron, total	mg/L	2.20
UA	G312	C	2021/07/27	Boron, total	mg/L	3.50
UA	G312	C	2023/06/01	Boron, total	mg/L	1.30
UA	G312	C	2023/08/09	Boron, total	mg/L	3.51
UA	G312	C	2021/03/30	Calcium, total	mg/L	190
UA	G312	C	2021/04/22	Calcium, total	mg/L	200
UA	G312	C	2021/05/04	Calcium, total	mg/L	210
UA	G312	C	2021/05/19	Calcium, total	mg/L	190
UA	G312	C	2021/06/15	Calcium, total	mg/L	220
UA	G312	C	2021/06/29	Calcium, total	mg/L	210
UA	G312	C	2021/07/13	Calcium, total	mg/L	200
UA	G312	C	2021/07/27	Calcium, total	mg/L	240
UA	G312	C	2023/06/01	Calcium, total	mg/L	160
UA	G312	C	2023/08/09	Calcium, total	mg/L	242
UA	G312	C	2021/03/30	Chloride, total	mg/L	20.0
UA	G312	C	2021/04/22	Chloride, total	mg/L	20.0
UA	G312	C	2021/05/04	Chloride, total	mg/L	25.0
UA	G312	C	2021/05/19	Chloride, total	mg/L	26.0
UA	G312	C	2021/06/15	Chloride, total	mg/L	26.0
UA	G312	C	2021/06/29	Chloride, total	mg/L	27.0
UA	G312	C	2021/07/13	Chloride, total	mg/L	26.0
UA	G312	C	2021/07/27	Chloride, total	mg/L	22.0
UA	G312	C	2023/06/01	Chloride, total	mg/L	23.0
UA	G312	C	2023/08/09	Chloride, total	mg/L	31.0
UA	G312	C	2023/06/01	Ferrous Iron, dissolved	mg/L	<0.02
UA	G312	C	2023/06/01	Iron, dissolved	mg/L	0.00620
UA	G312	C	2023/08/09	Iron, dissolved	mg/L	0.0240
UA	G312	C	2021/03/30	Magnesium, total	mg/L	120
UA	G312	C	2021/04/22	Magnesium, total	mg/L	130
UA	G312	C	2021/05/04	Magnesium, total	mg/L	130
UA	G312	C	2021/05/19	Magnesium, total	mg/L	120
UA	G312	C	2021/06/15	Magnesium, total	mg/L	120
UA	G312	C	2021/06/29	Magnesium, total	mg/L	130
UA	G312	C	2021/07/13	Magnesium, total	mg/L	120
UA	G312	C	2021/07/27	Magnesium, total	mg/L	170
UA	G312	C	2023/06/01	Magnesium, total	mg/L	100
UA	G312	C	2023/08/09	Magnesium, total	mg/L	176
UA	G312	C	2023/06/01	Manganese, dissolved	mg/L	3.00
UA	G312	C	2023/08/09	Manganese, dissolved	mg/L	4.68
UA	G312	C	2023/08/09	Phosphate, dissolved	mg/L	0.0250
UA	G312	C	2021/03/30	Potassium, total	mg/L	0.490
UA	G312	C	2021/04/22	Potassium, total	mg/L	0.670
UA	G312	C	2021/05/04	Potassium, total	mg/L	0.630
UA	G312	C	2021/05/19	Potassium, total	mg/L	0.400
UA	G312	C	2021/06/15	Potassium, total	mg/L	0.550
UA	G312	C	2021/06/29	Potassium, total	mg/L	0.560
UA	G312	C	2021/07/13	Potassium, total	mg/L	0.550
UA	G312	C	2021/07/27	Potassium, total	mg/L	0.650
UA	G312	C	2023/06/01	Potassium, total	mg/L	0.430
UA	G312	C	2023/08/09	Potassium, total	mg/L	0.850
UA	G312	C	2023/06/01	Silicon, dissolved	mg/L	11.0

UA	G312	C	2023/08/09	Silicon, dissolved	mg/L	12.0
UA	G312	C	2021/03/30	Sodium, total	mg/L	82.0
UA	G312	C	2021/04/22	Sodium, total	mg/L	85.0
UA	G312	C	2021/05/04	Sodium, total	mg/L	91.0
UA	G312	C	2021/05/19	Sodium, total	mg/L	81.0
UA	G312	C	2021/06/15	Sodium, total	mg/L	91.0
UA	G312	C	2021/06/29	Sodium, total	mg/L	95.0
UA	G312	C	2021/07/13	Sodium, total	mg/L	93.0
UA	G312	C	2021/07/27	Sodium, total	mg/L	140
UA	G312	C	2023/06/01	Sodium, total	mg/L	71.0
UA	G312	C	2023/08/09	Sodium, total	mg/L	139
UA	G312	C	2021/03/30	Sulfate, total	mg/L	600
UA	G312	C	2021/04/22	Sulfate, total	mg/L	650
UA	G312	C	2021/05/04	Sulfate, total	mg/L	920
UA	G312	C	2021/05/19	Sulfate, total	mg/L	1,000
UA	G312	C	2021/06/15	Sulfate, total	mg/L	920
UA	G312	C	2021/06/29	Sulfate, total	mg/L	890
UA	G312	C	2021/07/13	Sulfate, total	mg/L	930
UA	G312	C	2021/07/27	Sulfate, total	mg/L	800
UA	G312	C	2023/06/01	Sulfate, total	mg/L	750
UA	G312	C	2023/08/09	Sulfate, total	mg/L	965
UA	G312	C	2021/03/30	Temperature (Celsius)	degrees C	12.4
UA	G312	C	2021/04/22	Temperature (Celsius)	degrees C	13.0
UA	G312	C	2021/05/04	Temperature (Celsius)	degrees C	13.0
UA	G312	C	2021/05/19	Temperature (Celsius)	degrees C	15.8
UA	G312	C	2021/06/15	Temperature (Celsius)	degrees C	17.2
UA	G312	C	2021/06/29	Temperature (Celsius)	degrees C	21.2
UA	G312	C	2021/07/13	Temperature (Celsius)	degrees C	19.5
UA	G312	C	2021/07/27	Temperature (Celsius)	degrees C	18.2
UA	G312	C	2023/06/01	Temperature (Celsius)	degrees C	17.6
UA	G312	C	2023/08/09	Temperature (Celsius)	degrees C	16.6
UA	G312	C	2021/03/30	Total Dissolved Solids	mg/L	1,300
UA	G312	C	2021/04/22	Total Dissolved Solids	mg/L	1,400
UA	G312	C	2021/05/04	Total Dissolved Solids	mg/L	1,600
UA	G312	C	2021/05/19	Total Dissolved Solids	mg/L	1,700
UA	G312	C	2021/06/15	Total Dissolved Solids	mg/L	1,800
UA	G312	C	2021/06/29	Total Dissolved Solids	mg/L	1,600
UA	G312	C	2021/07/13	Total Dissolved Solids	mg/L	1,900
UA	G312	C	2021/07/27	Total Dissolved Solids	mg/L	1,800
UA	G312	C	2023/06/01	Total Dissolved Solids	mg/L	1,700
UA	G312	C	2023/08/09	Total Dissolved Solids	mg/L	2,010
UA	G313	C	2021/03/30	pH (field)	SU	6.9
UA	G313	C	2021/04/22	pH (field)	SU	6.8
UA	G313	C	2021/05/04	pH (field)	SU	7.0
UA	G313	C	2021/05/18	pH (field)	SU	7.0
UA	G313	C	2021/06/14	pH (field)	SU	7.1
UA	G313	C	2021/06/28	pH (field)	SU	7.0
UA	G313	C	2021/07/13	pH (field)	SU	6.9
UA	G313	C	2021/07/27	pH (field)	SU	6.9
UA	G313	C	2023/02/16	pH (field)	SU	6.9
UA	G313	C	2023/06/06	pH (field)	SU	6.9
UA	G313	C	2023/08/09	pH (field)	SU	6.7
UA	G313	C	2023/11/20	pH (field)	SU	6.7
UA	G313	C	2021/03/30	Oxidation Reduction Potential	mV	243
UA	G313	C	2021/04/22	Oxidation Reduction Potential	mV	97.7
UA	G313	C	2021/05/04	Oxidation Reduction Potential	mV	81.4
UA	G313	C	2021/05/18	Oxidation Reduction Potential	mV	38.5
UA	G313	C	2021/06/14	Oxidation Reduction Potential	mV	17.7
UA	G313	C	2021/06/28	Oxidation Reduction Potential	mV	46.3
UA	G313	C	2021/07/13	Oxidation Reduction Potential	mV	17.8
UA	G313	C	2021/07/27	Oxidation Reduction Potential	mV	13.8
UA	G313	C	2023/02/16	Oxidation Reduction Potential	mV	236

UA	G313	C	2023/06/06	Oxidation Reduction Potential	mV	38.2
UA	G313	C	2023/08/09	Oxidation Reduction Potential	mV	-36.0
UA	G313	C	2023/11/20	Oxidation Reduction Potential	mV	6.00
UA	G313	C	2021/03/30	Eh	V	0.44
UA	G313	C	2021/04/22	Eh	V	0.30
UA	G313	C	2021/05/04	Eh	V	0.28
UA	G313	C	2021/05/18	Eh	V	0.23
UA	G313	C	2021/06/14	Eh	V	0.21
UA	G313	C	2021/06/28	Eh	V	0.24
UA	G313	C	2021/07/13	Eh	V	0.21
UA	G313	C	2021/07/27	Eh	V	0.20
UA	G313	C	2023/02/16	Eh	V	0.44
UA	G313	C	2023/06/06	Eh	V	0.23
UA	G313	C	2023/08/09	Eh	V	0.16
UA	G313	C	2023/11/20	Eh	V	0.20
UA	G313	C	2021/03/30	Alkalinity, bicarbonate	mg/L CaCO3	500
UA	G313	C	2021/04/22	Alkalinity, bicarbonate	mg/L CaCO3	490
UA	G313	C	2021/05/04	Alkalinity, bicarbonate	mg/L CaCO3	480
UA	G313	C	2021/05/18	Alkalinity, bicarbonate	mg/L CaCO3	480
UA	G313	C	2021/06/14	Alkalinity, bicarbonate	mg/L CaCO3	490
UA	G313	C	2021/06/28	Alkalinity, bicarbonate	mg/L CaCO3	450
UA	G313	C	2021/07/13	Alkalinity, bicarbonate	mg/L CaCO3	480
UA	G313	C	2021/07/27	Alkalinity, bicarbonate	mg/L CaCO3	490
UA	G313	C	2023/02/16	Alkalinity, bicarbonate	mg/L CaCO3	500
UA	G313	C	2023/06/06	Alkalinity, bicarbonate	mg/L CaCO3	490
UA	G313	C	2023/08/09	Alkalinity, bicarbonate	mg/L CaCO3	501
UA	G313	C	2023/11/20	Alkalinity, bicarbonate	mg/L CaCO3	507
UA	G313	C	2021/03/30	Barium, total	mg/L	0.0250
UA	G313	C	2021/04/22	Barium, total	mg/L	0.0210
UA	G313	C	2021/05/04	Barium, total	mg/L	0.0230
UA	G313	C	2021/05/18	Barium, total	mg/L	0.0230
UA	G313	C	2021/06/14	Barium, total	mg/L	0.0220
UA	G313	C	2021/06/28	Barium, total	mg/L	0.0200
UA	G313	C	2021/07/13	Barium, total	mg/L	0.0200
UA	G313	C	2021/07/27	Barium, total	mg/L	0.0190
UA	G313	C	2023/02/16	Barium, total	mg/L	0.0170
UA	G313	C	2023/06/06	Barium, total	mg/L	0.0180
UA	G313	C	2023/08/09	Barium, total	mg/L	0.0193
UA	G313	C	2023/11/20	Barium, total	mg/L	0.0270
UA	G313	C	2021/03/30	Boron, total	mg/L	3.30
UA	G313	C	2021/04/22	Boron, total	mg/L	3.40
UA	G313	C	2021/05/04	Boron, total	mg/L	3.50
UA	G313	C	2021/05/18	Boron, total	mg/L	3.30
UA	G313	C	2021/06/14	Boron, total	mg/L	3.30
UA	G313	C	2021/06/28	Boron, total	mg/L	3.50
UA	G313	C	2021/07/13	Boron, total	mg/L	3.40
UA	G313	C	2021/07/27	Boron, total	mg/L	3.50
UA	G313	C	2023/02/16	Boron, total	mg/L	3.20
UA	G313	C	2023/06/06	Boron, total	mg/L	3.30
UA	G313	C	2023/08/09	Boron, total	mg/L	3.63
UA	G313	C	2023/11/20	Boron, total	mg/L	5.23
UA	G313	C	2021/03/30	Calcium, total	mg/L	200
UA	G313	C	2021/04/22	Calcium, total	mg/L	210
UA	G313	C	2021/05/04	Calcium, total	mg/L	200
UA	G313	C	2021/05/18	Calcium, total	mg/L	210
UA	G313	C	2021/06/14	Calcium, total	mg/L	220
UA	G313	C	2021/06/28	Calcium, total	mg/L	200
UA	G313	C	2021/07/13	Calcium, total	mg/L	200
UA	G313	C	2021/07/27	Calcium, total	mg/L	200
UA	G313	C	2023/02/16	Calcium, total	mg/L	190
UA	G313	C	2023/06/06	Calcium, total	mg/L	200
UA	G313	C	2023/08/09	Calcium, total	mg/L	200

UA	G313	C	2023/11/20	Calcium, total	mg/L	211
UA	G313	C	2021/03/30	Chloride, total	mg/L	23.0
UA	G313	C	2021/04/22	Chloride, total	mg/L	25.0
UA	G313	C	2021/05/04	Chloride, total	mg/L	26.0
UA	G313	C	2021/05/18	Chloride, total	mg/L	25.0
UA	G313	C	2021/06/14	Chloride, total	mg/L	26.0
UA	G313	C	2021/06/28	Chloride, total	mg/L	24.0
UA	G313	C	2021/07/13	Chloride, total	mg/L	24.0
UA	G313	C	2021/07/27	Chloride, total	mg/L	<240
UA	G313	C	2023/02/16	Chloride, total	mg/L	20.0
UA	G313	C	2023/06/06	Chloride, total	mg/L	23.0
UA	G313	C	2023/08/09	Chloride, total	mg/L	22.0
UA	G313	C	2023/11/20	Chloride, total	mg/L	20.0
UA	G313	C	2023/06/06	Ferrous Iron, dissolved	mg/L	0.0990
UA	G313	C	2023/06/06	Iron, dissolved	mg/L	0.0680
UA	G313	C	2023/08/09	Iron, dissolved	mg/L	0.0745
UA	G313	C	2021/03/30	Magnesium, total	mg/L	110
UA	G313	C	2021/04/22	Magnesium, total	mg/L	110
UA	G313	C	2021/05/04	Magnesium, total	mg/L	110
UA	G313	C	2021/05/18	Magnesium, total	mg/L	110
UA	G313	C	2021/06/14	Magnesium, total	mg/L	110
UA	G313	C	2021/06/28	Magnesium, total	mg/L	110
UA	G313	C	2021/07/13	Magnesium, total	mg/L	110
UA	G313	C	2021/07/27	Magnesium, total	mg/L	110
UA	G313	C	2023/02/16	Magnesium, total	mg/L	100
UA	G313	C	2023/06/06	Magnesium, total	mg/L	100
UA	G313	C	2023/08/09	Magnesium, total	mg/L	106
UA	G313	C	2023/11/20	Magnesium, total	mg/L	108
UA	G313	C	2023/06/06	Manganese, dissolved	mg/L	0.370
UA	G313	C	2023/08/09	Manganese, dissolved	mg/L	0.386
UA	G313	C	2023/08/09	Phosphate, dissolved	mg/L	<0.005
UA	G313	C	2021/03/30	Potassium, total	mg/L	1.20
UA	G313	C	2021/04/22	Potassium, total	mg/L	0.970
UA	G313	C	2021/05/04	Potassium, total	mg/L	1.00
UA	G313	C	2021/05/18	Potassium, total	mg/L	1.20
UA	G313	C	2021/06/14	Potassium, total	mg/L	1.20
UA	G313	C	2021/06/28	Potassium, total	mg/L	0.980
UA	G313	C	2021/07/13	Potassium, total	mg/L	0.970
UA	G313	C	2021/07/27	Potassium, total	mg/L	0.970
UA	G313	C	2023/02/16	Potassium, total	mg/L	0.950
UA	G313	C	2023/06/06	Potassium, total	mg/L	0.930
UA	G313	C	2023/08/09	Potassium, total	mg/L	1.20
UA	G313	C	2023/11/20	Potassium, total	mg/L	1.24
UA	G313	C	2023/06/06	Silicon, dissolved	mg/L	12.0
UA	G313	C	2023/08/09	Silicon, dissolved	mg/L	11.7
UA	G313	C	2021/03/30	Sodium, total	mg/L	160
UA	G313	C	2021/04/22	Sodium, total	mg/L	150
UA	G313	C	2021/05/04	Sodium, total	mg/L	160
UA	G313	C	2021/05/18	Sodium, total	mg/L	170
UA	G313	C	2021/06/14	Sodium, total	mg/L	170
UA	G313	C	2021/06/28	Sodium, total	mg/L	160
UA	G313	C	2021/07/13	Sodium, total	mg/L	160
UA	G313	C	2021/07/27	Sodium, total	mg/L	160
UA	G313	C	2023/02/16	Sodium, total	mg/L	150
UA	G313	C	2023/06/06	Sodium, total	mg/L	150
UA	G313	C	2023/08/09	Sodium, total	mg/L	153
UA	G313	C	2023/11/20	Sodium, total	mg/L	164
UA	G313	C	2021/03/30	Sulfate, total	mg/L	970
UA	G313	C	2021/04/22	Sulfate, total	mg/L	750
UA	G313	C	2021/05/04	Sulfate, total	mg/L	790
UA	G313	C	2021/05/18	Sulfate, total	mg/L	780
UA	G313	C	2021/06/14	Sulfate, total	mg/L	770

UA	G313	C	2021/06/28	Sulfate, total	mg/L	750
UA	G313	C	2021/07/13	Sulfate, total	mg/L	690
UA	G313	C	2021/07/27	Sulfate, total	mg/L	710
UA	G313	C	2023/02/16	Sulfate, total	mg/L	690
UA	G313	C	2023/06/06	Sulfate, total	mg/L	720
UA	G313	C	2023/08/09	Sulfate, total	mg/L	667
UA	G313	C	2023/11/20	Sulfate, total	mg/L	672
UA	G313	C	2021/03/30	Temperature (Celsius)	degrees C	12.8
UA	G313	C	2021/04/22	Temperature (Celsius)	degrees C	12.1
UA	G313	C	2021/05/04	Temperature (Celsius)	degrees C	13.3
UA	G313	C	2021/05/18	Temperature (Celsius)	degrees C	15.2
UA	G313	C	2021/06/14	Temperature (Celsius)	degrees C	20.7
UA	G313	C	2021/06/28	Temperature (Celsius)	degrees C	23.9
UA	G313	C	2021/07/13	Temperature (Celsius)	degrees C	21.7
UA	G313	C	2021/07/27	Temperature (Celsius)	degrees C	22.4
UA	G313	C	2023/02/16	Temperature (Celsius)	degrees C	9.80
UA	G313	C	2023/06/06	Temperature (Celsius)	degrees C	18.3
UA	G313	C	2023/08/09	Temperature (Celsius)	degrees C	18.1
UA	G313	C	2023/11/20	Temperature (Celsius)	degrees C	15.9
UA	G313	C	2021/03/30	Total Dissolved Solids	mg/L	1,600
UA	G313	C	2021/04/22	Total Dissolved Solids	mg/L	1,600
UA	G313	C	2021/05/04	Total Dissolved Solids	mg/L	1,600
UA	G313	C	2021/05/18	Total Dissolved Solids	mg/L	1,600
UA	G313	C	2021/06/14	Total Dissolved Solids	mg/L	1,700
UA	G313	C	2021/06/28	Total Dissolved Solids	mg/L	1,600
UA	G313	C	2021/07/13	Total Dissolved Solids	mg/L	1,800
UA	G313	C	2021/07/27	Total Dissolved Solids	mg/L	1,600
UA	G313	C	2023/02/16	Total Dissolved Solids	mg/L	1,600
UA	G313	C	2023/06/06	Total Dissolved Solids	mg/L	1,400
UA	G313	C	2023/08/09	Total Dissolved Solids	mg/L	1,500
UA	G313	C	2023/11/20	Total Dissolved Solids	mg/L	1,450
UA	G315	C	2021/03/30	pH (field)	SU	6.9
UA	G315	C	2021/04/22	pH (field)	SU	6.8
UA	G315	C	2021/05/05	pH (field)	SU	6.8
UA	G315	C	2021/05/18	pH (field)	SU	6.9
UA	G315	C	2021/06/15	pH (field)	SU	6.9
UA	G315	C	2021/06/29	pH (field)	SU	7.0
UA	G315	C	2021/07/14	pH (field)	SU	6.8
UA	G315	C	2021/07/28	pH (field)	SU	6.7
UA	G315	C	2023/02/15	pH (field)	SU	7.0
UA	G315	C	2023/06/07	pH (field)	SU	6.9
UA	G315	C	2023/08/10	pH (field)	SU	6.7
UA	G315	C	2023/11/21	pH (field)	SU	6.5
UA	G315	C	2021/03/30	Oxidation Reduction Potential	mV	192
UA	G315	C	2021/04/22	Oxidation Reduction Potential	mV	108
UA	G315	C	2021/05/05	Oxidation Reduction Potential	mV	157
UA	G315	C	2021/05/18	Oxidation Reduction Potential	mV	156
UA	G315	C	2021/06/15	Oxidation Reduction Potential	mV	135
UA	G315	C	2021/06/29	Oxidation Reduction Potential	mV	162
UA	G315	C	2021/07/14	Oxidation Reduction Potential	mV	18.8
UA	G315	C	2021/07/28	Oxidation Reduction Potential	mV	45.1
UA	G315	C	2023/02/15	Oxidation Reduction Potential	mV	182
UA	G315	C	2023/06/07	Oxidation Reduction Potential	mV	140
UA	G315	C	2023/08/10	Oxidation Reduction Potential	mV	98.0
UA	G315	C	2023/11/21	Oxidation Reduction Potential	mV	100
UA	G315	C	2021/03/30	Eh	V	0.39
UA	G315	C	2021/04/22	Eh	V	0.31
UA	G315	C	2021/05/05	Eh	V	0.35
UA	G315	C	2021/05/18	Eh	V	0.35
UA	G315	C	2021/06/15	Eh	V	0.33
UA	G315	C	2021/06/29	Eh	V	0.35
UA	G315	C	2021/07/14	Eh	V	0.21

UA	G315	C	2021/07/28	Eh	V	0.24
UA	G315	C	2023/02/15	Eh	V	0.38
UA	G315	C	2023/06/07	Eh	V	0.34
UA	G315	C	2023/08/10	Eh	V	0.29
UA	G315	C	2023/11/21	Eh	V	0.30
UA	G315	C	2021/03/30	Alkalinity, bicarbonate	mg/L CaCO3	210
UA	G315	C	2021/04/22	Alkalinity, bicarbonate	mg/L CaCO3	210
UA	G315	C	2021/05/05	Alkalinity, bicarbonate	mg/L CaCO3	200
UA	G315	C	2021/05/18	Alkalinity, bicarbonate	mg/L CaCO3	200
UA	G315	C	2021/06/15	Alkalinity, bicarbonate	mg/L CaCO3	210
UA	G315	C	2021/06/29	Alkalinity, bicarbonate	mg/L CaCO3	190
UA	G315	C	2021/07/14	Alkalinity, bicarbonate	mg/L CaCO3	200
UA	G315	C	2021/07/28	Alkalinity, bicarbonate	mg/L CaCO3	210
UA	G315	C	2023/02/15	Alkalinity, bicarbonate	mg/L CaCO3	210
UA	G315	C	2023/06/07	Alkalinity, bicarbonate	mg/L CaCO3	220
UA	G315	C	2023/08/10	Alkalinity, bicarbonate	mg/L CaCO3	240
UA	G315	C	2023/11/21	Alkalinity, bicarbonate	mg/L CaCO3	273
UA	G315	C	2021/03/30	Barium, total	mg/L	0.0280
UA	G315	C	2021/04/22	Barium, total	mg/L	0.0260
UA	G315	C	2021/05/05	Barium, total	mg/L	0.0240
UA	G315	C	2021/05/18	Barium, total	mg/L	0.0240
UA	G315	C	2021/06/15	Barium, total	mg/L	0.0250
UA	G315	C	2021/06/29	Barium, total	mg/L	0.0230
UA	G315	C	2021/07/14	Barium, total	mg/L	0.0280
UA	G315	C	2021/07/28	Barium, total	mg/L	0.0230
UA	G315	C	2023/02/15	Barium, total	mg/L	0.0170
UA	G315	C	2023/06/07	Barium, total	mg/L	0.0360
UA	G315	C	2023/08/10	Barium, total	mg/L	0.0175
UA	G315	C	2023/11/21	Barium, total	mg/L	0.0217
UA	G315	C	2021/03/30	Boron, total	mg/L	1.20
UA	G315	C	2021/04/22	Boron, total	mg/L	1.20
UA	G315	C	2021/05/05	Boron, total	mg/L	1.30
UA	G315	C	2021/05/18	Boron, total	mg/L	1.20
UA	G315	C	2021/06/15	Boron, total	mg/L	1.30
UA	G315	C	2021/06/29	Boron, total	mg/L	1.30
UA	G315	C	2021/07/14	Boron, total	mg/L	1.30
UA	G315	C	2021/07/28	Boron, total	mg/L	1.30
UA	G315	C	2023/02/15	Boron, total	mg/L	1.20
UA	G315	C	2023/06/07	Boron, total	mg/L	1.20
UA	G315	C	2023/08/10	Boron, total	mg/L	1.68
UA	G315	C	2023/11/21	Boron, total	mg/L	1.90
UA	G315	C	2021/03/30	Calcium, total	mg/L	190
UA	G315	C	2021/04/22	Calcium, total	mg/L	200
UA	G315	C	2021/05/05	Calcium, total	mg/L	190
UA	G315	C	2021/05/18	Calcium, total	mg/L	190
UA	G315	C	2021/06/15	Calcium, total	mg/L	210
UA	G315	C	2021/06/29	Calcium, total	mg/L	190
UA	G315	C	2021/07/14	Calcium, total	mg/L	190
UA	G315	C	2021/07/28	Calcium, total	mg/L	190
UA	G315	C	2023/02/15	Calcium, total	mg/L	150
UA	G315	C	2023/06/07	Calcium, total	mg/L	140
UA	G315	C	2023/08/10	Calcium, total	mg/L	147
UA	G315	C	2023/11/21	Calcium, total	mg/L	165
UA	G315	C	2021/03/30	Chloride, total	mg/L	1.90
UA	G315	C	2021/04/22	Chloride, total	mg/L	64.0
UA	G315	C	2021/05/05	Chloride, total	mg/L	19.0
UA	G315	C	2021/05/18	Chloride, total	mg/L	20.0
UA	G315	C	2021/06/15	Chloride, total	mg/L	19.0
UA	G315	C	2021/06/29	Chloride, total	mg/L	19.0
UA	G315	C	2021/07/14	Chloride, total	mg/L	17.0
UA	G315	C	2021/07/28	Chloride, total	mg/L	18.0
UA	G315	C	2023/02/15	Chloride, total	mg/L	12.0

UA	G315	C	2023/06/07	Chloride, total	mg/L	15.0
UA	G315	C	2023/08/10	Chloride, total	mg/L	14.0
UA	G315	C	2023/11/21	Chloride, total	mg/L	14.0
UA	G315	C	2023/06/07	Ferrous Iron, dissolved	mg/L	<0.02
UA	G315	C	2023/06/07	Iron, dissolved	mg/L	<0.00072
UA	G315	C	2023/08/10	Iron, dissolved	mg/L	0.0120
UA	G315	C	2021/03/30	Magnesium, total	mg/L	90.0
UA	G315	C	2021/04/22	Magnesium, total	mg/L	87.0
UA	G315	C	2021/05/05	Magnesium, total	mg/L	93.0
UA	G315	C	2021/05/18	Magnesium, total	mg/L	89.0
UA	G315	C	2021/06/15	Magnesium, total	mg/L	96.0
UA	G315	C	2021/06/29	Magnesium, total	mg/L	93.0
UA	G315	C	2021/07/14	Magnesium, total	mg/L	92.0
UA	G315	C	2021/07/28	Magnesium, total	mg/L	90.0
UA	G315	C	2023/02/15	Magnesium, total	mg/L	64.0
UA	G315	C	2023/06/07	Magnesium, total	mg/L	65.0
UA	G315	C	2023/08/10	Magnesium, total	mg/L	66.6
UA	G315	C	2023/11/21	Magnesium, total	mg/L	73.8
UA	G315	C	2023/06/07	Manganese, dissolved	mg/L	0.240
UA	G315	C	2023/08/10	Manganese, dissolved	mg/L	0.306
UA	G315	C	2023/08/10	Phosphate, dissolved	mg/L	0.0460
UA	G315	C	2021/03/30	Potassium, total	mg/L	0.370
UA	G315	C	2021/04/22	Potassium, total	mg/L	0.230
UA	G315	C	2021/05/05	Potassium, total	mg/L	0.390
UA	G315	C	2021/05/18	Potassium, total	mg/L	0.170
UA	G315	C	2021/06/15	Potassium, total	mg/L	0.390
UA	G315	C	2021/06/29	Potassium, total	mg/L	0.560
UA	G315	C	2021/07/14	Potassium, total	mg/L	0.370
UA	G315	C	2021/07/28	Potassium, total	mg/L	0.250
UA	G315	C	2023/02/15	Potassium, total	mg/L	0.160
UA	G315	C	2023/06/07	Potassium, total	mg/L	0.540
UA	G315	C	2023/08/10	Potassium, total	mg/L	0.299
UA	G315	C	2023/11/21	Potassium, total	mg/L	0.321
UA	G315	C	2023/06/07	Silicon, dissolved	mg/L	13.0
UA	G315	C	2023/08/10	Silicon, dissolved	mg/L	11.9
UA	G315	C	2021/03/30	Sodium, total	mg/L	140
UA	G315	C	2021/04/22	Sodium, total	mg/L	140
UA	G315	C	2021/05/05	Sodium, total	mg/L	150
UA	G315	C	2021/05/18	Sodium, total	mg/L	140
UA	G315	C	2021/06/15	Sodium, total	mg/L	150
UA	G315	C	2021/06/29	Sodium, total	mg/L	150
UA	G315	C	2021/07/14	Sodium, total	mg/L	140
UA	G315	C	2021/07/28	Sodium, total	mg/L	140
UA	G315	C	2023/02/15	Sodium, total	mg/L	110
UA	G315	C	2023/06/07	Sodium, total	mg/L	110
UA	G315	C	2023/08/10	Sodium, total	mg/L	117
UA	G315	C	2023/11/21	Sodium, total	mg/L	126
UA	G315	C	2021/03/30	Sulfate, total	mg/L	1,100
UA	G315	C	2021/04/22	Sulfate, total	mg/L	880
UA	G315	C	2021/05/05	Sulfate, total	mg/L	900
UA	G315	C	2021/05/18	Sulfate, total	mg/L	880
UA	G315	C	2021/06/15	Sulfate, total	mg/L	870
UA	G315	C	2021/06/29	Sulfate, total	mg/L	930
UA	G315	C	2021/07/14	Sulfate, total	mg/L	860
UA	G315	C	2021/07/28	Sulfate, total	mg/L	850
UA	G315	C	2023/02/15	Sulfate, total	mg/L	670
UA	G315	C	2023/06/07	Sulfate, total	mg/L	600
UA	G315	C	2023/08/10	Sulfate, total	mg/L	603
UA	G315	C	2023/11/21	Sulfate, total	mg/L	588
UA	G315	C	2021/03/30	Temperature (Celsius)	degrees C	13.9
UA	G315	C	2021/04/22	Temperature (Celsius)	degrees C	12.7
UA	G315	C	2021/05/05	Temperature (Celsius)	degrees C	14.7

UA	G315	C	2021/05/18	Temperature (Celsius)	degrees C	14.1
UA	G315	C	2021/06/15	Temperature (Celsius)	degrees C	17.6
UA	G315	C	2021/06/29	Temperature (Celsius)	degrees C	19.8
UA	G315	C	2021/07/14	Temperature (Celsius)	degrees C	17.6
UA	G315	C	2021/07/28	Temperature (Celsius)	degrees C	17.8
UA	G315	C	2023/02/15	Temperature (Celsius)	degrees C	11.4
UA	G315	C	2023/06/07	Temperature (Celsius)	degrees C	14.4
UA	G315	C	2023/08/10	Temperature (Celsius)	degrees C	16.1
UA	G315	C	2023/11/21	Temperature (Celsius)	degrees C	14.0
UA	G315	C	2021/03/30	Total Dissolved Solids	mg/L	1,500
UA	G315	C	2021/04/22	Total Dissolved Solids	mg/L	1,600
UA	G315	C	2021/05/05	Total Dissolved Solids	mg/L	1,500
UA	G315	C	2021/05/18	Total Dissolved Solids	mg/L	1,500
UA	G315	C	2021/06/15	Total Dissolved Solids	mg/L	1,500
UA	G315	C	2021/06/29	Total Dissolved Solids	mg/L	1,400
UA	G315	C	2021/07/14	Total Dissolved Solids	mg/L	1,700
UA	G315	C	2021/07/28	Total Dissolved Solids	mg/L	1,600
UA	G315	C	2023/02/15	Total Dissolved Solids	mg/L	1,300
UA	G315	C	2023/06/07	Total Dissolved Solids	mg/L	1,100
UA	G315	C	2023/08/10	Total Dissolved Solids	mg/L	1,190
UA	G315	C	2023/11/21	Total Dissolved Solids	mg/L	362

Notes:
< = results is less than detection limit
B = Background
C = Compliance
HSU = Hydrostratigraphic Unit
CCR = Coal Combustion Residuals
DA = Deep Aquifer
LCU = Lower Confining Unit
UA = Uppermost Aquifer
mg/L = milligrams per liter
SU = standard units
V = volts

Attachment I

Antidegradation Assessment Report
(Hansen 2017)

ATTACHMENT V

Antidegradation Assessment for Management of Coal Combustion Residuals Impoundment Waters

Coffeen Power Station
Illinois Power Generating Company
NPDES Permit No. IL0000108

November 21, 2017

Prepared for:

Illinois Power Generating Company
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Prepared by:

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Springfield, Illinois 62703

HANSON
Engineering | Planning | Allied Services

Table of Contents

Figures and Tables

Appendices

1. Introduction

Illinois Power Generating Company (IPGC) will be applying for a modification to NPDES Permit No. IL0000108 to reflect the planned physical alterations at the Coffeen Power Station (Coffeen, or "plant") required to meet the U.S. Environmental Protection Agency (USEPA) coal combustion residuals (CCR) rules. These physical alterations will require short-term discharge of waters from coal combustion residuals (CCR) surface impoundments, also known as "ash ponds". The ash ponds assessed in this report include Ash Ponds 1 and 2. Ash Pond 1 is currently an existing operating CCR impoundment, while Ash Pond 2 is an inactive CCR impoundment previously covered with a soil cover system that will require replacement in accordance with the federal CCR rules. This report assesses the potential effects of proposed pollutant load increases on the water quality of Coffeen Lake in accordance with the requirements of 35 Ill. Adm. Code §302.105. Alternatives considered to avoid discharging the waters are discussed.

2. Purpose and Anticipated Benefits

USEPA issued a final rule (the "CCR Rule") that regulates the disposal of CCR under Subtitle D of the Resource Conservation and Recovery Act (RCRA). The CCR Rule, effective October 19, 2015, establishes minimum national criteria for continued operation of CCR surface impoundments.[1] To comply with the CCR Rule, IPGC may need to close Coffeen Ash Ponds 1 and 2 by the end of the timeframe allowed by the Rule. Figure 1 illustrates the layout of the Coffeen ash ponds.

The closure plan for the Coffeen ash ponds includes removal of open water from the ash ponds, referred to as "unwatering;" partial removal of pore water contained in CCR-filled portions of the ash ponds, referred to as "dewatering;" grading and shaping the dewatered CCR surface to facilitate storm water runoff; and installation of a compacted vegetated earthen or composite cover system. Both unwatering and dewatering Ash Pond 1 is necessary to grade the CCR and construct the cover system. No unwaters are present in Ash Pond 2. Dewatering Ash Pond 2 will be necessary. The existing dewatering system in Ash Pond 2, which currently directs the dewaters to the Coffeen plant's Gypsum Management Facility (GMF) ponds, may be adequate to maintain the phreatic surface in the pond far enough below the existing cap to facilitate pond closure. However, this report evaluates the Ash Pond 2 dewaters in case the GMF ponds are overwhelmed and discharge of Ash Pond 2 dewaters is needed.

Due to the large volume of water contained in the ash ponds and the schedule constraints, the preferred alternative to remove the water is to discharge it through the existing NPDES-permitted outfall to Coffeen Lake.

The following sections of this report describe the water sampling, analytical laboratory results, hydraulic and concentration modeling, and alternatives considered to demonstrate the proposed short-term discharge of waters from the ash ponds will result in the continued attainment of water quality standards in Coffeen Lake.

[1] In September 2017, USEPA granted petitions to reconsider the CCR rule. USEPA's reconsideration process may result in revisions to the CCR rule that would change IPGC's current closure plans and future planning regarding the CCR surface impoundments at Coffeen.

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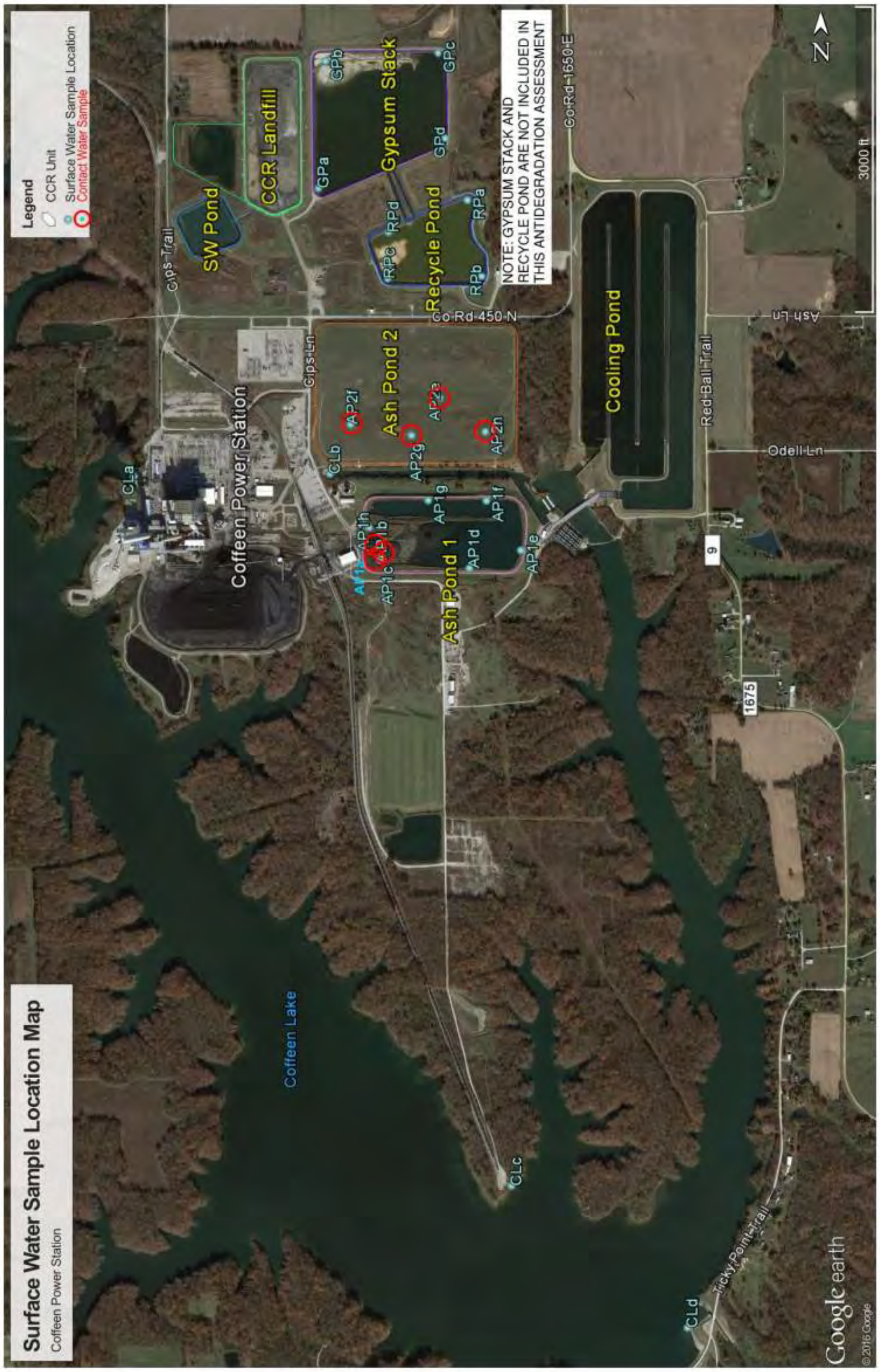
Figure 1 Site Map



3. Identification and Characterization of the Affected Water Body

Coffeen Lake (segment ROG) is an artificial cooling lake. The lake is listed on the 2016 *Illinois Integrated Water Quality Report and Section 303(d) List*. Fish consumption use is impaired, with a cause of mercury. A Total Maximum Daily Load (TMDL) has been completed for Coffeen Lake that sets allocations for phosphorus.

The IDNR EcoCAT system does not list any state threatened or endangered aquatic species as residing in the receiving water body near the Coffeen plant. A copy of the EcoCAT report is included in Appendix A.

4. Identification of Proposed Pollutant Load Increases or Potential Impacts on Uses

4.1 Water Sampling and Analyses

PDC Laboratories, Inc. (PDC), under subcontract and field oversight by Hanson Professional Services Inc. (Hanson), collected water samples from the ash ponds and receiving waters on October 24, 2016. Grab samples were collected from open water accumulated in Ash Pond 1 to characterize waters that would be discharged during “unwatering” of the ash pond; these waters are referred to in this report as “unwaters.” Ash Pond 2 is inactive and was previously covered. Unwaters are not associated with Ash Pond 2.

Grab samples were collected from test pits excavated in the CCR-filled portion of Ash Pond 1 and from wells installed in Ash Pond 2 to characterize waters that would be discharged during “dewatering” of the cells; these waters are referred to in this report as “dewaters.” The test pits in Ash Pond 1 were excavated the day before sampling, allowing CCR materials to settle overnight to reduce suspended solids in the samples. Each of the four operable wells in Ash Pond 2 was activated separately and allowed to run until the water appeared clear, then grab samples were collected from the pump discharge. Grab water samples were also collected from Coffeen Lake to evaluate the receiving water that may be affected by the proposed discharges.

In order to further characterize the dewaters as requested by Illinois EPA, an additional round of selected grab samples was collected on January 26, 2017. Table 1 summarizes the water samples collected. Figure 1 shows the sampling locations.

Table 1. Water Samples Collected and Analyzed

Impoundment/Waterbody Sampled	Unwater Samples	Dewater Samples
Ash Pond 1	AP1d, AP1e, AP1f, AP1g, AP1h	AP1a, AP1b, AP1c
Ash Pond 2	None	AP2e, AP2f, AP2g, AP2h

	Receiving Water	
Coffeen Lake	CLa, CLb, CLc, CLd	

The water samples were analyzed by PDC for constituents reviewed and approved by Illinois EPA in an email to Ms. Jacquelyn Bush of IPGC on October 11, 2016. PDC is accredited by Illinois EPA to conduct the laboratory analyses for this assessment. The laboratory analytical reports are included in Appendix B.

Table 2 summarizes the constituents analyzed and the analytical results of samples of the ash pond unwaters and the receiving water. The individual analytical results at each sample location were averaged for evaluation in this antidegradation assessment. None of the representative average unwaters concentrations exceeded the General Effluent Standards listed in 35 Ill. Adm. Code §304.

Table 3 summarizes the constituents analyzed and the analytical results of samples collected from CCR-filled portions of the ash ponds to characterize waters that would be discharged during dewatering the ponds. The individual analytical results at each sample location were averaged for evaluation in this antidegradation assessment. The representative average dewater concentrations of total suspended solids (TSS) in Ash Pond 1, Ash Pond 2, and the combined ash pond dewaters exceeded the General Effluent Standard of 15 mg/L listed in 35 Ill. Adm. Code §304. The representative average dewater concentrations of iron and manganese in Ash Pond 2 dewaters exceeded their respective General Effluent Standards of 2.0 mg/L and 1.0 mg/L. The representative average combined ash pond dewaters concentration of iron exceeded the General Effluent Standard. The representative average concentrations of manganese in Ash Pond 1 dewaters and the combined ash pond dewaters were less than the General Effluent Standard. All other analytes were less than the General Effluent Standards.

4.2 Pollutant Load Increases from Ash Pond Unwatering Discharge

Discharge of unwaters would occur from removal of the free surface water in Ash Pond 1. These waters result from the normal operation of the Coffeen plant and, except for storm water precipitation into the ash pond cells, are generally drawn from Coffeen Lake. These waters are currently discharged under the authorization of the plant's NPDES permit. No unwaters are present in Ash Pond 2.

The means and methods of collecting and conveying the unwaters are undetermined at this time. For purposes of this antidegradation assessment, substances in unwaters at concentrations less than the General Effluent Standards at 35 Ill. Adm. Code §304 are considered to be protective of the receiving water quality, i.e., would not cause degradation of the receiving water quality. As shown in Table 2, the representative average unwater concentrations of all the analytes were less than the General Effluent Standards.

Table 4 shows the estimated mass of each substance proposed to be discharged through the existing NPDES outfall to the Coffeen Lake receiving water (the "Added Load"). The Added Load calculations compensate for the existing receiving water quality by subtracting the "Source Load" of each substance based on the analytical results of the lake samples. Table 4 also estimates the predicted effects of discharging the unwaters to the lake and demonstrates the proposed discharge will not cause exceedances of the Public and Food Processing Water Supply Use Standards at 35 Ill. Adm. Code §302 Subpart C. For substances with no Public and Food Processing Water Supply Use Standard, the chronic General Use Water Quality Standards at 35 Ill. Adm. Code §302 Subpart B were used for comparison. Lake concentrations were calculated at normal pool volume. For substances where concentrations in the lake already exceed the applicable water quality standards (oil and grease, phenols, and phosphorus), the concentrations of these substances in the proposed unwaters discharge are equivalent to the existing lake concentrations. Table 4 illustrates the proposed unwaters discharge will not increase the existing concentrations of oil and grease, phenols, and phosphorus in the lake.

The estimated volume of unwaters to be discharged as part of the CCR closure plan is 40 million gallons. The unwatering rate for Ash Pond 1 will vary depending on schedule and pump rates. The calculations shown in Table 4 assume pumping rates of about 347 gpm (0.5 million gallons per day (MGD)) could remove the free water in approximately 80 days.

Table 2. Ash Pond Unwaters and Receiving Waters Sample Analytical Results

		General Effluent Standards	Ash pond surface water samples (Collected October 24, 2016) All concentration units converted to mg/L for comparison to limits.						Receiving Water				
			Ash Pond 1 Unwaters					Representative Unwaters Concentrations	Coffeen Lake				Representative Lake Concentrations
Sample Date			10/24/2016	10/24/2016	10/24/2016	10/24/2016	10/24/2016		10/24/2016	10/24/2016	10/24/2016	10/24/2016	
Sample ID	Units	35 IAC 304	AP1d	AP1e	AP1f	AP1g	AP1h		CLa	CLb	CLc	CLd	
Ammonia	mg/L	3	<0.1	<0.1	<0.1	<0.1	<0.1	0.05	<0.1	<0.1	<0.1	<0.1	0.05
Arsenic	mg/L	0.25	0.002	0.0014	0.0015	0.0013	0.0015	0.0015	0.0018	0.0018	0.0018	0.0018	0.0018
Barium	mg/L	2.0	0.2	0.16	0.15	0.14	0.18	0.17	0.054	0.052	0.056	0.054	0.054
Boron	mg/L		2	2.1	2.1	2.1	2.2	2.1	0.27	0.28	0.28	0.27	0.28
Cadmium	mg/L	0.15	<0.001	<0.001	<0.001	<0.001	<0.001	0.0005	<0.001	<0.001	<0.001	<0.001	0.0005
Chloride	mg/L		18	18	17	17	17	17	0.023	0.022	0.022	0.023	0.023
Chromium	mg/L	1.0	<0.004	<0.004	<0.004	<0.004	<0.004	0.002	<0.004	<0.004	<0.004	<0.004	0.002
Chromium (hexavalent)	mg/L	0.1	<0.005	<0.005	0.0074	<0.005	<0.005	0.0035	<0.005	<0.005	<0.005	<0.005	0.0025
Copper	mg/L	0.5	0.033	0.016	0.017	0.015	0.014	0.019	0.0091	0.013	0.011	0.012	0.011
Cyanide	mg/L	0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.0025	<0.005	<0.005	<0.005	<0.005	0.0025
Fluoride	mg/L	15.0	1.08	1.00	1.00	1.00	0.98	1.01	0.443	0.425	0.426	0.421	0.429
Iron	mg/L	2.0	0.54	0.15	0.11	0.089	0.46	0.27	0.22	0.2	0.27	0.14	0.2
Lead	mg/L	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	0.0005	<0.001	<0.001	<0.001	<0.001	0.0005
Manganese	mg/L	1.0	0.015	0.0095	0.0089	0.0081	0.0097	0.0102	0.015	0.022	0.026	0.024	0.022
Mercury	mg/L	0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0001	<0.0002	<0.0002	<0.0002	<0.0002	0.0001
Nickel	mg/L	1.0	<0.005	<0.005	<0.005	<0.005	<0.005	0.0025	<0.005	<0.005	<0.005	<0.005	0.0025
Nitrate	mg/L		<0.02	<0.02	<0.02	<0.02	<0.02	0.01	0.07	0.07	0.06	0.07	0.07
Nitrite	mg/L												
Total K Nitrogen	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0	0.5	1.3	1.1	<1.0	<1.0	1.2
Oil and Grease	mg/L	15.0	<6.0	<6.5	<5.7	<5.9	<6.0	6.0	<5.9	<5.7	<5.9	<6.0	2.9
pH		6 to 9	7.21	7.12	7.20	7.21	7.41	7.23	7.22	7.52	7.62	7.30	7.42
Phenols	mg/L	0.3	<0.005	<0.005	<0.005	<0.005	<0.005	0.0025	<0.005	<0.005	<0.005	<0.005	0.0025
Phosphorus	mg/L	1.0	0.18	0.12	0.12	0.12	0.15	0.14	0.16	0.14	0.15	0.17	0.16
Selenium	mg/L		0.0015	0.0012	0.0012	0.0014	0.0012	0.0013	<0.001	<0.001	<0.001	<0.001	0.0005
Silver	mg/L	0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.0025	<0.005	<0.005	<0.005	<0.005	0.0025
Sulfate	mg/L		1000	960	1000	970	1000	986	55	56	54	54	55
Total Dissolved Solids (TDS)	mg/L		980	1200	1200	1200	1200	1156	190	180	160	170	175
Total Suspended Solids (TSS)	mg/L	15.0	9.2	5.6	8	4	6	6.6	7.6	4.8	4.8	<4.0	4.8
Zinc	mg/L	1.0	<0.006	<0.006	<0.006	<0.006	<0.006	0.003	0.006	0.006	<0.006	0.015	0.0075

Notes:
1. Metals are total concentrations
2. Non-detect results are assumed to be half the laboratory reporting limit for calculations.
3. Ash Pond 2 contains no unwaters.

Table 3. Ash Pond Dewaters Sample Analytical Results

		General Effluent Standards	Ash pond CCR contact water samples (Collected October 24, 2016 and January 26, 2017) All concentration units converted to mg/L for comparison to limits.																
			Ash Pond 1						Ash Pond 1	Ash Pond 2								Ash Pond 2	Combined Ash Ponds
Sample Date			10/24/2016	1/26/2017	10/24/2016	1/26/2017	10/24/2016	1/26/2017	Representative Average	10/24/2016	1/26/2017	10/24/2016	1/26/2017	10/24/2016	1/26/2017	10/24/2016	1/26/2017	Representative Average	Representative Average
Sample ID	Units	35 IAC 304	AP1a	AP1a	AP1b	AP1b	AP1c	AP1c	Dewater Concentrations	AP2e	AP2e	AP2f	AP2f	AP2g	AP2g	AP2h	AP2h	Dewater Concentrations	Dewater Concentrations
Ammonia	mg/L	3	<0.1	<0.1	0.7	0.67	0.42	0.22	0.35	0.65	0.84	1.1	0.92	0.86	0.8	0.82	0.64	0.83	0.59
Arsenic	mg/L	0.25	0.0072	0.0093	0.017	0.0073	0.018	0.01	0.011	0.023	0.014	0.0012	<0.001	0.0055	0.0044	0.075	0.034	0.022	0.017
Barium	mg/L	2.0	0.13	0.13	0.1	0.099	0.13	0.25	0.14	0.026	0.019	0.022	0.014	0.02	0.015	0.023	0.013	0.02	0.08
Boron	mg/L		3.8	1.6	3.1	2.3	2.9	1.6	2.6	5.3	4.2	2	1.6	4.3	3.1	14	6.8	5.2	3.86
Cadmium	mg/L	0.15	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0005	<0.001	<0.001	<0.001	<0.001	0.0046	0.012	<0.001	<0.001	0.0025	0.00
Chloride	mg/L		3.2	9	13	10	13	14	10.4	<5	<5	<5	<5	<5	<5	1.7	1.6	2.3	6.3
Chromium	mg/L	1.0	<0.004	0.0045	<0.004	0.0052	<0.004	0.0057	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.002	0.003
Chromium (hexavalent)	mg/L	0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0025	<0.005	<0.005	0.0055	<0.005	<0.005	<0.005	<0.005	<0.005	0.0030	0.0028
Copper	mg/L	0.5	<0.003	<0.003	<0.003	<0.003	0.0043	0.0041	0.0024	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0015	0.0020
Cyanide	mg/L	0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0025	0.0025
Fluoride	mg/L	15.0	<0.25	0.142	0.977	0.507	0.614	0.512	0.480	0.438	0.485	0.398	0.32	0.506	0.377	0.406	0.181	0.389	0.434
Iron	mg/L	2.0	0.57	0.9	0.83	1.2	0.77	2.2	1.08	350	320	460	380	360	290	24	22	276	138
Lead	mg/L	0.2	<0.001	<0.001	<0.001	0.0012	<0.001	0.0015	0.0008	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0005	0.0006
Manganese	mg/L	1.0	0.012	0.0086	0.074	0.041	0.053	0.022	0.035	2.0	1.9	2.3	2.0	2.9	2.2	1.0	0.9	1.90	0.97
Mercury	mg/L	0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0001	0.0001
Nickel	mg/L	1.0	<0.005	<0.005	0.0061	0.0087	<0.005	<0.005	0.0041	<0.005	<0.005	<0.005	<0.005	0.0064	<0.005	<0.005	<0.005	0.0030	0.0036
Nitrate	mg/L		<0.02	<0.1	<0.02	<0.1	<0.02	<0.1	0.06	<0.02	<0.1	<0.02	<0.1	<0.02	<0.1	<0.02	<0.1	0.06	0.06
Nitrite	mg/L			<0.1		<0.1		<0.1	0.05		<0.1		<0.15		<0.15		<0.1	0.11	0.08
Total K Nitrogen	mg/L		<1.0	0.35	1.5	0.0014	1.4	0.6	0.65	1.2	0.78	1.5	0.77	1.1	0.81	1.4	0.9	1.06	0.85
Oil and Grease	mg/L	15.0	<5.7	<3.2	7.8	<3.1	8.3	<3.1	3.9	<6.0	<3.1	<5.9	<3.2	<5.7	<3.3	<5.7	<3	4.5	4.21
pH		6 to 9	6.99	6.52	7.01	6.92	7.05	6.85	6.890	6.49	5.96	6.42	5.99	6.46	6.34	7.17	6.27	6.39	6.64
Phenols	mg/L	0.3	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0025	<0.005	0.019	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	0.004
Phosphorus	mg/L	1.0	0.21	0.16	0.16	0.065	0.17	0.22	0.16	0.84	0.16	0.83	0.4	0.17	0.1	0.26	0.038	0.35	0.26
Selenium	mg/L		0.003	0.018	0.0069	0.0021	0.0031	0.003	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0005	0.0033
Silver	mg/L	0.1	<0.005	<0.003	<0.005	<0.003	<0.005	<0.003	0.002	<0.005	<0.003	<0.005	<0.003	<0.005	<0.003	<0.005	<0.003	0.004	0.003
Sulfate	mg/L		1500	1300	1300	1500	1600	1200	1400	1500	1400	1500	1200	2300	1800	1300	880	1485	1443
Total Dissolved Solids (TDS)	mg/L		1800	1900	1600	2200	1900	1700	1850	1700	1800	1700	1600	2400	2600	1500	1400	1838	1844
Total Suspended Solids (TSS)	mg/L	15.0	17	8.8	27	20	9.6	58	23	120	110	120	160	120	150	22	39	105	64
Zinc	mg/L	1.0	<0.006	<0.006	0.0092	0.0064	0.0082	0.0064	0.006	0.017	0.02	<0.006	<0.006	0.016	0.028	<0.006	<0.006	0.012	0.009

Notes:
1. Metals are total concentrations
2. Non-detect results are assumed to be half the laboratory reporting limit for calculations.

Table 4. Antidegradation Assessment - Ash Pond Unwaters

This table shows the "Added Load" of pollutants from unwaters that would be discharged to Coffeen Lake.
The table shows the proposed discharge will not cause exceedances of the 35 IAC Section 302 Public and Food Processing Water Supply Standards in the lake.

Contaminant	35 IAC 304 (mg/L)	35 IAC 302 Chronic (mg/L)	Ash Pond 1 - Unwaters					Flow Mixing with Process Water			Coffeen Lake					
			Treatment Flowrate (gpm) = 347					Average Flowrate (gpm) = 305,500			Normal Pool Volume (gallons) = 7,039,440,000					
			Total Volume (gallons) = 40,000,000													
			Concentration (mg/L)	Meet 304?	Total Load (lbs)	Source Load (lbs)	Added Load (lbs)	Process Water Concentration - CLb (mg/L)	Concentration at Outfall (mg/L)	Meet 304?	Coffeen Lake (mg/L)	Lake Meet 302?	Lake Conc. w/ Effluent (mg/L)	Meet 302?	Meet Lake?	Additional Treatment to meet 302 or Lake (lbs)
Ammonia	3	2.08	**0.05**	yes	16.69	16.69	0.00	0.05	0.05	yes	0.05	yes	0.05	yes	-	-
Arsenic	0.25	0.05	**0.0015**	yes	0.51	0.60	-0.09	0.0018	0.002	yes	0.002	yes	0.002	yes	-	-
Barium	2	1.0	**0.17**	yes	55.42	18.03	37.39	0.052	0.052	yes	0.054	yes	0.054	yes	-	-
Boron	-	1.0	**2.1**	-	701.06	91.81	609.25	0.28	0.282	-	0.275	yes	0.275	yes	-	-
Cadmium	0.15	0.010	**0.0005**	yes	0.17	0.17	0.00	0.0005	0.0005	yes	0.0005	yes	0.0005	yes	-	-
Chloride	-	250	**17**	-	5,808.8	7.5	5,801.25	0.022	0.042	-	0.023	yes	0.023	yes	-	-
Chromium	1	0.050	**0.002**	yes	0.67	0.67	0.00	0.002	0.0020	yes	0.0020	yes	0.0020	yes	-	-
Chromium (hex)	0.1	0.011	**0.003**	yes	1.16	0.83	0.33	0.0025	0.0025	yes	0.0025	yes	0.0025	yes	-	-
Copper	0.5	0.015	**0.019**	yes	6.34	3.76	2.58	0.013	0.0130	yes	0.0113	yes	0.0113	yes	-	-
Cyanide	0.1	5.2	**0.0025**	yes	0.83	0.83	0.00	0.0025	0.0025	yes	0.0025	yes	0.0025	yes	-	-
Fluoride	15	1.4	**1.01**	yes	337.8	143.1	194.71	0.425	0.426	yes	0.429	yes	0.429	yes	-	-
Iron	2	0.3	**0.27**	yes	90	69.27	20.80	0.20	0.20	yes	0.208	yes	0.207	yes	-	-
Lead	0.2	0.050	**0.0005**	yes	0.17	0.17	0.00	0.0005	0.0005	yes	0.0005	yes	0.0005	yes	-	-
Manganese	1	1.0	**0.0102**	yes	3.42	7.26	-3.84	0.0220	0.0220	yes	0.0218	yes	0.0218	yes	-	-
Mercury	0.0005	0.0011	**0.0001**	yes	0.0334	0.03	0.00	0.0005	0.0005	yes	0.0001	yes	0.0001	yes	-	-
Nickel	1	0.007	**0.0025**	yes	0.83	0.83	0.00	0.0025	0.0025	yes	0.0025	yes	0.0025	yes	-	-
Nitrate (302.304)	-	10	**0.01**	-	3.34	23.37	-20.03	0.07	0.070	-	0.070	yes	0.070	yes	-	-
Nitrite	-	-	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-
O&G	15	0.1	**6.0**	yes	2,009.7	980.6	1,029.05	2.85	2.9	yes	2.9	no	2.9	no	yes	-
pH	6 to 9	6 to 9	**7.23**	yes	-	-	-	7.52	7.52	yes	7.42	yes	7.42	yes	-	-
Phenols	0.3	0.001	**0.0025**	yes	0.83	0.83	0.00	0.0025	0.0025	yes	0.0025	no	0.0025	no	yes	-
Phosphorus	1	0.05	**0.14**	yes	46.07	51.74	-5.68	0.14	0.14	yes	0.16	no	0.15	no	yes	-
Selenium	-	0.01	**0.0013**	-	0.43	0.17	0.27	0.0005	0.0005	-	0.0005	yes	0.0005	yes	-	-
Silver	0.1	0.005	**0.0025**	yes	0.83	0.83	0.00	0.0025	0.0025	yes	0.0025	yes	0.0025	yes	-	-
Sulfate	-	250	**986**	-	329,163	18,278	310,885.71	56.0	57.1	-	54.8	yes	54.8	yes	-	-
TDS	-	500	**1156**	-	385,916	58,421	327,494.10	180	181	-	175	yes	175	yes	-	-
TSS	15	-	**7**	yes	2,190	1,602	587.55	4.8	4.8	yes	4.8	yes	4.8	-	-	-
TKN	-	-	**0.5**	-	166.9	400.6	-233.69	1.1	1.1	-	1.2	yes	1.2	-	-	-
Zinc	1	0.041	**0.003**	yes	1.00	2.50	-1.50	0.0060	0.0060	yes	0.0075	yes	0.0075	yes	-	-

Notes
* Hardness-based numeric water quality standards are calculated using analytical result of 110 mg/L from January 13, 2017 sampling.
* Concentration is represented as a mean of all samples collected. Non-detect results were assumed to be half of the detection limit.
* Concentration at outfall is weighted based on flow rate and concentration of process water flow.
* Additional treatment is the amount of additional treament needed to reduce the concentration of the effluent water to meet either the 302 water quality standard or the concentration of the source water (Coffeen

4.3 Pollutant Load Increases from Ash Pond Dewatering Discharge

Discharge of dewaters would occur from removal of the water from pore spaces in deposited ash in Ash Ponds 1 and 2. The means and methods of collecting and conveying the dewaters are undetermined at this time. This antidegradation assessment assumes the dewaters from Ash Ponds 1 and 2 will be combined for discharge.

For purposes of this antidegradation assessment, substances in dewaters at concentrations less than the General Effluent Standards at 35 Ill. Adm. Code §304 are considered to be protective of the receiving water quality, i.e., would not cause degradation of the receiving water quality. As shown in Table 3 and Table 5, the representative average dewater concentrations of TSS in Ash Pond 1, Ash Pond 2, and the combined ash pond dewaters exceeded the General Effluent Standard. The representative average dewater concentrations of iron and manganese in Ash Pond 2 dewaters exceeded their respective General Effluent Standards. The representative average combined ash pond dewaters concentration of iron exceeded the General Effluent Standard. The representative average concentrations of manganese in Ash Pond 1 dewaters and the combined ash pond dewaters were less than the General Effluent Standard. All other analytes were less than the General Effluent Standards.

Table 5 shows the estimated mass of each substance proposed to be discharged through the existing NPDES outfall to Coffeen Lake receiving water (the “Added Load”). Table 5 estimates the predicted effects of discharging the dewaters to the lake and demonstrates the proposed discharge will not cause exceedances of the Public and Food Processing Water Supply Use Standards at 35 Ill. Adm. Code §302 Subpart C. For substances with no Public and Food Processing Water Supply Use Standard, the chronic General Use Water Quality Standards at 35 Ill. Adm. Code §302 Subpart B were used for comparison. Lake concentrations were calculated at normal pool volume. For substances where concentrations in the lake already exceed the applicable water quality standards (oil and grease, phenols, and phosphorus), the concentrations of these substances in the proposed dewaters discharge are equivalent to the existing lake concentrations. Table 5 illustrates the proposed dewaters discharge will not increase the existing concentrations of oil and grease, phenols, and phosphorus in the lake.

The estimated combined volume of dewaters to be discharged from Ash Ponds 1 and 2 as part of the CCR closure plan is 25 million gallons. The dewaters are expected to be discharged over approximately 120 to 180 days, at a rate of approximately 0.1 to 0.2 MGD. Ash Pond 2 may be dewatered using the pumps in the existing wells. The dewatering volume may be reduced if less dewatering is required to construct the cover system. The proposed short-term CCR dewatering discharge will contribute a negligible effect on receiving water concentrations.

5. Fate and Effect of Parameters Proposed for Increased Loading

Tables 4 and 5 show the estimated mass of each substance proposed to be discharged through the existing NPDES outfall to Coffeen Lake from the ash pond unwatering and dewatering activities (the “Added Load” on each table). The tables also estimate the predicted effects of discharging the unwaters and dewaters and demonstrate the proposed discharges will not cause exceedances of the Public and Food Processing Water Supply Use Standards at 35 Ill. Adm. Code §302 Subpart C or increase the existing lake concentrations. For substances with no Public and Food Processing Water Supply Use Standard, the chronic General Use Water Quality Standards at 35 Ill. Adm. Code §302 Subpart B were used for comparison.

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Table 5. Antidegradation Assessment - Ash Pond Dewaters

This table shows the "Added Load" of pollutants from dewaters that would be discharged to Coffeen Lake.
The table shows the proposed discharge will not cause exceedances of the 35 IAC Section 302 Public and Food Processing Water Supply Standards in the lake.

Contaminant	35 IAC 304 (mg/L)	35 IAC 302 Chronic (mg/L)	Ash Ponds 1 and 2 - Dewaters Treatment Flowrate (gpm) = 100 Total Volume (gallons) = 25,000,000					Flow Mixing with Process Water Average Flowrate (gpm) = 305,500			Coffeen Lake Normal Pool Volume (gallons) = 7,039,440,000					
			Concentration (mg/L)	Meet 304?	Total Load (lbs)	Source Load (lbs)	Added Load (lbs)	Process Water Concentration - CLb (mg/L)	Concentration at Outfall (mg/L)	Meet 304?	Coffeen Lake (mg/L)	Lake Meet 302?	Lake Conc. w/ Effluent (mg/L)	Meet 302?	Meet Lake?	Additional Treatment to meet 302 or Lake (lbs)
Ammonia	3	2.08	**0.59**	yes	123.15	10.43	112.71	0.05	0.05	yes	0.05	yes	0.05	yes	-	-
Arsenic	0.25	0.05	**0.0170**	yes	3.54	0.38	3.16	0.0018	0.002	yes	0.002	yes	0.002	yes	-	-
Barium	2	1.0	**0.08**	yes	16.57	11.27	5.30	0.052	0.052	yes	0.054	yes	0.054	yes	-	-
Boron	-	1.0	**3.9**	-	804.60	57.38	747.22	0.280	0.281	-	0.275	yes	0.275	yes	-	-
Cadmium	0.15	0.010	**0.0015**	yes	0.31	0.10	0.20	0.0005	0.0005	yes	0.0005	yes	0.0005	yes	-	-
Chloride	-	250	**6**	-	1,320.1	4.7	1,315.44	0.022	0.024	-	0.023	yes	0.023	yes	-	-
Chromium	1	0.050	**0.003**	yes	0.58	0.42	0.16	0.002	0.0020	yes	0.0020	yes	0.0020	yes	-	-
Chromium (hex)	0.1	0.011	**0.003**	yes	0.57	0.52	0.05	0.0025	0.0025	yes	0.0025	yes	0.0025	yes	-	-
Copper	0.5	0.015	**0.002**	yes	0.41	2.35	-1.95	0.013	0.0130	yes	0.0113	yes	0.0113	yes	-	-
Cyanide	0.1	5.2	**0.0025**	yes	0.52	0.52	0.00	0.0025	0.0025	yes	0.0025	yes	0.0025	yes	-	-
Fluoride	15	1.4	**0.43**	yes	90.6	89.5	1.13	0.425	0.425	yes	0.429	yes	0.429	yes	-	-
Iron	2	0.3	**138.41**	no	28,880	43.29	28,836.56	0.20	0.25	yes	0.21	yes	0.21	yes	-	-
Lead	0.2	0.050	**0.0006**	yes	0.13	0.10	0.03	0.0005	0.0005	yes	0.0005	yes	0.0005	yes	-	-
Manganese	1	1.0	**0.9657**	yes	201.49	4.54	196.95	0.022	0.0223	yes	0.0218	yes	0.0218	yes	-	-
Mercury	0.0005	0.0011	**0.0001**	yes	0.0209	0.02	0.00	0.0005	0.0005	yes	0.0001	yes	0.0001	yes	-	-
Nickel	1	0.007	**0.0036**	yes	0.74	0.52	0.22	0.0025	0.0025	yes	0.0025	yes	0.0025	yes	-	-
Nitrate (302.304)	-	10	**0.06**	-	12.52	14.61	-2.09	0.07	0.070	-	0.070	yes	0.070	yes	-	-
Nitrite	-	-	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-
O&G	15	0.1	**4.2**	yes	879.4	612.9	266.46	2.85	2.9	yes	2.9	no	2.9	no	yes	-
pH	6 to 9	6 to 9	**6.64**	yes	-	-	-	7.52	7.52	yes	7.42	yes	7.42	yes	-	-
Phenols	0.3	0.001	**0.0035**	yes	0.74	0.52	0.22	0.0025	0.0025	yes	0.0025	no	0.0025	no	yes	-
Phosphorus	1	0.05	**0.26**	yes	53.61	32.34	21.27	0.14	0.14	yes	0.16	no	0.15	no	yes	-
Selenium	-	0.01	**0.0033**	-	0.68	0.10	0.58	0.0005	0.0005	-	0.0005	yes	0.0005	yes	-	-
Silver	0.1	0.005	**0.0030**	yes	0.63	0.52	0.10	0.0025	0.0025	yes	0.0025	yes	0.0025	yes	-	-
Sulfate	-	250	**1443**	-	300,975	11,423	289,551	56	56.5	-	54.8	yes	54.8	yes	-	-
TDS	-	500	**1844**	-	384,695	36,513	348,182	180	181	-	175	yes	175	yes	-	-
TSS	15	-	**64**	no	13,408	1,002	12,406.74	4.8	4.8	yes	4.8	yes	4.8	-	-	-
TKN	-	-	**0.9**	-	178.2	250.4	-72.22	1.1	1.1	-	1.2	yes	1.2	-	-	-
Zinc	1	0.041	**0.009**	yes	1.84	1.56	0.28	0.006	0.0060	yes	0.0075	yes	0.0075	yes	-	-

Notes
* Hardness-based numeric water quality standards are calculated using analytical result of 110 mg/L from January 13, 2017 sampling.
* Concentration is represented as a mean of all samples collected. Non-detect results were assumed to be half of the detection limit.
* Concentration at outfall is weighted based on flow rate and concentration of process water flow.
* Additional treatment is the amount of additional treament needed to reduce the concentration of the effluent water to meet either the 302 water quality standard or the concentration of the source water (Coffeen

Fish consumption use of Coffeen Lake is listed as impaired, with a cause of mercury. A TMDL has been completed for Coffeen Lake that sets allocations for phosphorus. The concentrations of mercury in the proposed discharges will not cause exceedances of the Public and Food Processing Water Supply Use Standards. The proposed unwaters and dewaters discharges will not increase the existing lake concentrations of the causes of impairment. Since the proposed short-term discharges would not cause exceedances of the Public and Food Processing Water Supply Use standards or contribute to the cause of impairment in the lake, adverse impacts to the existing uses of the water body are not anticipated.

6. Assessments of Alternatives for Less Increase in Loading or Minimal Environmental Degradation

6.1 Water Management Alternatives Considered

Discharge of unwaters would occur from removal of the free surface water in Ash Pond 1. These waters result from the normal operation of the Coffeen plant and, except for storm water precipitation into the ash pond cells, are generally drawn from Coffeen Lake. These waters comply with the General Effluent Standards at 35 Ill. Adm. Code §304 and are currently discharged under the authorization of the plant's NPDES permit. No unwaters are present in Ash Pond 2.

IPGC has considered management alternatives for the dewaters that could avoid or minimize increase in pollutant loading to the receiving water. In addition to assessment of potential degradation of receiving waters that could result from the dewatering discharges, an important criterion used in the alternatives analysis is the reliability of the time required to remove the dewaters from the ash ponds. The unwatering and dewatering must be completed in a limited time frame to enable the regulatory-driven CCR closure construction activities. The alternatives are summarized in Table 6 and discussed in the following sections.

Table 6. Water Management Alternatives Considered

<u>Alternatives that Avoid Discharge to Receiving Water</u>

- No action. (No unwatering or dewatering of ash ponds.)
- Mechanical evaporation.
- Agricultural irrigation.
- Land application.
- Use ash pond water in power generation plant processes.

<u>Alternatives that Discharge to Receiving Water</u>

- ✓ Discharge through existing NPDES Outfall 001. This is the preferred alternative.
- Discharge with additional treatment.
    - Coagulation/flocculation.
    - Precipitation/filtration.
    - Reverse osmosis.

6.2 Alternatives that Avoid Discharge to Receiving Water

6.2.1 No Action Alternative

The closure plan for the Coffeen Ash Ponds 1 and 2 includes installation of a compacted earthen material and vegetated or composite cover system. Site preparation for installation of the cover system requires removal of open water from the ash ponds and partial removal of pore water contained in CCR-filled portions of the ash ponds. Impoundment closure to comply with the federal CCR Rule could not be achieved without removing the unwaters and dewaters. Therefore, the no action alternative is not feasible and is excluded from further consideration.

6.2.2 Mechanical Evaporation

IPGC and Hanson evaluated dewatering the ash ponds by mechanical evaporation. Hanson consulted with one mechanical evaporation equipment provider to discuss the feasibility of removing the ash pond dewaters by evaporation. Based on the information reviewed and the typical climate in this project area, mechanical evaporators could each be expected to evaporate approximately 60,000 gallons per day. Multiple evaporators would be needed to remove the estimated 25 million gallons of dewaters from the ash ponds.

Evaporation rates would be dependent upon many factors such as performance of the evaporation equipment, water make-up and chemistry, ambient temperature and humidity, solar radiation, wind, free flow of air over the ash ponds, and other factors. Evaporation could occur only in the warmer months, between approximately April and October, with the most efficient evaporation occurring in mid-summer.

It is unlikely that ideal evaporation conditions would occur for enough duration to eliminate the total 25 million gallons of dewaters. The unpredictability of weather and unreliability of evaporation rates make this alternative infeasible to comply with the CCR closure timeframes.

6.2.3 Agricultural Irrigation

IPGC and Hanson evaluated using the CCR dewaters for agricultural irrigation. The Coffeen plant is located in a rural agricultural area, although the plant is situated between Coffeen Lake and other waterbodies including East Fork Shoal Creek and Rocky Ford Lakes. Review of aerial photography does not indicate that irrigation is currently used in the vicinity of the plant. Dewaters could be pumped from the ash ponds and piped to fields east of the plant. However, the nearest agricultural fields do not appear to be feasible for the installation of large irrigation rigs due to the presence of large high-voltage electric transmission lines. The nearest fields that could potentially be irrigated would require running about 1.2 miles of temporary piping across and along County Road 1650E. It is unknown if permission could be obtained from the landowners and/or tenant farmers to utilize the irrigation rigs in their fields, and what conditions or payments may be required to obtain permission. It is likely IPGC would have to compensate the farmers for at least one season of crops. Since the purpose of the irrigation would be to remove the dewaters from the ash ponds, it is likely that water would be applied at higher rates than desired for crop growth, resulting in damaged crop or diminished yields.

IPGC has not estimated the cost to negotiate permissions and install the temporary piping to the agricultural irrigation rig(s). As with the mechanical evaporation discussed above, it is unlikely that ideal conditions would occur for enough duration to eliminate the total 25 million gallons of dewaters. The unpredictability of weather and unreliability of evaporation and infiltration rates make this alternative infeasible to comply with the CCR closure timeframes. The technical obstacles and potential detrimental effects to local farms make this alternative infeasible for the proposed short-term discharge.

6.2.4 Land Application

IPGC and Hanson evaluated land application of the CCR dewaters. Dewaters could be utilized on site for dust control. Land-applied water would be dissipated by evaporation and infiltration. In order to avoid discharge to the receiving water, land application would need to be controlled so that surface runoff did not occur. Due to the large volume of dewaters to be removed, the relatively compact size of the Coffeen plant, and the small area of pervious surfaces for infiltration, it is unlikely the dewaters could be eliminated in a timely manner by land application on stored coal or ground surfaces without causing plant inefficiency (wet coal) or safety or housekeeping issues. Land application is infeasible to eliminate the total 25 million gallons of dewaters within the CCR closure timeframes.

6.2.5 Use CCR Dewaters in Power Generation Plant Processes

IPGC and Hanson evaluated using the CCR dewaters in power plant processes. The plant uses makeup water for various processes. However, the quality of the dewaters, including concentrations of iron, sulfate, TSS, and total dissolved solids (TDS) would not be usable in the processes without substantial pretreatment. The likely pretreatment processes would generate waste streams that would result in wastewater discharges or disposal. Due to the undesirable water quality and the large volume of dewaters, it is infeasible to eliminate the anticipated total 25 million gallons of dewaters by using it in plant processes.

Currently the existing Ash Pond 2 dewatering system is directed to the GMF system, which recirculates to the “closed-loop” scrubber system. This dewatering system could be adequate to lower the Ash Pond 2 phreatic surface, facilitate Ash Pond 2 closure, and reduce the volume of Ash Pond 2 dewaters that would need to be discharged to Coffeen Lake during Ash Pond 2 closure. However, the GMF ystem could be overwhelmed with the large volume of Ash Pond 2 dewaters. Therefore, the option to discharge Ash Pond 2 dewaters to Coffeen Lake must be available.

6.3 Alternatives that Discharge to Receiving Water

6.3.1 Discharge through Existing NPDES Outfall

IPGC and Hanson evaluated discharging the dewaters through the existing NPDES Outfall 001. This is the normal operation and discharge of the ash pond waters. The dewaters would be conveyed through the outfall using existing infrastructure, including pumps, piping, and outfall structures.

Table 5 estimates the predicted effects of discharging the dewaters to the lake and demonstrates the proposed discharge will not cause exceedances of the Public and Food Processing Water Supply Use Standards or the chronic General Use Water Quality Standards at 35 Ill. Adm. Code §302. For substances where concentrations in the lake already exceed the applicable water quality standards (oil and grease, phenols, and phosphorus), the concentrations of these substances in the proposed dewaters discharge are equivalent to the existing lake concentrations. Table 5 illustrates the proposed dewaters discharge will not increase the existing concentrations of oil and grease, phenols, and phosphorus in the lake.

Pollutant loading from the proposed dewatering would increase during the short-term discharges (approximately 120 to 180 days). Considering the demonstration presented in Table 5, no adverse impacts to the existing uses of the receiving water are anticipated. Pollutant loading would decrease when the short-term dewaters discharges are completed. This alternative eliminates the dewaters in the shortest time and will enable the dewatering to be completed within the CCR closure timeframes.

6.3.2 Direct Discharge with Additional Treatment

IPGC and Hanson conducted cursory evaluations of treatment processes to reduce pollutant concentrations in the dewaters discharges. Wastewater pretreatment processes could conceivably be installed prior to Outfall 001. Pretreatment processes including oxidation, precipitation, coagulation, and flocculation would reduce the TSS in the dewaters and could reduce the dissolved concentrations of certain pollutants such as iron and manganese. However, industry experience has shown that biological treatment, chemical precipitation, or ion exchange processes are not effective in reducing concentrations of boron.

Specialized adsorption processes or reverse osmosis (RO) could be utilized to reduce the concentration of boron in the ash pond dewaters. These technologies are complex, expensive, and generate waste streams that need to be disposed or treated. Considering the large volume of dewaters (25 million gallons total), it is predicted the volumes of wastewaters from the pretreatment processes would be substantially large and concentrated to make these processes infeasible for the proposed short-term discharges of ash pond dewaters.

7. Identification of Preferred Alternative

Discharging the unwaters and dewaters through the existing NPDES outfall is consistent with the plant's normal operation. This alternative would use existing infrastructure at minimal or no additional cost and has been demonstrated to not cause exceedances of the Public and Food Processing Water Supply Standard or the chronic General Use Water Quality Standards. This alternative will remove the dewaters in the shortest practicable time to comply with the CCR closure timeframes. Discharging the dewaters through the existing NPDES outfall is IPGC's preferred alternative.

8. References

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Appendix

EcoCAT Report

ATTACHMENT V

EcoCAT
Ecological Compliance Assessment Tool

Applicant: Hanson Professional Services Inc.
Contact: Doug Dorsey
Address: 1525 S. 6th St.
Springfield, IL 62703

IDNR Project Number: 1704719
Date: 11/25/2016

Project: Coffeen Lake
Address: 134 CIPS Lane, Coffeen

Description: Antidegradation study for CCR Discharge

Natural Resource Review Results

This project was submitted for information only. It is not a consultation under Part 1075.

The Illinois Natural Heritage Database shows the following protected resources may be in the vicinity of the project location:

Eastern Blue-Eyed Grass *(Sisyrinchium atlanticum)*

Location

The applicant is responsible for the accuracy of the location submitted for the project.

County: Montgomery

Township, Range, Section:
7N, 3W, 3
7N, 3W, 4
7N, 3W, 9
7N, 3W, 10
7N, 3W, 11
7N, 3W, 14
7N, 3W, 15
7N, 3W, 22
7N, 3W, 23

IL Department of Natural Resources Contact
Impact Assessment Section
217-785-5500
Division of Ecosystems & Environment

Disclaimer

The Illinois Natural Heritage Database cannot provide a conclusive statement on the presence, absence, or condition of natural resources in Illinois. This review reflects the information existing in the Database at the time of this inquiry, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, compliance with applicable statutes and regulations is required.

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Attachment J

Memorandum – Evaluation of Partition Coefficient Results – Coffeen AP1

1 McBride and Son Center Drive, Suite 202
Chesterfield, MO 63005
www.geosyntec.com

Memorandum

Date: July 5, 2022

To: David Mitchell, Stu Cravens, Vic Modeer
Illinois Power Generating Company

Copies to: Brian Hennings - Ramboll

From: Allison Kreinberg, Ryan Fimmen – Geosyntec Consultants, Inc.

Subject: Evaluation of Partition Coefficient Results – Coffeen Ash Pond No. 1
CCR Unit 101, Coffeen Power Plant, Coffeen, Illinois

INTRODUCTION

The Illinois Power Generation Company (IPGC) currently operates the Coffeen Power Plant (CPP) and its associated ash ponds located in Coffeen, Illinois. Ash Pond Number (No.) 1 (AP1) (Vistra identification (ID) No. 101; Illinois Environmental Protection Agency [IEPA] ID No. W1350150004-01; National Inventory of Dams [NID] No. IL50722) is a 23-acre, unlined SI used to manage CCR (bottom ash) and non-CCR waste streams at the CPP in accordance with the plant's Water Pollution Control Permit 1978-EA-389 issued by the Agency on May 26, 1978. Geosyntec Consultants (Geosyntec) is assisting IPGC with Part 845 compliance at the Site.

IPGC is currently preparing a Construction Permit application for AP1 as required under Section 845.220. As part of the Construction Permit application, groundwater modeling is being completed for known potential exceedances of groundwater protection standards (GWPS) identified in the Operating Permit (Burns & McDonnell, 2021). In the Operating Permit (October 2021), Burns & McDonnell identified potential GWPS exceedances for several compounds potentially associated with AP1, including boron, cobalt, pH (field), sulfate, and total dissolved solids (TDS). An evaluation of potential exceedances of applicable GWPS found that both cobalt and pH potential exceedances are not related to AP1 (Geosyntec, 2022). Batch adsorption testing was conducted for boron and sulfate to generate site-specific partition coefficients. This technical memorandum summarizes the results of the batch adsorption testing and calculation of partition coefficients.

BATCH ATTENUATION TESTING

In 2021, Geosyntec conducted a field investigation at AP1 which included completion of four (4) soil/rock borings ranging in depth from 13 to 18 feet below ground surface. As part of that investigation, soil and groundwater samples were submitted to SiREM Laboratories (Guelph, ON) for batch solid/liquid partitioning testing. A summary of the soil samples used for the batch testing is provided in **Table 1**.

Two groundwater samples (G311 and G313) and three soil samples (SB-306, SB-311, and SB-313) were used for batch attenuation testing at five (5) soil:solution ratios (**Table 1**), each ran in duplicate. For each treatment, 0.1 L of groundwater was brought into contact with varying amounts of soil (0.004 to 0.2 kg, depending on the ratio) and equilibrated over a seven-day period. Each microcosm was amended (i.e., spiked) with sodium sulfate (Na_2SO_4), and the microcosms with G313 groundwater were also amended with boric acid (H_3BO_3), to achieve a target concentration of sulfate and boron, respectively (**Table 2**). The G311 microcosm was not amended with boric acid because potential boron exceedances were not identified in the vicinity of G311. G313 groundwater was combined with aquifer solids both adjacent to downgradient location G311 and background location G306 to understand how partitioning behavior may be affected by position relative to AP1.

An initial sample of the stock solution for each experimental design was collected on Day 0, and a control sample (i.e., only amended G311 or G313 groundwater with no aquifer solids) was collected on Day 7 after tumbling in polypropylene bottleware to evaluate any loss to interactions with the bottleware or ambient conditions. Duplicates were constructed for each microcosm, including the control samples. After seven days of contact time, an aliquot of the free liquid was collected and filtered through a 0.45 micron (μm) filter prior to analysis for dissolved concentrations of sulfate and/or boron. The oxidation/reduction potential (redox) and pH were measured for each batch test at the beginning and end of the contact period and in the control samples.

Data obtained from the tests (**Tables 3** and **4**) were used to construct isotherms for boron and sulfate; 5-point isotherms were constructed by averaging duplicate results for each soil:solution ratio. Mathematical fitting was used to calculate the attenuation distribution coefficients (K_d), assuming linear adsorption. The linear adsorption equation was used:

$$q_e = K_d \times C_e \qquad \text{Eq. 1}$$

where q_e is the mass of constituent adsorbed to the solid phase at equilibrium, C_e is the remaining aqueous constituent concentration at equilibrium, and K_d is the linear sorption coefficient (reported in liters per kilogram [L/kg]). Some of the data showed a deviation from a linear trend, and so were also fitted using non-linear isotherms. The non-linear Langmuir isotherm was used:

$$q_e = \frac{q_m K_L C_e}{1 + K_L C_e} \qquad \text{Eq. 2}$$

where q_m is the inverse of the slope and K_L is the Langmuir distribution coefficient. The adsorption data were linearized according to:

$$\frac{C_e}{q_e} = \frac{1}{(K_L \times q_m)} + \frac{C_e}{q_m} \qquad \text{Eq. 3}$$

A common non-linear Freundlich equation was also used:

$$q_e = K_F (C_e)^{1/n} \qquad \text{Eq. 4}$$

where q_e is the mass of constituent adsorbed to the solid phase at equilibrium, C_e is the remaining aqueous constituent concentration at equilibrium, K_F is the Freundlich distribution coefficient, and *1/n* is a non-linearity constant. The adsorption data were plotted as log-transformed values to perform the non-linear isotherm fitting using the linearized Freundlich equation:

$$log(q_e) = \log(K_F) + \left(1/n\right)\log(C_e) \qquad \text{Eq. 5}$$

The calculated linear, Langmuir, and Freundlich distribution coefficients (K_d, K_L, and K_F, respectively) and 1/*n* values are shown in **Tables 5** and **6**.

SUMMARY OF RESULTS

The partition coefficient values for G311 and G313 (denoted below as G313/SB-306 when combined with SB-306 geologic material and G313/SB-313 when combined with the SB-313 geologic material) are presented in **Tables 5** and **6**, respectively. Figures which show the linear, Langmuir, and Freundlich isotherms for boron and sulfate are provided in **Appendix A**.

A boron partition coefficient was not calculated for G311, since the microcosm was not amended with boric acid because potential boron exceedances were not identified in the vicinity. The Freundlich isotherm fit the data best for G313/SB-306 and G313/SB-313, yielding K_F values of 0.65 L/kg and 2.03 L/kg, respectively. Though slightly higher at G313/SB-313, these values are comparable to boron partition coefficients reported in the literature, which range from 0.19 to 1.3 L/kg depending on pH conditions and the amount of sorbent present (EPRI, 2005; Strenge & Peterson, 1989).

The G311 partition coefficient for sulfate ranged from -624 L/kg for the Langmuir isotherm to 10.11 L/kg for the linear isotherm, but the best-fitting Freundlich isotherm yielded a low K_F value of 9.2×10^{-12} L/kg. None of the isotherms showed a high goodness-of-fit (i.e., R^2) for either G313/SB-306 or G313/SB-313, with the highest correlation being 0.51, and were associated with erroneously high (1700 L/kg) and low (-690 L/kg) partition coefficients. An accurate sulfate partition coefficient could therefore not be calculated from any of the data. These results are consistent with the findings of Strenge and Peterson (1989), who found that partition coefficients for sulfate are 0.0 L/kg, regardless of pH conditions and the amount of sorbent present.

REFERENCES

EPRI, 2005. *Chemical constituents in coal combustion product leachate: boron. Final Report 1005258.*

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Strenge, D. and Peterson, S. 1989. Chemical Data Bases for the Multimedia Environmental Pollutant Assessment System (MEPAS) (No. PNL-7145). Pacific Northwest National Laboratory, Richland, WA (USA).

Geosyntec. 2022. Evaluation of Potential Groundwater Protection Standard Exceedances. Coffeen Ash Pond No. 1. Coffeen, Illinois. May

TABLES

Table 1 - Batch Attenuation Testing Data Summary
Coffeen AP1

Groundwater Sample ID	Soil Sample ID	Soil: Water Ratio
G311	SB-311 (14-15 ft bgs)	2:1.4
		1:1.3
		1:5.7
		1:11.3
		1:27.8
G313	SB-306 (14-16 ft bgs)	2:1.5
		1:1.3
		1:6.0
		1:11.7
		1:28.8
G313	SB-313 (8-9 ft bgs)	2:1.5
		1:1.3
		1:6.0
		1:11.7
		1:28.8

Notes:

ft bgs = feet below ground surface

Table 2 - Microcosm Amendment and Target Concentrations
Coffeen AP1

Groundwater Sample ID	Soil Sample ID	Compound	Amendment	Target Concentration (mg/L)
G311	SB-311 (14-15 ft bgs)	Boron	--	--
		Sulfate	2.76 g of Na_2SO_4	1500
G313	SB-306 (14-16 ft bgs)	Boron	19.73 mL of a 2 g/L H_3BO_3	5
		Sulfate	1.98 g of Na_2SO_4	1500
G313	SB-313 (8-9 ft bgs)	Boron	19.73 mL of a 2 g/L H_3BO_3	5
		Sulfate	1.98 g of Na_2SO_4	1500

Notes:
ft bgs - feet below ground surface
mg/L - milligrams per liter
Na_2SO_4 - sodium sulfate
H_3BO_3 - boric acid

Table 3 - Batch Attenuation Testing Results, G311
Coffeen AP1

Groundwater Sample ID	Geologic Material Sample ID	Treatment	Date	Day	Replicate	Dissolved Sulfate	pH	ORP
						mg/L	**SU**	**mV**
G311	--	Groundwater Only Control	25-Jan-22	0	G311-1a	1,589	6.83	-62
					G311-2a	1,826	6.88	-66
					Average Concentration (mg/L)	**1,708**	**6.86**	**-64**
			1-Feb-22	7	G311-1	1,617	6.85	42
					G311-2	1,478	6.85	38
					Average Concentration (mg/L)	**1,548**	**6.85**	**40**
	G311 SB-311 Geologic Material	2:1 Soil:Water Ratio	25-Jan-22	0				
			1-Feb-22	7	SB-311:G311 2:1-1	1,321	6.92	50
					SB-311:G311 2:1-2	1,302	6.86	100
					Average Concentration (mg/L)	**1,311**	**6.89**	**75**
		1:1 Soil:Water Ratio	25-Jan-22	0				
			1-Feb-22	7	SB-311:G311 1:1-1	1,727	6.92	51
					SB-311:G311 1:1-2	860	6.88	24
					Average Concentration (mg/L)	**1,294**	**6.90**	**38**
		1:5 Soil:Water Ratio	25-Jan-22	0				
			1-Feb-22	7	SB-311:G311 1:5-1	1,326	6.87	93
					SB-311:G311 1:5-2	1,516	6.88	56
					Average Concentration (mg/L)	**1,421**	**6.88**	**75**
		1:10 Soil:Water Ratio	25-Jan-22	0				
			1-Feb-22	7	SB-311:G311 1:10-1	1,570	6.89	27
					SB-311:G311 1:10-2	1,551	6.86	133
					Average Concentration (mg/L)	**1,560**	**6.88**	**80**
		1:20 Soil:Water Ratio	25-Jan-22	0				
			1-Feb-22	7	SB-311:G311 1:20-1	1,511	6.88	88
					SB-311:G311 1:20-2	1,588	6.86	39
					Average Concentration (mg/L)	**1,550**	**6.87**	**64**

Notes:
mg/L - milligrams per liter
mV - millivolts
SU - Standard Units
ORP - oxidation/reduction potential

Table 4 - Batch Attenuation Testing Results, G313
Coffeen AP1

Groundwater Sample ID	Geologic Material Sample ID	Treatment	Date	Day	Replicate	Dissolved Boron	Dissolved Sulfate	pH	ORP
						mg/L	mg/L	SU	mV
G313	--	Groundwater Only Control	25-Jan-22	0	G313-1a	6.5	1,372	6.98	-60
					G313-2a	6.7	1,473	6.98	-21
					Average Concentration (mg/L)	**6.6**	**1,423**	**6.98**	**-41**
			1-Feb-22	7	G313-1	6.3	1,158	6.98	113
					G313-2	6.2	1,058	6.97	40
					Average Concentration (mg/L)	**6.2**	**1,108**	**6.98**	**77**
	G313 SB-306 Geologic Material	2:1 Soil:Water Ratio	25-Jan-22	0					
			1-Feb-22	7	SB-306:G313 2:1-1	4.5	884	6.95	46
					SB-306:G313 2:1-2	4.7	779	6.95	44
					Average Concentration (mg/L)	**4.6**	**831**	**6.95**	**45**
		1:1 Soil:Water Ratio	25-Jan-22	0					
			1-Feb-22	7	SB-306:G313 1:1-1	5.3	1,049	6.94	75
					SB-306:G313 1:1-2	5.3	976	6.93	44
					Average Concentration (mg/L)	**5.3**	**1,012**	**6.94**	**60**
		1:5 Soil:Water Ratio	25-Jan-22	0					
			1-Feb-22	7	SB-306:G313 1:5-1	5.8	243	6.95	80
					SB-306:G313 1:5-2	6.1	1,005	6.96	-5
					Average Concentration (mg/L)	**5.9**	**624**	**6.96**	**38**
		1:10 Soil:Water Ratio	25-Jan-22	0					
			1-Feb-22	7	SB-306:G313 1:10-1	6.1	958	6.96	203
					SB-306:G313 1:10-2	6.1	832	6.97	90
					Average Concentration (mg/L)	**6.1**	**895**	**6.97**	**147**
		1:20 Soil:Water Ratio	25-Jan-22	0					
			1-Feb-22	7	SB-306:G313 1:20-1	6.0	881	6.96	39
					SB-306:G313 1:20-2	6.0	1,409	6.94	81
					Average Concentration (mg/L)	**6.0**	**1,145**	**6.95**	**60**
	G313 SB-313 Geologic Material	2:1 Soil:Water Ratio	25-Jan-22	0					
			1-Feb-22	7	SB-313:G313 2:1-1	4.3	852	6.96	164
					SB-313:G313 2:1-2	4.6	900	6.93	143
					Average Concentration (mg/L)	**4.5**	**876**	**6.95**	**154**
		1:1 Soil:Water Ratio	25-Jan-22	0					
			1-Feb-22	7	SB-313:G313 1:1-1	4.9	482	6.99	78
					SB-313:G313 1:1-2	5.0	1,000	6.95	39
					Average Concentration (mg/L)	**4.9**	**741**	**6.97**	**59**
		1:5 Soil:Water Ratio	25-Jan-22	0					
			1-Feb-22	7	SB-313:G313 1:5-1	6.0	1,227	6.96	23
					SB-313:G313 1:5-2	6.2	837	6.97	25
					Average Concentration (mg/L)	**6.1**	**1,032**	**6.97**	**24**
		1:10 Soil:Water Ratio	25-Jan-22	0					
			1-Feb-22	7	SB-313:G313 1:10-1	6.0	1,459	6.97	63
					SB-313:G313 1:10-2	5.8	2,105	6.98	85
					Average Concentration (mg/L)	**5.9**	**1,782**	**6.98**	**74**
		1:20 Soil:Water Ratio	25-Jan-22	0					
			1-Feb-22	7	SB-313:G313 1:20-1	5.8	1,000	6.96	125
					SB-313:G313 1:20-2	6.0	1,043	6.97	47
					Average Concentration (mg/L)	**5.9**	**1,022**	**6.97**	**86**

Notes:

mg/L - milligrams per liter
mV - millivolts
SU - Standard Units
ORP - oxidation/reduction potential

Table 5 - Partition Coefficient Results, G311
Coffeen AP1

Analyte	Isotherm	Variable	Value
Sulfate	Linear	R^2	0.61
		K_D (L/kg)	10.11
	Langmuir	R^2	0.65
		q_m (mg/g)	-0.10
		K_L (L/kg)	-6.24E+02
	Freundlich	R^2	0.78
		1/n	10.27
		K_F (L/kg)	9.20E-12

Notes:

K_D - linear partition coefficient

K_L - Langmuir partition coefficient

K_F - Freundlich partition coefficient

q_m - inverse of the slope of the linearized Langmuir isotherm

n - non-linearity constant of the Freundlich isotherm

Table 6 - Partition Coefficient Results, G313
Coffeen AP1

Materials	Analyte	Isotherm	Variable	Value
G313/SB-306	Boron	Linear	R^2	0.37
			K_D (L/kg)	6.13
		Langmuir	R^2	0.76
			q_m (mg/g)	0.00
			K_L (L/kg)	-1.51E+05
		Freundlich	R^2	0.64
			1/n	6.65
			K_F (L/kg)	6.50E-01
	Sulfate	Linear	R^2	0.05
			K_D (L/kg)	3.97
		Langmuir	R^2	0.01
			q_m (mg/g)	2.20
			K_L (L/kg)	1.19E+03
		Freundlich	R^2	0.00
			1/n	-0.06
			K_F (L/kg)	1.70E+03
G313/SB-313	Boron	Linear	R^2	0.24
			K_D (L/kg)	5.68
		Langmuir	R^2	0.50
			q_m (mg/g)	0.00
			K_L (L/kg)	-1.43E+05
		Freundlich	R^2	0.46
			1/n	5.25
			K_F (L/kg)	2.03E+00
	Sulfate	Linear	R^2	0.21
			K_D (L/kg)	-6.50
		Langmuir	R^2	0.51
			q_m (mg/g)	-0.66
			K_L (L/kg)	-6.91E+02
		Freundlich	R^2	--
			1/n	--
			K_F (L/kg)	--

Notes:

The Freundlich isotherm was not calculated for G313/SB-313 because the data were not conducive to log transformation

K_D - linear partition coefficient

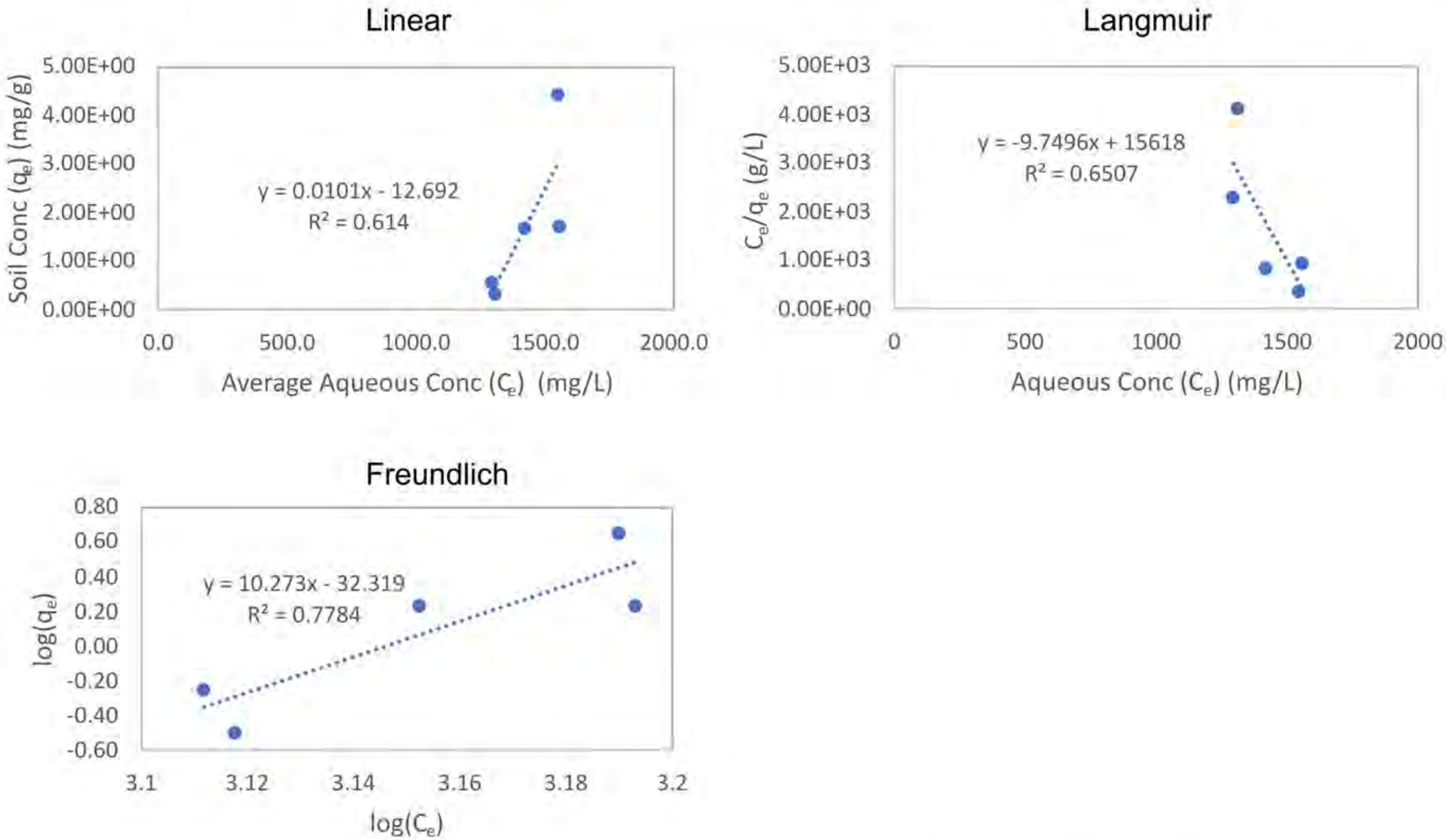
K_L - Langmuir partition coefficient

K_F - Freundlich partition coefficient

q_m - inverse of the slope of the linearized Langmuir isotherm

n - non-linearity constant of the Freundlich isotherm

APPENDIX A
BATCH TESTING ISOTHERM PLOTS



Notes:

q_e - mass of constituent adsorbed to the solid phase
C_e - remaining aqueous constituent concentration
mg/L - milligrams per liter
mg/g - milligrams per gram
g/L - grams per liter

G311 Sulfate Partitioning Coefficients
Coffeen Power Plant AP-1
Coffeen, Illinois

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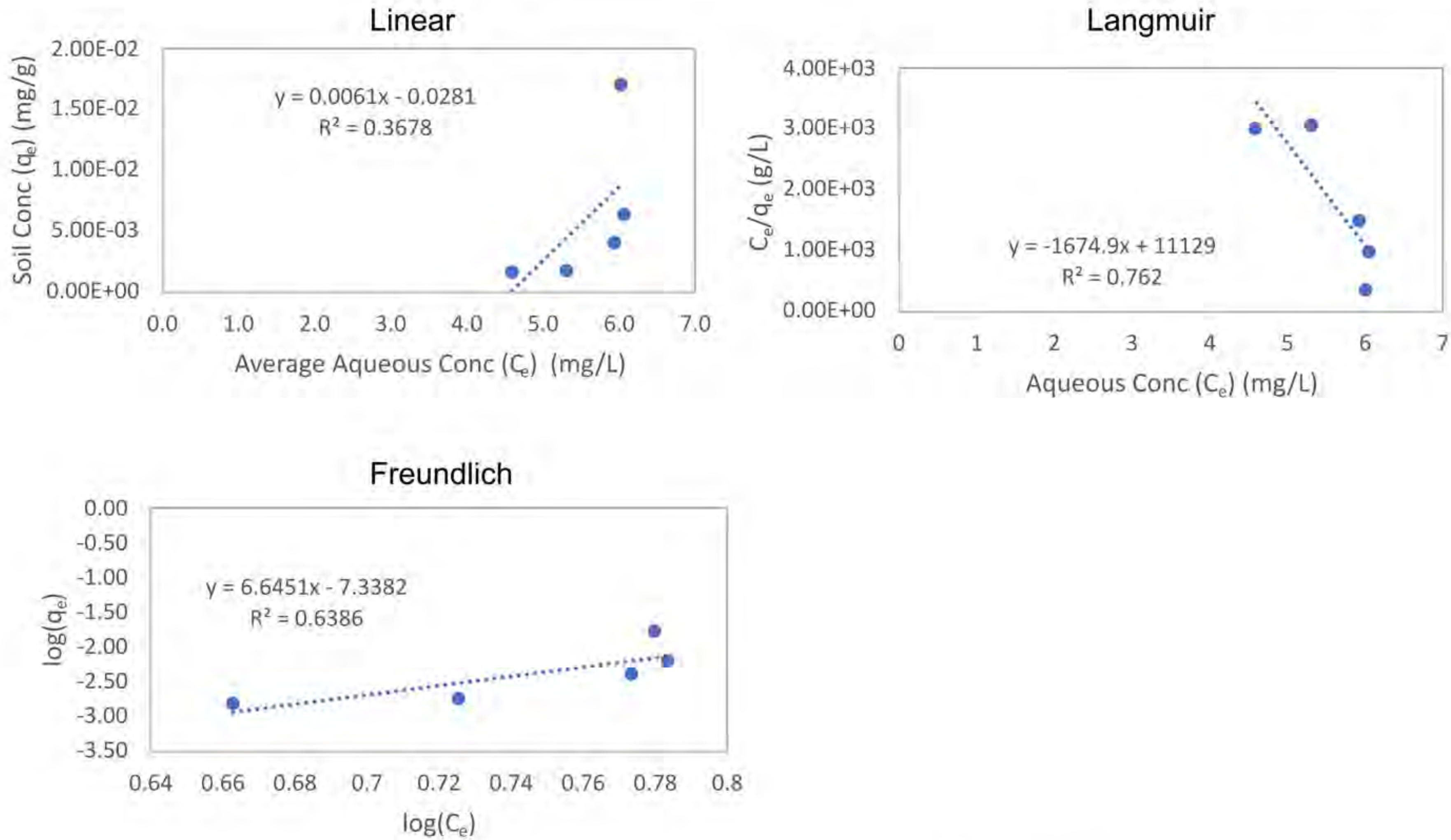
Figure
1



Notes:

q_e - mass of constituent adsorbed to the solid phase
C_e - remaining aqueous constituent concentration
mg/L - milligrams per liter
mg/g - milligrams per gram
g/L - grams per liter

G313/SB-306 Boron Partitioning Coefficients
Coffeen Power Plant AP-1
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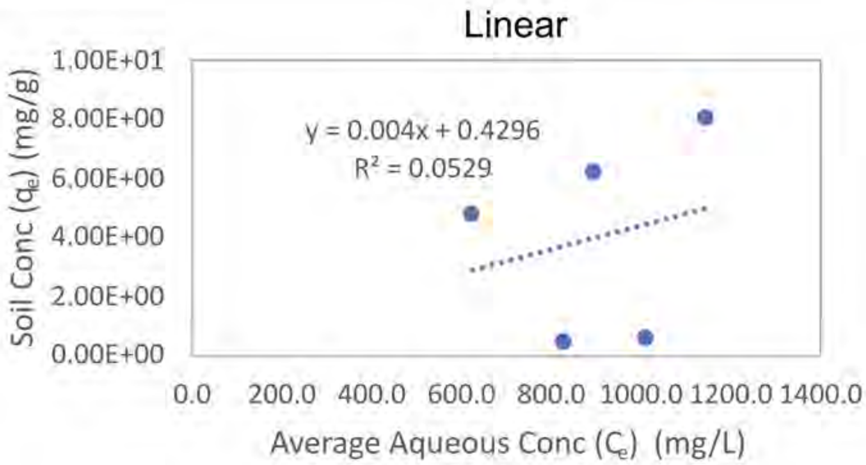
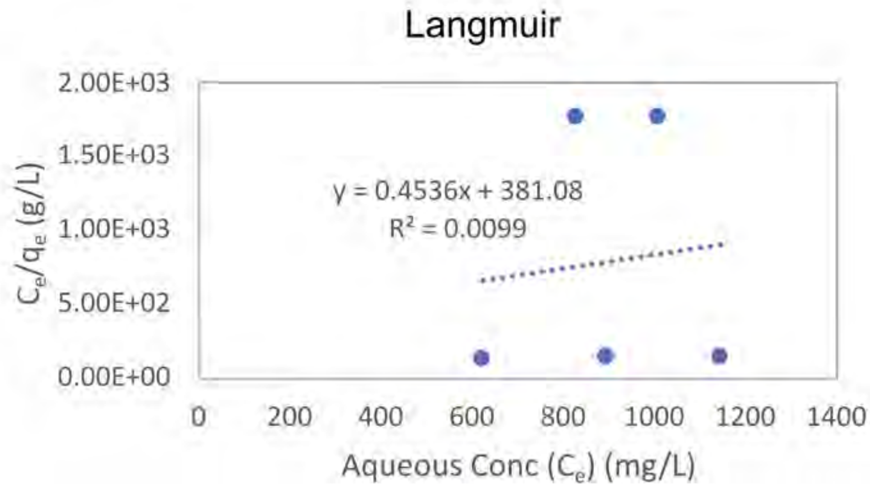
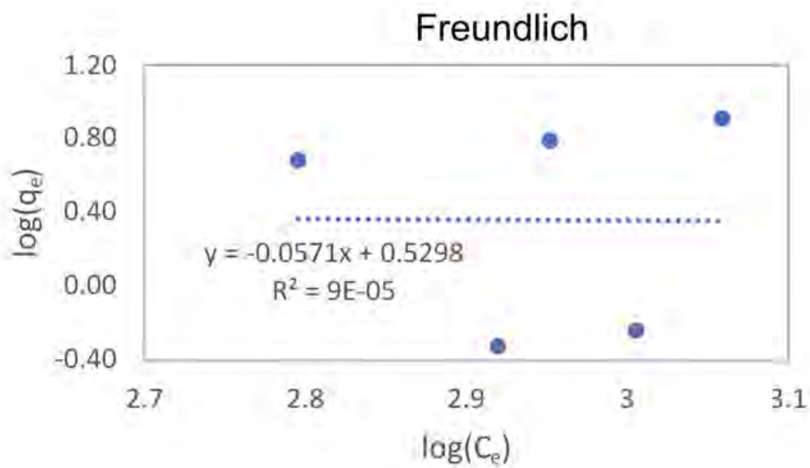
Figure 2







Notes:

q_e - mass of constituent adsorbed to the solid phase
C_e - remaining aqueous constituent concentration
mg/L - milligrams per liter
mg/g - milligrams per gram
g/L - grams per liter

G313/SB-306 Sulfate Partitioning Coefficients
Coffeen Power Plant AP-1
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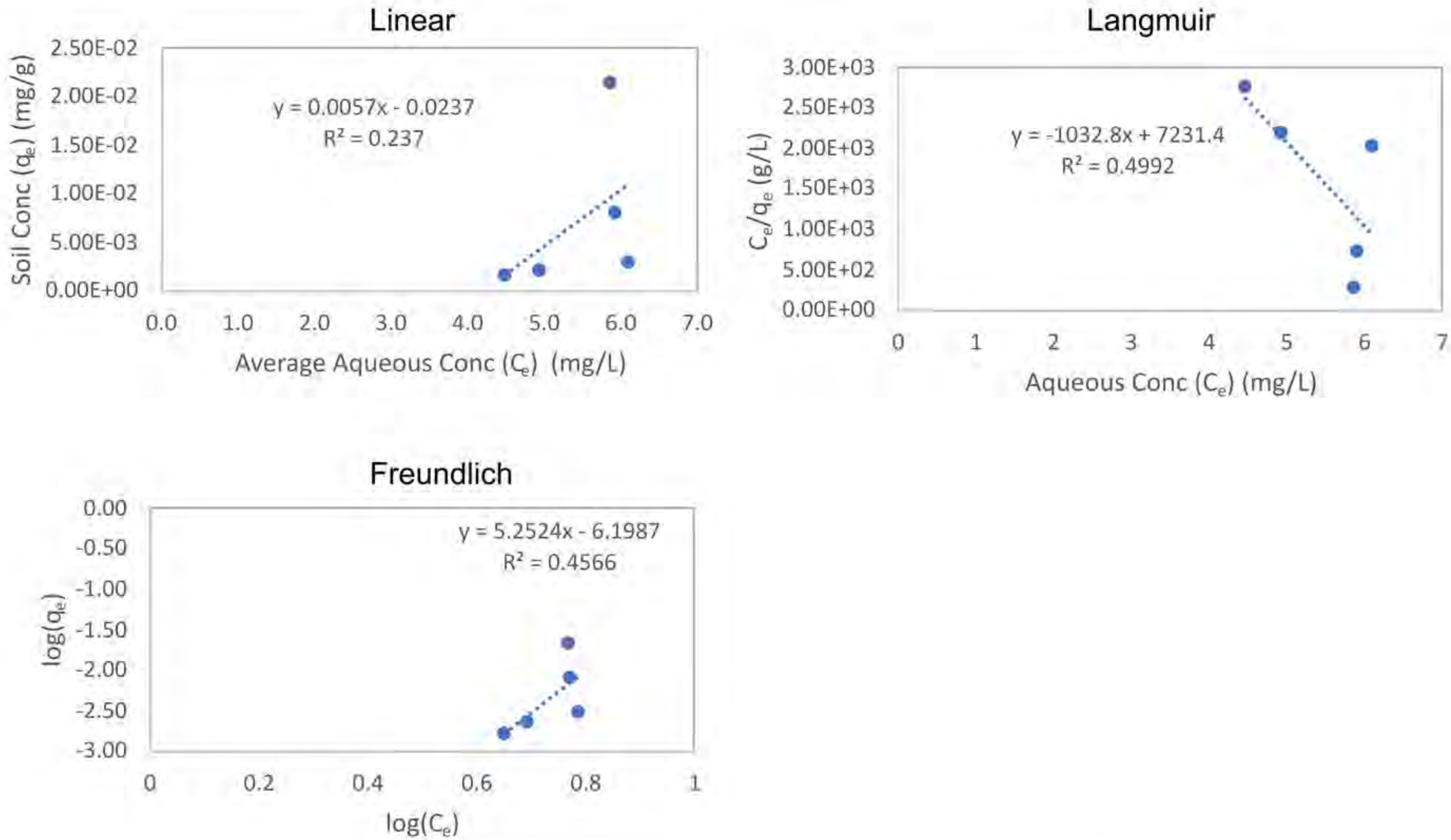
Figure 3



Notes:
- q_e - mass of constituent adsorbed to the solid phase
- C_e - remaining aqueous constituent concentration
- mg/L - milligrams per liter
- mg/g - milligrams per gram
- g/L - grams per liter

G313/SB-313 Boron Partitioning Coefficients
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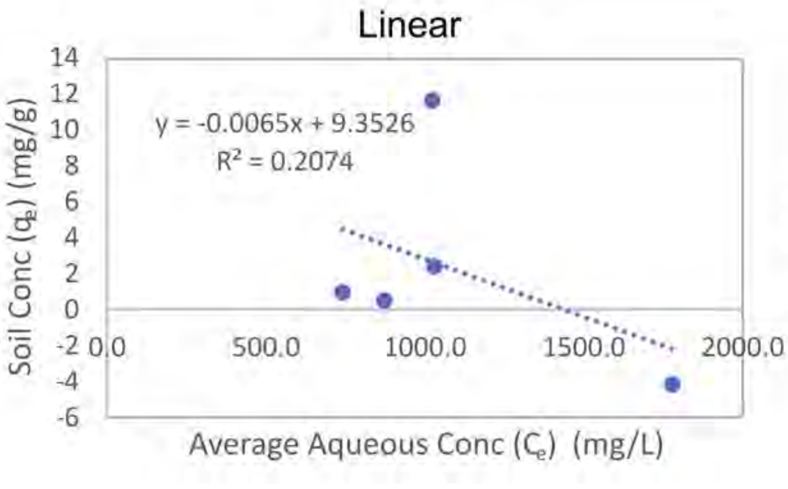
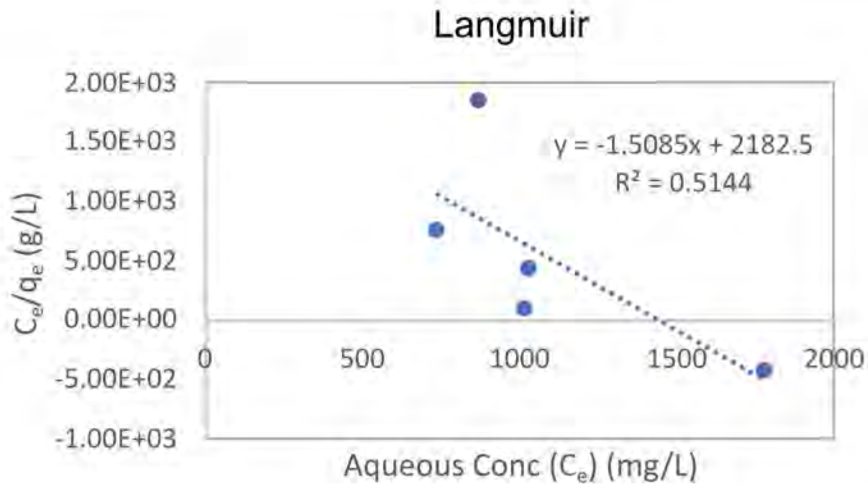
Figure
4





Notes:

The Freundlich isotherm was not calculated because the data were not conducive to log transformation.

q_e - mass of constituent adsorbed to the solid phase
C_e - remaining aqueous constituent concentration
mg/L - milligrams per liter
mg/g - milligrams per gram
g/L - grams per liter

G313/SB-313 Sulfate Partitioning Coefficients
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Figure 5