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. 2 (ID No. W1350150004-02)

Illinois Power Generating Company (IPGC) is hereby submitting this assessment of groundwater corrective measures for Coffeen Power Plant Ash Pond No. 2 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. 2

COFFEEN POWER PLANT

COFFEEN, ILLINOIS

IEPA ID: W135015004-02

RAMBOLL Bright ideas. Sustainable change.

35 I.A.C. § 845 CORRECTIVE MEASURES ASSESSMENT COFFEEN POWER PLANT ASH POND NO. 2

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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
CIP	closure-in-place
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; quarter 2, 2023
GMF	Gypsum Management Facility
GMF GSP	GMF Gypsum Stack Pond
GMF RP	GMF Recycle Pond
GMP	Groundwater Monitoring Plan
GWPS	groundwater protection standard(s)
ID	identification
IDNR	Illinois Department of Natural Resources
IEPA	Illinois Environmental Protection Agency
IPCB	Illinois Pollution Control Board
IPGC	Illinois Power Generating Company
ITRC	National Research Council, Interstate Technology & Regulatory Council
LCU	lower confining unit
NID	National Inventory of Dams
No.	number
NPDES	National Pollutant Discharge Elimination System
NRT	Natural Resource Technology
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.) 2 (AP2) at the Coffeen Power Plant (CPP), also referred to as CCR unit identification (ID) No. 102, Illinois Environmental Protection Agency (IEPA) ID No. W1350150004-02, and National Inventory of Dams (NID) No. IL50723. This report addresses content requirements specific to 35 I.A.C. § 845.660 (Assessment of Corrective Measures) for exceedances of boron, cobalt, pH, sulfate, and total dissolved solids (TDS) at AP2.

1.1 Source Control and Residual Plume Management

IPGC completed significant source control and residual plume management efforts in 2020 as part of final closure of AP2 (Golder Associates, Inc., 2021). The final closure was performed in accordance with the Closure and Post-Closure Care Plan (AECOM, 2017) that was developed in accordance with Title 40 of the Code of Federal Regulations (40 C.F.R.) § 257 and approved by IEPA on January 30, 2018.

The AP2 closure construction included closure-in-place (CIP) of the entire AP2 and installation of an alternative geomembrane cover system. This was accomplished by constructing a final cover system that complies with 40 C.F.R. § 257.102 to minimize water infiltration into the closed AP2 and improve surface water drainage off the cover system, thus reducing generation of potentially impacted water and ultimately reducing the extent of CCR impacts to groundwater. The source control was predicted to lower water levels and decrease the potential transport of CCR constituents off-site (Natural Resource Technology [NRT], 2017a). These source control activities will serve as the primary groundwater corrective measure at AP2. The potentially feasible corrective measures presented herein are intended to be supplementary to the primary source control and are intended to serve as management measures to address any residual plume that may remain after completion of source control.

1.2 Adaptive Site Management

Adaptive site management strategies will be employed as an integral part of ongoing corrective action at AP2. The adaptive site management approach will allow timely incorporation of new site information over the closure and post-closure life cycle of AP2 to ensure the achievement of the groundwater protection standards (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 United States Environmental Protection Agency (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 AP2 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 AP2. 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 AP2. 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 AP2.

3. Ongoing groundwater monitoring at AP2 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. AP2 is a closed CCR surface impoundment (SI) located in Section 11, Township 7 North and Range 7 East. AP2 is located south of the power plant and situated in a predominantly agricultural area (**Figure 2-1**). AP2 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 Figures 2-1 and 2-2), which surround the SI to the west, east, and south. The southern edge of AP2 is adjacent to the former discharge flume for the closed generating plant. AP2 is bordered by other CCR units and agricultural land to the north. **Figure 2-2** is a site map showing the location of AP2 (35 I.A.C. § 845 regulated CCR Unit and subject of this CMA), Ash Pond No. 1 (AP1), the Gypsum Management Facility (GMF) Gypsum Stack Pond (GMF GSP), GMF Recycle Pond (GMF RP), and Landfill. The area near AP2 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 surface impoundments. AP2 was utilized in the early 1970's until the mid-1980's, beginning in 2010 CCR material was placed in the Landfill and GMF Units.

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, AP2 has been well characterized and detailed in the Hydrogeologic Characterization Report (NRT, 2017b). The conceptual site model (CSM) is presented below.

In addition to the CCR present at AP2, 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 AP2, near the Unnamed Tributary.
- **Uppermost Aquifer:** The uppermost aquifer 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, and 1 to 2 feet thick near AP2. Similar to the Loess Unit and upper Hagarstown, the lower Hagarstown is absent in some locations near the Unnamed Tributary. Historical hydraulic conductivities near AP2 ranged from 4.3 x 10^{-5} to 9.8 x 10^{-4} centimeters per second (cm/s) (geometric mean of 2.7 x 10^{-4} 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 through this unit. The LCU is approximately 7 to 18 feet thick near AP2. Historical hydraulic conductivities ranged from 4.0×10^{-8} to 3.4×10^{-5} cm/s (geometric mean of 5.6×10^{-6} 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. This unit is also identified as a PMP due to presence of downward gradients in the overlying LCU and the relatively greater hydraulic conductivities measured in the DA. Historical hydraulic conductivity in the DA ranged from 7.5×10^{-8} to 3.6×10^{-5} cm/s (geometric mean of 4.4×10^{-4} cm/s).
- **Deep Confining Unit (DCU):** Comprised of the Banner Formation, 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 towards 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 the former discharge flume present along the southern perimeter of AP2 and 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 AP2 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 10 wells screened in the UA (three background and seven compliance), one compliance well screened in the LCU, and three temporary water level only surface water staff gages. The groundwater samples collected from the 11 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 sampling 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 wells G401, G402, G404, and G405
- Cobalt in UA well G401
- pH in UA well G401

- Sulfate in UA wells G401, G402, G404, G405, G406, and G407
- TDS in UA wells G401, G402, G404, G405, and G407

Pursuant to 35 I.A.C. § 845.650(e), an alternative source demonstration (ASD) was prepared and submitted to IEPA that presented evidence demonstrating that sources other than AP2 were the cause of the cobalt GWPS exceedance in G401, and sulfate and TDS GWPS exceedances in G407 listed above (Geosyntec Consultants, Inc., 2023).

The IEPA did not concur with the cobalt ASD due to the following alleged data gaps:

1. Source characterization of the CCR at AP2 must include total solids sampling in accordance with SW846.
2. Research on porewater characterization of CCR does not come from an independent peer reviewed publication.

The IEPA did not concur with the G407 sulfate and TDS ASD due to the following alleged data gaps:

1. Characterization to include sample and analysis in accordance with 35 I.A.C. § 845.640 must be provided with the ASD.
2. Updated geologic cross sections must be provided and must include data surrounding the hydrogeologic divide and the exceedance well G407 in accordance with § 845.620(b)(9).

IPGC filed a petition asking the Illinois Pollution Control Board (IPCB) to review IEPA's ASD denial. The petition included a motion for a partial stay of the 35 I.A.C. § 845 requirements as they apply to the cobalt, sulfate, and TDS GWPS exceedances at AP2. The IEPA had no objection to the requested stay, which was granted by IPCB on April 18, 2024. Therefore, the CMA will address identified GWPS exceedances summarized above, exclusive of the cobalt exceedance at well G401, and the sulfate and TDS exceedances in G407, in accordance with 35 I.A.C. § 845.660 and the partial stay. The 35 I.A.C. § 845.650 groundwater monitoring requirements will continue to ensure that there will be timely detection of any additional changes in groundwater quality during the stay.

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 AP2 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 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 AP2, 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 AP2. 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 AP2 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 actions, namely the completed source control activities described in **Section 1.1** (CIP with an alternative geomembrane cover system). The completed source control has significantly reduced infiltration rates relative to pre-closure conditions. 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 completed 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 were completed for AP2 in 2020, 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 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, the United States Environmental Protection Agency (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 completed source control activities at the site, which consisted of CIP with an alternative 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, 2015). 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, 2015):

Both physical and chemical processes can contribute to the reduction of the small amount of residual mass remaining since closure of AP2, 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.

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, 2015) 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.
- 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.

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 transport of impacted groundwater and can isolate soils that have been impacted by CCR to prevent contact 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 a cutoff wall and groundwater extraction in specific areas may provide advantages over independent use of these potential corrective technologies. Cutoff walls can also be used in combination with groundwater extraction or as part of a PRB system (as the "funnel" in a funnel-and-gate system; **Section 3.4**).

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 and sulfate 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 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 as 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 emplaced 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 zero-valent iron 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, pH, sulfate, and TDS (exclusive of the sulfate and TDS exceedances in G407) at the downgradient waste boundary of AP2 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 corrective action plan; and
- Institutional requirements, such as State or local permit requirement or other environmental or public health requirements that may substantially affect implementation of the corrective action plan.

Table 5-1 presents the qualitative CMA evaluation of each corrective technology relative to these requirements, as well as their ability to address boron, pH, sulfate, and TDS GWPS exceedances. 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 35 I.A.C. § 845.670 CAAA process for selecting the final remedy for AP2.

5.2 Groundwater Corrective Technology Assessment

Source control, consisting of CIP with an alternate geomembrane cover system, is the primary groundwater corrective measure for AP2 and was completed in 2020. Each of the potential groundwater corrective measure technologies would supplement the positive impact of the prior closure activities. The following sections evaluate groundwater corrective measure technologies that, when combined with site closure, may be viable to address the boron, pH, sulfate, and TDS GWPS exceedances (exclusive of the sulfate and TDS exceedances in G407). Technologies that are not viable for addressing the GWPS at AP2 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

Completed source control corrective measures (**Section 1.1**) have reduced the mass loading to the groundwater system. Performance of groundwater polishing, which is currently occurring at the site to some degree, could decrease the timeframe for attainment of GWPS for one or more parameters in the UA. The time estimated for plume contraction at AP2 is relatively long, based on previous groundwater modeling (NRT, 2017c). Groundwater polishing is dependent on site-specific conditions and may not significantly reduce the time to attain the GWPS for all parameters at AP2.

Groundwater polishing by natural geochemical processes is a widely accepted component of groundwater remediation and is routinely approved by the USEPA 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. Site conditions are favorable for physical attenuation, while chemical attenuation may be limited under normal UA conditions.

Naturally occurring geochemical processes are currently ongoing at post-closure AP2 and will continue to affect post-closure groundwater constituent concentrations. 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, 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 approximately 90 days after CAP permit approval.

No potential safety impacts or exposure to human health or environmental receptors are expected to result from implementing 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 AP2 will require approval of the CAP permit by the IEPA.

Monitoring the groundwater polishing to track progress toward achievement of the GWPS, in conjunction with source control at AP2, 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. Monitoring activities could be initiated immediately after approval of the CAP permit.

Groundwater polishing processes will continue to occur naturally at AP2. It may be a viable corrective measure for the boron, pH, sulfate, and TDS exceedances at AP2. Therefore, it is being advanced to the CAAA for further evaluation.

5.2.2 Source Control with Groundwater Extraction

Source control is currently reducing mass loading to the AP2 groundwater system and implementing a downgradient 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 off-site flow and/or to remove potentially

contaminated groundwater, horizontal and vertical capture zone(s) must be created. Additionally, the groundwater flow direction and location of the existing former discharge flume 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 former discharge flume (*i.e.,* dewatering). This approach could passively increase the hydraulic gradient and corresponding groundwater flow velocities between AP2 and the former discharge flume, without the need for groundwater collection or active pumping. More active methods, such as groundwater extraction trenches, collection sumps, or horizontal wells could also be utilized. 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 heterogeneous, varied nature of the UA. An extraction system in the UA would have to consider the potential for extracting water from the former 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 south and east 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 the groundwater flow system and some limited exposure to extracted groundwater. The construction of trenches could also cause stability impacts to the AP2 dikes and/or adjacent structures. 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 AP2 would require IEPA approval of the CAP permit, and extracted groundwater could likely be discharged under the NPDES permit. 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 site and in the vicinity of the extraction system. 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.

Groundwater extraction could be a viable corrective measure for the boron, pH, sulfate, and TDS exceedances at AP2. Implementation of groundwater extraction may require combining an extraction system with a cutoff wall to provide directional control of groundwater flow. Therefore, groundwater extraction is being advanced to the CAAA for further evaluation.

5.2.3 Source Control with Groundwater Cutoff Wall

Source control is reducing mass loading to the groundwater system and implementing additional groundwater corrective measures may reduce the time required to attain the GWPS in the UA. A

low permeability cutoff wall could be used in combination with a groundwater extraction system in the UA to reduce the water management and treatment requirements for an extraction system.

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/s 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 (NRT, 2017a), 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 depending upon the required construction methodology and site access considerations, 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. 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 AP2 would require IEPA approval of the CAP permit and, depending on the location, an IDNR dam safety modification permit may be required. Construction of a cutoff wall may also require an evaluation and/or permits related to wetlands if they are determined to be present in the area of the proposed remedy.

A cutoff wall alone would not be a viable corrective measure for the boron, pH, sulfate, and TDS exceedances at AP2. However, a cutoff wall may provide directional control, which, when combined with other corrective measures, would reduce the time required to achieve and attain GWPS. Therefore, the cutoff wall is being advanced to the CAAA for further evaluation.

5.2.4 Source Control with In-Situ Chemical Treatment

Source control is reducing 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 ion exchange (IX) to address boron and sulfate 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 due to the heterogeneous and varied nature of the UA. Depending upon the location of a PRB system, construction may affect AP2 embankment and/or final cover system and periodic change-outs of ion exchange 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 along with 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 hurdles, in-situ chemical treatment is not a viable corrective measure for the boron and sulfate exceedances at AP2 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;
- Source control and with groundwater extraction; and
- Source control with a groundwater cutoff wall.

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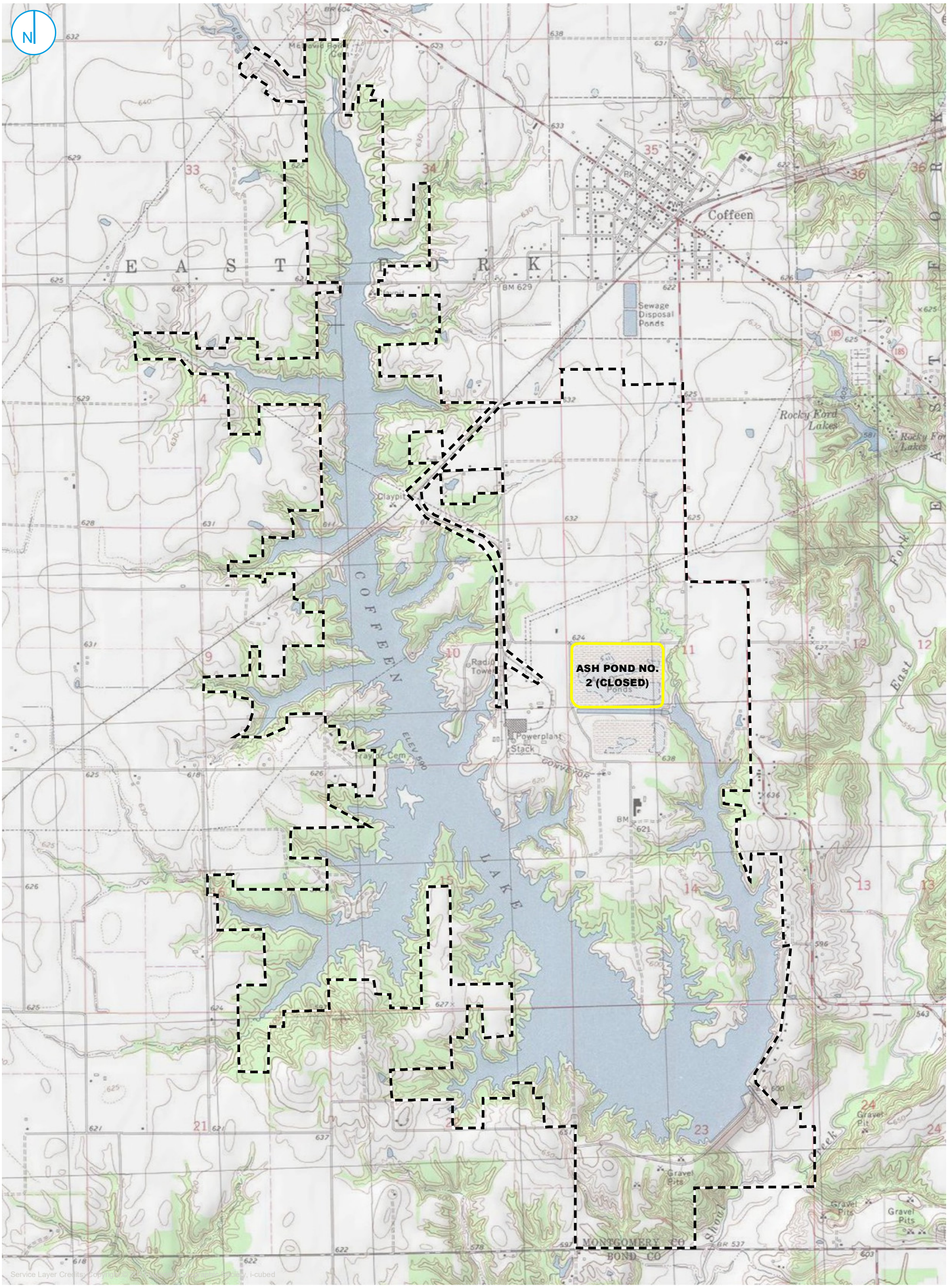
TABLES

TABLE 5-1. CORRECTIVE MEASURES ASSESSMENT MATRIX
ASH POND NO. 2
COFEEN 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 was completed by closure in place with an alternate cover system in 2020. Site conditions are favorable for physical processes, while attenuation processes may be 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 physical processes.	Evaluation is underway and is expected to be completed in 2024. Long-term monitoring would be required. Implementing would not require extensive specialized equipment or contractors.	None identified.	Approximately 90 days after CAP permit approval.	Dependent on site-specific conditions including source decay rate. Less than the post-closure timeframe predicted by the groundwater model.	IEPA approval of the CAP is required.
Source Control with Groundwater Extraction	Widely accepted and routinely approved technology; variable performance of a pumping system is anticipated in the heterogeneous uppermost aquifer and possibly due to proximity of CPP discharge flume (might capture water from the extraction system). A downgradient extraction trench, or alternately, deepening the discharge flume, combined with a groundwater pumping system, may be more effective that an independent groundwater pumping system.	Reliable if properly designed, constructed and maintained. Heterogeneous, varied nature of uppermost aquifer may present reliability challenges for pumping wells.	Design challenges due to heterogeneous, varied nature of uppermost aquifer. Specialized contractors may 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 south and east, 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. Potential for some limited exposure to extracted groundwater. Groundwater extraction may induce settlement, which could cause structural impacts to the AP1 or AP2 embankments 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.	May be similar to the timeframe predicted by the groundwater model due to the low permeability Upper Confining Unit.	IEPA approval of the CAP permit 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. An IDNR dam safety modification permit might also be required, depending on location of wells and settlement. 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 in the area of the proposed remedy.
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 embankment, depending on the location of the wall.	Design, permitting and construction is expected to take 4 to 5 years after CAP approval. Implementation could potentially 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 attain GWPS. Time required may be similar to the groundwater model prediction due to the low permeability Upper Confining Unit.	IEPA approval of the CAP permit 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	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 and due to heterogenous, discontinuous nature of uppermost aquifer. Could require periodic change-outs of resin media.	A permeable reactive barrier may cause structural impacts to the embankment, depending on the location of the barrier.	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 the barrier. 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.
AP1 - Ash Pond No. 1
AP2 - Ash Pond No. 2
CAP - Corrective Action Plan
CPS - Coffeen Power Station
GWPS - groundwater protection standard
IDNR - Illinois Department of Natural Resources
IEPA - Illinois Environmental Protection Agency
IX - Ion Exchange
NPDES - National Pollutant Discharge and Elimination System

FIGURES



REGULATED UNIT (SUBJECT UNIT)
PROPERTY BOUNDARY

0 1,000 2,000 Feet

SITE LOCATION MAP

35 I.A.C. § 845 CORRECTIVE MEASURES ASSESSMENT
ASH POND NO.2
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

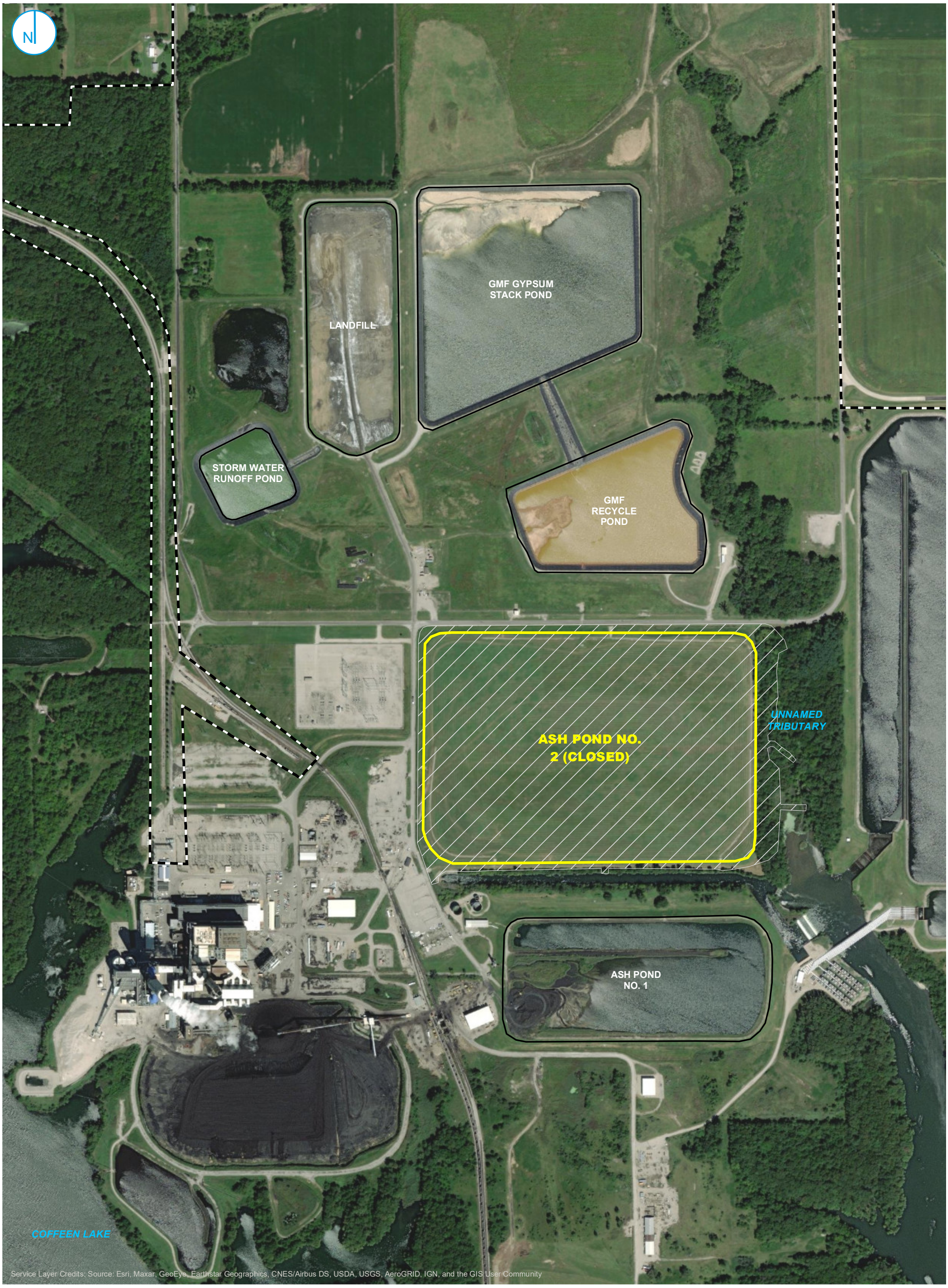
FIGURE 2-1

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

PROJECT: 169000XXXX | DATED: 10/6/2021 | DESIGNER: STOLZSD

Y:\Mapping\Projects\22\2285\MXD\845_Operating_Permit\Coffeen\AP2_GMP\Figure 1-2_Site Map AP2.mxd



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

0 275 550 Feet

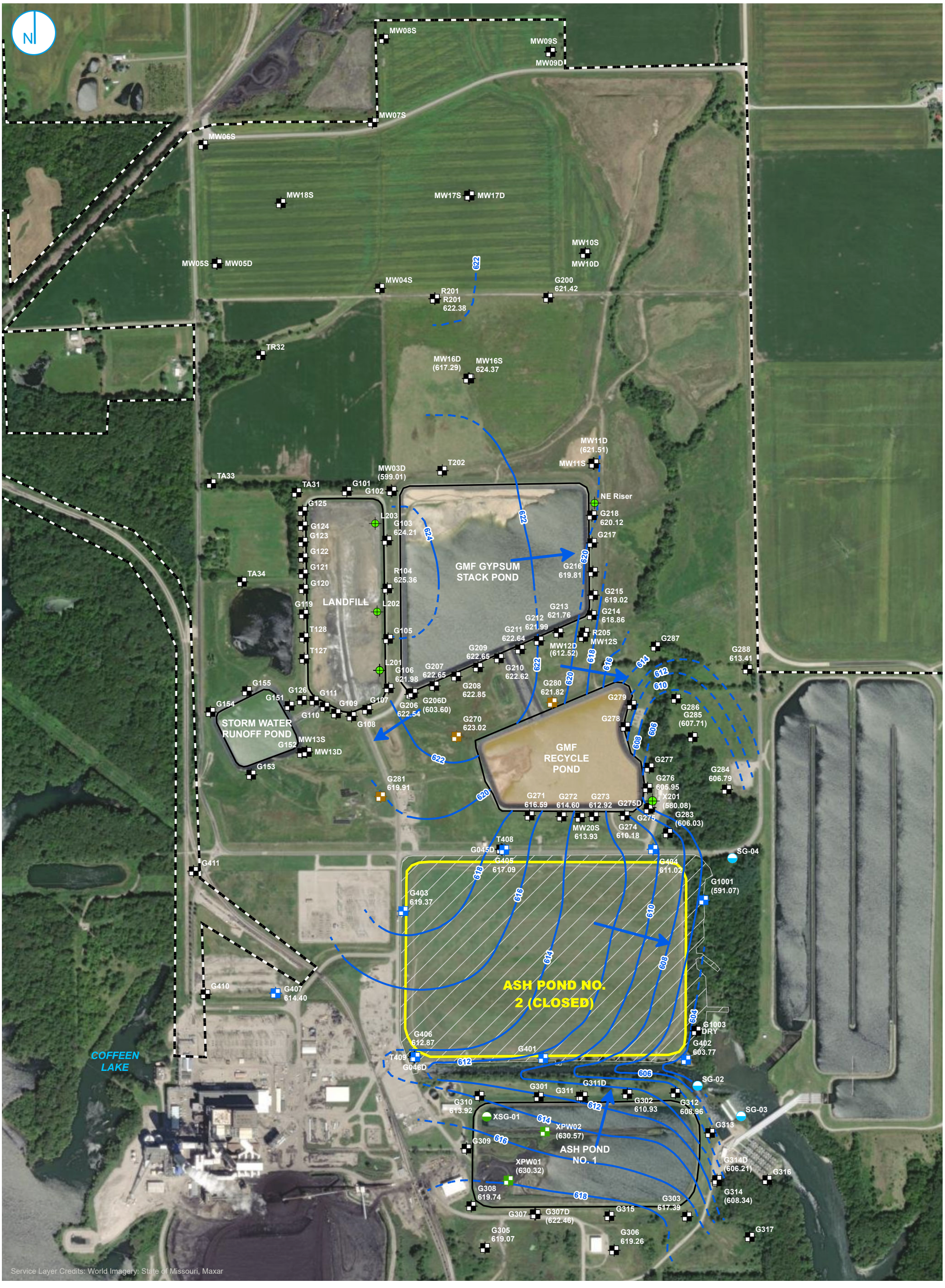
SITE MAP

35 I.A.C. § 845 CORRECTIVE MEASURES ASSESSMENT
ASH POND NO.2
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

FIGURE 2-2

RAMBOLL AMERICAS
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RAMBOLL



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

- GROUNDWATER ELEVATION CONTOUR (2-FT CONTOUR INTERVAL, NAVD88)
- INFERRED GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- REGULATED UNIT (SUBJECT UNIT)
- SITE FEATURE
- 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

35 I.A.C. § 845 CORRECTIVE MEASURES ASSESSMENT
ASH POND NO. 2
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

FIGURE 2-3

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

RAMBOLL



COMPLIANCE WELL
BACKGROUND WELL
MONITORING 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.2
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

FIGURE 2-4

RAMBOLL AMERICAS
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PROJECT: 169000XXXX | DATED: 10/6/2021 | DESIGNER: STOLZSD

Y:\Mapping\Projects\22\2285\MXD\845_Operating_Permit\Coffeen\AP2_GMP\Figure 2-1_Proposed Monitoring Well Network.mxd

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. 2, IEPA ID NO. W1350150004-02

RAMBOLL Bright ideas. Sustainable change.

NATURE AND EXTENT REPORT
COFFEEN POWER PLANT, ASH POND NO. 2, IEPA ID NO. W1350150004-02

Project name	**Coffeen Power Plant Ash Pond No. 2**
Project no.	**1940103584-002**
Recipient	**Illinois Power Generating Company**
Document type	**Nature and Extent Report**
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Date	**June 12, 2024**
Prepared by	**Alison O'Connor, PhD and Nathaniel Keller**
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ACRONYMS AND ABBREVIATIONS

35 I.A.C.	Title 35 of the Illinois Administrative Code
AP1	Ash Pond No. 1
AP2	Ash Pond No. 2
bgs	below ground surface
CCR	coal combustion residuals
cm/s	centimeters per second
CPP	Coffeen Power Plant
CSM	conceptual site model
DA	deep aquifer
DCU	deep confining unit
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
IPCB	Illinois Pollution Control Board
Kd	soil adsorption coefficient
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.) 2 (AP2) during May and June 2023 for the Quarter 2, 2023 compliance sampling event (Event 1 [E001]) were evaluated for statistical exceedances of the groundwater protection standards (GWPS) described in Title 35 of the Illinois Administrative Code (35 I.A.C.) § 845.600. Statistical exceedances were identified in the following hydrostratigraphic units and wells:

- Detected Uppermost aquifer (UA) Exceedances:
  - Boron at G401, G402, G404, and G405
  - Cobalt at G401
  - pH at G401
  - Sulfate at G401, G402, G404, G405, G406, and G407
  - Total dissolved solids (TDS) at G401, G402, G404, G405, and G407

As a result of the identified E001 statistical 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 statistical exceedances of the GWPS as described in 35 I.A.C. § 845.600. Statistical exceedances identified during the E002 and E003 events were consistent with those listed above, with the notable exception of a sulfate statistical exceedance absent at G402 during E003.

In accordance with 35 I.A.C. § 845.650(e), Alternative Source Demonstrations (ASD) were completed on December 15, 2023 for sulfate and TDS statistical exceedances at well G407 and the cobalt statistical exceedance at well G401 [2, 3]. The Illinois Environmental Protection Agency (IEPA) provided a non-concurrence letter for both ASDs on January 11, 2024 [4, 5]. The non-concurrences were appealed, and the Illinois Pollution Control Board (IPCB) granted a partial stay on March 7, 2024 [6, 7]. As a result of the IPCB partial stay, GWPS statistical exceedances of cobalt (G401), and sulfate and TDS (G407) will not be discussed in this nature and extent report.

As required by 35 I.A.C. § 845.650(d)(1), this report characterizes the nature and extent of boron, pH, sulfate, and TDS, and relevant site conditions to determine how they may affect the corrective measures ultimately selected for AP2 and documents the additional measures taken in accordance with 35 I.A.C. § 845.650(d).

Statistical exceedances of boron greater than the GWPS were encountered within the UA at multiple monitoring well locations. The lateral extent of boron statistical exceedances are defined to the west by monitoring wells G403 and G406 (and additionally the groundwater divide running north-south across the CPP), to the east by the Unnamed Tributary and Coffeen Lake, and to the south by the former discharge flume. Due to erosion, the UA is absent east of monitoring wells G402 and G404 and boron statistical exceedances are ultimately defined by Coffeen Lake. The boron concentrations in the groundwater system may be attenuated via surface complexation reactions and via interactions with clay minerals, which are present in solids across the UA and lower confining unit (LCU).

The boron concentrations from monitoring wells around AP1, the discharge flume, and Coffeen Lake were used to evaluate risk to Human Health or ecological receptors and findings indicate they do not present unacceptable risk [8]. Comparison of boron concentrations from AP1 used in the analysis (7.5 mg/L) to the maximum measured in G401 and G402 at AP2 (8.1 mg/L) suggests that results for AP2 would also not present an unacceptable risk. At both AP1 and AP2 the vertical extent of boron greater than the GWPS is limited by the presence of low permeability tills.

Measurements of pH less than the lower GWPS were encountered only within the UA at G401. The lateral extent of pH statistical exceedances are defined to the west by G406, to the east by G402, and to the south by the former discharge flume. Vertically, the extent of pH less than the lower GWPS is limited by the presence of low permeability tills.

Statistical exceedances of sulfate and TDS greater than the GWPS were encountered within the UA at multiple monitoring well locations. The extent of sulfate and TDS statistical exceedances greater than the GWPS are laterally defined as follows: to the west of AP2 by the groundwater divide running north-south across the CPP; to the east by the Unnamed Tributary and Coffeen Lake; and to the south by the former discharge flume. Due to erosion, the UA is absent east of monitoring wells G402 and G404 and sulfate and TDS statistical exceedances are ultimately defined by Coffeen Lake. Sulfate and TDS statistical exceedances are not expected to extend a significant distance to the north or west due to observed groundwater flow direction in the vicinity of AP2. The sulfate concentrations in the groundwater system may be attenuated via surface complexation reactions. Attenuation of the constituents contributing to TDS, such as sulfate, will reduce TDS concentrations as well. Sulfate and TDS concentrations in Coffeen Lake and the former discharge flume were evaluated for AP1 and they do not present unacceptable risk [8]. Vertically, the extent of sulfate and TDS statistical exceedances greater than the GWPS is limited by the presence of low permeability tills.

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 AP2.

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 [9, 10, 11]. The statistical determination presented in the report identified the following statistical exceedances of the GWPS at compliance groundwater wells in the following hydrostratigraphic unit:

- Detected UA Exceedances:
  - Boron at G401, G402, G404, and G405
  - Cobalt at G401
  - pH at G401
  - Sulfate at G401, G402, G404, G405, G406, and G407
  - TDS at G401, G402, G404, G405, and G407

An ASD, as allowed by 35 I.A.C. § 845.650(e), was completed for the cobalt statistical exceedance at UA monitoring well G401 [2] and an ASD was completed for the sulfate and TDS statistical exceedances at UA monitoring well G407 [3]. The IEPA did not concur with the ASDs. The non-concurrences were appealed, and the IPCB granted partial stays on March 7, 2024 [6] [7]. Therefore, the nature and extent of cobalt at G401, and sulfate and TDS at G407, are not discussed in this document. Evaluations were not conclusive in demonstrating an alternative source for the other identified GWPS statistical exceedances. This Nature and Extent Report discusses in detail the extent of the boron, pH, sulfate, and TDS statistical exceedances as well as a geochemical conceptual site model (GCSM) describing the nature of these statistical 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: AP2 (35 I.A.C. § 845 regulated CCR Unit and subject of this report), Ash Pond No. 1 (AP1), the Gypsum Management Facility (GMF) Gypsum Stack Pond (GSP), GMF Recycle Pond (RP), and Landfill (LF). AP2 is located in Section 11, Township 7 North and Range 3 West. AP2 is located south of the CPP and situated in a predominantly agricultural area (**Figure 2-2**). AP2 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 **Figures 2-1** and **2-2**), which surround the SI to the west, east, and south. The southern edge of AP2 is adjacent to the former discharge flume for the closed generating plant. AP2 is bordered by other CCR units and agricultural land to the north.

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.

- **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 [12]. No CCR was sampled in 2021 because the pond was closed and capped [13]. The unit contains bottom ash and fly ash and the base of CCR at AP2 is shown in **Figure 2-3**.

  Water that may come into contact with CCR within the footprint of AP2 becomes CCR source water. Results from CCR source water samples collected from porewater wells and historically from porewater grab samples [13] are used to provide information for groundwater transport modeling[1].

- **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

[1] Per Federal Register 80 (21302), which promulgated the final Title 40 of the Code of Federal Regulations. § 257 rule, porewater concentrations should be used to characterize potential leaching from impoundments. As discussed further in USEPA's risk assessment of CCR surface impoundments (USEPA 2014), 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 within the unit, represent the CCR source term.

Pollution Control Permit (WPCP) 1978-EA-389 issued by the 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.

- **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 1×10^{-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 used. Illinois Power Generating Company (IPGC) ceased receipt 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 1×10^{-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 receipt 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).

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, AP2 has been well characterized and detailed in the Hydrogeologic Site Characterization Report (HCR) [13].

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

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

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.

- **Uppermost 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 CCR Units. 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 likely absent in several locations due to weathering. The UA exhibits a moderate hydraulic conductivity and is the most likely unit to indicate potential impacts from AP2. Based on the geologic information, the top of the aquifer is highest in elevation at the northern side of AP2, with an elevation of approximately 610 feet. Except in areas where the UCU and UA have been eroded (adjacent to the Unnamed Tributary), 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 (**Figure 2-4**, **Appendix A**). The base of the UA is the top of the LCU, which contains the low permeability Vandalia Member, Mulberry Grove Member, and Smithboro Till. In 2021, soil borings and monitoring wells (G1001 and G1003) were completed between the eastern edge of AP2 and the Unnamed Tributary. The borings did not identify the presence of either the UCU or UA, indicating that the UA is absent east of AP2. Wells G1001 and G1003 were screened in the LCU to evaluate shallow groundwater quality east of AP2. Only G1001 contains measurable amounts of groundwater that can be collected and analyzed; G1003 is routinely dry.

2.3.3 Potential Migration Pathways

Potential migration pathways (PMP) 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 G1001 and G1003 are

considered LCU PMP monitoring locations. Wells G1001 and G1003 are used to evaluate the potential for migration of impacts through the LCU where the UCU and UA are absent.

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 the 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. [14] and Kolata [15]. 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) [16]. 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 [17].

2.3.5 Water Table Elevation and Groundwater Flow Direction

Porewater (*i.e.,* CCR source water) elevations within AP2 (as observed in AP2-D) are greater than the surrounding areas. The phreatic surface within AP2 in 2023 averaged approximately 624.1 feet, ranging from 623.7 to 624.8 feet (**Appendix B**). As indicated in **Section 2.3.2**, UA groundwater is typically separated from overlying CCR material by several feet of the low permeability soils of the UCU, except along the eastern edge of AP2 where two incised stream gullies were backfilled to construct the eastern berm of AP2.

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 southeast to east across AP2 (**Figure 2-5** and **Table 2-1**) toward the former discharge flume and Unnamed Tributary. Groundwater elevations are

lowest near the Unnamed Tributary and east of AP2 towards the eastern lobe of Coffeen Lake. Based on the elevations of the tributary and groundwater elevations measured east of the tributary (**Appendix B** and **Table 2-1)**, the Unnamed Tributary may be a local groundwater receiving body and prevent or reduce groundwater migration east of the Unnamed Tributary. During 2023, groundwater elevations in the UA in the vicinity of AP2 ranged from approximately 601 to 621 feet (**Figure 2-5**). 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 2-5** and **Table 2-1**). LCU monitoring wells G1001, G1003, T408, and T409 are nearest AP2 and typically have groundwater elevations ranging from approximately 591 to 618 feet. Monitoring well G1003 was dry for the entirety of 2023 and groundwater elevation could not be established at this location.

DA (PMP) groundwater elevations are generally lower than those in the UA and LCU (PMP) and ranged from about 576 to 618 feet in 2023 (**Figures 2-6** and **Table 2-1**). Monitoring well G275D (south of the GMF RP) is nearest AP2 and typically had groundwater elevations ranging from about 576 to 589 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 2-6**).

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 AP2 are presented in **Table 2-2** and well locations are shown on **Figure 2-5**. Vertical hydraulic gradients for other nested well locations at the CPP, discussed below, are presented in **Appendix C**. 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.
- 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.

- 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.
- 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 southwest of AP2, where consistent upward gradients were measured between the UA and upper LCU. However, 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 2-5**). 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 can be variable, but flow directions are generally consistent.

Groundwater near AP2 discharges locally to the former discharge flume to the south and the Unnamed Tributary to the east, which flows south 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 [18]. 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 [19].

2.3.6 Hydraulic Conductivities

2.3.6.1 Field Hydraulic Conductivities

Field hydraulic conductivity tests were performed historically by Hanson as part of initial characterization efforts for the CPP [13]. In 2021, additional field hydraulic conductivity tests

were completed by Hanson to support 35 I.A.C. § 845 requirements for AP1, the GMF GSP, and the GMF RP [20, 21, 22]. Historical field hydraulic conductivity test results are included in **Appendix D** and tests completed for other CCR units in 2021 are included in **Appendix E** [13].The results of the tests are summarized as follows:

- **UA:** Historical tests completed in UA monitoring wells (G401, G402, G403, G404, and G405) indicated hydraulic conductivities ranged from 4.3×10^{-5} to 9.8×10^{-4} cm/s, with a geometric mean of 2.7×10^{-4} cm/s.
- **LCU:** Historical tests completed in the LCU for monitoring wells and temporary piezometers (G45D, G46D, T408, and T409) indicated hydraulic conductivities ranged from 7.5×10^{-8} to 3.6×10^{-5} cm/s, with a geometric mean of 5.6×10^{-6} cm/s.
- **DA:** Geometric mean hydraulic conductivity at DA well G314D, near AP1, was 8.7×10^{-5} cm/s and was slightly lower than tests completed in the northern portion of the CPP in 2009 that estimated hydraulic conductivity values ranged from 1.3×10^{-4} to 1.7×10^{-3} cm/s, with a geometric mean of 4.4×10^{-4} cm/s.
- 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 at the CPP [22, 21, 20] and historically [13]. The results are summarized in **Appendix D** and discussed below.

- **CCR:** No laboratory vertical hydraulic conductivity tests were completed during 2021 on CCR materials in AP2.
- **UCU:**
  - The 2021 sitewide geometric mean of vertical hydraulic conductivities of three samples collected from the UCU is 2.5×10^{-8} cm/s, which is consistent with historically reported values.
  - Geotechnical tests conducted prior to 2017 indicated UCU vertical hydraulic conductivity values ranged 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 and immediately northeast of AP2, with a vertical hydraulic conductivity of 1.6×10^{-4} cm/s.
- **LCU:**
  - The 2021 sitewide geometric mean of vertical hydraulic conductivities of three samples collected from the LCU is 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 ranged 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 during 2021 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 AP2 is shown on **Figure 2-2** and consists of three background monitoring wells (G270, G280, and G281), eight compliance monitoring wells (G401, G402, G403, G404, G405, G406, G407, and G1001), one water level only monitoring well (G1003), and three temporary water level only surface water staff gages (SG-02, SG-03, and SG-04) to monitor potential impacts from AP2 [23]. The monitoring wells are screened within the UA (G270, G280, G281, G401, G402, G403, G404, G405, G406, and G407) and LCU (G1001 and G1003) along the perimeter of AP2. Porewater samples are not regularly collected as part of the groundwater monitoring plan for AP2 (**Figure 2-2**), but porewater samples were collected from dewatering locations in 2016 [13], and a leachate sample was collected from the C102 PumpQbox in 2020 to provide information on the source concentrations. Additional porewater samples are collected as needed from an existing porewater monitoring well (AP2D) (**Figure 2-2**).

2.5 Hydrogeologic Conceptual Site Model

The HCR [13] and information provided above forms the foundation of the AP2 hydrogeological setting. AP2 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, where present.

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 closure plan groundwater modeling [24] 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 Deep Aquifer (*i.e.,* DA) and Deep Confining Unit (*i.e.,* DCU) were not included in the model, for consistency with the original model [25].

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 and Unnamed Tributary 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 AP2 by the laterally continuous low permeability UCU. Erosion caused by incised streams has occurred along the eastern side of AP2 which likely results in ash being in 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.

Based on the geology and hydrogeology, monitoring wells at AP2 can be separated into two distinct groupings that exhibit similar geologic and hydraulic characteristics. 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 G270, G280, G281, G401, G402, G403, G404, G405, G406, and G407.
- LCU wells: shallow wells (less than 15 feet bgs) east of AP2 where the UCU and UA have been eroded (G1001 and G1003). LCU wells are screened across moderate permeability (generally about 10^{-4} cm/s) sand lenses within the low permeability till.

3. OCCURRENCE AND DISTRIBUTION OF GROUNDWATER EXCEEDANCES (EXTENT)

Results from groundwater samples collected from AP2 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 statistical exceedances of the GWPS was completed [9, 10, 11]. Statistical exceedances for which an ASD was not completed include the following parameters and wells by hydrostratigraphic unit:

- UA (**Figure 3-1**):
  - Boron at G401, G402, G404, and G405
  - pH at G401
  - Sulfate at G401, G402, G404, G405, and G406
  - TDS at G401, G402, G404, and G405

The extents of statistical exceedances discussed below were defined using existing monitoring wells, including wells present on-site (**Table 3-1** and **Figure 3-2**) 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 statistical exceedances of the GWPS were identified for the parameters and locations identified above [9, 10, 11]. A total of three borings were advanced later in 2021 adjacent to locations with potential statistical exceedances (G401 and G1001), and background well (G270). Solids samples were collected and analyzed for the following:

- 6010B for 7-step sequential extraction (arsenic, boron, cobalt, lithium, and molybdenum);
- EPA 6010B for Total Metals (aluminum, arsenic, beryllium, calcium, chromium, cobalt, iron, lead, lithium, manganese, molybdenum, and selenium);
- Bulk Mineralogy by Reitveld x-ray diffraction analysis;
- Bulk elemental composition by X-ray fluorescence
- 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 and supplement previous samples collected in 2016 (**Appendix F**) [26]. 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 surface water sampling has been incorporated into this report where applicable.

3.2 Extent in the Uppermost Aquifer

Groundwater samples are evaluated quarterly and statistical 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 statistical exceedances, because there is no single value for LCLs.

3.2.1 Boron

Boron GWPS (2 milligrams per liter [mg/L]) statistical exceedances were encountered within the UA at monitoring well locations (G401, G402, G404, and G405). Concentrations of boron from locations where the GWPS was exceeded range from 1.1 to 21.2 mg/L (**Table 3-3**) and generally exhibit stable to declining trends except for G404. Concentrations of boron at G404 have increased from approximately 2.8 mg/L in 2020, prior to completion of closure, to 21 mg/L in November 2023. Review of porewater elevations within AP2 (Appendix X) indicate an increase during closure activities that has since stabilized and started to decline after closure was completed. Modeling completed as part of the Closure Plan [27] indicated that water levels beneath the cover system would equilibrate in approximately 46 years, suggesting that concentrations in G404 may be a result of altered flow conditions following placement of the geomembrane and closure of AP2.

The extents of statistical exceedances above the GWPS are defined laterally in the UA to the west by monitoring wells G403 and G406 (and additionally the groundwater divide running north-south across the CPP), to the east by the Unnamed Tributary and Coffeen Lake, and to the south by the former discharge flume (**Figure 3-1**). The boring logs from G1001 and G1003, and historical topographic maps, indicate that the UA has been eroded east of AP2 and statistical exceedances are not expected to extend a significant distance in these directions due to the absence of UA materials. The eastern lobe of Coffeen Lake is located approximately 200 feet downgradient of G402. The former discharge flume is located approximately 60 feet downgradient of G401. Comparison of water elevations indicates that groundwater migrates toward Coffeen Lake and the former discharge flume from AP2. The eastern extent of boron is defined downgradient by surface water sample CL-1, collected east of G402 from the eastern lobe of Coffeen Lake, which had a boron concentration of 0.1 mg/L (**Appendix F**). The southern extent of boron is defined downgradient by surface water samples D-1 and D-2, collected south of G402 from the former discharge flume, which had boron concentrations of 0.33 and 0.3 mg/L, respectively (**Appendix F**). Concentrations of boron at CL-1, D-1, and D-2 are a similar magnitude to boron concentrations measured in a Coffeen Lake background sample (BKG-1; 0.086 mg/L).

Downward migration of boron 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 2.7×10^{-4} cm/s). The significant contrast in permeability (greater than two orders of magnitude) indicates groundwater will preferentially migrate horizontally toward the Unnamed Tributary and ultimately Coffeen Lake and the elevated boron concentrations will not extend into the underlying hydrostratigraphic units.

3.2.2 pH

Lower limit pH GWPS (6.5 Standard Units [S.U.]) statistical exceedances in the UA are limited to G401. Monitoring well G401 is located south of the south berm between AP2 and the former

discharge flume. Measurements of pH in G401 range from 5.6 to 6.4 S.U. (**Table 3-3**). The extents of measurements less than the lower GWPS are defined laterally in the UA to the west by monitoring well G406, to the east by monitoring well G402, to the north by wells G404 and G405, and to the south by the former discharge flume (**Figure 3-1**). Measurements of pH from the former discharge flume (CLb in 2016) and Coffeen Lake (CL-1 and CL-2 in 2021) were 7.52, 8.90 and 8.13 S.U, respectively (**Appendix F**).

Downward migration of low pH conditions in the UA at G401 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 will preferentially migrate horizontally toward and the former discharge flume and lower limit pH GWPS statistical exceedances will not extend into the underlying hydrostratigraphic units.

3.2.3 Sulfate

Sulfate statistical exceedances in the UA have been measured in monitoring wells G401, G402, G404, G405, and G406 for events E001, E002, and E003. Concentrations of sulfate in these wells ranged from 25 to 4,600 mg/L (**Table 3-3)**. The extents of the sulfate statistical exceedances are limited laterally to the west by the groundwater divide, running north-south across the CPP, to the east by the Unnamed Tributary and Coffeen Lake, and to the south by the former discharge flume. Erosion of the UA east of monitoring wells G402 and G404 limits migration of sulfate impacts horizontally as the LCU has a much lower hydraulic conductivity (See **Section 2.3.6**) than the materials in the UA. Migration of potentially impacted groundwater is expected to have a limited extent to the north and west as groundwater tends to flow south and east in the vicinity of AP2.

The eastern extent of sulfate is defined downgradient by surface water sample CL-1, collected east of G402 from the eastern lobe of Coffeen Lake, which had a sulfate concentration of 33 mg/L (**Appendix F**). The southern extent of sulfate is defined downgradient by surface water samples D-1 and D-2, collected south of G402 from the former discharge flume, which had sulfate concentrations of 110 and 69 mg/L, respectively (**Appendix F**). Concentrations of sulfate at CL-1, D-1, and D-2 are a similar magnitude as sulfate concentrations measured in a Coffeen Lake background sample (BKG-1; 36 mg/L).

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 7.5×10^{-8} to 3.6×10^{-5} cm/s. This is very low relative to the horizontal hydraulic conductivity measured within the UA (geometric mean of 2.7×10^{-4} cm/s). The significant contrast in permeability (up to four orders of magnitude) indicates groundwater will preferentially migrate horizontally toward Coffeen Lake and the elevated sulfate concentrations will not extend into the underlying hydrostratigraphic units.

3.2.4 Total Dissolved Solids

TDS results indicate the mass of dissolved material in 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 statistical exceedances in the UA are coincident with most of the sulfate statistical exceedances except for well G406, which has a sulfate statistical exceedance without a TDS statistical exceedance. TDS statistical exceedances in the UA have been measured in monitoring wells G401, G402, G404, and G405 for events E001, E002, and E003. Concentrations of TDS in these wells ranged from 1,250 to 2,800 mg/L during 2023 compliance sampling events (**Table 3-2)**. The extent of the TDS statistical exceedances, similar to sulfate, are limited laterally to the west by the groundwater divide running north-south across the CPP and to the east by the Unnamed Tributary and Coffeen Lake, to the south by the former discharge flume. Erosion of the UA east of monitoring wells G402 and G404 limits migration of sulfate impacts horizontally as the LCU has a much lower hydraulic conductivity (see **Section 2.3.6**) than the materials in the UA. Migration of potentially impacted groundwater is expected to have a limited extent to the north and west as groundwater in the vicinity of AP2 tends to flow south and east.

The eastern extent of TDS is defined downgradient by surface water sample CL-1 collected east of G402 from the eastern lobe of Coffeen Lake, which had a TDS concentration of 120 mg/L (**Appendix F**).The southern extent of sulfate is defined downgradient by surface water samples D-1 and D-2 collected south of G402 from the former discharge flume, which each had a TDS concentration of 240 mg/L (**Appendix F**). Concentrations of TDS at CL-1, D-1, and D-2 are a similar magnitude as TDS concentrations measured in a Coffeen Lake background sample (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 7.5×10^{-8} to 3.6×10^{-5} cm/s. This is very low relative to the horizontal hydraulic conductivity measured within the UA (geometric mean of 2.7×10^{-4} cm/s). The significant contrast in permeability (up to four orders of magnitude) indicates groundwater will preferentially migrate horizontally toward Coffeen Lake and the elevated TDS concentrations will not extend into the underlying hydrostratigraphic units.

4. GEOCHEMICAL CONCEPTUAL SITE MODEL (NATURE)

A GCSM was developed to describe the conditions of the groundwater in the vicinity of the CPP AP2 and is summarized here (full analysis presented in **Appendix G**). 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 AP2 groundwater and will be addressed in the Corrective Action Plan are included in the GCSM. As discussed in previous sections, the statistical exceedances observed at AP2 include boron, pH, sulfate, and TDS.

CCR porewater is water "collected from the interstitial water between waste particles in surface impoundments as it occurs in the field" [28] 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. Porewater is therefore representative of the mobile phase constituents capable of migrating into the underlying materials and potentially downgradient in groundwater. AP2 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.

Conditions within UA groundwater are predicted to favor amorphous iron oxide stability at most locations, which indicates that a portion of the boron and sulfate in the groundwater system may be attenuated via surface complexation reactions. Attenuation of the constituents contributing to TDS, such as sulfate, will reduce TDS concentrations as well. Boron may be further attenuated via interactions with clay minerals, which are present in solids across the UA and LCU. Site-specific partition coefficients could not be calculated from the results of batch attenuation testing completed with solids from the site. These results indicate that chemical attenuation of boron and sulfate could be minimal. Low pH at one downgradient location is potentially caused by geochemical reactions driven by the mixing of porewater and groundwater, although the specific drivers are still under investigation.

5. COMBINED GEOCHEMICAL AND HYDROGEOLOGIC CONCEPTUAL SITE MODELS

5.1 Boron

The CSM describing current conditions at AP2 combining the hydrogeologic and geochemical CSMs for boron is as follows. Water that may come into contact with CCR in AP2 becomes porewater within the closed and geomembrane capped 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 AP2 travels horizontally south and southeast outward from AP2. The horizontal migration of groundwater outward from AP2 is influenced by groundwater flow gradients towards adjacent receiving water bodies, including the former discharge flume, Unnamed Tributary, and ultimately into the east lobe of Coffeen Lake.

Conditions within the UA are predicted to favor amorphous iron oxide stability at most 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 and LCU. However, batch attenuation testing results indicate that chemical attenuation of boron downgradient of AP2 could be minimal.

5.2 pH Conceptual Site Model

The CSM describing current conditions at AP2 combining the hydrogeologic and geochemical CSMs for pH is as follows. Water that may come into contact with CCR in AP2 becomes porewater within the closed and geomembrane capped CCR unit. Porewater with a geochemical signature distinct from groundwater is capable of migrating into and mixing with groundwater of the UA. Statistical exceedances of sulfate and TDS indicate that AP2 porewater is influencing groundwater at G401. AP2 porewater does not have sufficiently low pH to directly cause the pH values observed at G401, suggesting that geochemical reactions driven by interaction of porewater with the underlying UCU materials and/or mixing of porewater with groundwater may cause a low pH. These reactions may include iron oxidation and precipitation or carbonate mineral precipitation. Geochemical modeling to support evaluation of corrective actions may clarify the drivers of low pH at AP2.

5.3 Sulfate and TDS Conceptual Site Model

The CSM describing current conditions at AP2 combining the hydrogeologic and geochemical CSMs for sulfate and TDS is as follows. Water that may come into contact with CCR in AP2 becomes porewater within the closed and geomembrane capped 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 higher hydraulic conductivity zones of the UA in the vicinity of AP2 travels horizontally south and southeast outward from AP2. The horizontal migration of groundwater south and southeast outward from AP2 is influenced by groundwater flow gradients towards adjacent receiving water bodies, including the former discharge flume, Unnamed Tributary, and ultimately into the east lobe of Coffeen Lake.

Conditions within UA groundwater are predicted to favor amorphous iron oxide stability at most 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. Attenuation of the constituents contributing to TDS, such as sulfate, will reduce TDS concentrations as well. However, batch attenuation testing results indicate that chemical attenuation of sulfate downgradient of AP2 could be minimal.

Surface water samples collected from the former discharge flume and Coffeen Lake indicate concentrations are below the GWPS. In addition, a screening level human health and ecological risk assessment [8] 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. Given the similar CCR constituents and concentrations in AP1 and AP2, and the same local groundwater receiving bodies for each SI, the constituents of concern that were identified in the AP1 risk assessment are appropriate for assessing human health and ecological risks that may be attributable to AP2. 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 (which has concentrations similar to AP2) 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 either AP1 or AP2, 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, pH, 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 AP2.

The lateral extents of statistical exceedances in the UA are illustrated in **Figure 3-1**. As discussed in **Sections 3.2.1** through **3.2.4**, boron, pH, sulfate, and TDS statistical exceedances are defined downgradient by surface water samples collected from the former discharge flume to the south of AP2, and by surface water samples collected from the east lobe of Coffeen Lake to the southeast of AP2. GWPS statistical exceedances of boron, pH, sulfate, and TDS are not expected to extend a significant distance to the west due to the north-south groundwater divide or to the north due to groundwater flow directions surrounding AP2. Boron, pH, sulfate, and TDS statistical exceedances are constrained vertically by the underlying Vandalia Till.

Boron was selected for modeling source control as presented in the Closure Plan [12] and Groundwater Modeling Report [25]. For modeling purposes, it was assumed that boron would not significantly sorb or chemically react with aquifer solids in the UA (soil adsorption coefficient [Kd] was set to 0 milliliters per gram), which is a conservative estimate for predicting contaminant transport times in the model. A Kd value of 0.7 cubic centimeters per gram was used for the UCU and LCU.

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TABLES

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

Well ID	Well Type	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G1001	Compliance	05/30/2023	6.61	590.99
G1003	Water Level	05/30/2023	10.97	599.82
G270	Background	05/30/2023	5.06	620.79
G280	Background	05/30/2023	3.96	621.38
G281	Background	05/30/2023	6.64	619.71
G401	Compliance	05/30/2023	21.72	603.85
G402	Compliance	05/30/2023	10.56	602.80
G403	Compliance	05/30/2023	8.13	618.33
G404	Compliance	05/30/2023	5.42	610.24
G405	Compliance	05/30/2023	6.83	616.79
G406	Compliance	05/30/2023	13.06	612.29
G407	Compliance	05/30/2023	7.35	613.96
SG-02	Water Level	05/30/2023	7.47	598.40
SG-03	Water Level	05/30/2023	9.85	585.09
SG-04	Water Level	05/30/2023	6.41	593.11

Notes:
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. 2
Coffeen, IL

Well ID	Well Type	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G1001	Compliance	08/08/2023	6.32	591.29
G1003	Water Level	08/08/2023	Dry	
G270	Background	08/14/2023	[8.52]	[617.34]
G280	Background	08/08/2023	5.80	619.55
G281	Background	08/08/2023	6.39	619.97
G401	Compliance	08/08/2023	21.75	603.82
G402	Compliance	08/08/2023	11.65	601.72
G403	Compliance	08/08/2023	7.45	619.02
G404	Compliance	08/14/2023	[5.62]	[610.05]
G405	Compliance	08/08/2023	6.85	616.78
G406	Compliance	08/08/2023	11.49	613.87
G407	Compliance	08/08/2023	8.79	612.53
SG-03	Water Level	08/08/2023	9.65	585.29

Notes:
Only wells with groundwater elevations measured are included.
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. 2
Coffeen, IL

Well ID	Well Type	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
G1001	Compliance	11/13/2023	6.49	591.12
G1003	Water Level	11/13/2023	Dry	
G270	Background	11/13/2023	10.90	614.96
G280	Background	11/13/2023	8.91	616.44
G281	Background	11/13/2023	8.59	617.77
G401	Compliance	11/13/2023	13.63	611.94
G402	Compliance	11/13/2023	11.71	601.66
G403	Compliance	11/13/2023	8.27	618.20
G404	Compliance	11/13/2023	6.48	609.19
G405	Compliance	11/13/2023	7.73	615.90
G406	Compliance	11/13/2023	13.83	611.53
G407	Compliance	11/13/2023	8.31	613.01
SG-02	Water Level	11/13/2023	7.36	598.51
SG-03	Water Level	11/13/2023	9.71	585.23
SG-04	Water Level	11/13/2023	Not Measured	

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. 2
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. 2
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. 2
Coffeen, IL

Date	T408 Groundwater Elevation (ft NAVD88) LCU (upper)	G45D Groundwater Elevation (ft NAVD88) LCU (lower)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
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. 2
Coffeen, IL

Date	T409 Groundwater Elevation (ft NAVD88) LCU (upper)	G46D Groundwater Elevation (ft NAVD88) LCU (lower)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
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

[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: 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.
- - = no data collected on date / no vertical gradient calculated
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

Table 3-1. Monitoring Well Construction Details
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 2
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)
G270	UA	02/26/2008	--	625.43	Top of Disk	623.73	13.13	17.92	610.60	605.81	18.27	605.50	4.8	2	39.0665638	-89.3974031
G280	UA	02/26/2008	625.35	625.26	Top of Riser	623.11	12.79	17.63	610.32	605.48	17.98	605.10	4.8	2	39.0672155	-89.3949916
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
G401	UA	09/14/2015	--	625.57	Top of Disk	623.03	14.36	18.79	608.67	604.24	19.29	603.70	4.4	2	39.0602586	-89.3952949
G402	UA	08/27/2010	--	613.06	Top of Disk	610.36	10	20	600.36	590.36	20.4	590.00	10	2	39.0602071	-89.3917118
G403	UA	09/11/2015	--	626.24	Top of Disk	623.81	13.11	17.78	610.70	606.03	18.15	605.70	4.7	2	39.0631666	-89.3987788
G404	UA	05/01/2007	--	615.67	Top of Disk	613.57	6.42	11.17	607.15	602.40	11.62	601.60	4.8	2	39.0643292	-89.3924931
G405	UA	05/01/2007	--	623.41	Top of Disk	621.40	9.01	13.76	612.39	607.64	14.21	607.20	4.8	2	39.064345	-89.3962337
G406	UA	08/19/2016	625.36	625.05	Top of PVC	621.86	13.56	18.37	608.30	603.49	18.75	603.10	4.8	2	39.0603094	-89.3985078
G407	UA	08/16/2016	621.32	620.95	Top of PVC	618.35	13.78	18.61	604.57	599.74	19.04	598.40	4.8	2	39.0615735	-89.4020036
G1001	LCU	04/05/2021	597.61	597.78	Top of PVC	594.82	6	11	588.82	583.82	11	562.82	5	4	39.0633242	-89.39123631
G1003	LCU	05/25/2021	610.791	610.791	Top of PVC	608.01	8	12	600.01	596.01	14.79	587.01	4	2	39.06077048	-89.3914461

Notes:
All elevation data are presented relative to the North American Vertical Datum 1988 (NAVD88), GEOID 12A
-- = not measured/recorded
bgs = below ground surface
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. 2
Coffeen, IL

Location	Parameter	Unit	Groundwater Protection Standard	2023 Q2 LCL	2023 Q3 LCL	2023 Q4 LCL
G401	Boron, total	mg/L	2	3.50	3.50	3.50
G402	Boron, total	mg/L	2	4.43	4.50	5.44
G404	Boron, total	mg/L	2	5.52	6.35	7.42
G405	Boron, total	mg/L	2	9.19	9.25	9.42
G401	Cobalt, total	mg/L	0.006	0.0629	0.0656	0.0692
G401	Sulfate, total	mg/L	400	2,000	2,000	1,410
G402	Sulfate, total	mg/L	400	442	427	393
G404	Sulfate, total	mg/L	400	422	452	478
G405	Sulfate, total	mg/L	400	412	436	442
G406	Sulfate, total	mg/L	400	450	450	450
G407	Sulfate, total	mg/L	400	440	440	830
G401	Total Dissolved Solids	mg/L	1,200	2,800	2,800	2,800
G402	Total Dissolved Solids	mg/L	1,200	1,310	1,300	1,290
G404	Total Dissolved Solids	mg/L	1,200	1,250	1,300	1,320
G405	Total Dissolved Solids	mg/L	1,200	1,530	1,540	1,540
G407	Total Dissolved Solids	mg/L	1,200	1,920	1,910	1,920
G401	pH (field)	SU	6.5/9.0	5.9/6.1	5.9/6.1	5.9/6.1

Notes:
LCL = Lower Confidence Level
mg/L = milligrams per liter
SU = standard units

Table 3-3. Summary of Groundwater Data
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 2
Coffeen, IL

HSU	Location	Parameter	Unit	Sample Count	Non-Detect Result Count	Percent Non-Detect Results	First Sample	Last Sample	Minimum	Median	Mean	Maximum
LCU	G1001	Boron, total	mg/L	4	0	0	05/12/2021	11/14/2023	0.720	1.03	1.04	1.40
LCU	G1001	Cobalt, total	mg/L	4	1	25	05/12/2021	11/14/2023	0.000200	0.00119	0.0129	0.0490
LCU	G1001	Sulfate, total	mg/L	4	0	0	05/12/2021	11/14/2023	140	236	310	630
LCU	G1001	Total Dissolved Solids	mg/L	3	0	0	02/15/2023	11/14/2023	830	900	1,143	1,700
LCU	G1001	pH (field)	SU	3	0	0	02/15/2023	11/14/2023	6.8	6.97	6.92	7.0
UA	G270	Boron, total	mg/L	39	25	64	01/20/2015	11/17/2023	<0.0071	0.0100	0.0170	0.120
UA	G270	Cobalt, total	mg/L	37	34	92	04/13/2015	11/17/2023	0.000200	0.00200	0.00170	<0.002
UA	G270	Sulfate, total	mg/L	39	0	0	01/20/2015	11/17/2023	48.0	54.0	62.4	140
UA	G270	Total Dissolved Solids	mg/L	39	0	0	01/20/2015	11/17/2023	340	420	436	570
UA	G270	pH (field)	SU	39	0	0	01/20/2015	11/17/2023	6.6	7.10	7.09	7.5
UA	G280	Boron, total	mg/L	40	19	48	01/21/2015	11/20/2023	<0.0071	0.0105	0.0539	1.00
UA	G280	Cobalt, total	mg/L	37	32	86	04/13/2015	11/20/2023	0.000200	0.00200	0.00195	0.00600
UA	G280	Sulfate, total	mg/L	40	0	0	01/21/2015	11/20/2023	43.0	82.0	100	910
UA	G280	Total Dissolved Solids	mg/L	40	0	0	01/21/2015	11/20/2023	350	460	476	1,100
UA	G280	pH (field)	SU	39	0	0	01/21/2015	11/20/2023	6.0	7.26	7.24	7.7
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	Cobalt, total	mg/L	34	26	76	11/20/2015	11/20/2023	0.000400	0.00200	0.00189	0.00560
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	G281	pH (field)	SU	35	0	0	11/20/2015	11/20/2023	6.7	7.00	7.0	7.3
UA	G401	Boron, total	mg/L	28	0	0	11/21/2015	11/21/2023	1.10	3.90	3.77	5.37
UA	G401	Cobalt, total	mg/L	27	0	0	11/21/2015	11/21/2023	0.0460	0.240	0.222	0.420
UA	G401	Sulfate, total	mg/L	28	0	0	11/21/2015	11/21/2023	870	2,100	2,345	4,600
UA	G401	Total Dissolved Solids	mg/L	28	0	0	11/21/2015	11/21/2023	1,200	2,920	3,028	6,600
UA	G401	pH (field)	SU	30	0	0	11/21/2015	11/21/2023	5.6	6.00	6.03	6.4
UA	G402	Boron, total	mg/L	28	0	0	11/21/2015	11/21/2023	4.60	5.70	5.84	8.13
UA	G402	Cobalt, total	mg/L	27	5	19	11/21/2015	11/21/2023	0.000930	0.00370	0.00587	0.0190
UA	G402	Sulfate, total	mg/L	28	0	0	11/21/2015	11/21/2023	78.0	840	790	1,200
UA	G402	Total Dissolved Solids	mg/L	28	0	0	11/21/2015	11/21/2023	1,300	1,600	1,554	1,800
UA	G402	pH (field)	SU	28	0	0	11/21/2015	11/21/2023	6.4	6.79	6.76	7.3
UA	G403	Boron, total	mg/L	28	5	18	11/23/2015	11/20/2023	<0.0023	0.0309	0.0393	0.110
UA	G403	Cobalt, total	mg/L	27	13	48	11/23/2015	11/20/2023	<0.00048	0.00200	0.00201	0.00340
UA	G403	Sulfate, total	mg/L	28	0	0	11/23/2015	11/20/2023	4.90	34.5	34.7	74.0
UA	G403	Total Dissolved Solids	mg/L	28	0	0	11/23/2015	11/20/2023	270	355	369	508
UA	G403	pH (field)	SU	28	0	0	11/23/2015	11/20/2023	6.5	6.92	6.92	7.3
UA	G404	Boron, total	mg/L	29	0	0	10/07/2015	11/21/2023	1.40	4.10	5.68	21.2
UA	G404	Cobalt, total	mg/L	28	25	89	10/07/2015	11/21/2023	<0.00048	0.00200	0.00176	0.00330
UA	G404	Sulfate, total	mg/L	29	0	0	10/07/2015	11/21/2023	140	310	375	840

Table 3-3. Summary of Groundwater Data
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 2
Coffeen, IL

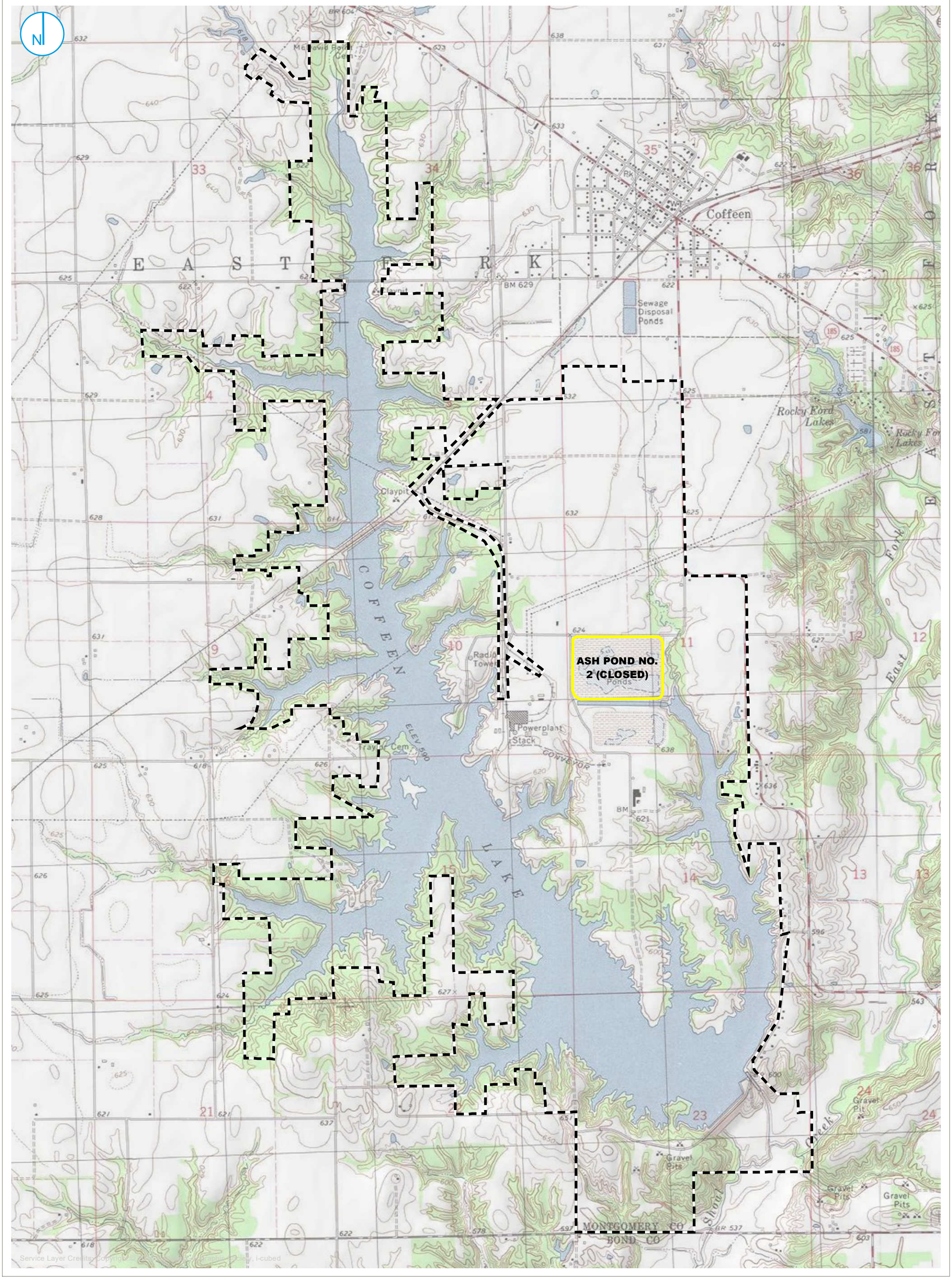
HSU	Location	Parameter	Unit	Sample Count	Non-Detect Result Count	Percent Non-Detect Results	First Sample	Last Sample	Minimum	Median	Mean	Maximum
UA	G404	Total Dissolved Solids	mg/L	29	0	0	10/07/2015	11/21/2023	460	950	1,037	1,900
UA	G404	pH (field)	SU	29	0	0	10/07/2015	11/21/2023	6.4	6.80	6.89	7.5
UA	G405	Boron, total	mg/L	29	0	0	10/07/2015	11/21/2023	4.00	10.8	11.3	20.0
UA	G405	Cobalt, total	mg/L	28	14	50	10/07/2015	11/21/2023	0.000790	0.00200	0.00211	0.00440
UA	G405	Sulfate, total	mg/L	29	0	0	10/07/2015	11/21/2023	340	1,000	1,095	1,900
UA	G405	Total Dissolved Solids	mg/L	29	0	0	10/07/2015	11/21/2023	720	1,700	1,763	2,900
UA	G405	pH (field)	SU	29	0	0	10/07/2015	11/21/2023	6.6	6.95	6.92	7.4
UA	G406	Boron, total	mg/L	13	0	0	10/14/2020	11/20/2023	0.170	1.50	1.44	2.29
UA	G406	Cobalt, total	mg/L	13	10	77	10/14/2020	11/20/2023	<0.00048	0.000800	0.00123	<0.002
UA	G406	Sulfate, total	mg/L	13	0	0	10/14/2020	11/20/2023	25.0	480	464	610
UA	G406	Total Dissolved Solids	mg/L	13	0	0	10/14/2020	11/20/2023	920	1,070	1,078	1,200
UA	G406	pH (field)	SU	13	0	0	10/14/2020	11/20/2023	6.4	6.56	6.60	7.0
UA	G407	Boron, total	mg/L	13	0	0	10/14/2020	11/20/2023	0.0614	0.0900	0.0970	0.150
UA	G407	Cobalt, total	mg/L	13	7	54	10/14/2020	11/20/2023	<0.00048	0.00200	0.00170	0.00620
UA	G407	Sulfate, total	mg/L	13	0	0	10/14/2020	11/20/2023	400	960	897	1,100
UA	G407	Total Dissolved Solids	mg/L	13	0	0	10/14/2020	11/20/2023	1,800	2,000	2,022	2,200
UA	G407	pH (field)	SU	13	0	0	10/14/2020	11/20/2023	6.4	6.66	6.65	6.9

Notes:
< = less than the method detection limit
HSU = Hydrostratigraphic Unit
LCU = Lower Confining Unit
mg/L = milligrams per liter
SU = standard units
UA = Uppermost Aquifer

FIGURES

PROJECT: 169000XXXX | DATED: 5/16/2024 | DESIGNER: GALARNMC

Y:\Mapping\Projects\22\2285\MXD\Nature_and_Extent\COF\Nature_and_Extent_Report\102\Figure 2-1_Site Location Map AP2.mxd



REGULATED UNIT (SUBJECT UNIT)

PROPERTY BOUNDARY

0 1,000 2,000 Feet

SITE LOCATION MAP

NATURE AND EXTENT REPORT
ASH POND NO. 2
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

FIGURE 2-1

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

PROJECT: 169000XXXX | DATED: 6/7/2024 | DESIGNER: GALARNMC

Y:\Mapping\Projects\22\2285\MXD\Nature_and_Extent\COF\Nature_and_Extent_Report\102\Figure 2-2. Monitoring Well Location Map.mxd



- COMPLIANCE MONITORING WELL
- BACKGROUND MONITORING WELL
- MONITORING WELL
- STAFF GAGE, RIVER
- PORE WATER WELL
- REGULATED UNIT (SUBJECT UNIT)
- SITE FEATURE
- LIMITS OF FINAL COVER
- PROPERTY BOUNDARY

0 275 550 Feet

NOTE:
STAFF GAGE SG-04 WAS IDENTIFIED AS DESTROYED DURING OCTOBER 2023.

MONITORING WELL LOCATION MAP

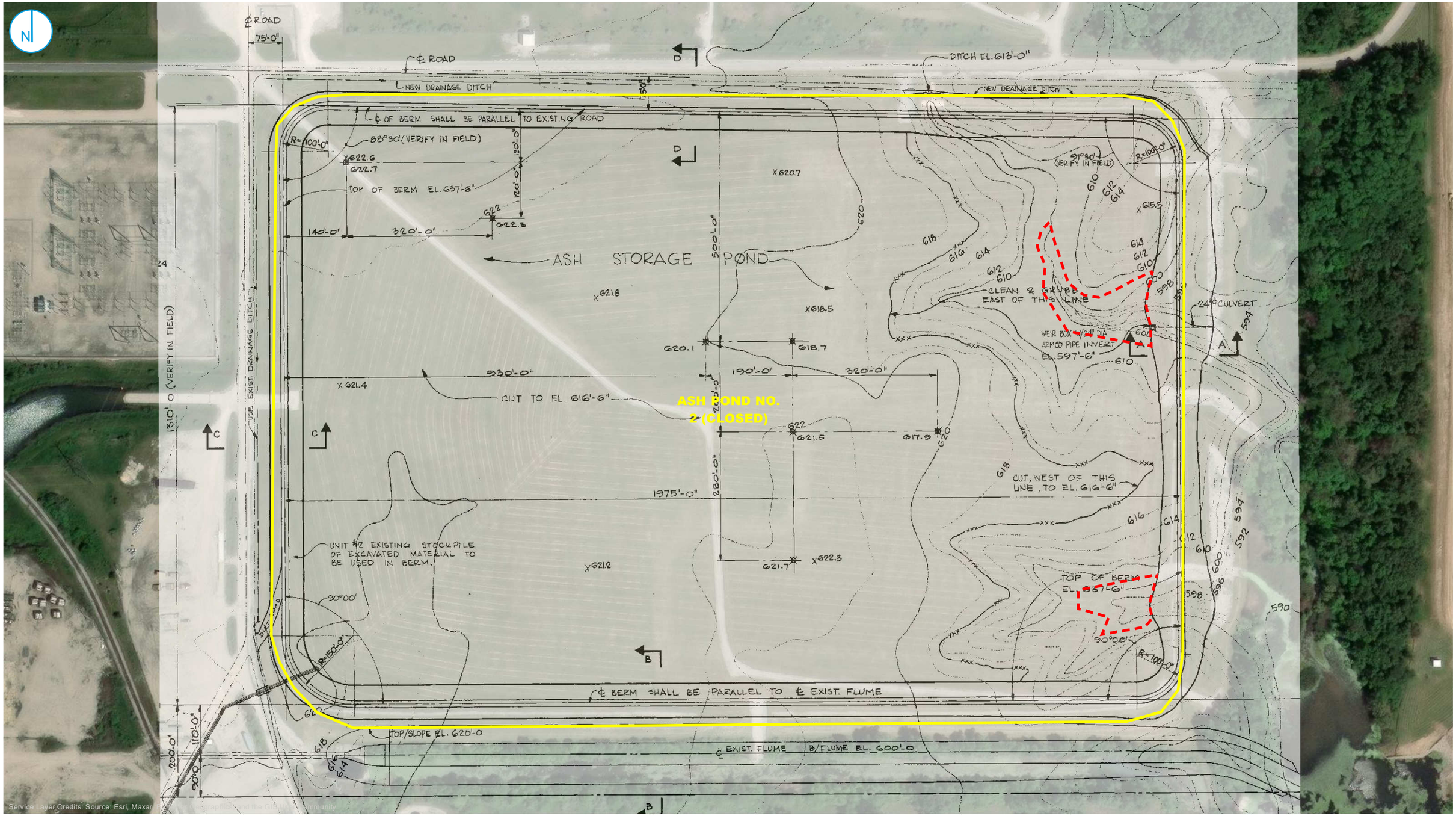
NATURE AND EXTENT REPORT
ASH POND NO. 2
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

FIGURE 2-2

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

Y:\Mapping\Projects\2202285\MXD\Nature_and_Extent\COF\Nature_and_Extent_Report\102\Figure 2-4_Base of CCR.mxd



Service Layer Credits: Source: Esri, Maxar, [illegible] Graphics, and the GIS User Community

PROJECT: 169000XXX | DATED: 6/6/2024 | DESIGNER: GALARNMC

HAGARSTOWN BEDS POTENTIALLY IN CONTACT WITH ASH

REGULATED UNIT (SUBJECT UNIT)

0 100 200 Feet

NOTES:
BACKGROUND DRAWING SOURCE: SARGENT & LUNDY, 1/21/1971

BASE OF CCR

NATURE AND EXTENT REPORT
ASH POND NO. 2
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

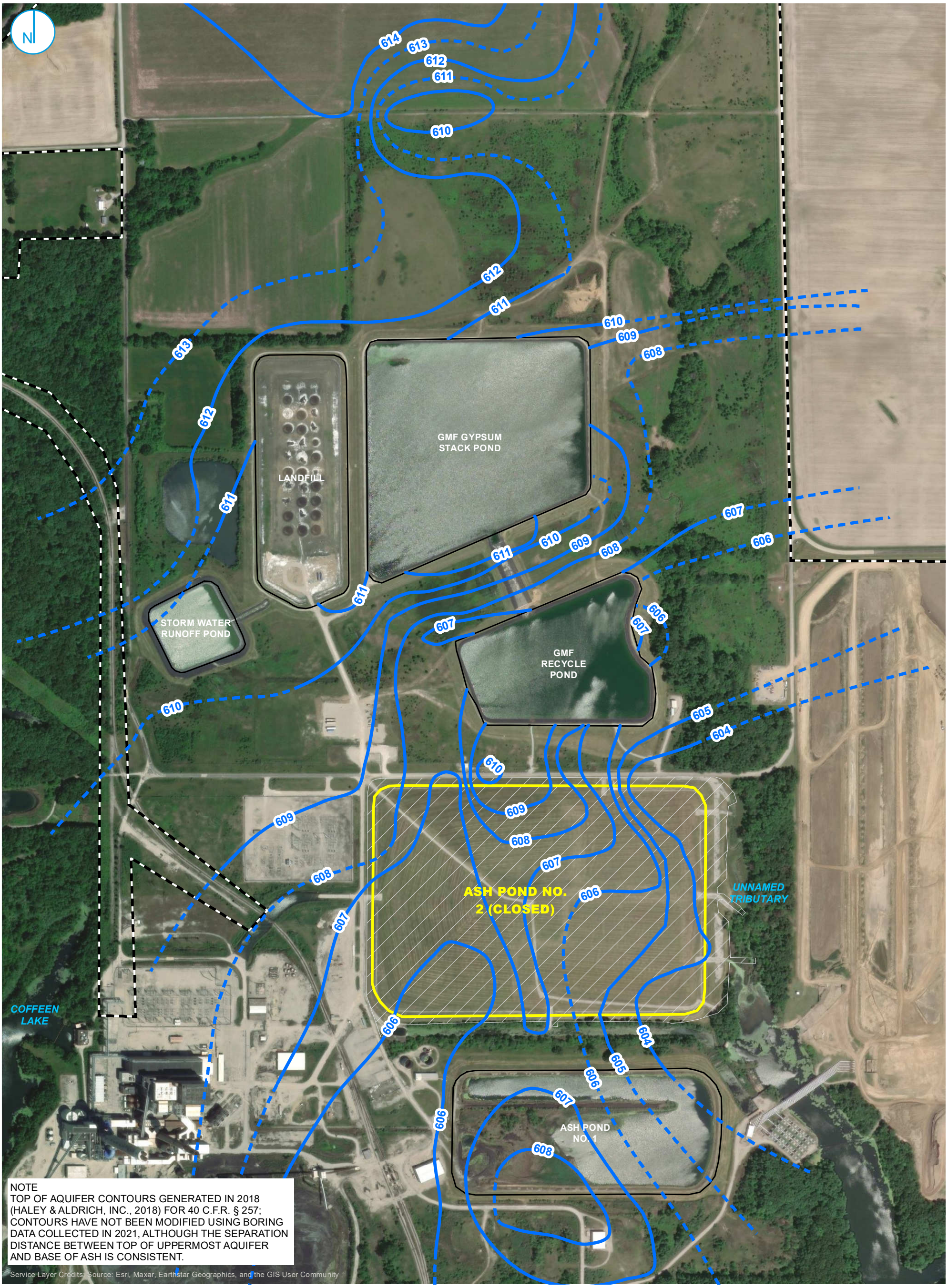
FIGURE 2-3

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

PROJECT: 169000XXXX | DATED: 5/16/2024 | DESIGNER: GALARNMC

Y:\Mapping\Projects\22\2285\MXD\Nature_and_Extent\COF\Nature_and_Extent_Report\102\Figure 2-5_Top of Uppermost Aquifer AP2.mxd



HAGARSTOWN MEMBER ELEVATION CONTOUR (1-FT INTERVAL, NAVD88)

INFERRED HAGARSTOWN MEMBER ELEVATION CONTOUR

REGULATED UNIT (SUBJECT UNIT)

SITE FEATURE

LIMITS OF FINAL COVER

PROPERTY BOUNDARY

0 275 550 Feet

TOP OF UPPERMOST AQUIFER

FIGURE 2-4

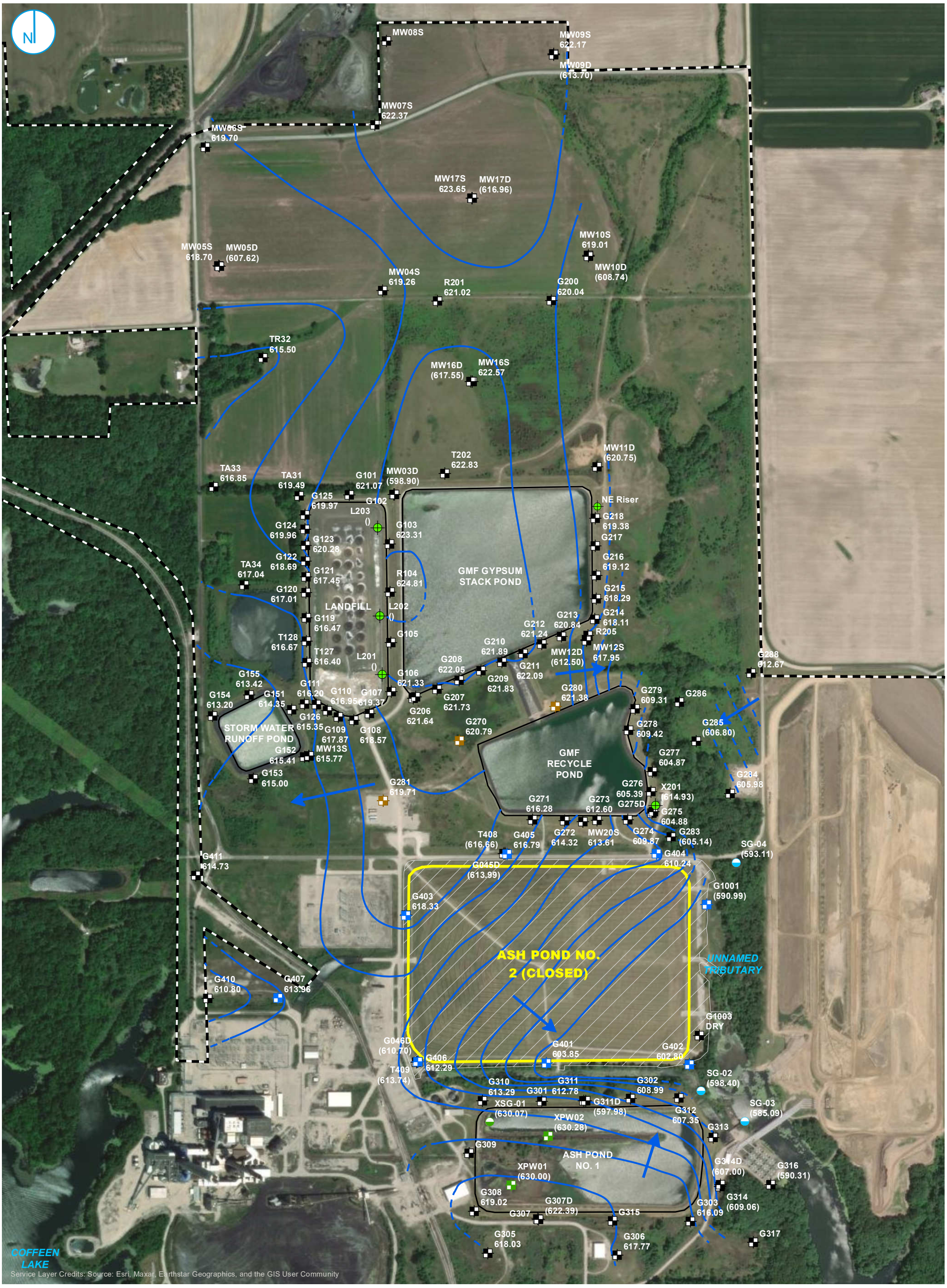
NATURE AND EXTENT REPORT
ASH POND NO. 2
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

PROJECT: 169000XXXX | DATED: 5/16/2024 | DESIGNER: GALARNMC

Y:\Mapping\Projects\22\2285\MXD\Nature_and_Extent\COF\Nature_and_Extent_Report\102\Figure 2-6. COF 102 Pot Surface 20230530.mxd



- COMPLIANCE MONITORING WELL
- BACKGROUND MONITORING WELL
- MONITORING WELL
- PORE WATER WELL
- 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

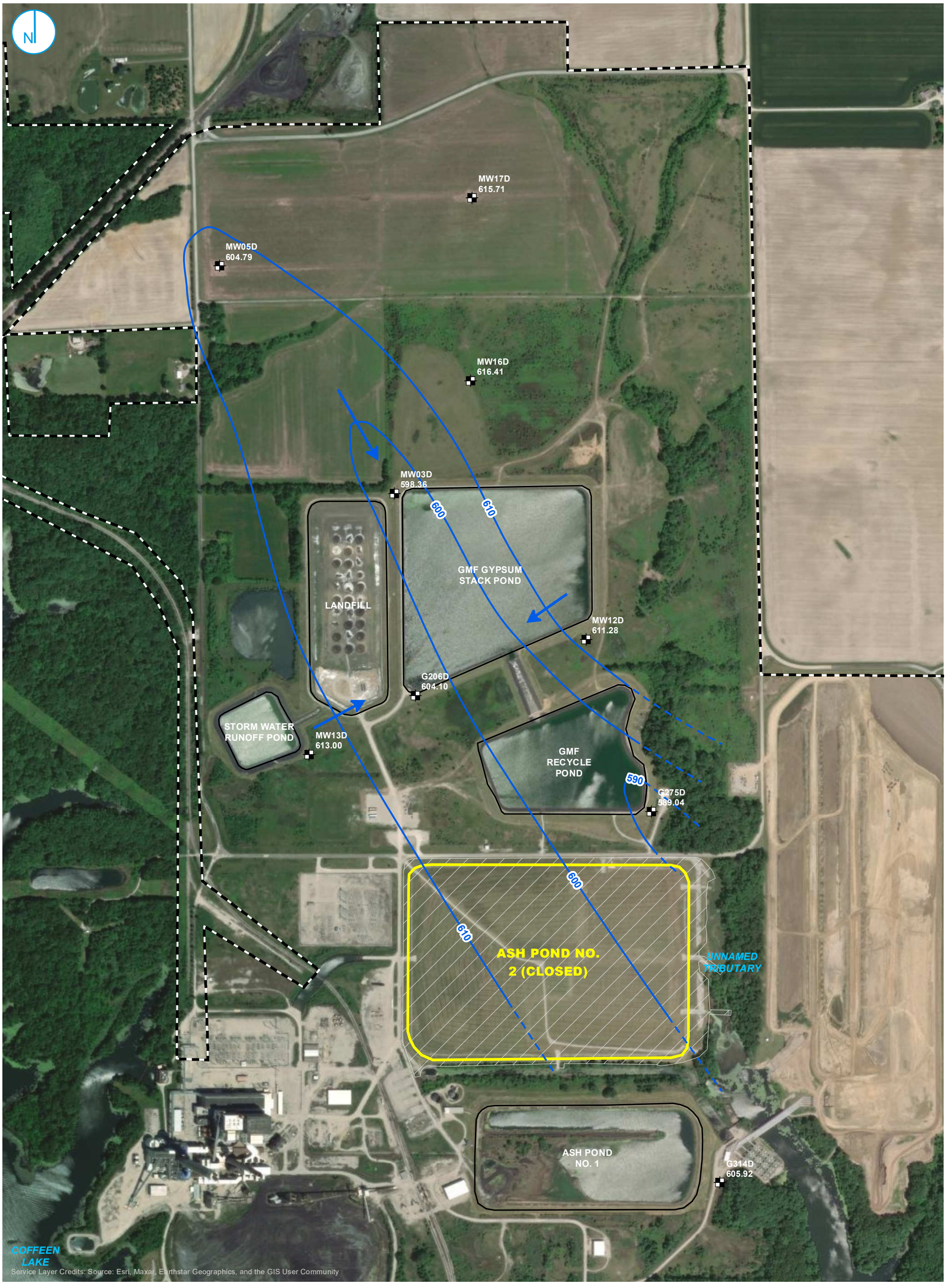
UPPERMOST AQUIFER POTENTIOMETRIC SURFACE MAP MAY 30, 2023 (E001)

FIGURE 2-5

NATURE AND EXTENT REPORT
ASH POND NO. 2
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

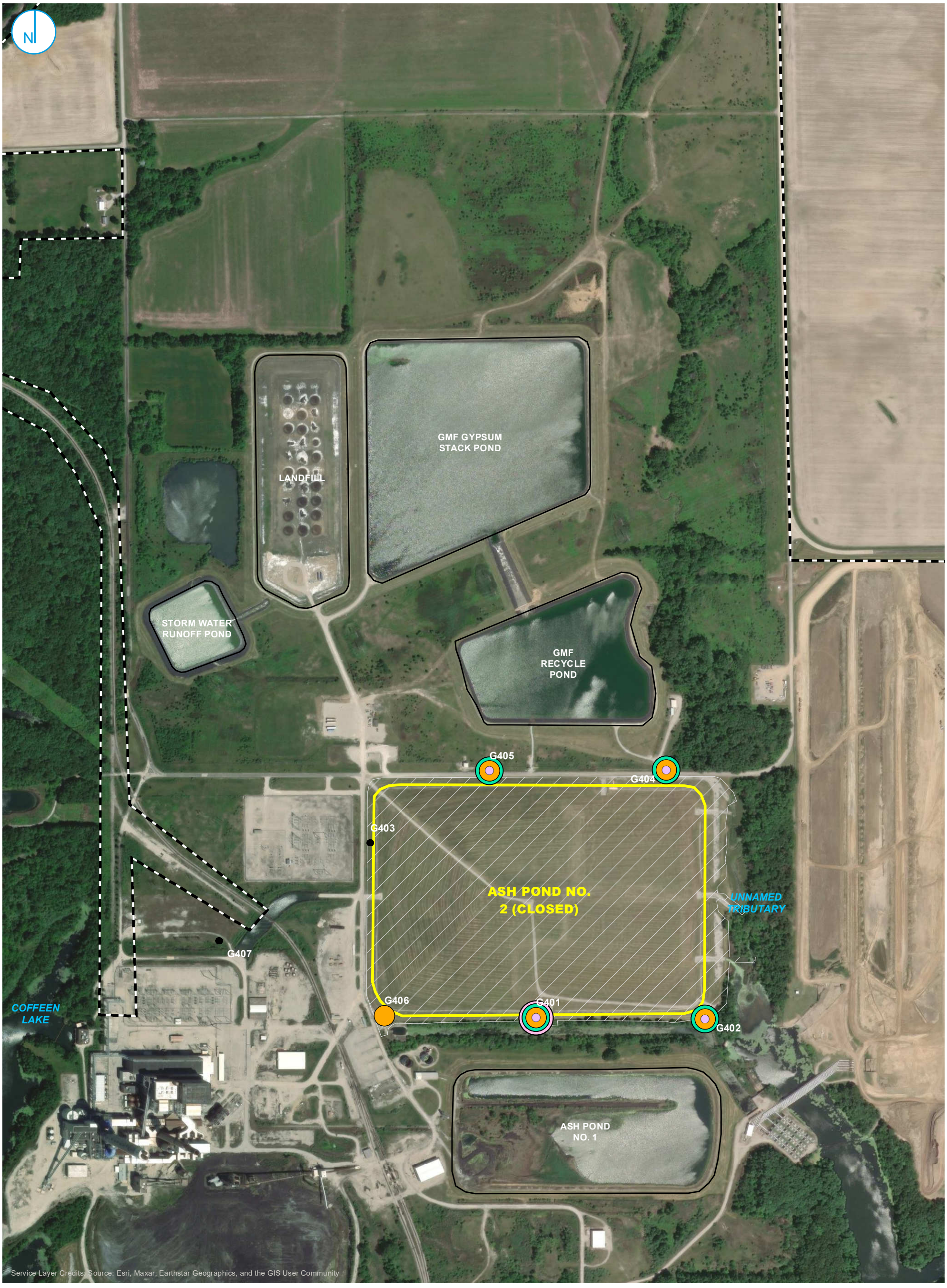
DEEP AQUIFER POTENTIOMETRIC SURFACE MAP AUGUST 8, 2023 (E002)

FIGURE 2-6

NATURE AND EXTENT REPORT
ASH POND NO. 2
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL



TOTAL BORON EXCEEDANCE
TOTAL SULFATE EXCEEDANCE
TOTAL DISSOLVED SOLIDS EXCEEDANCE
pH 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

NATURE AND EXTENT REPORT
ASH POND NO. 2
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

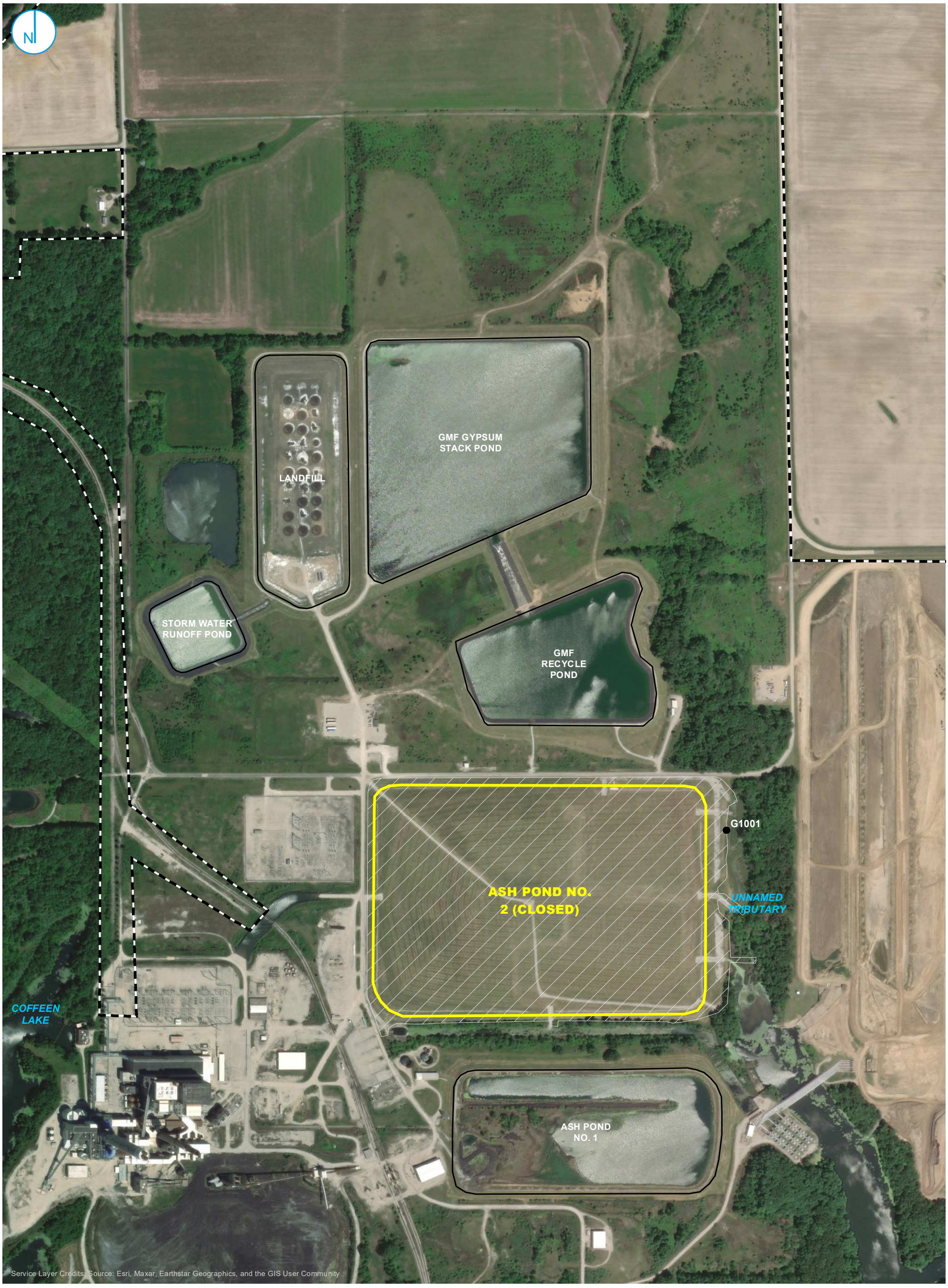
FIGURE 3-1

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

RAMBOLL

PROJECT: 169000XXXX | DATED: 5/16/2024 | DESIGNER: GALARNMC

Y:\Mapping\Projects\22\2285\MXD\Nature_and_Extent\COF\Nature_and_Extent_Report\102\Figure 3-2. COF 102 GWPS LCU.mxd



● COMPLIANCE WELL WITHOUT EXCEEDANCE

REGULATED UNIT (SUBJECT UNIT)

SITE FEATURE

LIMITS OF FINAL COVER

PROPERTY BOUNDARY

0 275 550 Feet

GWPS EXCEEDANCE MAP LOWER CONFINING UNIT

FIGURE 3-2

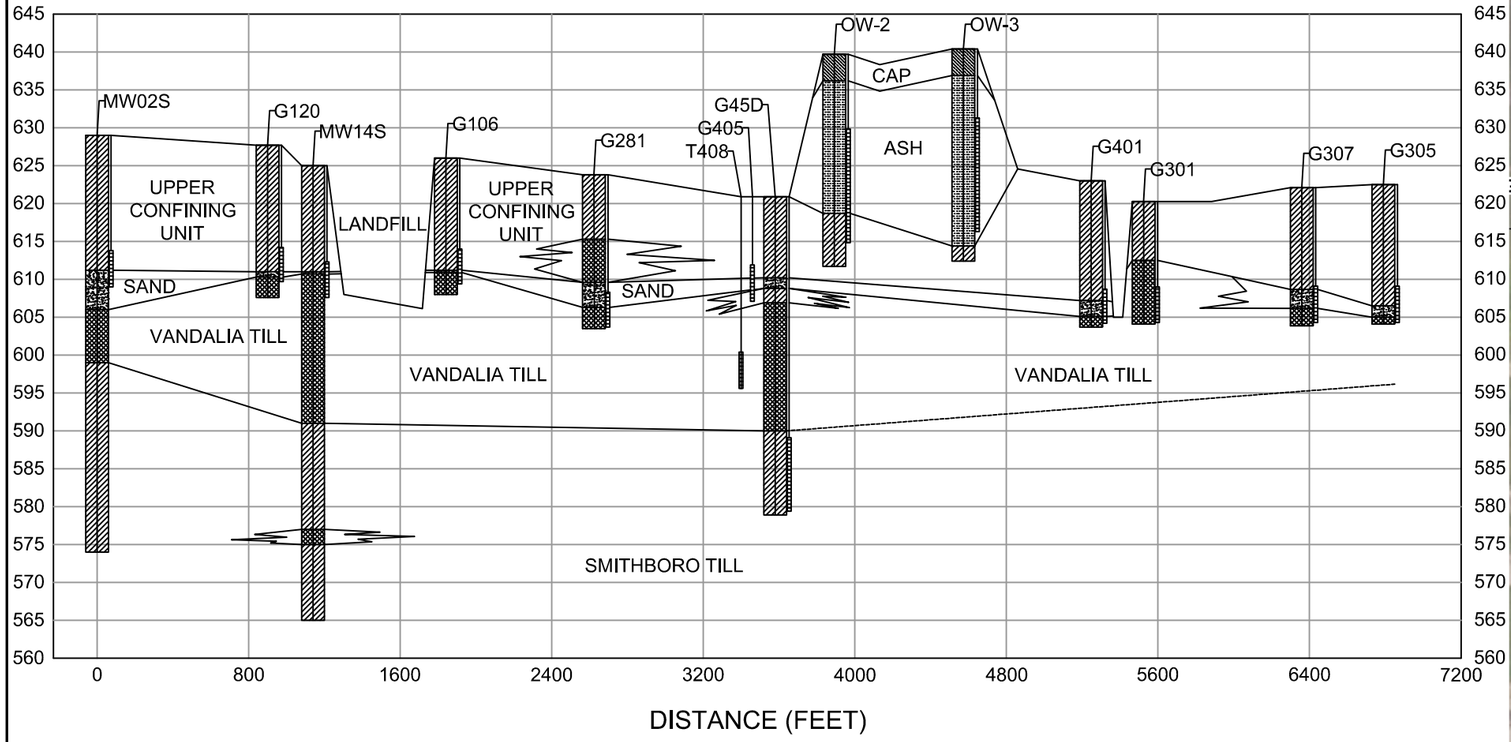
NATURE AND EXTENT REPORT
ASH POND NO. 2
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

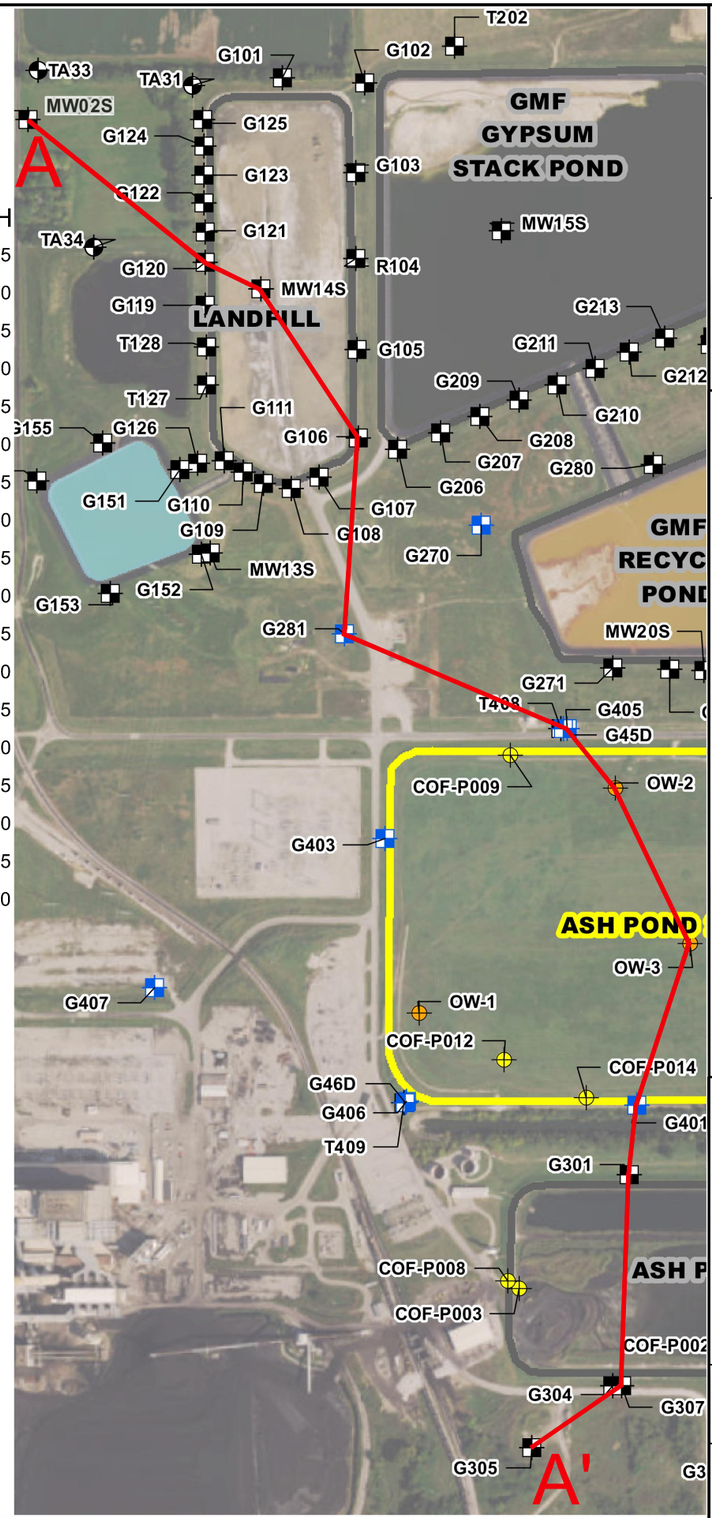
RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

APPENDICES

APPENDIX A
Hydrogeologic Characterization Report Cross-Sections





VERTICAL SCALE IN FEET: 20

HORIZONTAL SCALE IN FEET: 800

VERTICAL EXAGGERATION =40

B—B' CROSS-SECTION TRANSECT

CLAY

SOIL

SAND

SILT

ASH

WELL SCREEN

DRAWN BY:	AGC	DATE: 12/6/16
CHECKED BY:	NRK	DATE: 12/20/16
APPROVED BY:	SJC	DATE: 12/20/16

DRAWING NO: Fig 9_Geologic Cross-Section A-A'

REFERENCE: SEE INFO BLOCK

GEOLOGIC CROSS-SECTION A-A'

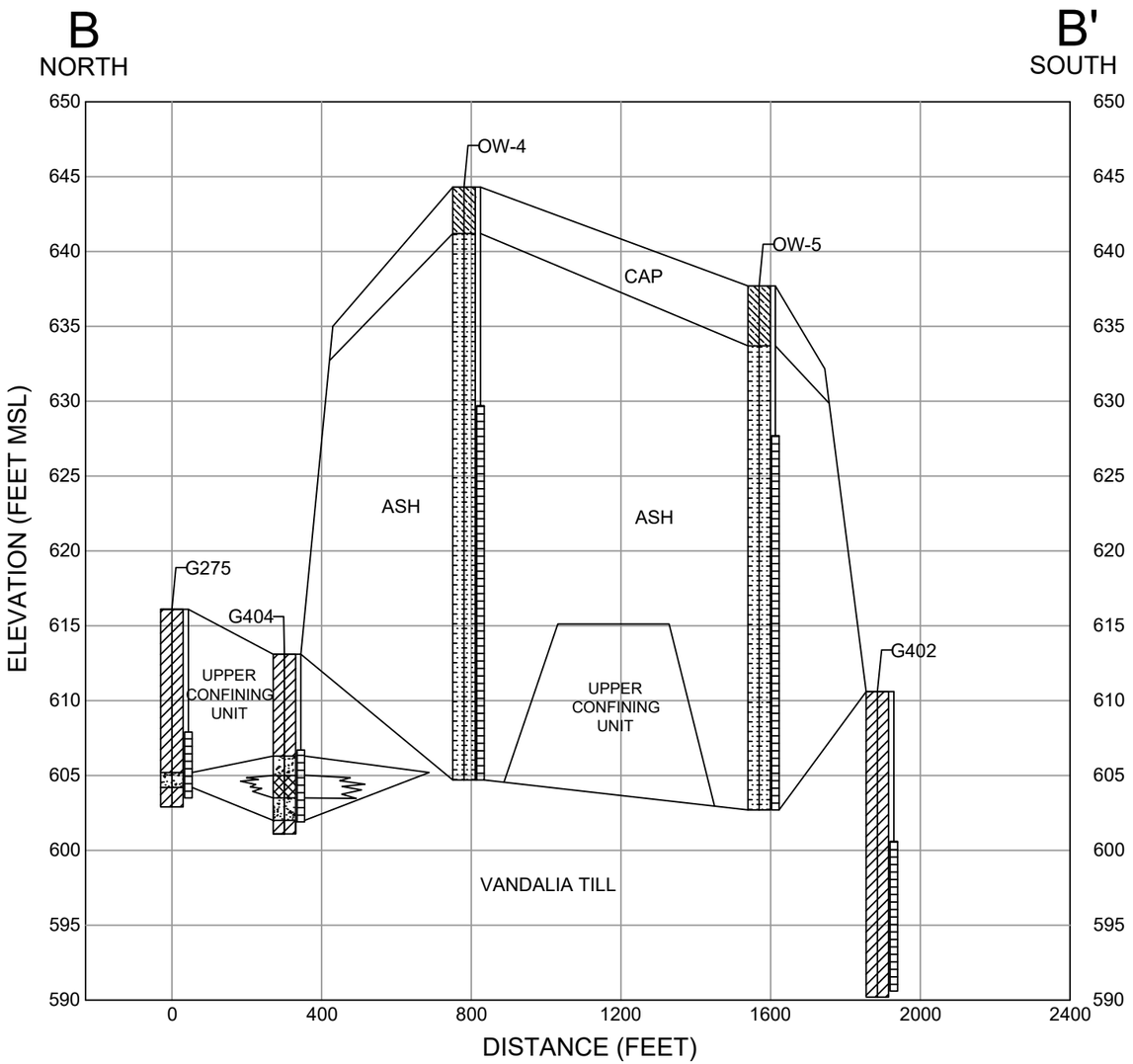
HYDROGEOLOGIC CHARACTERIZATION REPORT
ASH POND 2
COFFEEN POWER STATION
COFFEEN, IL

NATURAL RESOURCE TECHNOLOGY

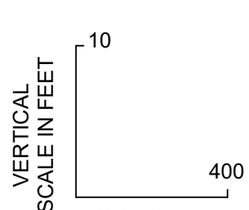
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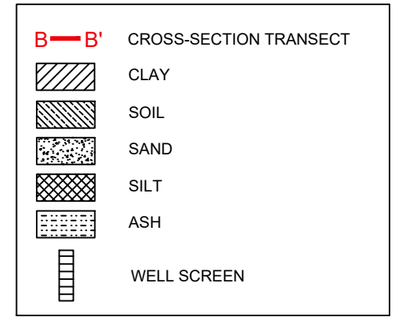
FIGURE NO.
9

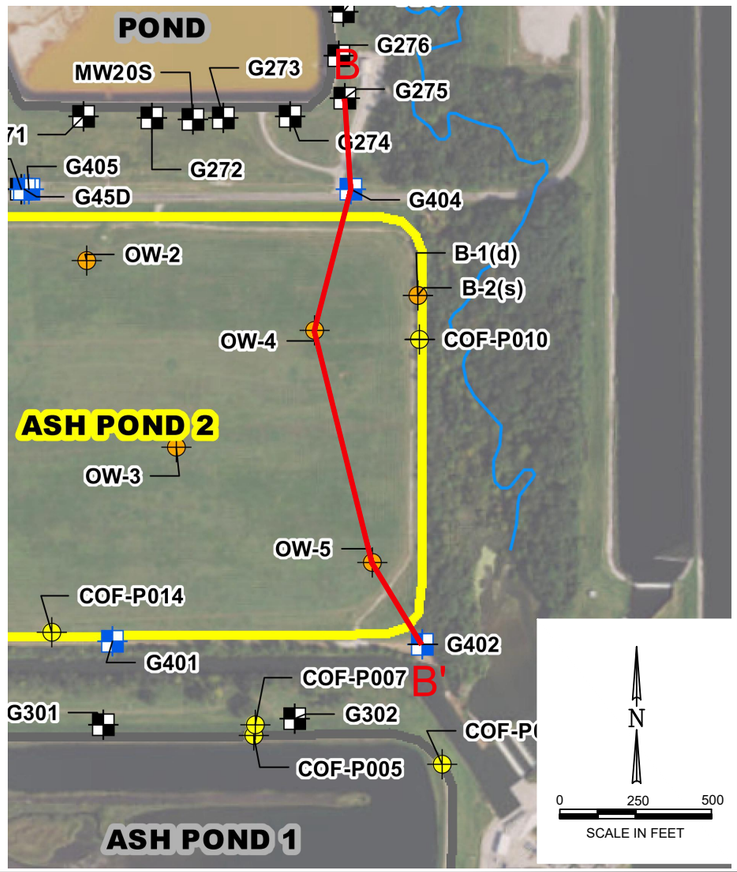
Dec 21, 2016 12:07pm PLOTTED BY: amillispaugh SAVED BY: acawrse
Y:\Mapping\Projects\23\2380\CAD\2-0\Figure 9_Geologic Cross-Section A-A'.dwg Layout1
IMAGES: Y:\Mapping\Projects\23\2380\CAD\2-0\Reference\MW02S.JPG;
XREFS:



NOTE: FIGURE UPDATED IN 2024 TO MAINTAIN CONSISTENCY WITH CROSS-SECTION C-C'







DRAWN BY:	AGC	DATE: 11/30/16
CHECKED BY:	NRK	DATE: 12/20/16
APPROVED BY:	SJC	DATE: 12/20/16

DRAWING NO: Fig 10_Geologic Cross-Section B-B'

REFERENCE: SEE INFO BLOCK

GEOLOGIC CROSS-SECTION B-B'

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

NATURAL RESOURCE TECHNOLOGY

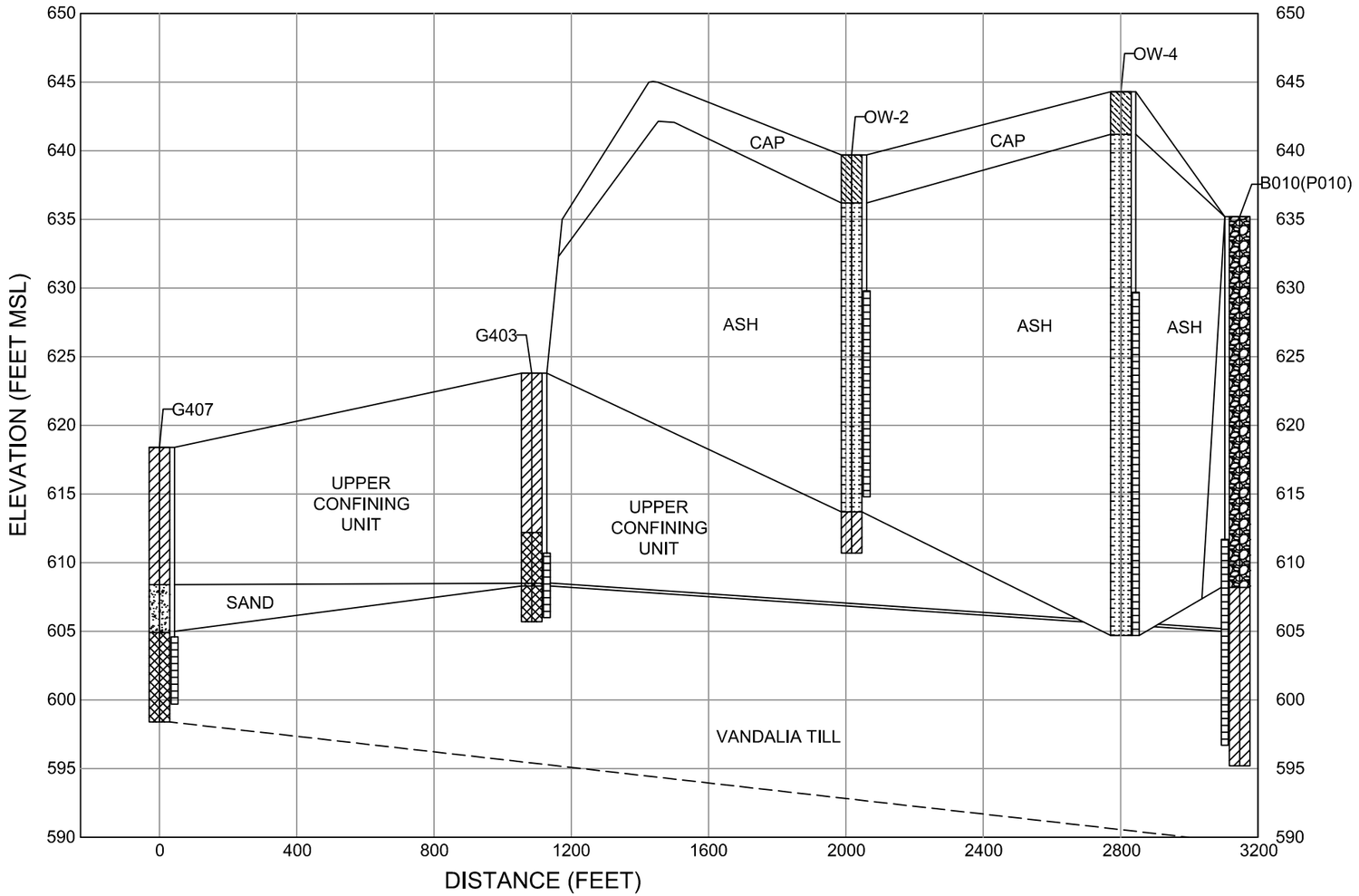
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2380/2.0

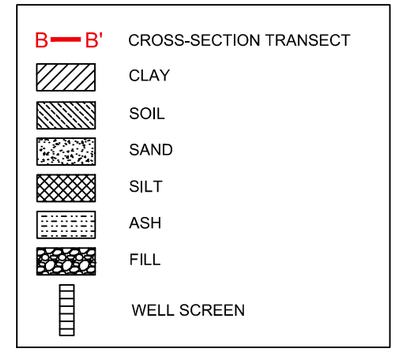
FIGURE NO.
10

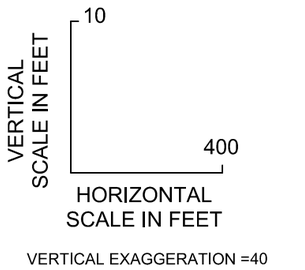
Jun 11, 2024 8:25am PLOTTED BY: CAWRSEAG SAVED BY: CAWRSEAG
X:\Mapping\Projects\23\2380\CAD\2-0\Figure 10_Geologic Cross-Section B-B' rev.dwg Layout1
IMAGES:
XREFS:

C
WEST

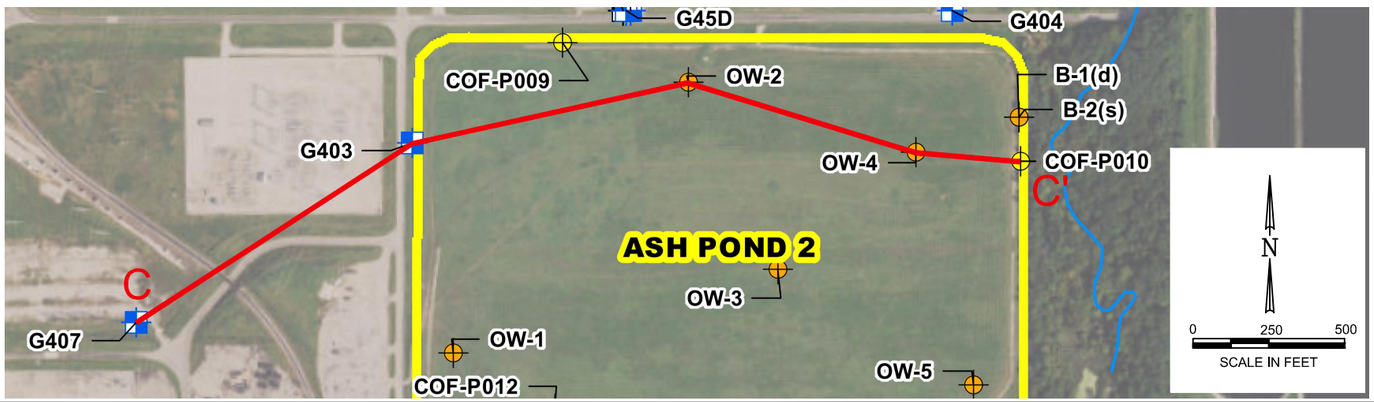
C'
EAST







VERTICAL EXAGGERATION =40



GEOLOGIC CROSS-SECTION C-C'

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

DRAWN BY:	AGC	DATE: 12/1/16
CHECKED BY:	NRK	DATE: 12/20/16
APPROVED BY:	SJC	DATE: 12/20/16

DRAWING NO: Fig 11_Geologic Cross-Section C-C'

REFERENCE: SEE INFO BLOCK

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
2380/2.0

FIGURE NO.
11

Dec 21, 2016 12:13pm PLOTTED BY: amillspaugh SAVED BY: acowrse
Y:\Mapping\Projects\23\2380\CAD\2-0\Figure 11_Geologic Cross-Section C-C'.dwg Layout1
IMAGES:
XREFS:

APPENDIX B
Site-Wide Groundwater Elevations

Appendix B. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 2
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 B. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 2
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

Appendix B. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 2
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 B. Site-Wide Groundwater Elevations
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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

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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

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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

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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

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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

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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

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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

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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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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 B. Site-Wide Groundwater Elevations
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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

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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

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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

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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

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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

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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

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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

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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

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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 B. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 2
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 B. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 2
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 B. Site-Wide Groundwater Elevations
Nature and Extent Report
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Ash Pond No. 2
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 B. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 2
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 B. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 2
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 B. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 2
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

Appendix B. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 2
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
OW-1	Water Level	Porewater	1/23/2023	17.38	624.34
OW-1	Water Level	Porewater	2/21/2023	17.06	624.30
OW-1	Water Level	Porewater	3/15/2023	17.32	624.35
OW-1	Water Level	Porewater	4/19/2023	17.19	624.17
OW-1	Water Level	Porewater	5/24/2023	17.29	623.90
OW-1	Water Level	Porewater	6/22/2023	17.34	623.76
OW-1	Water Level	Porewater	7/24/2023	17.41	624.08
OW-1	Water Level	Porewater	8/18/2023	17.49	623.82
OW-1	Water Level	Porewater	9/14/2023	17.58	623.95
OW-1	Water Level	Porewater	10/18/2023	17.47	623.85
OW-1	Water Level	Porewater	11/17/2023	17.55	623.80
OW-1	Water Level	Porewater	12/15/2023	17.56	623.73
OW-2	Water Level	Porewater	1/23/2023	17.73	624.37
OW-2	Water Level	Porewater	2/21/2023	17.42	624.28
OW-2	Water Level	Porewater	3/15/2023	17.72	624.35
OW-2	Water Level	Porewater	4/19/2023	17.55	624.17
OW-2	Water Level	Porewater	5/24/2023	17.65	623.90
OW-2	Water Level	Porewater	6/22/2023	17.71	623.77
OW-2	Water Level	Porewater	7/24/2023	17.80	624.08
OW-2	Water Level	Porewater	8/18/2023	17.90	623.78
OW-2	Water Level	Porewater	9/14/2023	17.89	623.95
OW-2	Water Level	Porewater	10/18/2023	17.83	623.85
OW-2	Water Level	Porewater	11/17/2023	17.91	623.79
OW-2	Water Level	Porewater	12/15/2023	17.91	623.70
OW-3	Water Level	Porewater	1/23/2023	28.39	624.38
OW-3	Water Level	Porewater	2/21/2023	27.30	624.27
OW-3	Water Level	Porewater	3/15/2023	28.36	624.41
OW-3	Water Level	Porewater	4/19/2023	28.19	624.10
OW-3	Water Level	Porewater	5/24/2023	28.31	624.45
OW-3	Water Level	Porewater	6/22/2023	28.33	623.71
OW-3	Water Level	Porewater	7/24/2023	28.45	624.80
OW-3	Water Level	Porewater	8/18/2023	28.55	623.74
OW-3	Water Level	Porewater	9/14/2023	28.53	623.91
OW-3	Water Level	Porewater	10/18/2023	28.47	623.79
OW-3	Water Level	Porewater	11/17/2023	28.57	623.77
OW-3	Water Level	Porewater	12/15/2023	28.53	623.65
OW-5	Water Level	Porewater	1/23/2023	17.73	624.64
OW-5	Water Level	Porewater	2/21/2023	17.57	624.65

Appendix B. Site-Wide Groundwater Elevations
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 2
Coffeen, IL

Well ID	Well Type	Monitored Unit	Date	Depth to Groundwater (feet BMP)	Groundwater Elevation (feet NAVD88)
OW-5	Water Level	Porewater	3/15/2023	17.90	624.70
OW-5	Water Level	Porewater	4/19/2023	17.70	624.32
OW-5	Water Level	Porewater	5/24/2023	17.79	624.41
OW-5	Water Level	Porewater	6/22/2023	17.84	624.27
OW-5	Water Level	Porewater	7/24/2023	17.84	624.43
OW-5	Water Level	Porewater	8/18/2023	17.86	624.10
OW-5	Water Level	Porewater	9/14/2023	17.92	624.30
OW-5	Water Level	Porewater	10/18/2023	18.02	624.21
OW-5	Water Level	Porewater	11/17/2023	18.07	624.16
OW-5	Water Level	Porewater	12/15/2023	18.22	624.16
AP2-D	Water Level	Porewater	1/23/2023	20.20	623.90
AP2-D	Water Level	Porewater	2/21/2023	19.86	624.24
AP2-D	Water Level	Porewater	3/15/2023	20.19	623.91
AP2-D	Water Level	Porewater	4/19/2023	20.01	624.09
AP2-D	Water Level	Porewater	5/24/2023	20.10	624.00
AP2-D	Water Level	Porewater	6/22/2023	20.17	623.93
AP2-D	Water Level	Porewater	7/24/2023	20.25	623.85
AP2-D	Water Level	Porewater	8/18/2023	20.36	623.74
AP2-D	Water Level	Porewater	9/14/2023	20.33	623.77
AP2-D	Water Level	Porewater	10/18/2023	20.28	623.82
AP2-D	Water Level	Porewater	11/17/2023	20.34	623.76
AP2-D	Water Level	Porewater	12/15/2023	20.35	623.75

Notes:
BMP = below measuring point
NAVD88 = North American Vertical Datum of 1988

APPENDIX C
Supplemental Vertical Hydraulic Gradients

Appendix C. Supplemental Vertical Hydraulic Gradients

Nature and Extent Report

Coffeen Ash Pond No. 1

Coffeen Power Plant

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

Appendix C. Supplemental Vertical Hydraulic Gradients

Nature and Extent Report

Coffeen Ash Pond No. 1

Coffeen Power Plant

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

Appendix C. Supplemental Vertical Hydraulic Gradients

Nature and Extent Report

Coffeen Ash Pond No. 1

Coffeen Power Plant

Coffeen, IL

Date	T408 Groundwater Elevation (ft NAVD88) LCU (upper)	G45D Groundwater Elevation (ft NAVD88) LCU (lower)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
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

Appendix C. Supplemental Vertical Hydraulic Gradients

Nature and Extent Report

Coffeen Ash Pond No. 1

Coffeen Power Plant

Coffeen, IL

Date	T409 Groundwater Elevation (ft NAVD88) LCU (upper)	G46D Groundwater Elevation (ft NAVD88) LCU (lower)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
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

Appendix C. Supplemental Vertical Hydraulic Gradients

Nature and Extent Report

Coffeen Ash Pond No. 1

Coffeen Power Plant

Coffeen, IL

Date	G307 Groundwater Elevation (ft NAVD88) UA	G307D Groundwater Elevation (ft NAVD88) LCU (lower)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
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) UA	G311D Groundwater Elevation (ft NAVD88) LCU (lower)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
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

Appendix C. Supplemental Vertical Hydraulic Gradients
Nature and Extent Report
Coffeen Ash Pond No. 1
Coffeen Power Plant
Coffeen, IL

Date	G314 Groundwater Elevation (ft NAVD88) LCU (upper)	G314D Groundwater Elevation (ft NAVD88) DA (PMP)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
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.
- - = no data collected on date / no vertical gradient calculated
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

Appendix C. Supplemental Vertical Hydraulic Gradients

Nature and Extent Report

Coffeen GMF Gypsum Stack Pond

Coffeen Power Plant

Coffeen, IL

Date	G206 Groundwater Elevation (ft NAVD88)	G206D Groundwater Elevation (ft NAVD88)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
	UA	DA (PMP)				
4/20/2021	622.07	585.96	36.11	33.51	1.08	down
5/3/2021	622.60	587.42	35.18	33.51	1.05	down
5/17/2021	622.31	587.81	34.50	33.51	1.03	down
6/9/2021	621.71	584.19	37.52	33.51	1.12	down
6/23/2021	620.54	589.66	30.88	33.51	0.92	down
7/12/2021	622.39	590.72	31.67	33.51	0.95	down
7/26/2021	622.00	591.14	30.86	33.51	0.92	down
8/16/2021	622.08	592.00	30.08	33.51	0.90	down
10/25/2021	622.94	595.04	27.90	33.51	0.83	down
2/7/2022	622.37	598.22	24.15	33.51	0.72	down
5/9/2022	623.70	601.30	22.40	33.51	0.67	down
8/23/2022	621.61	602.86	18.75	33.51	0.56	down
3/30/2023	623.69	601.99	21.70	33.51	0.65	down
4/30/2023	622.54	603.60	18.94	33.51	0.57	down
5/30/2023	621.64	603.91	17.73	33.51	0.53	down
7/8/2023	620.69	604.04	16.65	33.51	0.50	down
8/8/2023	618.93	604.10	14.83	33.51	0.44	down
9/25/2023	618.08	604.06	14.02	33.51	0.42	down
10/25/2023	617.11	603.80	13.31	33.51	0.40	down
11/13/2023	616.66	603.74	12.92	33.51	0.39	down
12/18/2023	616.97	603.82	13.15	33.51	0.39	down
			Middle of screen elevation G206			610.8
			Middle of screen elevation G206D			577.3

[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.

-- = no data collected on date / no vertical gradient calculated
DA = deep aquifer
dh = head change
dl = distance change
ft = foot/feet
NAVD88 = North American Vertical Datum of 1988
PMP = potential migration pathway
UA = uppermost aquifer

Appendix C. Supplemental Vertical Hydraulic Gradients

Nature and Extent Report

Coffeen GMF Recycle Pond

Coffeen Power Plant

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	0.005	down
10/25/2021	618.12	615.50	2.62	12.00	0.218	down
2/7/2022	617.28	616.88	0.40	12.00	0.033	down
5/9/2022	617.91	617.78	0.13	12.00	0.011	down
8/23/2022	616.85	616.99	-0.14	12.00	-0.012	up
2/13/2023	617.50	617.16	0.34	12.00	0.028	down
5/30/2023	616.79	616.66	0.13	12.00	0.011	down
8/8/2023	616.78	616.62	0.16	12.00	0.013	down
10/24/2023	615.79	615.97	-0.18	12.00	-0.015	up
11/13/2023	615.90	616.06	-0.16	12.00	-0.013	up
			Middle of screen elevation G405D			610.0
			Middle of screen elevation T408			598.0

Appendix C. Supplemental Vertical Hydraulic Gradients

Nature and Extent Report

Coffeen GMF Recycle Pond

Coffeen Power Plant

Coffeen, IL

Date	G275 Groundwater Elevation (ft NAVD88)	G275D Groundwater Elevation (ft NAVD88)	Head Change (ft)	Distance Change [1] (ft)	Vertical Hydraulic Gradient [2] (dh/dl)	
	UA	DA (PMP)				
4/20/21-4/21/20	605.00	568.33	36.67	42.14	0.87	down
7/12/21-7/13/21	605.63	570.43	35.20	42.77	0.82	down
7/26/2021	605.05	570.35	34.70	42.18	0.82	down
8/16/2021	605.09	571.48	33.61	42.23	0.80	down
10/25/2021	605.17	578.52	26.65	42.30	0.63	down
2/7/2022	605.10	580.46	24.64	42.24	0.58	down
5/9/2022	605.67	581.11	24.56	42.80	0.57	down
2/13/2023	605.24	580.82	24.42	42.38	0.58	down
			Middle of screen elevation G275			605.7
			Middle of screen elevation G275D			562.9

Appendix C. Supplemental Vertical Hydraulic Gradients

Nature and Extent Report

Coffeen GMF Recycle Pond

Coffeen Power Plant

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

[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: 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.

-- = no data collected on date / no vertical gradient calculated
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

APPENDIX D
Historical Field and Laboratory Hydraulic Conductivities

Appendix D. Historical Field and Laboratory Hydraulic Conductivities

Nature and Extent Report

Coffeen Power Plant

Ash Pond No. 2

Coffeen, IL

Well ID	Unit	Method (fh)	Method (rh)	K (fh)	K (rh)	Well Geometric Mean	Approximate Screened Elevation (ft)	Interpreted Unit
Upper-most Aquifer								
R104	**Landfill**	KGS	B-R	7.0E-05	2.8E-04	1.4E-04	614.4-609.7	Hagarstown Beds
G105		KGS	KGS	1.5E-04	5.7E-05	9.2E-05	613.2-608.4	
G106		B-R	B-R	4.0E-05	7.4E-04	1.7E-04	614.0-609.4	
G107		KGS	KGS	6.3E-05	8.9E-05	7.5E-05	613.9-609.3	
G110		KGS	KGS	4.7E-05	2.0E-05	3.1E-05	612.0-607.4	
G119		KGS	KGS	8.6E-05	8.2E-05	8.4E-05	611.6-607	
G120		low water elevation; no test conducted					614.2-609.7	
G125		KGS	KGS	4.8E-05	4.1E-05	4.4E-05	613.7-609.1	
T127		KGS	KGS	1.2E-03	1.7E-05	1.4E-04	610.5-606	
			Unit Geometric Mean			8.5E-05		
T202	**Gypsum Pond**	KGS	KGS	4.5E-04	5.5E-04	5.0E-04	614.0-609.6	Hagarstown Beds
G206		B-R	KGS	3.0E-04	1.6E-04	2.2E-04	613.0-608.6	
G208		KGS	KGS	6.0E-05	2.1E-05	3.5E-05	613.0-608.5	
G209		KGS	KGS	2.0E-04	1.6E-04	1.8E-04	612.8-608.3	
G210		KGS	KGS	5.0E-04	4.8E-04	4.9E-04	611.1-606.6	
G212		KGS	KGS	1.3E-04	1.8E-04	1.5E-04	613.9-609.3	
G215		KGS	KGS	5.0E-04	3.5E-04	4.2E-04	611.1-606.7	
G218		KGS	KGS	4.1E-04	4.1E-04	4.1E-04	610.3-605.9	
			Unit Geometric Mean			2.3E-04		
G270	**Recycle Pond**	KGS	KGS	5.5E-04	4.8E-04	5.1E-04	609.8-605.0	Hagarstown Beds
G271		KGS	KGS	1.6E-04	1.1E-03	4.2E-04	612.9-608.6	
G273		KGS	KGS	1.0E-03	8.3E-04	9.1E-04	611.1-605.6	
G276		low water					606.7-601.9	Hagarstown Beds, v. thin
G279		KGS	KGS	1.7E-03	1.5E-03	1.6E-03	606.8-602.4	Hagarstown Beds
G280		KGS	KGS	1.3E-03	1.3E-03	1.3E-03	610.2-605.3	
G281		KGS	KGS	2.1E-03	8.9E-04	1.4E-03	608.3-603.7	
			Unit Geometric Mean			9.0E-04		
G301	**Ash Pond 1**	KGS	KGS	2.7E-04	5.0E-04	3.7E-04	609-604.3	Upper Vandalia Till
G302		KGS	KGS	4.9E-04	6.3E-04	5.6E-04	604.7-600.1	
G303		KGS	KGS	5.6E-05	3.1E-05	4.2E-05	609.1-599.1	Hagarstown/Vandalia Till Contact
G304		KGS	KGS	8.9E-04	1.0E-03	9.4E-04	613.5-603.5	Hagarstown Beds
			Unit Geometric Mean			3.0E-04		
G401	**Ash Pond 2**	B-R	B-R	1.8E-04	2.8E-04	2.2E-04	608.7-603.7	Hagarstown Beds
G402		KGS	KGS	4.5E-04	1.9E-04	2.9E-04	600.6-590.6	Upper Vandalia Till
G403		KGS	KGS	4.3E-05	7.2E-05	5.6E-05	610.7-606.0	Hagarstown Beds, v. thin
G404		KGS	KGS	4.2E-04	3.8E-04	4.0E-04	606.7-601.9	Hagarstown Beds
G405		KGS	KGS	9.8E-04	9.7E-04	9.7E-04	611.9-607.1	
			Unit Geometric Mean			2.7E-04		
G153	**SW Pond**	KGS	KGS	2.5E-04	5.4E-04	3.7E-04	607.5-603.0	Hagarstown Beds
			Unit Geometric Mean			3.7E-04		
MW03S	**2009 Hydrogeo. Invest.**	B-R	B-R	6.0E-04	1.1E-03	8.1E-04	613.7-608.6	Hagarstown Beds
MW04S		B-R	B-R	1.3E-03	8.0E-04	1.0E-03	612.6-607.6	
MW10S		B-R	B-R	8.0E-04	8.0E-04	8.0E-04	610.9-604.9	
MW13S		B-R	B-R	1.0E-03	2.0E-04	4.5E-04	611.3-606.1	
MW14S		B-R	B-R	1.0E-03	5.0E-04	7.1E-04	612.4-607.2	
MW15S		B-R	B-R	1.5E-04	8.1E-05	1.1E-04	609.3-604.2	
MW16S		B-R	B-R	6.0E-04	4.5E-04	5.2E-04	611.5-606.3	
MW17S		B-R	B-R	5.8E-04	5.5E-04	5.6E-04	613.1-603	
			Unit Geometric Mean			5.4E-04		
Lower Confining Unit (Vandalia and Smithboro Till)								
T408	**Ash Pond 2**	KGS	KGS	2.15E-06	7.50E-08	9.02E-07	600.4-595.2	Vandalia Till
T409		KGS	KGS	3.6E-05	3.20E-05	3.41E-05	600.1-594.9	Vandalia Till (sand seam)
G405D		KGS	KGS			4.90E-07	589.1-579	Smithboro Till
G406D		KGS	KGS			4.00E-08	580.3-570.3	
			Unit Geometric Mean			5.55E-06		

Notes:

fh = Falling head test

rh = Rising head test

Hydraulic Conductivity tests analyzed using Aqtesolv® Pro version 4.50 (HydroSOLVE, Inc.)

Test Methods

B-R Bouwer and Rice, 1976. "A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifer with Completely or Partially Penetrating Wells", Water Resources Research v.12, no. 3. American Geophysical Union, Washington, DC. pp. 423-428.

KGS Hyder, Z., J.J. Butler, C.D. McElwee, and W. Liu, 1974. "Slug tests in partially penetrating wells", Water Resources Research, v. 30, no. 11. American Geophysical Union, Washington, DC. pp. 2945-2957.

Natural Resource Technology AN OBG COMPANY

Appendix D. Historical Field and Laboratory Hydraulic Conductivities
Nature and Extent Report
Coffeen Power Plant
Ash Pond No. 2
Coffeen, IL

Laboratory Tests			
Well/ Soil Boring ID	**Approximate Sample Elevation (ft)**	**Hydraulic Conductivity (cm/sec)**	**Interpreted Unit**
COF-B001	613.0	1.3E-08	Loess - Upper Confining Unit
COF-B003	606.5	2.2E-07	
COF-B004	610.5	5.0E-07	
COF-B007	615.0	7.0E-08	
	Geometric Mean	**1.0E-07**	
G46D	599.2	4.5E-06	Vandalia Till
T408	597.6	1.5E-07	
SB-12	577.7-572.7	6.8E-09	
SB-13	598-593	7.0E-09	
SB-18	603.5-603	8.8E-09	
	Geometric Mean	**4.9E-08**	
SB-09	598.5-598	1.9E-06	Mulberry Grove Silt
SB-16	589-588.5	1.6E-06	
	Geometric Mean	**1.7E-06**	
G45D	586.4	1.0E-07	Smithboro Till
G46D	578.9	2.1E-08	
SB-07	572-571.5	1.1E-09	
	Geometric Mean	**1.3E-08**	
SB-19	569-564	3.4E-09	Deep Confining Unit
SB-16	548-547.5	1.3E-08	
	Geometric Mean	**6.6E-09**	

APPENDIX E
Supplemental Field Hydraulic Conductivities

Appendix E. Supplemental Field Hydraulic Conductivities
Nature and Extent Report
Coffeen Ash Pond No. 1
Coffeen Power Plant
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
SP = Poorly-Graded Sand

Appendix E. Supplemental Field Hydraulic Conductivities

Nature and Extent Report

GMF Gypsum Stack Pond

Coffeen Power Plant

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											
G206	D	608.61	4.41	SM, s(CL), CL	solid	Kansas Geological Survey	5.0E-04	4.9E-04			
G209	D	608.29	4.54	CL	solid	Kansas Geological Survey	- -	2.5E-04			
G212	D	609.30	4.55	SM, s(CL), CL	solid	Kansas Geological Survey	2.1E-03	1.8E-03	2.5E-04	4.0E-03	1.4E-03
G215	D	606.68	4.39	SM, s(CL), ML	solid	Kansas Geological Survey	4.0E-03	3.5E-03			
G218	D	605.87	4.44	SM, SC, CL	solid	Kansas Geological Survey	2.6E-03	2.4E-03			

[O: KLT, 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
PVC = polyvinyl chloride

USCS = Unified Soil Classification System

CL = Lean Clay
s(CL) = Sandy Lean Clay
ML = Silt
SC = Clayey Sand
SM = Silty Sand

Appendix E. Supplemental Field Hydraulic Conductivities
Nature and Extent Report
GMF Recycle Pond
Coffeen Power Plant
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											
G272	D	606.74	4.87	SP to ML, (CL)s	solid	Kansas Geological Survey	1.7E-03	- -	7.8E-04	1.7E-03	1.1E-03
G284	D	602.48	4.77	ML	solid	Kansas Geological Survey	1.2E-03	7.8E-04			
G286	D	601.81	4.79	SP, ML, CL	solid	Kansas Geological Survey	1.2E-03	- -			
G287	D	604.09	4.82	SP, ML, CL	solid	Kansas Geological Survey	1.1E-03	1.1E-03			
Lower Confining Unit (PMP)											
G283	D	590.13	9.78	SP, ML	solid	Kansas Geological Survey	4.2E-03	4.5E-03	2.7E-04	4.5E-03	1.2E-03
G285	D	587.09	9.77	CL	solid	Bouwer-Rice	2.7E-04	4.3E-04			

[O: KLT, 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
PVC = polyvinyl chloride
PMP = potential migration pathway

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

APPENDIX F
Surface Water Sampling Locations and Laboratory Analytical Report



GSI Surface Water Sample

Background Surface Water Sample

Figure adapted by Ramboll from Geosyntec-provided figure

N

0 520 Feet

Notes:
Locations are approximate

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

LINKS

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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.

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Case Narrative

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

Job ID: 500-203343-1

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.
Project/Site: GLP8029 Coffeen, IL

Job ID: 500-203343-1

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.

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.
Project/Site: GLP8029 Coffeen, IL

Job ID: 500-203343-1

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: 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.
Project/Site: GLP8029 Coffeen, IL

Job ID: 500-203343-1

Client Sample ID: D-1-20210803

Date Collected: 08/03/21 10:50
Date Received: 08/05/21 09:45

Lab Sample ID: 500-203343-2

Matrix: Water

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

Job ID: 500-203343-1

Client Sample ID: BKG-1-20210803

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

Lab Sample ID: 500-203343-3

Matrix: Water

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

Job ID: 500-203343-1

Client Sample ID: DUP-20210803

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

Lab Sample ID: 500-203343-5

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	08/10/21 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: Geosyntec Consultants, Inc.
Project/Site: GLP8029 Coffeen, IL

Job ID: 500-203343-1

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

Definitions/Glossary

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

Job ID: 500-203343-1

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

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

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 500-614638/3
Matrix: Water
Analysis Batch: 614638

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

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
Matrix: Water
Analysis Batch: 614638

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	2.81		mg/L		94	80 - 120

Lab Sample ID: 500-203337-F-2 MS
Matrix: Water
Analysis Batch: 614638

Client Sample ID: Matrix Spike
Prep Type: Total/NA

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
Matrix: Water
Analysis Batch: 614638

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

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
Matrix: Water
Analysis Batch: 614951

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

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
Matrix: Water
Analysis Batch: 614951

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

Lab Sample ID: MB 500-615118/3
Matrix: Water
Analysis Batch: 615118

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

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
Matrix: Water
Analysis Batch: 613305

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

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
Matrix: Water
Analysis Batch: 613305

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

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
Matrix: Water
Analysis Batch: 613305

Client Sample ID: Matrix Spike
Prep Type: Total/NA

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
Matrix: Water
Analysis Batch: 613305

Client Sample ID: Duplicate
Prep Type: Total/NA

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
Matrix: Water
Analysis Batch: 613311

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

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
Matrix: Water
Analysis Batch: 613311

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

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
Matrix: Water
Analysis Batch: 613311

Client Sample ID: D-2-20210803
Prep Type: Total/NA

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
Matrix: Water
Analysis Batch: 613311

Client Sample ID: D-2-20210803
Prep Type: Total/NA

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
Matrix: Water
Analysis Batch: 614916

Client Sample ID: Method Blank
Prep Type: Total/NA
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
Matrix: Water
Analysis Batch: 614916

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

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

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
Matrix: Water
Analysis Batch: 613518

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

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
Matrix: Water
Analysis Batch: 613518

Client Sample ID: Matrix Spike
Prep Type: Total/NA

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
Matrix: Water
Analysis Batch: 613518

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

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

Lab Chronicle

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

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

Date Collected: 08/03/21 10:50
Date Received: 08/05/21 09:45

Lab Sample ID: 500-203343-2

Matrix: Water

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.
Project/Site: GLP8029 Coffeen, IL

Job ID: 500-203343-1

Client Sample ID: BKG-1-20210803

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

Lab Sample ID: 500-203343-3

Matrix: Water

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

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

Lab Sample ID: 500-203343-4

Matrix: Water

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.
Project/Site: GLP8029 Coffeen, IL

Job ID: 500-203343-1

Client Sample ID: DUP-20210803

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

Lab Sample ID: 500-203343-5

Matrix: Water

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

Date Collected: 08/03/21 13:50
Date Received: 08/05/21 09:45

Lab Sample ID: 500-203343-6

Matrix: Water

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.
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

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

Accreditation/Certification Summary

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

Job ID: 500-203343-1

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

eurofins Environment Testing America

500-203343 COC

Client Information	Sampler: Nick Williams	Lab PM: Kintz Robin M	Ca:	COC No: 500-93566-41606 1
Client Contact: Brian Ares	Phone: 317 694 9143	E-Mail: Robin Kintz@Eurofinset com	Sta:	Page: Page 1 of 1
Company: Geosyntec Consultants Inc	PWSID:			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#:			

Analysis Requested

Preservation Codes

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

Other:

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 Sample (Yes or No)	Perform MS/MSD (Yes or No)	9056A - Chloride, Sulfate	6010B - Metals (ICP) - 9 elements	6010B - Dissolved Metals (ICP) - 9 elements	4500_P_E - Phosphorus as PO4	SM4500_S2_F - Sulfide	9060A_Diss - Organic Carbon Dissolved (DOC)	2320B 2540C 3500_F+2_B_Calc 3500_F+3_B_Calc	9056A Chloride, Sulfate (Dissolved)	Total Number of containers	Special Instructions/Note
			Preservation Code:				N	D	D	S	CB	S	N	N		
D-2-20210803	8/3/21	1015	G	W		N	X	X	X	X	X	X	X	X		Filtered in field for
D-1-20210803		1050	G	W		N	X	X	X	X	X	X	X	X		Dissolved Metals, DOC,
BKG-1-20210803		1245	G	W		N	X	X	X	X	X	X	X	X		~~and Dissolved Chloride,~~
CL-1-20210803		1320	G	W		N	X	X	X	X	X	X	X	X		Sulfate NW
DUP-20210803		1330	G	W		N	X	X	X	X	X	X	X	X		
CL-2-20210803		1350	G	W		N	X	X	X	X	X	X	X	X		
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
		8/4/21 930	EQ		8/5/21 0945	ETA
	Relinquished by:	Date/Time	Company	Received by:	Date/Time	Company
	Relinquished by:	Date/Time	Company	Received by:	Date/Time	Company

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

8/20/2021

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	

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 J Schindler

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

PDC Laboratories, Inc.
2231 West Altorfer Drive
Peoria, IL 61615
(800) 752-6651

ANALYTICAL RESULTS

Sample: 6103663-01
Name: AP1a
Matrix: Surface Water - Grab

Sampled: 10/24/16 11:52
Received: 10/25/16 07:45

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

PDC Laboratories, Inc.
2231 West Altorfer Drive
Peoria, IL 61615
(800) 752-6651

ANALYTICAL RESULTS

Sample: 6103663-02
Name: AP1b
Matrix: Surface Water - Grab

Sampled: 10/24/16 11:56
Received: 10/25/16 07:45

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
Name: AP1c
Matrix: Surface Water - Grab

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

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
Name: AP1d
Matrix: Surface Water - Grab

Sampled: 10/24/16 12:15
Received: 10/25/16 07:45

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
Name: AP1e
Matrix: Surface Water - Grab

Sampled: 10/24/16 12:01
Received: 10/25/16 07:45

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
Name: AP1f
Matrix: Surface Water - Grab

Sampled: 10/24/16 12:40
Received: 10/25/16 07:45

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
Name: AP1g
Matrix: Surface Water - Grab

Sampled: 10/24/16 12:50
Received: 10/25/16 07:45

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
Name: AP2e
Matrix: Surface Water - Grab

Sampled: 10/24/16 11:30
Received: 10/25/16 07:45

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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Peoria, IL 61615
(800) 752-6651

ANALYTICAL RESULTS

Sample: 6103663-10
Name: AP2f
Matrix: Surface Water - Grab

Sampled: 10/24/16 11:20
Received: 10/25/16 07:45

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
Name: CLa
Matrix: Surface Water - Grab

Sampled: 10/24/16 15:30
Received: 10/25/16 07:45

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
Name: GPa
Matrix: Surface Water - Grab

Sampled: 10/24/16 14:00
Received: 10/25/16 07:45

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
Name: RPb
Matrix: Surface Water - Grab

Sampled: 10/24/16 14:50
Received: 10/25/16 07:45

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
Name: RPc
Matrix: Surface Water - Grab

Sampled: 10/24/16 15:00
Received: 10/25/16 07:45

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
Name: RPd
Matrix: Surface Water - Grab

Sampled: 10/24/16 15:05
Received: 10/25/16 07:45

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
Name: RPa
Matrix: Surface Water - Grab

Sampled: 10/24/16 14:40
Received: 10/25/16 07:45

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

PDC Laboratories, Inc.
2231 West Altorfer Drive
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 J Schindler

Certified by: Gail Schindler, Project Manager

PDC LABORATORIES, INC.
2231 WEST ALTORFER DRIVE **PHONE # 309-692-9688**
PEORIA, IL 61615 **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:
MATRIX TYPES: WW- WASTEWATER; DW- DRINKING WATER; GW- GROUND WATER; WWSL- SLUDGE; NAS- SOLID; OTHER:

(3) ANALYSIS REQUESTED — GJS 10-26-16
SB,AS,BA,BE,ALKHCO3 | B,CD,CA,ALK CO3, CL | CR,CR+6,CO,CU,ON,F | PE,PB,LI,MG,MN,HG,MO | NI,GRO,PHENOL,P,SE, | AG,NA,SO4,TL,TDS,ZN | TSS,NO2,NO3,NH3,TKN
Custom list

(FOR LAB USE ONLY)
LOGIN # G103663-24 GJS
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	REMARKS
AP1 a	10/24/16	11:52	X		SW	7	pH 6.99
AP1 b	10/24/16	11:56	X		SW	7	pH 7.01
AP1 c	10/24/16	12:10	X		SW	7	pH 7.05
AP1 d	10/24/16	12:15	X		SW	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) — 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					3 ANALYSIS REQUESTED GJS 10-26-16							(FOR LAB USE ONLY)
CLIENT: Hanson Professional Services **COFFEEN ENERGY CENTER**	PROJECT NUMBER	P.O. NUMBER	MEANS SHIPPED	SB,AS,BA,BE,ALKHCO3	B,CD,CA,ALK CO3, CL	CR,CR+6,CO,CU,ON,F	PE,PB,LI,MG,MN,HG,MO	M,GRO,PHENOL,P,SE,	AG,NA,SO4,TL,TDS,ZN	TSS,NO2,NO3,NH3,TKN	LOGIN #
ADDRESS: **134 CIPS LANE**	PHONE NUMBER	FAX NUMBER	DATE SHIPPED								LOGGED BY:
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:								**NATURAL RESOURCE TECHNOLOGY** **COFFEEN POND LAKE** **GAIL J SCHINDLER**
CONTACT PERSON: **JOHN ROMANG**	SAMPLER'S SIGNATURE										

2 SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED	SAMPLE TYPE GRAB	SAMPLE TYPE COMP	MATRIX TYPE	TOTAL # OF CONT	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) X(RUSH TAT IS SUBJECT TO PDC LABS APPROVAL AND SURCHARGE)	NORMAL	RUSH
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	DATE	TIME		DATE	TIME
RELINQUISHED BY: (SIGNATURE)	10/25/16	7:45	RECEIVED BY: (SIGNATURE)		
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:

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,ON,F	FE,PB,LI,MG,MN,HG,MO	NI,GRO,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: 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: 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)

GPc
GPb
GMF GYPSUM
STACK POND
LANDFILL
GPd
GPa
RPa
RPd
GMF RECYCLE
POND
RPc
RPb
ASH POND 2
AP2e
AP2f
AP2g
AP2h
COFFEEN LAKE
CLa
CLb
AP1g
AP1f
AP1h
ASH POND 1
AP1e
AP1b
AP1c
AP1d

N

0 250 500

SCALE IN FEET

POTENTIAL SOURCE WATER AND
SURFACE WATER SAMPLE LOCATIONS

CCR MONITORED UNIT

CCR MONITORED UNIT

Y:\Mapping\Projects\231380\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

Cips Trail

SW Pond

CCR Landfill

Cips Ln

CLb

AP2f

AP1h

AP1c

AP1b

Ash Pond 2

GPa

GPb

RPc

RPd

Gypsum Stack

AP2g

AP2e

Recycle Pond

GPd

GPc

Ash Pond 1

AP1g

AP1d

AP1f

AP2h

Co Rd 450 N

RPb

RPa

CLc

AP1e

Co Rd 1650 E

Cooling Pond

CLd

Red Ball Trail

Tricky Point Trail

9

1675

Odell Ln

Ash 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]

Natural Resource Technology

APPENDIX G
Geochemical Conceptual Site Model

Geosyntec consultants

engineers | scientists | innovators

Geochemical Conceptual Site Model

Coffeen Power Plant –Ash Pond No. 2

(CCR Unit #102)

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

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ACRONYMS AND ABBREVIATIONS

AP1	Ash Pond No. 1
AP2	Ash Pond No. 2
ASD	alternative source demonstration
bgs	below ground surface
CEC	cation exchange capacity
CCR	coal combustion residuals
cm/s	centimeters per second
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
IEPA	Illinois Environmental Protection Agency
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
SU	standard units
TDS	total dissolved solids
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. 2 (AP2) coal combustion residuals unit (Unit #102). A GCSM describes the environmental media and geochemical processes that contribute to the mobilization, distribution, and attenuation of chemicals in the environment. This report describes the GCSM for parameters that have exceeded the GWPS in AP2 groundwater and which will be addressed in the corrective action plan. The exceedances detected at AP2 were boron, sulfate, pH, and total dissolved solids. Constituents of concern (COC) exceedances are present in one hydrostratigraphic unit at the Site: the uppermost aquifer (UA), comprised predominantly of sandy to gravelly silts with thin sand beds.

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 AP2 CCR source 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. 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 groundwater are predicted to favor amorphous iron oxide stability at most 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. Attenuation of the constituents contributing to TDS, such as sulfate, will reduce TDS concentrations as well. Boron may be further attenuated via interactions with clay minerals, which are present in solids across the UA and LCU. Site-specific partition coefficients could not be calculated from the results of batch attenuation testing completed with solids from the Site. These results indicate that chemical attenuation of boron and sulfate is expected to be limited.

Low pH at G401 is potentially caused by geochemical reactions driven by the mixing of porewater and groundwater, although the specific drivers are still under investigation. The low pH values at G401 are likely to be buffered further downgradient by the abundance of carbonate minerals identified in site solids via XRD.

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. 2 (AP2) coal combustion residuals (CCR) unit (Unit #102). 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 AP2. The document has been prepared as an appendix to the CPP AP2 Nature and Extent (N&E) Report prepared by Ramboll Americas Engineering Solutions. Inc. (Ramboll).

Constituents with statistical exceedances above the GWPS at CPP AP2 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, pH, and total dissolved solids (TDS). For the 2023 events discussed above, exceedances of boron were detected at compliance monitoring wells G401, G402, G404, and G405; exceedances of sulfate were detected at G401, G402, G404, G405, and G406; an exceedance of pH below the GWPS was detected at G401; and exceedances of TDS were detected at G401, G402, G404, and G405 (Ramboll 2024). All exceedances are present within the uppermost aquifer (UA).

An exceedance above the GWPS of cobalt was detected at compliance monitoring well G401 during the Q2 2023 monitoring event. An alternative source demonstration (ASD), as allowed by 35 I.A.C. § 845.650(e), was completed for the cobalt exceedance (Geosyntec 2023a). The cobalt ASD was rejected by the Illinois Environmental Protection Agency (IEPA) on January 11, 2024 (IEPA 2024a); however, the Illinois Power Generating Company has filed a motion for stay with Office of the Clerk of the Pollution Control Board. Therefore, cobalt is not included as a COC in this GCSM.

Exceedances above the GWPS of both sulfate and TDS were detected at compliance monitoring well G407 during the Q2 2023 monitoring event. An ASD, as allowed by 35 I.A.C. § 845.650(e), was completed for the exceedances of TDS and sulfate at G407 (Geosyntec 2023b). The G407 sulfate and TDS ASD was rejected by IEPA on January 11, 2024 (IEPA 2024b); however, the Illinois Power Generating Company has filed a motion for stay with Office of the Clerk of the Pollution Control Board. Therefore, these constituents are not presented as exceedances at G407 within this report, although data for these analytes is included in figures for completeness.

3. SITE BACKGROUND

3.1 Site Overview

An overview of Site characteristics and hydrogeology is presented in the CPP AP2 N&E Report. A Site layout figure is provided in Attachment A.[1] Briefly, the CPP AP2 impoundment is located to the north of the Ash Pond No. 1 CCR unit (Unit #101), and south of the Gypsum Management Facility Recycle Pond (Unit #104). 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. An unnamed tributary runs north to south to the east of AP2.

AP2 is a 78-acre unlined surface impoundment that received bottom ash and fly ash between 1972 until the mid-1980's, when it was capped with a 2-foot compacted clay and soil cap. AP2 was recapped starting in 2019 using a geomembrane cover system in accordance with a closure plan submitted to the IEPA (AECOM 2017). The cover system installation was completed on November 17, 2020. The geomembrane cap design addresses the potential for slope failure and water infiltration into the closed CCR unit by directing the drainage of surface water (i.e., precipitation) off the cover system.

A Hydrogeologic Site Characterization Report (NRT 2017) has previously described the hydrostratigraphic units (HSUs) present in the vicinity of the CPP AP2, which consist of an Upper Confining Unit (UCU), Uppermost Aquifer (UA), Lower Confining Unit (LCU), Deep Aquifer (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. CCR within AP2 is underlain by the UCU in the majority of the footprint, with limited direct contact with the UA in pre-construction ravines on the eastern edge of AP2.

Vertical gradients measured near the CPP indicate variable flow directions, although on average it is downward from the UA to the LCU north of AP2 in G405/T408 (0.02 feet per foot); and in G406/T409, south of AP2 near the former discharge flume, it is upward with an average of –0.06 feet per foot. Vertical gradients between the LCU and DA are consistently downward (CPP AP2 N&E Report). Both the DA and the LCU have been identified as PMPs due to the presence of these downward gradients.

[1] This figure is also provided as Figure 2-1 of the CPP AP2 N&E Report.

3.2 Groundwater Monitoring Network

A groundwater monitoring network was proposed in accordance with 35 I.A.C. § 845.630 to monitor groundwater quality which passes the waste boundary as part of the Operating Permit application to IEPA for AP2. The proposed groundwater monitoring network is described in the Groundwater Monitoring Plan (Ramboll 2021b) and shown in Attachment B.[2] Well construction information, including the HSU in which each well is screened, is provided in Attachment C.[3]

Groundwater flow in the vicinity of AP2 is generally to the south and east. The groundwater to the west of AP2 is separated from the groundwater flow regime under AP2 by a groundwater divide. 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 AP2 N&E Report.

[2] This figure is also provided as Figure 2-2 of the CPP AP2 N&E Report.
[3] This table is also provided as Table 3-1 of the CPP AP2 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 AP2 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 because reduced sulfur readily precipitates as 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.

pH is a measure of the concentration of proton (H^+) species in solution and is presented on a logarithmic scale. pH represents the acidity or basicity of an aqueous solution and is one of the master variables that controls ion speciation and chemical processes within groundwaters. The carbonic acid – carbonate system is the most important acid-base system in groundwaters, typically controlling pH conditions within groundwaters such that they are circumneutral to slightly alkaline, with a pH range between 6-9 SU. The pH of groundwater can be affected by weathering and dissolution reactions of minerals, as wells as the biogeochemical processes associated with sulfur cycling, nitrification, and humic and fulvic acids (Brezonik and Arnold 2011), among other processes.

4.2 Site Solids Characterization

Solid phase data for the CCR source material within the unit were not collected, as the unit has been closed since the mid-1980s.

Solids from across the CPP were characterized to determine the type and abundance of minerals present in the UA and LCU. 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 from these analyses are presented in Tables 1 – 4. Solids were collected from five locations adjacent to the following existing wells in the AP2 monitoring network:

- 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. Statistical exceedances of boron, sulfate, TDS, and pH outside the GWPS limits were determined at G401 during 2023.
- 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.

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 AP2 were not submitted for analysis via this technique.

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

- 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.
- 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.
- G314 and G314D, located downgradient of AP1 to the east, with solids collected within six intervals representing the UCU, UA, LCU, and DA.
- G316, located downgradient of AP1 to the east, with solids collected within two intervals within the UA that were combined for analysis.

A map showing these monitoring well locations 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 Site solids are presented in Table 1 and the analytical data is provided in Attachment E. CEC values range from 3.32 – 31.02 milliequivalents per 100 g of sample (meq/100g), with lower CEC values reported for sandier lithologies (i.e., G307D). TOC abundances range from 0.06 – 1.74 percent by dry weight [% wt], whereas the reported LOI abundances ranged from 2.5 – 12.4 % wt). No clear patterns in CEC, TOC or LOI between HSUs 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 %).

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 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 relatively similar between UA solids (4,900 milligrams per kilogram [mg/kg] to 22,000 mg/kg) and those detected for LCU solids (10,000 to 21,000 mg/kg). The abundance of iron within the bulk solids matrix of both the UA and LCU indicates the likelihood of iron-bearing minerals within the system. The presence of iron-bearing minerals was confirmed via X-Ray diffraction (XRD) as discussed in Section 4.2.3. Total manganese concentrations follow a similar pattern to iron, with concentrations in UA solids (34 mg/kg to 1,200 mg/kg) spanning those detected in LCU solids (370 to 470 mg/kg). Aluminum concentrations in UA solids vary from 9,600 mg/kg at the background location G270 to 32,000 mg/kg at the downgradient AP1 compliance location G316. Boron concentrations within solids were analyzed in the vicinity of AP2, with concentrations ranging between 4 to 6 mg/kg.

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 geologic units 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

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 4.1%), 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 solids side gradient of AP2 (G407 and G410), and in LCU and DA solids adjacent to AP1, but otherwise crystalline forms of iron oxides were not detected in Site solids. Metal oxides such as iron, manganese, or aluminum oxides can serve as attenuating surfaces for boron. Ankerite, an iron-bearing carbonate mineral, was detected in all Site solids at abundances from 0.5 to 9.4%. Compared to the XRF 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

Groundwater from wells across the UA and LCU in the vicinity of AP2 were analyzed for a range of geochemical parameters, as presented in Figures 1–9. For clarity in interpretation, the figures present data from the UA and the LCU with differing symbology. UA well locations are shown with circular symbology on the figures and LCU locations are shown with triangular symbology. Background locations G270, G280, and G281, all 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.

A limited set of porewater (i.e., CCR contact water) samples have been collected in the recent past, including porewater collected from four locations screened within AP2 CCR in 2016 (AP2e-h; data originally presented in the 2017 *Antidegradation Assessment for Management of Coal Combustion Residuals Impoundment Waters, Coffeen Power Station*; Attachment I) and one sample of leachate collected during construction closure activities in 2020 (CO 102 Pump Q Box). The 2020 leachate sample pH value was analyzed by the analytical laboratory following sampling and was qualified as being analyzed after the acceptable holding time window; it has therefore

been excluded from figures and the following discussion. Other analytes measured for the 2020 AP2 leachate sample were unimpacted and are included throughout.

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.

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.

AP2 porewater pH values ranged between 6.4 to 7.2 standard units (SU). In wells across the groundwater monitoring network, pH values appear to be stable and circumneutral, with the exception of G401 (Figure 1). Compliance UA groundwater pH values largely range between 6.4 to 7.5 SU, which is a relatively lower range than detected for background UA groundwater with pH values 6.8 to 7.9 SU. Lower pH values were detected at UA well G401 relative to similarly located downgradient UA wells (e.g. G402), with reported values ranging from 5.6 to 6.4 SU, consistently below the GWPS of 6.5 SU. These pH values are also lower than the reported pH values within the AP2 unit. LCU groundwater pH, as represented by values reported for G1001, ranged between 6.8 to 7.0 SU.

Since 2020, positive ORP values have been reported in all groundwater monitoring network wells across the Site (Figure 2). Prior to 2020, groundwater at background wells G270, G280, and G281 was consistently more oxidizing than downgradient UA wells G401, G402, G403, and G404. After cessation of combustion activities and initiation of pond-recapping activities in late 2019 and early 2020, redox conditions at G401, G402, G403, and G404 shifted to more oxidizing conditions that are more consistent with the background locations. G401, G402, G403, and G404 are distributed around AP2, representing upgradient, side gradient, and downgradient locations, such that the detected shift in redox conditions likely relates to changes related to new flow patterns following plant cessation and re-closure activities. Many of the UA wells across the network (G402, G403, G404, and G405) appear to fluctuate seasonally between relatively more oxidizing (winter) and more reducing (summer) conditions. This pattern is not consistently observed across the monitoring network and appears to have developed after the completion of closure construction in 2020, which may have altered recharge conditions at these locations.

4.3.2 Exceedance Parameters

Total boron concentrations in AP2 porewaters and leachate varied from 2.0 to 14 milligrams per liter (mg/L), with concentrations detected above the site-specific GWPS for boron of 2.0 mg/L

(Table 5; Figure 3a). UA background wells G270, G280, and G281 are not detected to exceed the GWPS for boron (Figure 3a). Boron concentrations appear to increase as the sampling location moves east across AP2 (i.e., lower concentrations at G403 compared to G405; locations shown in Attachment B), consistent with the general direction of groundwater flow within the UA beneath the unit. Boron concentrations have been stable above the GWPS at downgradient UA compliance wells G401 and G402, and stable below the GWPS at G403, G406, G407, and G1001. Boron concentrations have increased at G404 following the completion of closure construction, and concentrations at G405 have also increased after a period of decline. Boron dynamics at G404 and G405 may be influenced by increasing porewater elevations within AP2 during closure that are still returning to equilibrium (Section 3.2.1 of the CPP AP2 N&E Report). When measured, dissolved boron represents the majority of total boron at all locations (Figure 3b), consistent with the expectation that the majority of boron is present as neutral boric acid at the pH ranges detected within the monitoring network and would have limited associations with particulates.

Total sulfate concentrations within AP2 porewater and leachate ranged between 1,300 to 2,300 mg/L, above the GWPS of 400 mg/L (Table 5; Figure 4a). Sulfate concentrations in groundwater are largely stable through time across the monitoring network, with sulfate concentrations detected at higher concentrations at G401 (Figure 4a). Sulfate concentration trends at both G404 and G405 are consistent with the changes in boron concentrations described above, although at a lesser magnitude. Measurements of dissolved sulfate within compliance well groundwaters are limited; when measured, dissolved sulfate represents the majority of total sulfate at all locations (Figure 4b), indicative of limited association with suspended solids in the unfiltered samples.

TDS values in AP2 porewater and leachate ranged between 1,500 to 2,400 mg/L, above the GWPS of 1,200 mg/L (Table 5; Figure 5). UA background wells G270 (60 to 510 mg/L), G280 (400 to 608 mg/L), and G281 (700 to 1,000 mg/L) have a similar range of TDS concentrations relative to UA compliance wells (270 to 1,200 mg/L; excluding exceedance wells) and LCU well G1001 (830 to 1,700 mg/L). TDS concentrations at wells with statistically significant exceedances of TDS are higher (460 to 6,600 mg/L), exceeding the range of values for AP2 porewater (1,500 to 2,400 mg/L) at some locations. Total sulfate concentrations are positively linearly correlated with TDS concentrations across wells in the monitoring network ($R^2 = 0.81$; Figure 6), indicating that sulfate is a major contributor to TDS across the AP2 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 detected for a groundwater sample. Select crystalline mineral species were suppressed to be representative of groundwater conditions (e.g. mineral formation not anticipated to be kinetically favored for igneous and metamorphic minerals in the low temperature near-surface environment), except when identified in XRD data from solids in the site.

Using conditions detected at compliance well G402 on 6 June 2023 to represent downgradient groundwater within the UA (Table 6), amorphous ferrihydrite is predicted to be the predominant iron species under groundwater conditions at all locations, except for G401, where solid phase iron minerals are not expected to be stable (Figure 7a).[5] The lower predicted stability of ferrihydrite at G401 appears to be driven by the low pH values detected at this location. Conditions at most UA wells, including background wells G270 and G281, are poised on the redox boundary for solid phase iron stability under conditions at G402; the lower aqueous concentrations of iron at other locations (see Table 7) would tend to shift the redox boundary upwards such that aqueous iron is more likely to occur under conditions at other UA wells. Additionally, the higher abundance of total iron at G402, which was used to inform the Eh-pH diagram generation, compared to dissolved iron at G402 (Table 7) may overestimate the stability of solid phase iron species.

When not suppressed, crystalline magnetite is expected to be stable at all locations except G401 (Figure 7b), consistent with the detection of magnetite via XRD near G407 and G410 (Table 4). Magnetite is likely in a dynamic state at G401, with its stability poised between dissolution to aqueous iron and subsequent reprecipitation as amorphous iron oxides. Ankerite, which was identified via XRD and is an analogous iron-bearing carbonate species to siderite, is 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 potentially unstable, at some locations within the UA.

The Eh-pH diagrams for manganese show that solid phase manganese minerals, including manganese oxides, are not predicted to be thermodynamically stable under conditions across the Site (Figure 8). Background UA well G280 is the exception, as manganese carbonate mineral rhodochrosite was predicted to be thermodynamically stable. Mineralogical analyses were not completed at well G280 to verify the presence of rhodochrosite, although manganese-bearing carbonate mineral kutnohorite was detected in XRD results throughout the site.[6]

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, with results also available for Q4 2023 at the background locations. A comparison of the total and dissolved iron and manganese data for these events is provided in Table 7.

[5] Field ORP measurements were converted to Eh by adding +200 millivolts to correct for the Ag/AgCl electrode.
[6] Kutnohorite is a solid-solution carbonate mineral with the chemical formula $(Ca,Mn^{2+})(CO_3)_2$ which is not included in most thermodynamic databases used for geochemical model calculations. Rhodochrosite (manganese carbonate) represents the most analogous mineral to kutnohorite in geochemical modeling efforts.

Total iron concentrations ranged from 0.012 mg/L at UA compliance well G406 on 31 May 2023 to 101 mg/L at downgradient UA well G401 on 11 August 2023. Dissolved iron concentrations ranged from below reporting limits to 93.8 mg/L at downgradient UA well G401 on 11 August 2023. The total and dissolved iron concentrations detected at G401 were over an order of magnitude higher than the reported values elsewhere in the network. Where dissolved iron was detected, the dissolved concentration was at typically less than 50% of the total iron value, and frequently only about 10%, indicating that iron is largely associated with suspended particulates across the AP2 monitoring network. However, dissolved iron concentrations at G401 are more than 93% of the total iron, consistent with the Eh-pH diagram results indicating geochemical conditions favor the stability of dissolved iron at this location driven by consistently lower pH and ORP (Figure 7a).

Total manganese concentrations ranged from 0.0159 mg/L at background UA well G280 on 14 August to 28.8 mg/L at downgradient UA well G401 on 11 August 2023 (Table 7). Dissolved manganese concentrations ranged from 0.0014 mg/L at background UA well G280 on 8 June to 36 mg/L at downgradient UA well G401 on 11 August 2023. Total and dissolved manganese were also much higher at G401 compared to other locations in the monitoring network, consistent with the iron results. Dissolved manganese represents the majority of total manganese concentrations at all locations except for UA background wells G270, G280, and G281 and LCU well G1001. This is consistent with the predicted greater manganese-carbonate mineral stability at G280 (Figure 8).

4.3.5 Major Ion Distribution and Groundwater Signatures

A Piper diagram was constructed using data from AP2 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 the AP2 leachate is dominated by calcium, with the major anion composition sulfate-dominated. Groundwater composition for background wells G270, G280, and G281 has lower contributions of sulfate, greater contributions of carbonate alkalinity (consistent with the presence of carbonates in the UA solids), and major cation distributions of near equal contributions of both monovalent and divalent cations. Groundwater from side gradient UA compliance well G403 and downgradient LCU well G1001 (neither of which exhibited GWPS exceedances) cluster with these background wells. Groundwater from the compliance network wells spans the range between the background wells and AP2 leachate, indicating variable influences from the AP2 CCR unit on groundwater at these locations. G401 groundwater composition is most similar to AP2 porewater leachate, consistent with the relatively higher concentrations of sulfate detected at this location (Figure 4a). These results provide further evidence for the influence of AP2 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. Batch attenuation testing was conducted for sulfate and boron to evaluate the potential for sorption and to attempt to generate Site-specific distribution coefficients between the solid and aqueous phase.

5.1 Batch Attenuation Testing

In 2021, Geosyntec conducted a field investigation at AP2 which included completion of one soil boring at G270 ranging in depth from 12 to 16 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. One groundwater sample (G401) and one soil sample (G270) were used for batch attenuation testing at five soil:solution ratios (Table 8), each ran in duplicate. Statistically significant exceedances of for boron, sulfate, and TDS were identified at G401, as well as being below the bounds of the GWPS for pH, while G270 is representative of background conditions at AP2. For each treatment, ~0.1 liter of groundwater was brought into contact with varying amounts of soil (0.003 to 0.17 kg, depending on the ratio) and equilibrated over a seven-day period.

An initial sample of the stock solution for each experimental design was collected on Day 0, and a control sample (i.e., G401 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. Analysis of the dissolved phase is important to adequately measure the partitioning of mass between the solid and liquid fractions of the experiment. The 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 (Table 8) 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:

$$q_e = \frac{q_m K_L C_e}{1 + K_L C_e} \quad \text{Eq. 2}$$

where q_m is the inverse of the slope and K_L is the Langmuir distribution coefficient. The adsorption data were linearized according to:

$$\frac{C_e}{q_e} = \frac{1}{(K_L \times q_m)} + \frac{C_e}{q_m} \quad \text{Eq. 3}$$

A common non-linear Freundlich equation was also used:

$$q_e = K_F (C_e)^{1/n} \quad \text{Eq. 4}$$

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:

$$log(q_e) = \log(K_F) + (1/n)\log(C_e) \quad \text{Eq. 5}$$

The calculated linear, Langmuir, and Freundlich distribution coefficients (K_d, K_L, and K_F, respectively) and $1/n$ values are shown in Table 9.

5.2 Partition Coefficient Results

The partition coefficient values for G401 groundwater combined with G270 geologic material are presented in Table 9. The linear and Langmuir isotherms for sulfate and boron are provided in Figures 10a and 10b, respectively.

The G401 partition coefficient for boron ranged from -464,440 L/kg for the Langmuir isotherm to -11.08 L/kg for the linear isotherm. A Freundlich isotherm was not fit to the data due to the lack of suitability for log transformation. Neither isotherm showed a high goodness-of-fit (i.e., R^2), with the highest correlation constant 0.44. An accurate boron coefficient could therefore not be calculated from the data.

The G401 partition coefficient for sulfate ranged from -564 L/kg for the Langmuir isotherm to -11.08 L/kg for the linear isotherm. A Freundlich isotherm was not fit to the data due to the lack of suitability for log transformation. Both of the isotherms showed reasonable goodness-of-fit with correlations between 0.56 and 0.60, but both isotherms predicted a negative relationship. An accurate sulfate partition coefficient could therefore not be calculated from 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 or leachate at concentrations up to 14 mg/L. The likely primary source of boron to the UA is the AP2 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 is AP2 CCR porewater. Sulfate was identified in the CCR leachate or porewater at concentrations up to 2,300 mg/L. Elevated concentrations of sulfate are a major contributor to the exceedances of TDS identified at G401, G402, G404 and G405.

Statistical exceedances of sulfate and TDS indicate that AP2 porewater is influencing groundwater at G401. The reported pH values at G401 (5.6 to 6.4 SU) are lower than those reported in AP2 leachate or porewater (6.4 to 7.2 SU), suggesting that geochemical reactions driven by interaction of porewater with the underlying UCU materials and/or mixing of porewater with groundwater may cause a low pH. These reactions may include iron oxidation and precipitation or carbonate mineral precipitation. Geochemical modeling to support evaluation of corrective actions may clarify the drivers of low pH at AP2. The low pH values at G401 are likely to be buffered further downgradient by the abundance of carbonate minerals identified in site solids via XRD.

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 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. Given the low abundance of total manganese in the solids (Table 2) and the predicted instability of solid manganese phases (Figure 8), 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 (Table 4). These lines of evidence are not supported by batch attenuation testing for boron, which indicated boron chemical attenuation is limited at locations downgradient of AP2.

Sulfate exceedances are currently limited to the UA. 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. XRD analyses (Table 4) support the presence of iron oxides crystalline phases across the Site in the UA, 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. The low pH values at G401 are likely to be buffered by the abundance of carbonate minerals identified in site solids via XRD.

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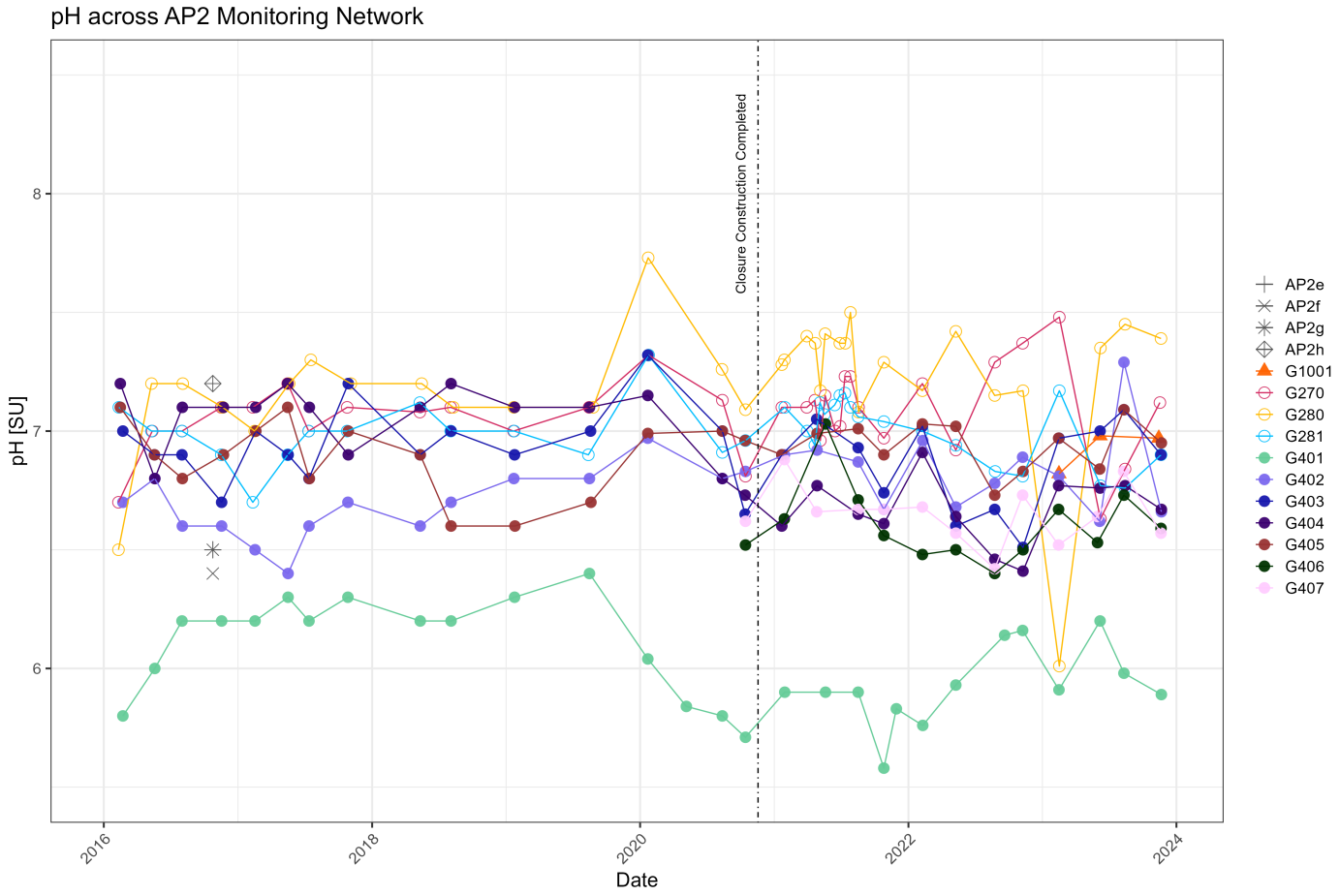
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FIGURES



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

pH Time Series

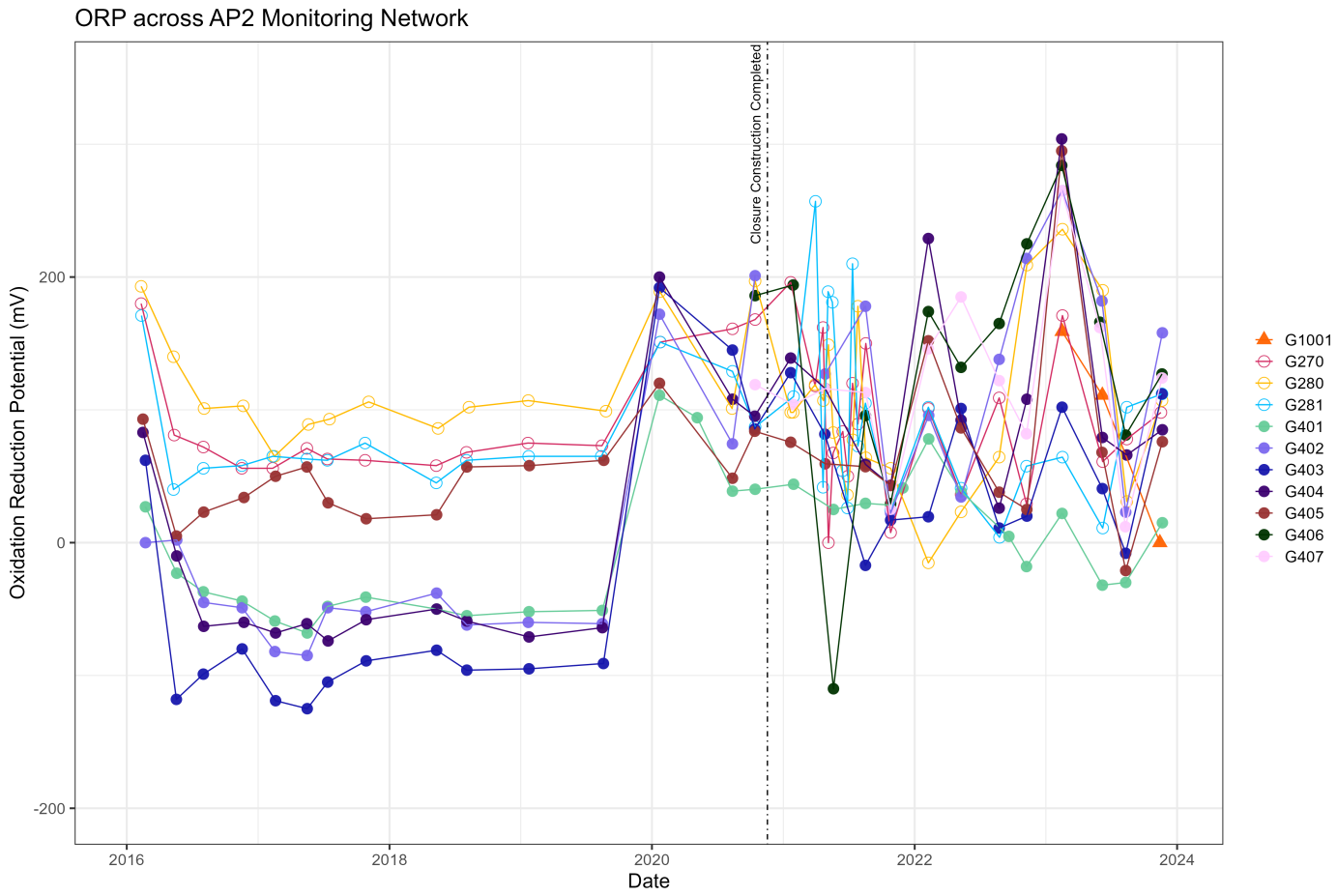
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Figure 1

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

ORP Time Series

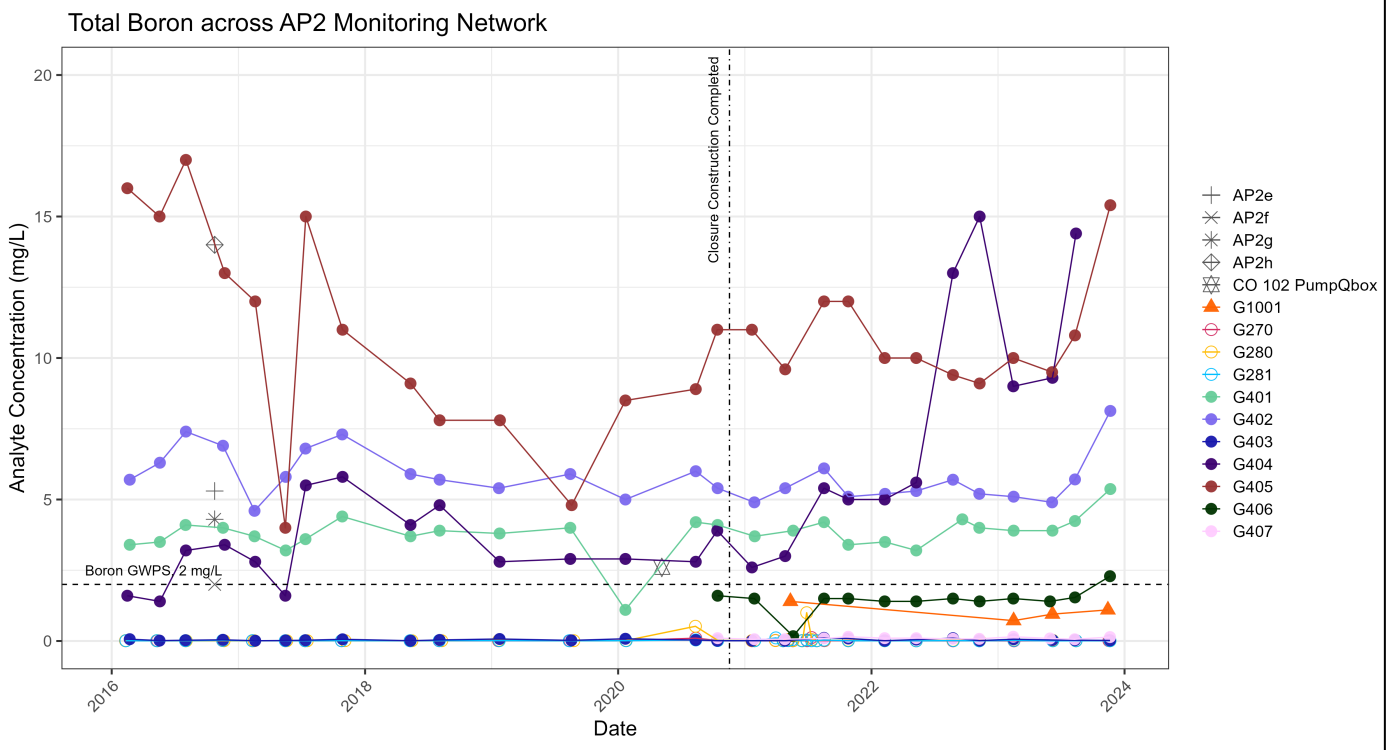
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Figure **2**

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

Total Boron Concentration Time Series

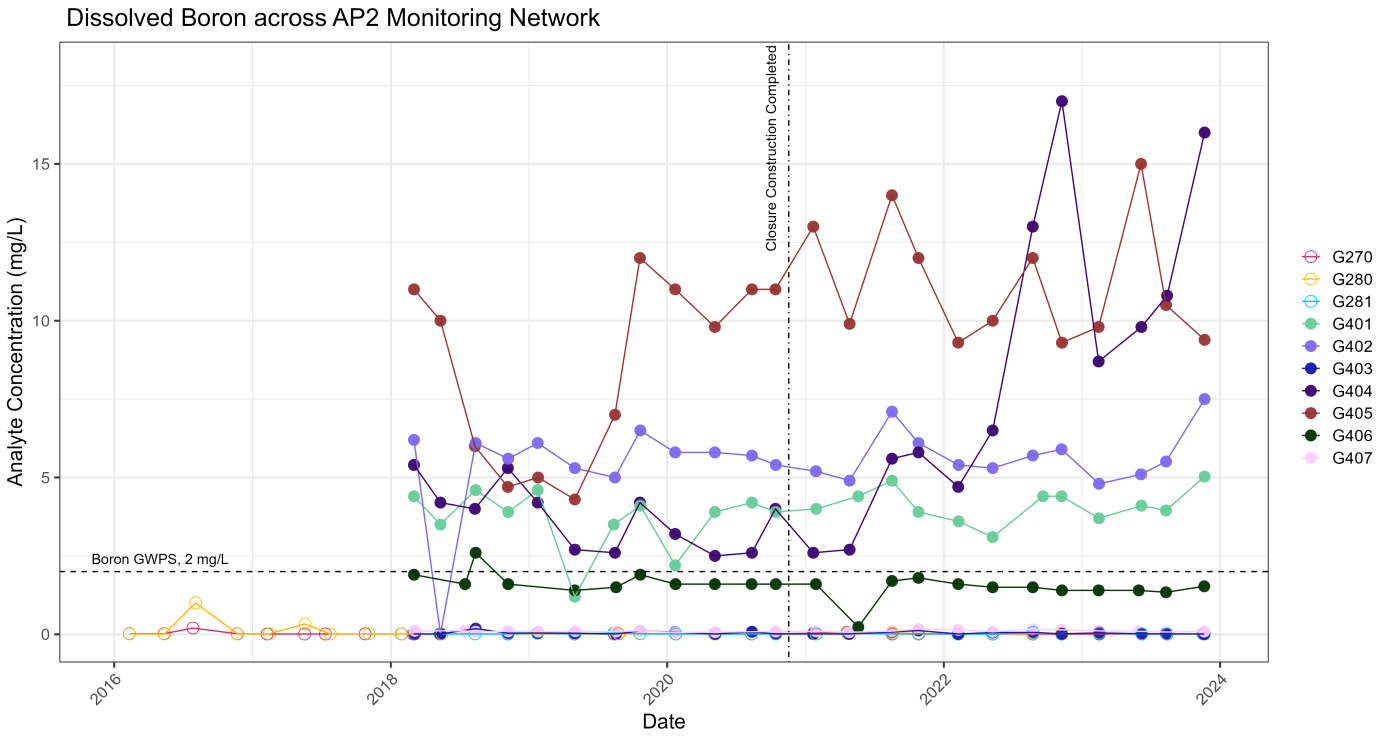
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Figure **3a**

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

Dissolved Boron Concentration Time Series

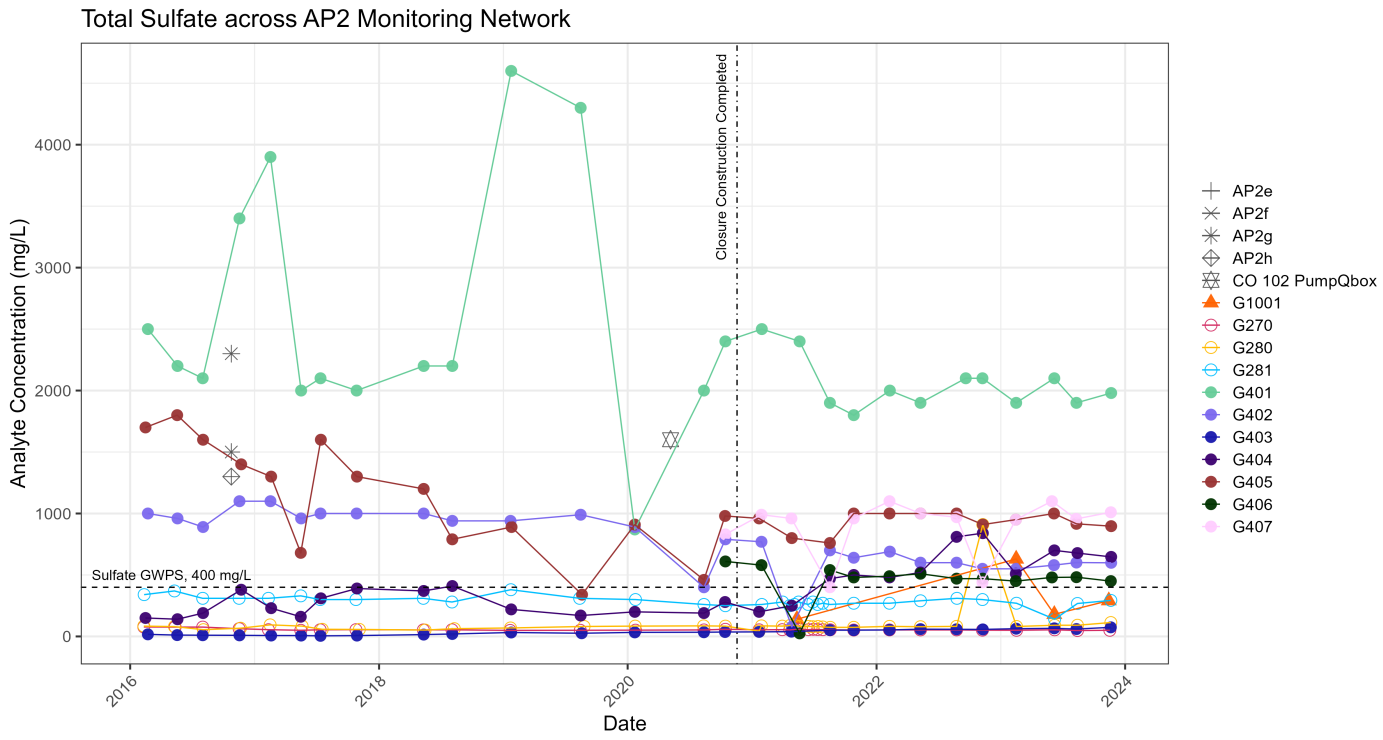
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Figure **3b**

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

Total Sulfate Concentration Time Series

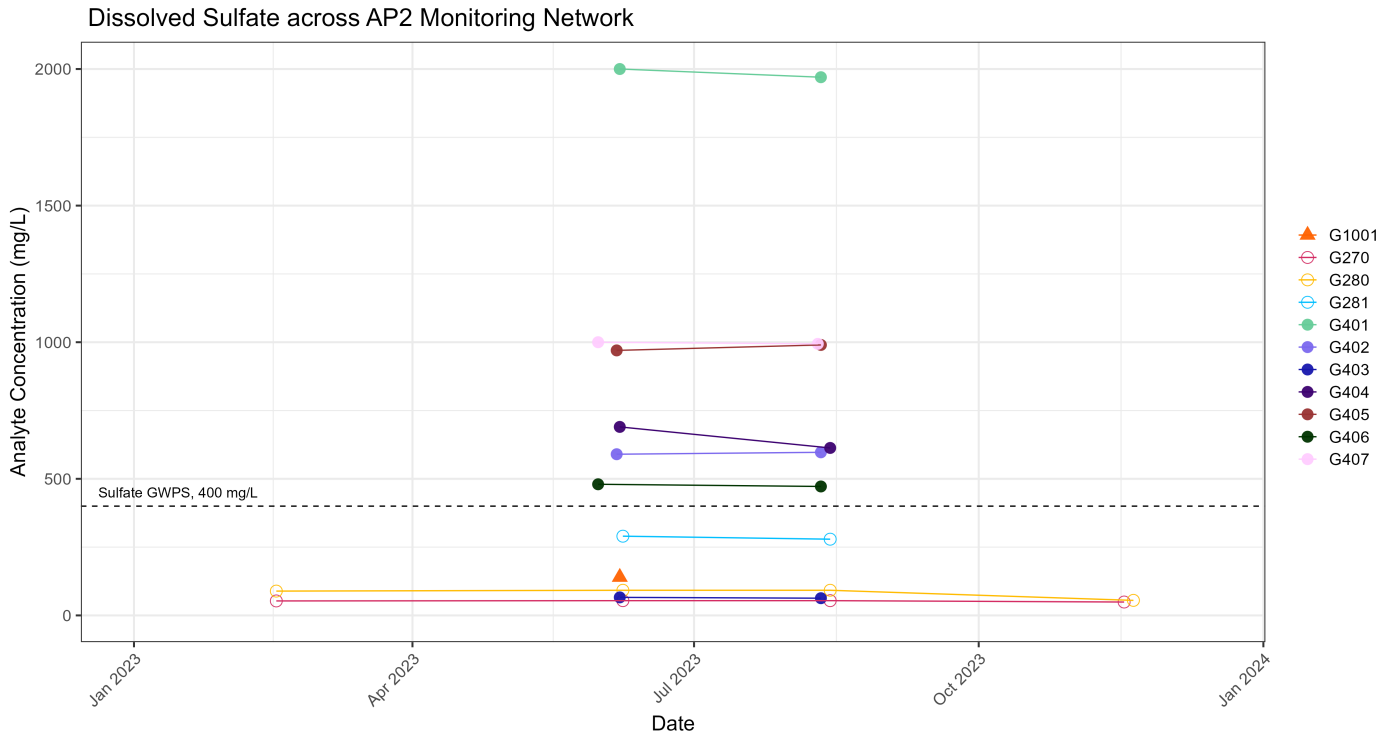
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Figure **4a**

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

Dissolved Sulfate Concentration Time Series

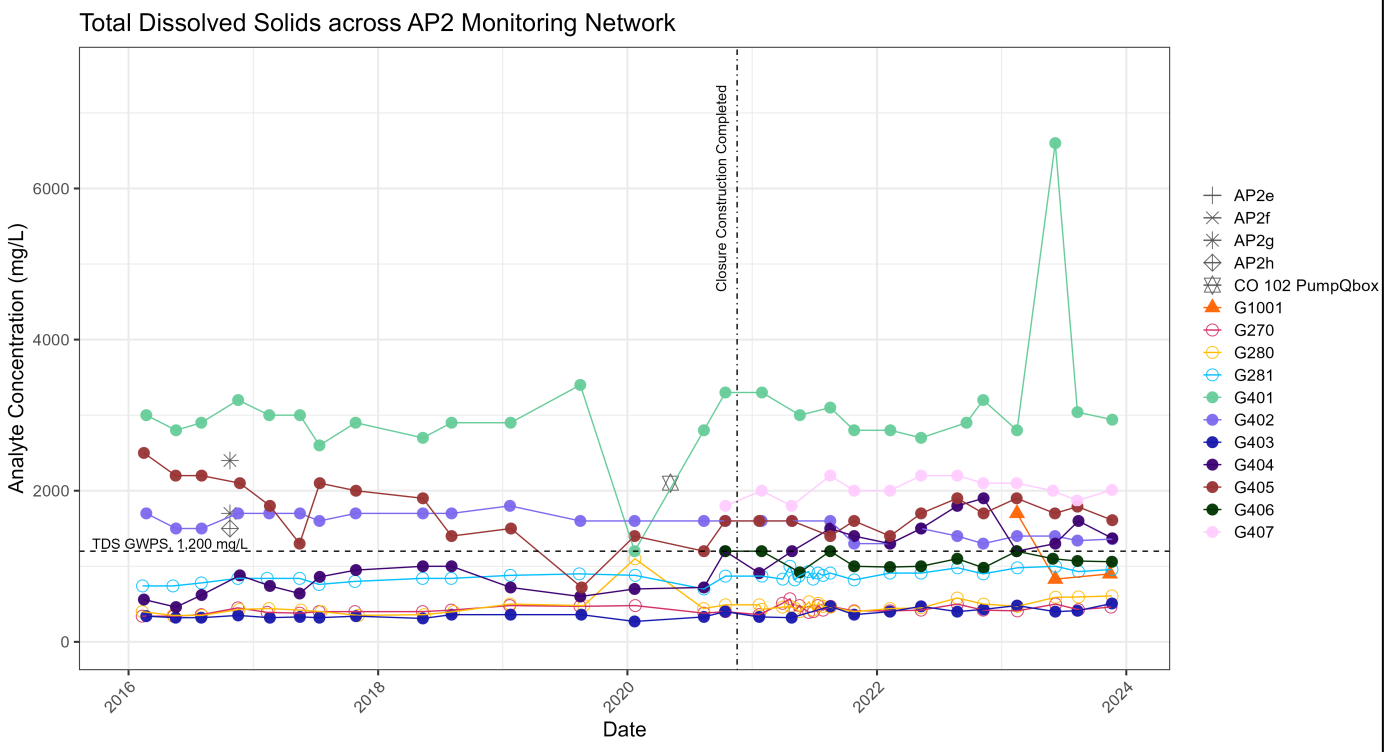
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Figure **4b**

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

Total Dissolved Solids Concentration Time Series

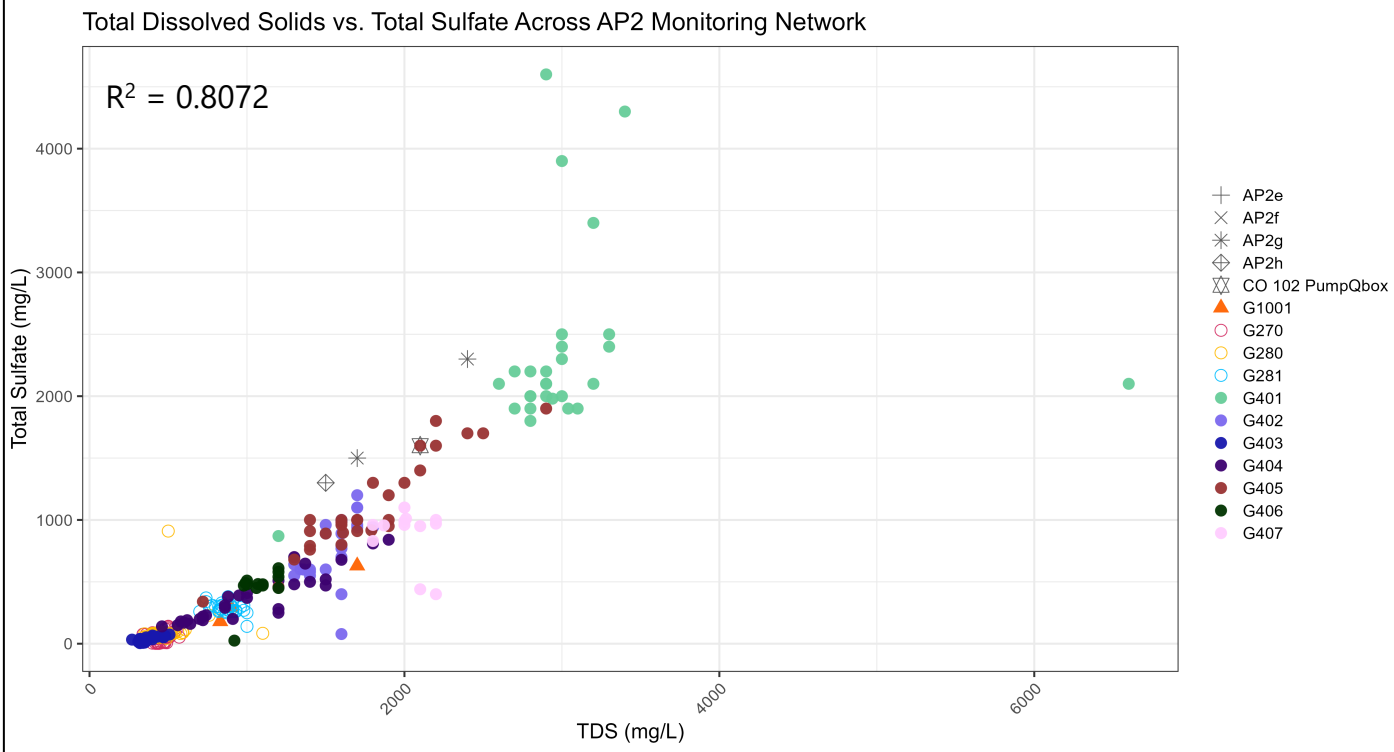
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Figure **5**

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Notes:
mg/L: milligrams per liter
GWPS: Groundwater Protection Standard
Background wells shown with open symbols.
Regression was run using only groundwater results.

TDS Concentration vs Sulfate Concentration

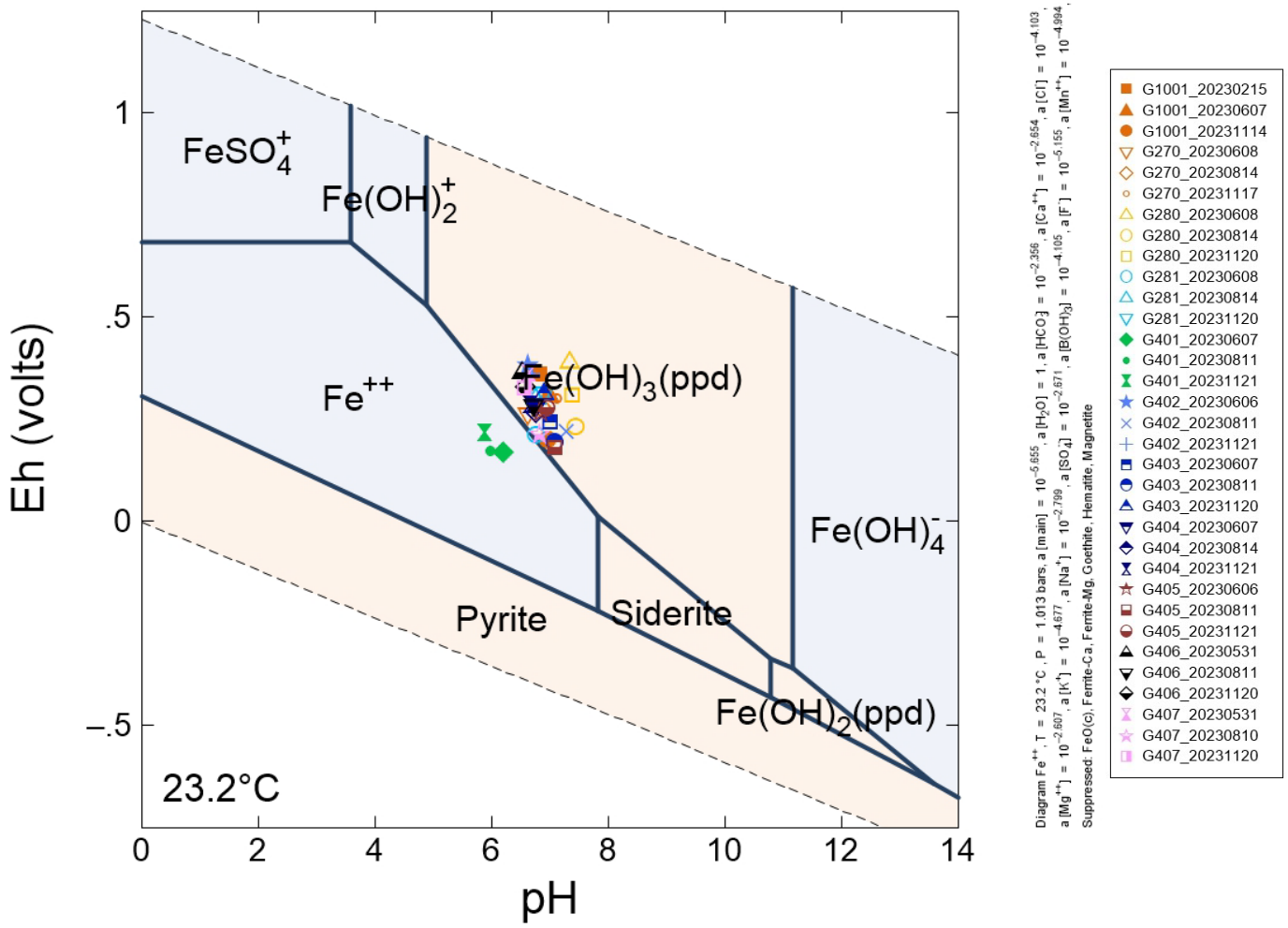
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Figure **6**

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Notes:

1. Diagram was generated using conditions detected at well G402 on 6/6/2023.
2. Well G402 is screened in the uppermost aquifer.
3. The most recent available pH and ORP data for each location are displayed.
4. Ferrite-Ca, ferrite-Mg, goethite, crystalline iron oxide, hematite, and magnetite were suppressed during model generation.

Iron Pourbaix Diagram; Crystalline Phases Suppressed

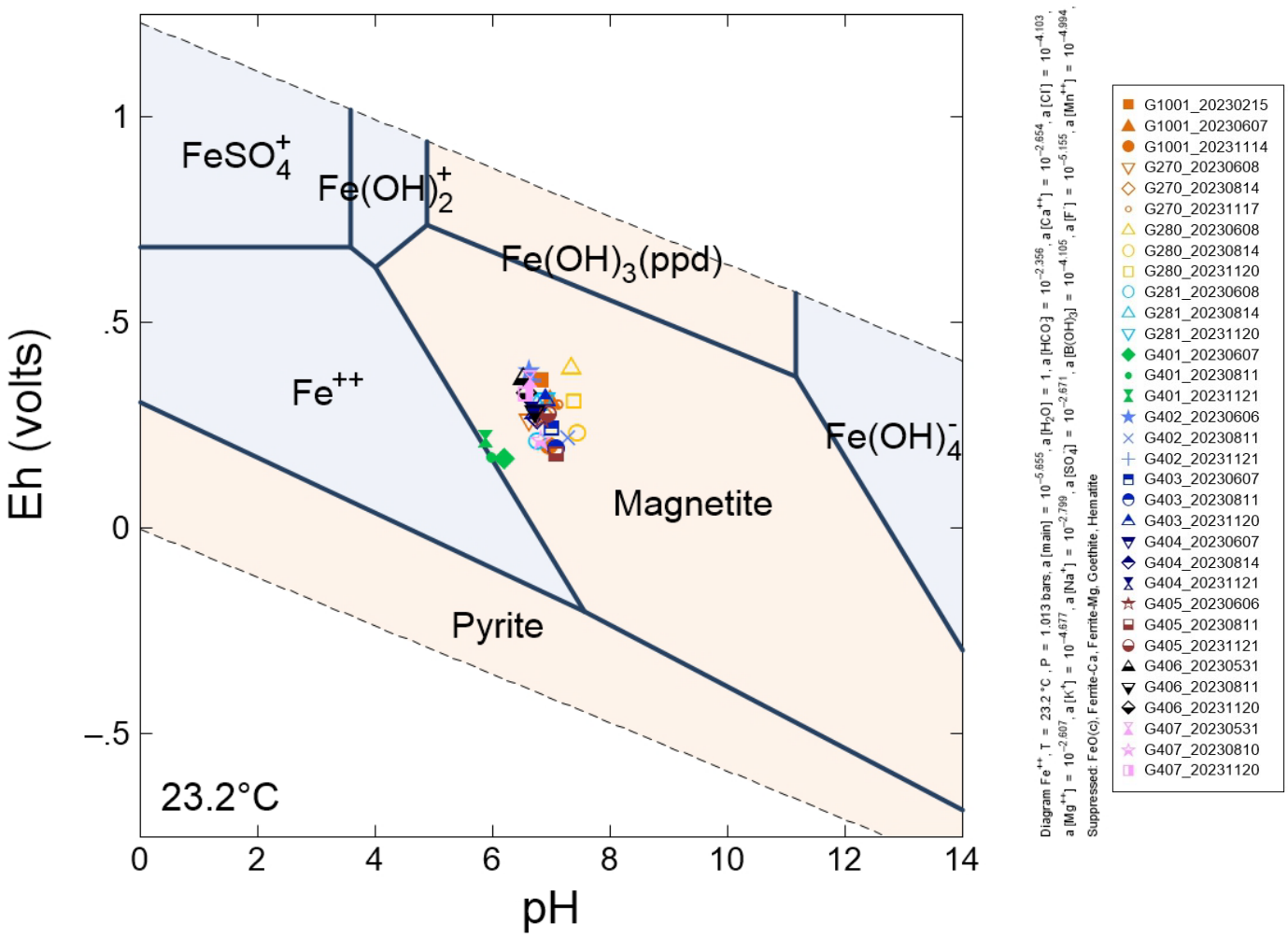
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Figure **7a**

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Notes:

1. Diagram was generated using conditions detected at well G402 on 6/6/2023.
2. Well G402 is screened in the uppermost aquifer.
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

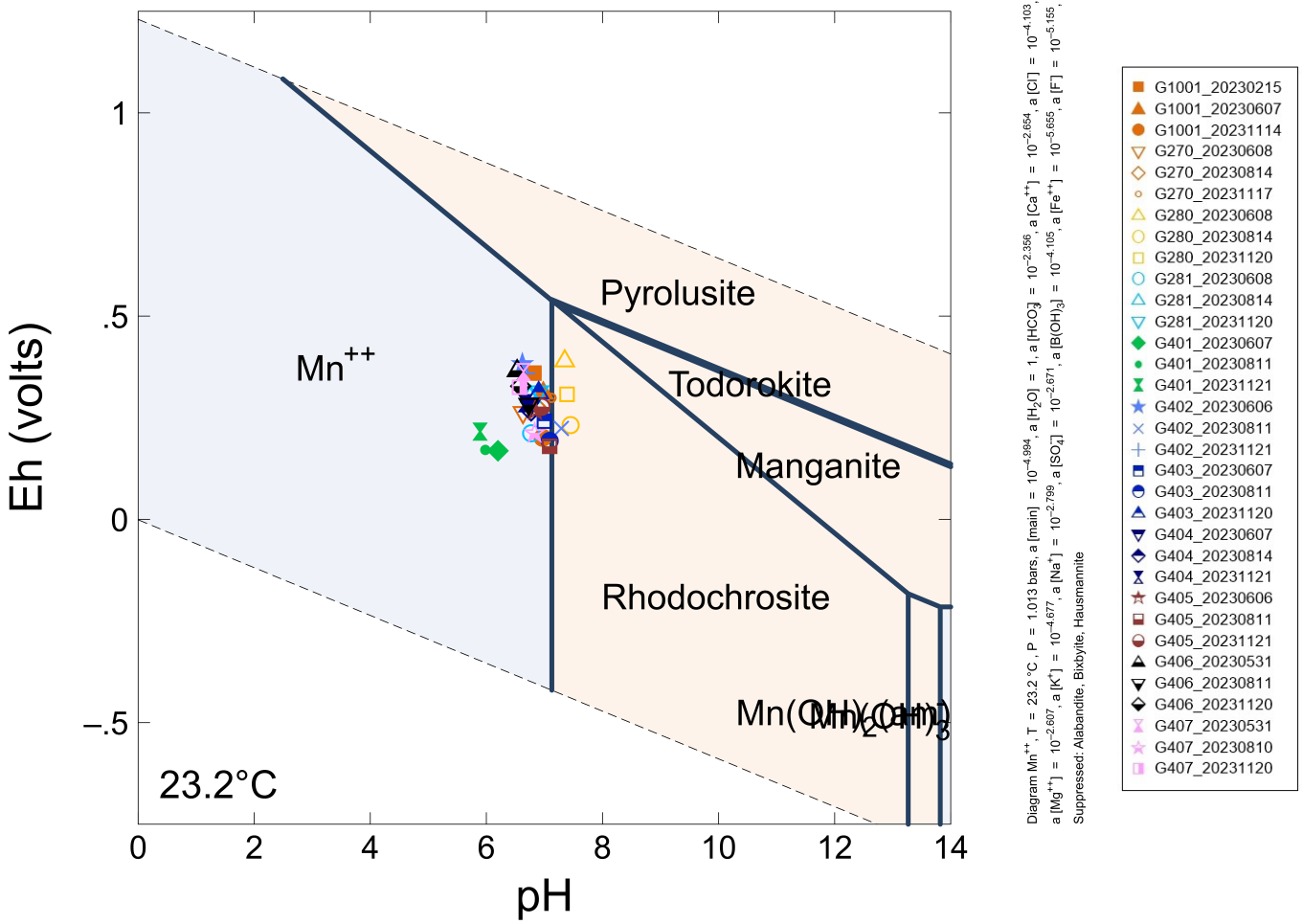
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Figure **7b**

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Notes:

1. Diagram was generated using conditions detected at well G402 on 6/6/2023.
2. Well G402 is screened in the uppermost aquifer.
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

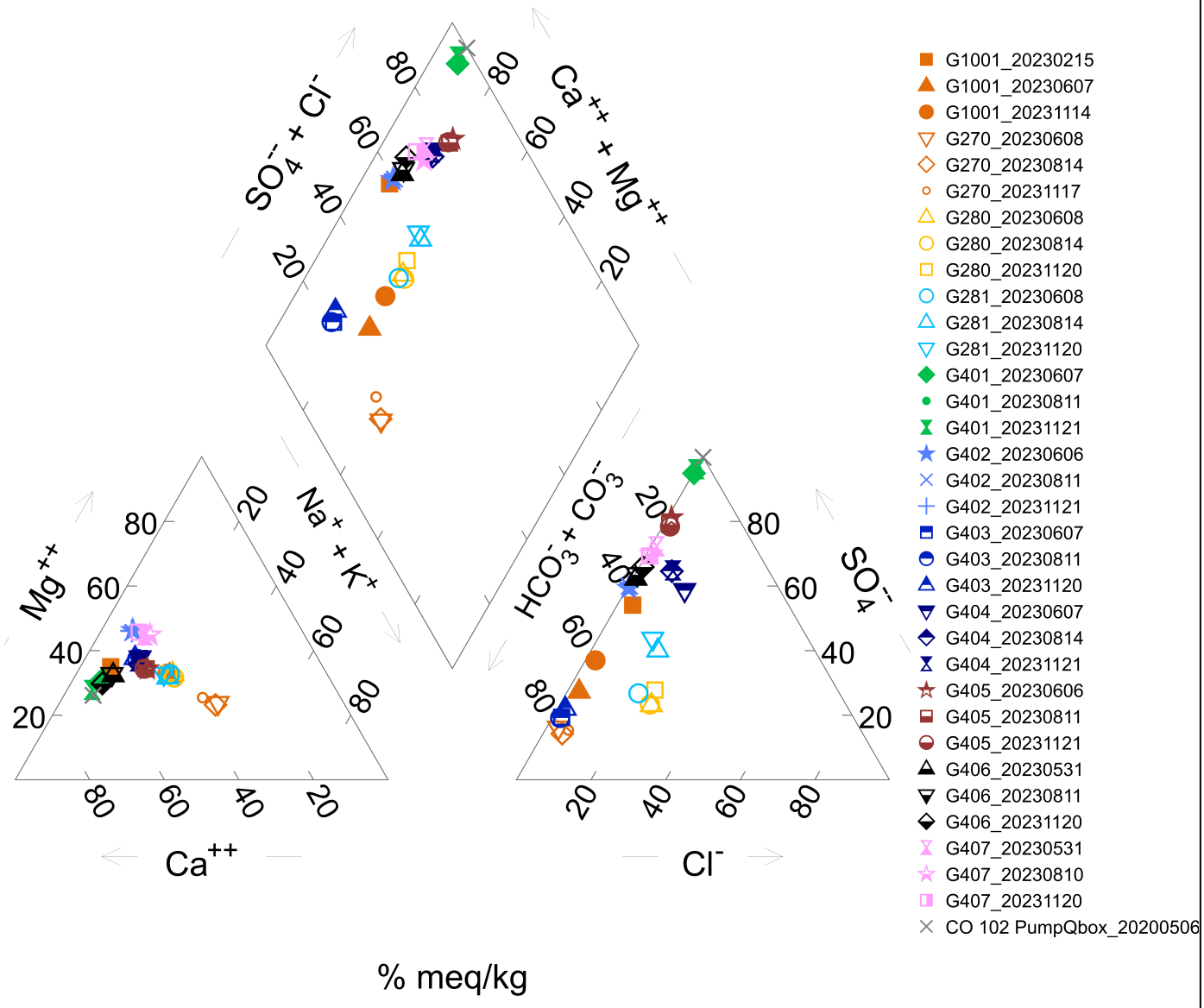
Coffeen Power Plant – Ash Pond No. 2

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Figure **8**

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% meq/kg

Notes:

1. The three most recent available data points for each location are displayed.
2. Background wells shown with open symbols.

% meq/kg: percent milliequivalents per kilogram

Piper Diagram

Coffeen Power Plant – Ash Pond No. 2

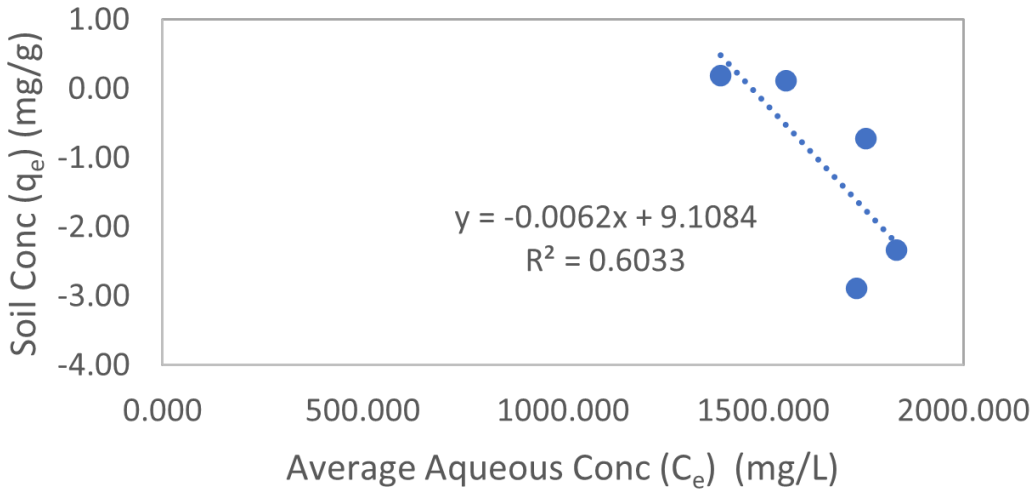
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Figure 9

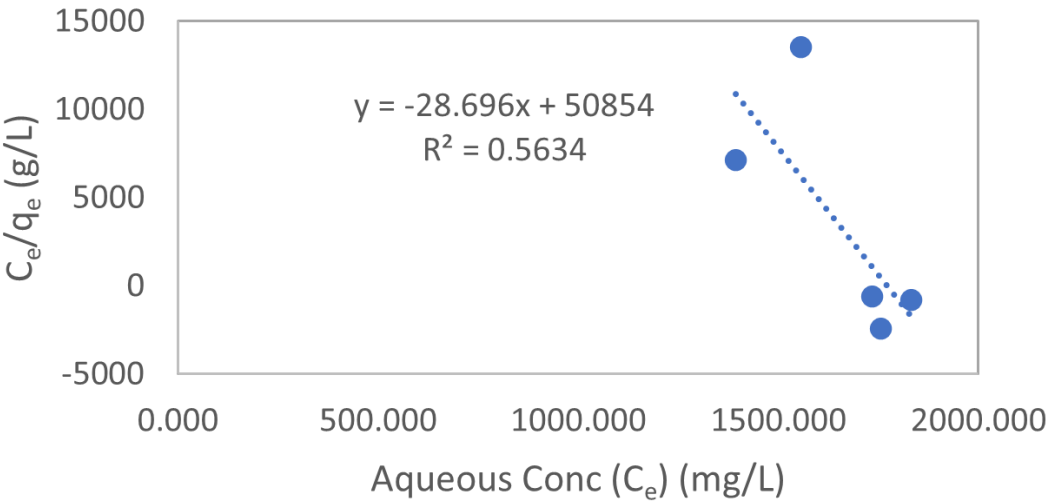
Columbus, Ohio | March 2024

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Linear



Langmuir



Notes:

1. 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

G401 Sulfate Partitioning Coefficients

Coffeen Power Plant – Ash Pond No. 2

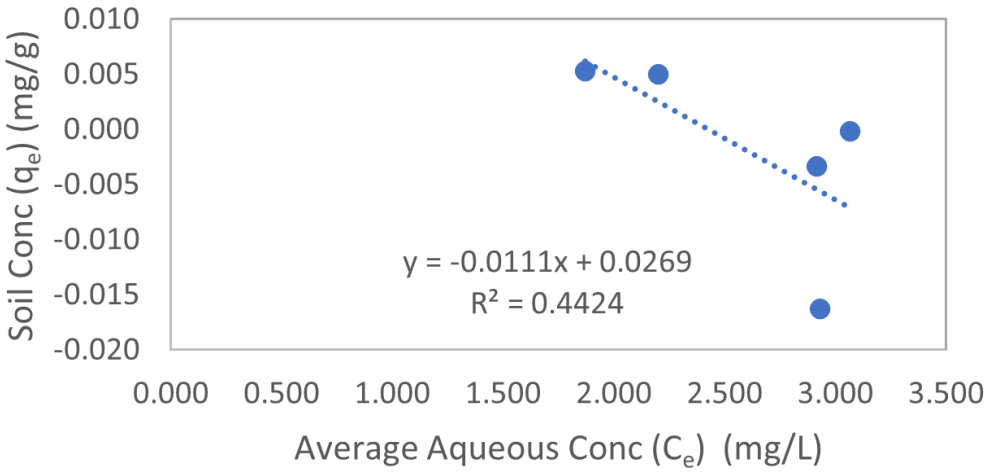
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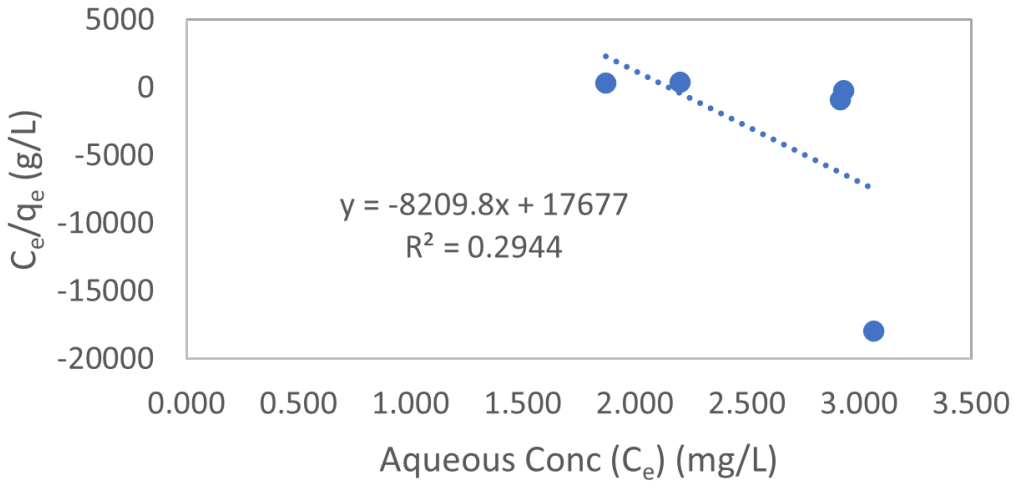
Figure **10a**

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Linear



Langmuir



Notes:

1. 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

G401 Boron Partitioning Coefficients

Coffeen Power Plant – Ash Pond No. 2

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Figure **10b**

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TABLES

Table 1. CEC and LOI of Site Solids
Geochemical Conceptual Site Model
Coffeen Power Plant - Ash Pond No. 2

Well ID	G270	G306	G311	G313	G316	G314	G314	G314	G401	G407	G410	G410	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)
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
Sampled Aquifer Unit	UA	UA	UA	UA	UA	LCU	LCU	DA	UA	UA	UA	UA	UCU
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
CEC (meq/100 g solid)	-	-	-	-	-	17.84	18.95	14.39	-	11.41	15.39	31.02	18.82
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
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
Sulfide (%)	<0.04	<0.04	<0.04	<0.04	<0.04	-	-	-	<0.04	-	-	-	-

Well ID	G307D	G307D	G307D	G307D	G311D	G311D	G311D	G311D	G314D	G314D	G314D	G1001
Depth (ft bgs)	(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)	(6-11)
Well Characterization	AP1 Compliance	AP1 Compliance	AP1 Compliance	AP1 Compliance	AP1 Adjacent	AP1 Adjacent	AP1 Adjacent	AP1 Adjacent	AP1 Compliance	AP1 Compliance	AP1 Compliance	AP2 Compliance
Sampled Aquifer Unit	UA	UA	LCU	LCU	UCU	UA	UA	LCU	UCU/UA	UA/LCU	LCU	LCU
Field Boring Log Description	Sand	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
CEC (meq/100 g solid)	3.32	3.91	8.31	17.24	9.36	9.23	9.61	13.05	9.44	9.72	12.45	-
LOI (%)	-	-	-	-	-	-	-	-	-	-	-	-
TOC (%)	1.12	1.67	1.24	0.11	<0.0318	1.15	1.48	0.06	<0.0498	1.74	0.85	0.85
AVS (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-
Total Carbon (%)	-	-	-	-	-	-	-	-	-	-	-	-
Sulfur (%)	<0.0066	0.14	0.09	0.01	0.01	0.08	0.08	0.08	0.01	0.11	<0.008	0.03
Sulfide (%)	-	-	-	-	-	-	-	-	-	-	-	0.05

Notes
Sample depth is shown in feet below ground surface (ft bgs)
Dashes indicate sample was not analyzed for analyte
meq/100 g solid: milliequivalents per 100 grams solids
M - Reporting limit elevated due to matrix interference
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. 2

Well ID	G270	G306	G311	G313	G316	G307D	G307D	G307D	G307D	G307D	G311D	G311D	G311D	G311D	G314D	G314D	G314D	G401	G1001
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)**
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**
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**
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)
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
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
Barium	210	98	58	310	320	150	10	20	93	110	57	44	69	90	63	27	140	190	120
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
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
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
Calcium	5000	35000	52000	69000	10000	-	-	-	-	-	-	-	-	-	-	-	-	1900	42000
Chloride	-	-	-	-	-	<10	19	<10	<10	<10	<1	<1	<1	<1	<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
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
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	-	-
Iron	22000	-	-	-	-	20000	4900	11000	10000	19000	10000	8600	11000	12000	4900	11000	21000	14000	16000
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
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
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
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	-	-
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
Nickel	20	15	11	17	13	-	-	-	-	-	-	-	-	-	-	-	-	10	15
Nitrogen (total)	-	-	-	-	-	160	<63	260	360	310	510	360	370	530	140	360	260	-	-
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
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	-	-
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
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. 2

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. 2

Well ID			G270	G306	G311	G313	G316	G314	G314	G314	G401
Depth (ft bgs)			(12-16)	(14-16)	(14-15)	(8-9)	(13-14, 15-16)	(13-18)	(18-23)	(38-43)	(16-20)
Well Characterization			AP2 Background	AP1 Background	AP1 Adjacent	AP1 Compliance	AP1 Compliance	AP1 Compliance	AP1 Compliance	AP1 Compliance	AP2 Compliance
Sampled Aquifer Unit			UA	UA	UA	UA	UA	LCU	LCU	DA	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
Mineral/Compound	**Formula**	**Mineral Type**	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)	(wt %)
Quartz	SiO_2	Silicate	60.6	70.9	58.9	51.3	67.6	53.9	67.5	73.5	68.9
Dolomite	$CaMg(CO_3)_2$	Carbonate	0.6	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	0.5	2.1	5.0	7.7	0.8	7.2	1.2	0.5	0.1
Kutnohorite	$CaMn(CO_3)_2$	Carbonate	-	-	-	-	-	0.5	0.3	0.2	-
Albite	$NaAlSi_3O_8$	Feldspar	9.1	9.6	8.6	7.9	9.6	6.1	8.3	8.2	8.6
Microcline	$KAlSi_3O_8$	Feldspar	9.8	8.5	7.4	7.6	9.8	5.1	9.7	7.8	7.8
Actinolite	$Ca_2(Mg,Fe)_5Si_8O_{22}(OH)_2$	Amphibole	3.3	-	-	-	-	0.3	0.7	0.8	1.4
Diopside	$CaMgSi_2O_6$	Pyroxene	1.3	3.1	3.8	4.6	1.3	1.0	0.7	0.7	1.4
Magnetite	Fe_3O_4	Oxide	-	-	-	-	-	-	0.2	0.0	-
Pyrite	FeS_2	Sulfide	0.2	-	-	-	-	-	-	-	-
Biotite	$K(Mg,Fe)_3(AlSi_3O_{10})(OH)_2$	Mica	2.4	-	-	-	-	-	-	-	2.1
Muscovite	$KAl_2(AlSi_3O_{10})(OH)_2$	Mica	9.0	-	-	-	7.3	1.0	4.8	3.3	6.8
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	2.0	-	-	-	-	-	-		2.7
Chlorite	$(Fe,(Mg,Mn)_5,Al)(Si_3Al)O_{10}(OH)_8$	Sheet silicate	1.4	1.8	1.7	1.1	1.7	1.6	1.7	1.5	-
Clay Minerals Total			3.4	1.8	1.7	1.1	1.7	7.4	5.8	5.0	2.7

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 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. AP2 Porewater Chemistry
Geochemical Conceptual Site Model
Coffeen Power Plant - Ash Pond No. 2

Location Name		AP2e	AP2f	AP2g	AP2h	CO 102 PumpQbox
Sample Date		2016/10/24	2016/10/24	2016/10/24	2016/10/24	2020/05/06
Total Boron	(mg/L)	5.3	2	4.3	14	2.6
Dissolved Iron	(mg/L)	-	-	-	-	530
Total Iron	(mg/L)	-	-	-	-	530
Dissolved Manganese	(mg/L)	-	-	-	-	3.2
Total Manganese	(mg/L)	-	-	-	-	3.2
pH	(SU)	6.5	6.4	6.5	7.2	4.82Q
Total Sulfate	(mg/L)	1500	1500	2300	1300	1600
Total Dissolved Solids	(mg/L)	1700	1700	2400	1500	2100
Total Lithium	(mg/L)	0.19	0.13	0.18	0.12	0.14
Dissolved Cobalt	(mg/L)	-	-	-	-	0.0041

Notes
Q - Analysis performed after the acceptable holding time window
SU: standard units
mg/L: milligrams per liter
- : Analyte not included in analyses for sampling date

Table 6. AP2 Eh-pH Diagram Inputs
Geochemical Conceptual Site Model
Coffeen Power Plant - Ash Pond No. 2

Well ID		G402
Sample Date		6/6/2023
Aquifer Unit		UA
Input Parameter	**Unit**	
Temperature	°C	23.2
pH	SU	6.62
Calcium	mg/L	210
Chloride	mg/L	3.4
Bicarbonate Alkalinity	mg/L	500
Magnesium	mg/L	130
Sodium	mg/L	44
Potassium	mg/L	1
Sulfate	mg/L	580
Total Manganese	mg/L	1.3
Total Iron	mg/L	3.5

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

Table 7. Total and Dissolved Aqueous Iron and Manganese Results
Geochemical Conceptual Site Model
Coffeen Power Plant - Ash Pond No. 2

Well ID	Well Characterization	Sampled Aquifer Unit	Date	Total Iron	Dissolved Iron	Total Manganese	Dissolved Manganese
				(mg/L)	(mg/L)	(mg/L)	(mg/L)
G1001	AP2 Compliance	LCU	2023/06/07	0.12	<0.01	0.19	0.14
G270	AP2 Background	UA	2023/06/08	0.68	0.044	0.85	0.079
			2023/08/14	0.147	0.019	0.244	0.157
			2023/11/17	0.119	0.0115	0.197	0.0675
G280	AP2 Background	UA	2023/06/08	0.97	0.0061	0.043	0.0014
			2023/08/14	0.264	<0.0175	0.0159	0.0032
			2023/11/20	0.31	0.0115	0.0452	0.0123
G281	AP2 Background	UA	2023/06/08	0.88	0.016	0.7	0.31
			2023/08/14	0.194	<0.0175	0.352	0.291
G401	AP2 Compliance	UA	2023/06/07	60	84	22	27
			2023/08/11	101	93.8	28.8	36
G402	AP2 Compliance	UA	2023/06/06	3.5	0.0033	1.3	0.86
			2023/08/11	3.58	<0.0115	1.2	0.867
G403	AP2 Compliance	UA	2023/06/07	0.23	0.011	0.4	0.36
			2023/08/11	0.284	0.0763	0.486	0.376
G404	AP2 Compliance	UA	2023/06/07	0.11	0.058	1.3	1.2
			2023/08/14	3.42	0.0718	5.42	2.85
G405	AP2 Compliance	UA	2023/06/06	0.31	0.13	1.1	1.1
			2023/08/11	0.239	0.165	1.15	1.07
G406	AP2 Compliance	UA	2023/05/31	0.012	<0.00072	4.5	4.4
			2023/08/11	0.016	<0.0115	4.76	4.45
G407	AP2 Compliance	UA	2023/05/31	0.073	0.01	0.42	0.38
			2023/08/10	0.0501	0.015	0.285	0.445

Notes
mg/L: milligrams per liter
Non-detect values are shown as less than the reporting limit.
AP2: Ash Pond 2
LCU: Lower Confining Unit
UA: Uppermost Aquifer

Table 8. Batch Attenuation Testing Results, G401
Geochemical Conceptual Site Model
Coffeen Power Plant - Ash Pond No. 2

Groundwater Sample ID	Geologic Material Sample ID	Treatment	Actual Ratio	Date	Day	Replicate	Dissolved Boron	Dissolved Sulfate	pH	ORP
							mg/L	mg/L	SU	mV
G401	--	Groundwater Only Control		19-Aug-21	0	G401-1a	2.6	1,677	3.15	518
						G401-2b	1.9	1,597	3.15	520
						Average Concentration (mg/L)	**2.2**	**1,637**	**3.15**	**519**
				26-Aug-21	7	G401-1	3.2	1,713	3.05	312
						G401-2	3.2	1,618	2.95	369
						Average Concentration (mg/L)	**3.2**	**1,666**	**3.00**	**341**
G401	G270 (12-16 bgs)	2:1 Soil:Water Ratio	2:1.6	19-Aug-21	0					
				26-Aug-21	7	G270:G401 2:1-1	1.8	1,356	6.35	156
						G270:G401 2:1-2	1.9	1,431	6.48	160
						Average Concentration (mg/L)	**1.9**	**1,394**	**6.42**	**158**
		1:1 Soil:Water Ratio	1:1.4	19-Aug-21	0					
				26-Aug-21	7	G270:G401 1:1-1	2.2	1,456	6.42	170
						G270:G401 1:1-2	2.2	1,658	6.46	174
						Average Concentration (mg/L)	**2.2**	**1,557**	**6.44**	**172**
		1:5 Soil:Water Ratio	1:6.1	19-Aug-21	0					
				26-Aug-21	7	G270:G401 1:5-1	3.2	1,708	6.33	347
						G270:G401 1:5-2	3.0	1,805	6.20	327
						Average Concentration (mg/L)	**3.1**	**1,756**	**6.27**	**337**
		1:10 Soil:Water Ratio	1:12.0	19-Aug-21	0					
				26-Aug-21	7	G270:G401 1:10-1	2.7	1,881	6.10	312
						G270:G401 1:10-2	3.1	1,785	6.05	299
						Average Concentration (mg/L)	**2.9**	**1,833**	**6.08**	**306**
		1:20 Soil: Water Ratio	1:29.9	19-Aug-21	0					
				26-Aug-21	7	G270:G401 1:20-1	2.9	1,784	6.05	285
						G270:G401 1:20-2	3.0	1,683	5.86	275
						Average Concentration (mg/L)	**2.9**	**1,734**	**5.96**	**280**

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

Table 9. Partition Coefficient Results, G401
Geochemical Conceptual Site Model
Coffeen Power Plant - Ash Pond No. 2

Materials	Analyte	Isotherm	Variable	Value
G401/G270	Boron	Linear	R^2	0.442
			K_D (L/kg)	-11.08
		Langmuir	R^2	0.294
			q_m (mg/g)	0.000
			K_L (L/kg)	-4.64E+05
		Freundlich	R^2	--
			1/n	--
			K_F (L/kg)	--
	Sulfate	Linear	R^2	0.603
			K_D (L/kg)	-6.18
		Langmuir	R^2	0.563
			q_m (mg/g)	-0.035
			K_L (L/kg)	-5.64E+02
		Freundlich	R^2	--
			1/n	--
			K_F (L/kg)	--

Notes

-- - Freundlich isotherm not calculated because the data were not conducive to log transformation

K_D - linear partition coefficient

K_L - Langmuir partition coefficient

K_F - Freundlich partition coefficient

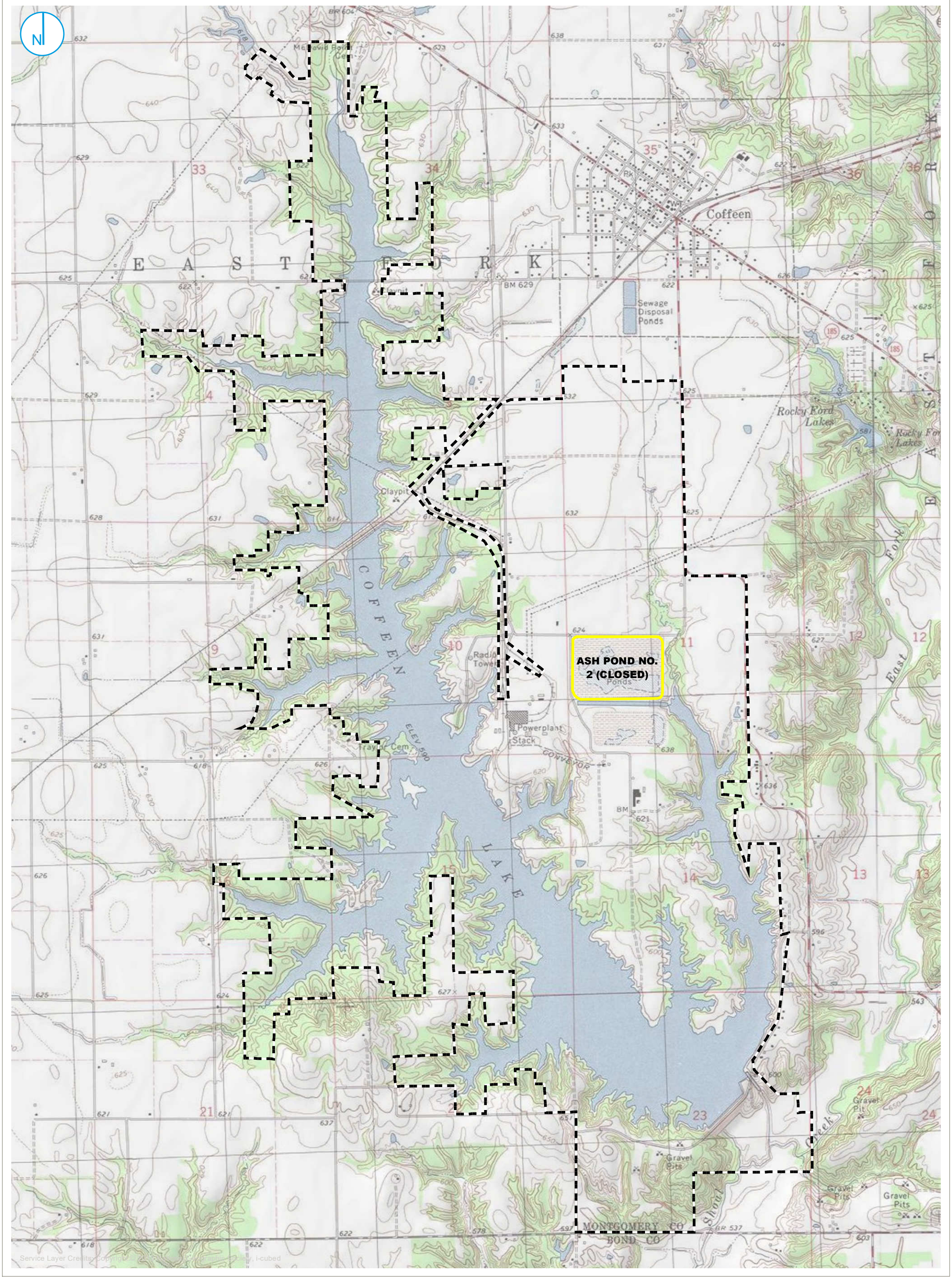
q_m - inverse of the slope of the linearized Langmuir isotherm

n - non-linearity constant of the Freundlich isotherm

Attachment A
Site Layout Figure

PROJECT: 169000XXXX | DATED: 5/16/2024 | DESIGNER: GALARNMC

Y:\Mapping\Projects\22\2285\MXD\Nature_and_Extent\COF\Nature_and_Extent_Report\102\Figure 2-1_Site Location Map AP2.mxd



REGULATED UNIT (SUBJECT UNIT)

PROPERTY BOUNDARY

0 1,000 2,000 Feet

SITE LOCATION MAP

NATURE AND EXTENT REPORT
ASH POND NO. 2
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

FIGURE 2-1

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

Attachment B
Proposed Part 845 Groundwater Monitoring Network

PROJECT: 169000XXXX | DATED: 5/21/2024 | DESIGNER: GALARNMC

Y:\Mapping\Projects\22\2285\MXD\Nature_and_Extent\COF\Nature_and_Extent_Report\102\Figure 2-2. Monitoring Well Location Map.mxd



COMPLIANCE MONITORING WELL
BACKGROUND MONITORING WELL
STAFF GAGE, RIVER
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. 2
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

FIGURE 2-2

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

RAMBOLL

Attachment C
Monitoring Well Construction Information

TABLE 2-1. MONITORING WELL LOCATIONS AND CONSTRUCTION DETAILS
GROUNDWATER MONITORING PLAN
COFFEEN POWER PLANT
ASH POND NO. 2
COFFEEN, ILLINOIS

Well Number	Type	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)
G1001	C	UA	04/05/2021	597.61	--	Top of PVC	594.82	6.00	11.00	588.82	583.82	11.00	562.82	5	4	39.063324	-89.391236
G270	B	UA	02/26/2008	--	625.86	Top of Disk	623.73	13.13	17.92	610.60	605.81	18.27	605.50	4.8	2	39.066564	-89.397403
G280	B	UA	02/26/2008	625.35	625.35	Top of Riser	623.11	12.79	17.63	610.32	605.48	17.98	605.10	4.8	2	39.067216	-89.394992
G281	B	UA	09/08/2015	--	626.36	Top of Disk	623.82	15.51	20.16	608.31	603.66	20.30	603.50	4.7	2	39.065405	-89.399322
G401	C	UA	09/14/2015	--	625.57	Top of Disk	623.03	14.36	18.79	608.67	604.24	19.29	603.70	4.4	2	39.060259	-89.395295
G402	C	UA	08/27/2010	--	613.37	Top of Disk	610.36	10.00	20.00	600.36	590.36	20.40	590.00	10	2	39.060207	-89.391712
G403	C	UA	09/11/2015	--	626.47	Top of Disk	623.81	13.11	17.78	610.70	606.03	18.15	605.70	4.7	2	39.063167	-89.398779
G404	C	UA	05/01/2007	--	615.67	Top of Disk	613.57	6.42	11.17	607.15	602.40	11.62	601.60	4.8	2	39.064329	-89.392493
G405	C	UA	05/01/2007	--	623.63	Top of Disk	621.40	9.01	13.76	612.39	607.64	14.21	607.20	4.8	2	39.064345	-89.396234
G406	C	UA	08/19/2016	625.36	625.36	Top of PVC	621.86	13.56	18.37	608.30	603.49	18.75	603.10	4.8	2	39.060309	-89.398508
G407	C	UA	08/16/2016	621.32	621.32	Top of PVC	618.35	13.78	18.61	604.57	599.74	19.04	598.40	4.8	2	39.061574	-89.402004
SG-02	WLO	SW	--	--	605.87	Top of Prot Casing	605.87	--	--	--	--	--	--	--	--	39.059695	-89.391429
SG-03	WLO	SW	--	--	594.94	Top of Prot Casing	594.94	--	--	--	--	--	--	--	--	39.059092	-89.390342
SG-04	WLO	SW	--	--	599.52	Top of Prot Casing	599.52	--	--	--	--	--	--	--	--	39.064146	-89.390504

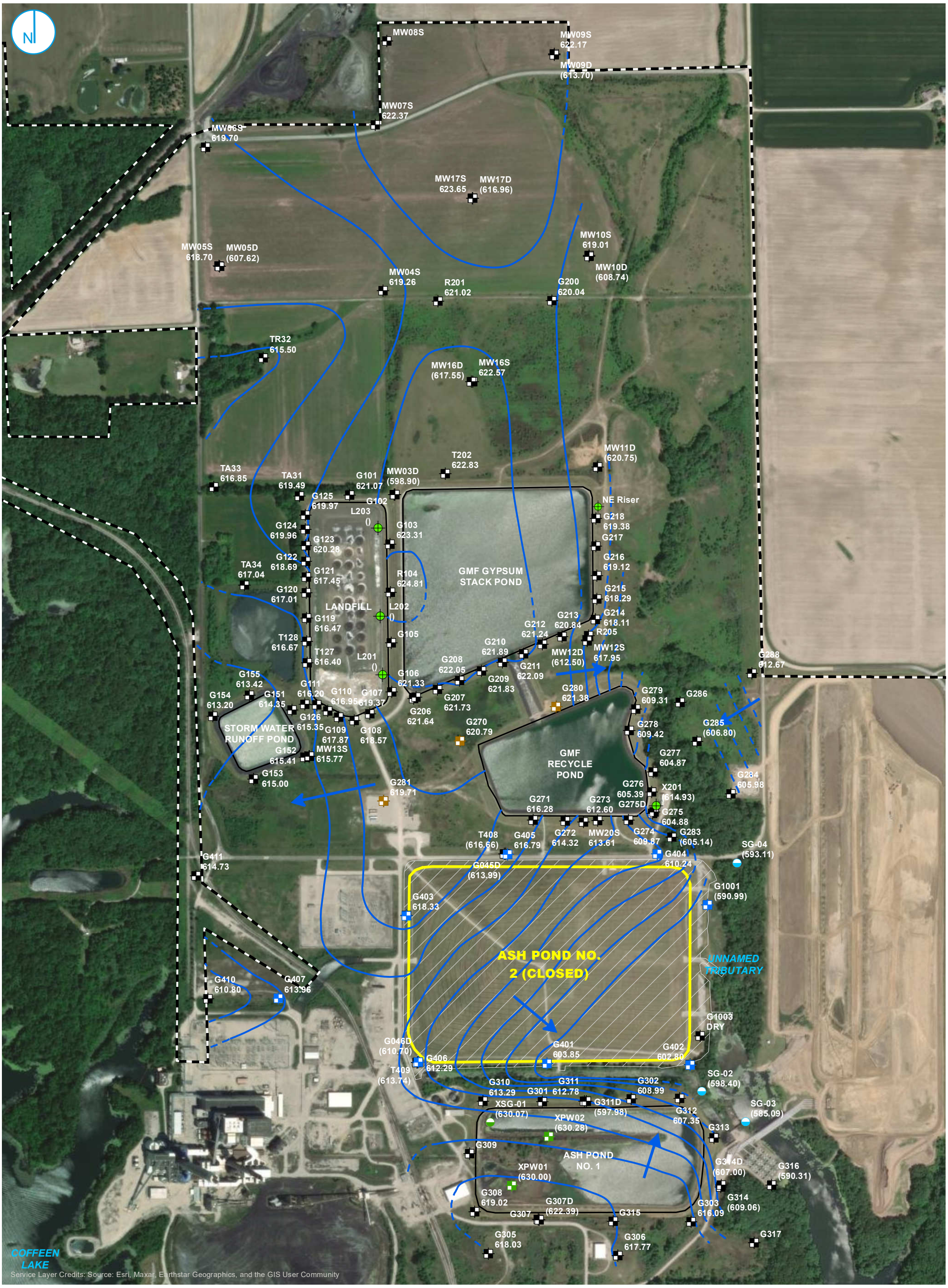
Notes:
All elevation data are presented relative to the North American Vertical Datum 1988 (NAVD88), GEOID 12A
Type refers to the role of the well in the monitoring network: background (B), compliance (C), or water level measurements only (WLO)
WLO wells are temporary pending implementation of impoundment closure per an approved Construction Permit application
-- = data not available
BGS = below ground surface
ft = foot or feet
HSU = Hydrostratigraphic Unit
PVC = polyvinyl chloride
SW = surface water
UA = uppermost aquifer

generated 10/05/2021, 3:12:20 PM CDT

Attachment D
Boring Logs

PROJECT: 169000XXXX | DATED: 5/16/2024 | DESIGNER: GALARNMC

Y:\Mapping\Projects\22\2285\MXD\Nature_and_Extent\COF\Nature_and_Extent_Report\102\Figure 2-6. COF 102 Pot Surface 20230530.mxd



COMPLIANCE MONITORING WELL
BACKGROUND MONITORING WELL
MONITORING WELL
PORE WATER WELL
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

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

FIGURE 2-6

NATURE AND EXTENT REPORT
ASH POND NO. 2
COFFEEN POWER PLANT
COFFEEN, ILLINOIS

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

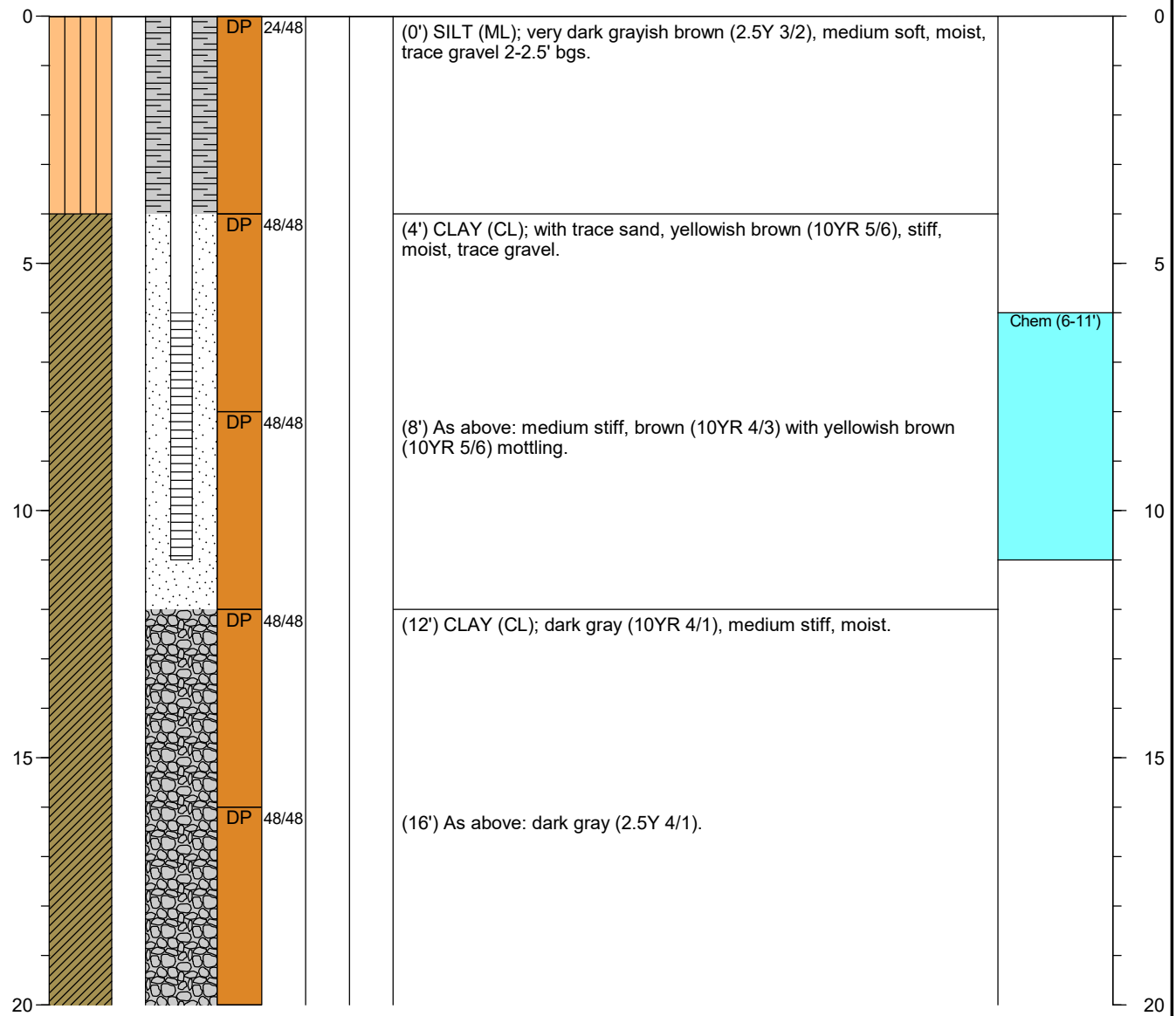
RAMBOLL

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



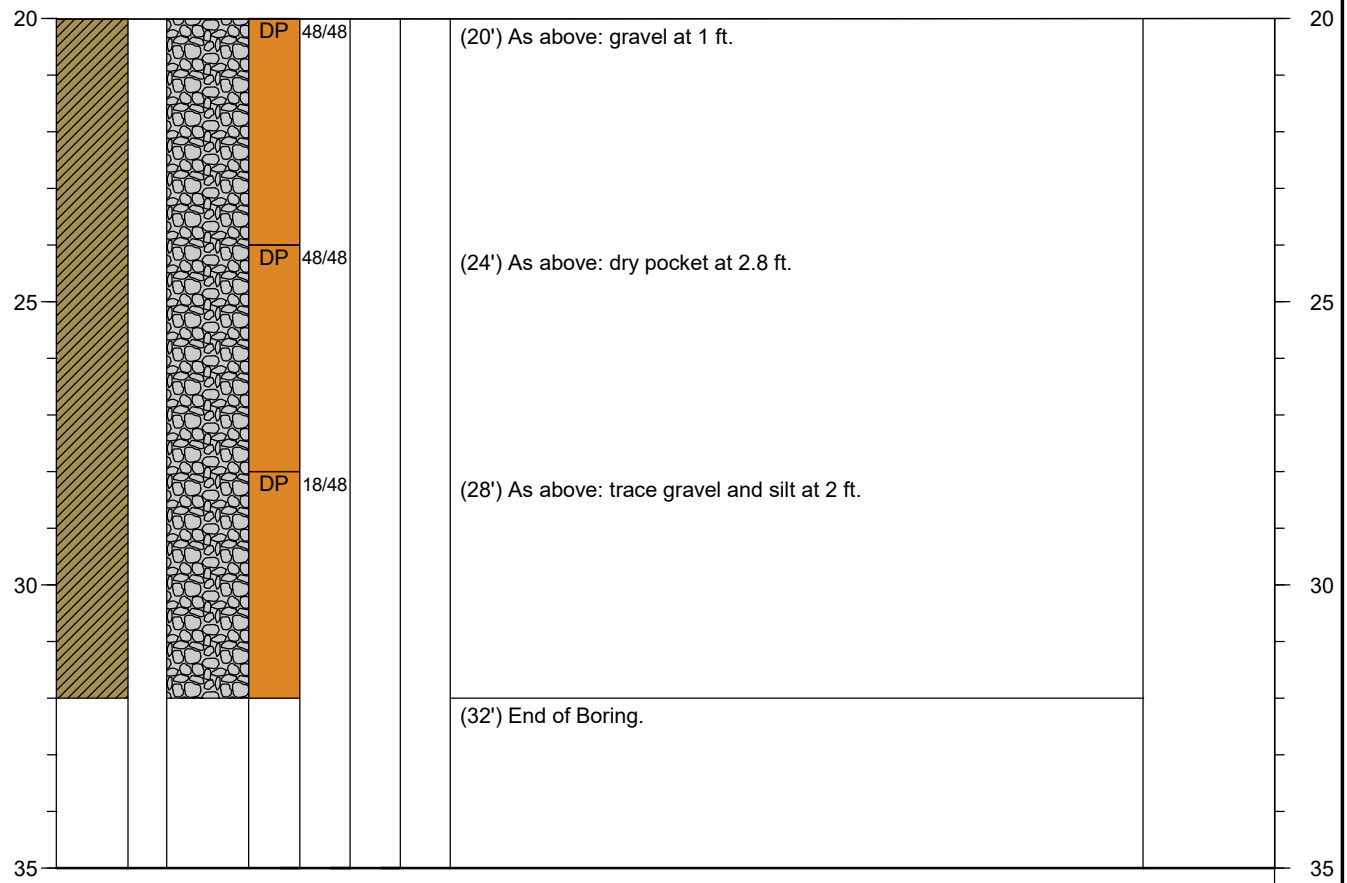
NOTES: No groundwater encountered.

Geosyntec consultants
engineers | scientists | innovators

Client: Dynegy
Project: GLP8005, Coffeen Power Station
Address: Coffeen, IL 62017

WELL LOG
Well No. G1001
Page: 2 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



NOTES: No groundwater encountered.

FIELD BORING LOG

CLIENT: AEG 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	TESTING Blows / 6 in N - Value RQD	Moisture (%)	Dry Den. (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	20/24 83%	ss	2-2 2-4 N=4					Dark grayish brown (10YR4/2), moist, firm, clayey SILT		622	
1A				24				Dark grayish brown (10YR4/2), moist, firm, silty CLAY			
							2	Dark grayish brown (10YR4/2) with 5% yellowish brown (10YR5/8) mottles, moist, firm, silty CLAY, slight trace sand			
2A	19/24 79%	ss	3-4 5-9 N=9	22		2.33 B				620	
2B				20		5.04 Sh	4	Gray (10YR5/1) with 70% yellowish brown (10YR5/8) mottles, moist, firm, silty CLAY, slight trace sand and gravel			
	20/24 83%	ss	14-5 7-8 N=12							618	
3A				17		2.52 Sh	▼	Dark gray (10YR4/1) with 5% yellowish brown (10YR5/8) mottles, moist, firm, silty CLAY, trace sand, slight trace gravel			
							6				
4A	24/24 100%	ss	8-6 7-5 N=13	21		1.24 BSh				616	
4B				21		1.20 B	8	Gray (10YR5/1) with 10% yellowish brown (10YR5/8) mottles, moist, firm, silty CLAY, trace sand, slight trace gravel			
	22/24 92%	ss	2-3 4-4 N=7							614	
5A				21		1.36 B					
							10	Gray (10YR5/1) with 60% yellowish brown (10YR5/8) mottles, moist, firm, silty CLAY, trace sand, slight trace gravel			
6A	24/24 100%	ss	1-2 2-3 N=4	21		0.74 BSh				612	
6B				24		0.78 B		Gray (10YR5/1), moist, soft, sandy CLAY			
							12				
	17/24 71%	ss	2-2 2-3 N=4					Gray (10YR5/1), moist, soft, sandy CLAY, trace gravel		610	
7A				21							
8A				20			14	Gray (10YR5/1), moist, soft, fine- to coarse-grained SAND, trace gravel			
	19/24 79%	ss	1-3 5-6 N=8					Dark yellowish brown (10YR4/4), moist, soft, sandy CLAY		608	
8B				17		4.46 Sh		Gray (10YR5/1) with 10% yellowish brown (10YR5/8) mottles, moist, firm, silty CLAY, slight trace sand and gravel			
							▼ 16				
9A	24/24 100%	ss	6-8 30-35 N=38	20				Yellowish brown (10YR5/4), wet, soft, fine to coarse SAND		606	
9B				8				Gray (10YR5/1), moist, hard, silty CLAY, trace sand and gravel			
							18				

End of Boring = 18.27 ft. BGS

NOTE(S):

FIELD BORING LOG

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	TESTING Blows / 6 in N - Value RQD	Moisture (%)	Dry Den. (lb/ft³)	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	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.		618	
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.		616	
4A	20/24 83%	ss	3-4 6-6 N=10	26			8	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	
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, stiff, silty CLAY with few very fine- to coarse-grained sand.		612	
6A	22/24 92%	ss	1-2 3-4 N=5	20			12	Yellowish brown (10YR5/6), wet, soft, very fine- to coarse-grained sandy CLAY with little silt.		610	
7A	20/24 83%	ss	5-6 6-6 N=12	21			14	Yellowish brown (10YR5/6), wet, medium dense, silty, very fine- to medium-grained SAND with trace coarse-grained sand.		608	
8A	20/24 83%	ss	2-2 8-14 N=10	15			16	Yellowish brown (10YR5/6), moist, dense, fine- to coarse-grained SAND with little silt, little very fine-grained sand, and trace small gravel.		606	
8B				12			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.			
9A	23/24 96%	ss	14-17 28-50/5" N=45	10				**End of boring = 18.0 feet**			
9B				13							

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	Recov / Total (in) / % Recovery	Type	TESTING Blows / 6 in N - Value RQD	Moisture (%)	Dry Den. (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
1A	18/24 75%	SS	1-3 3-2 N=6	22			0	Brown (10YR5/3), moist, stiff, SILT with few clay, trace sand, gravel and roots.			
2A	22/24 92%	SS	2-1 3-3 N=4	28			2	Gray (10YR5/1), moist, soft, CLAY, with some silt, trace sand, gravel and roots.		620	
3A	24/24 100%	SS	1-2 3-4 N=5	26			4	Gray (10YR5/1) with 30% yellowish brown (10YR5/8) mottles, moist, soft, CLAY with some silt, trace sand, gravel and roots.		618	
4A	24/24 100%	SS	1-3 3-3 N=6	18			6			616	
5A	24/24 100%	SS	3-3 4-5 N=7	19			8	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.		614	
6A	24/24 100%	SS	3-3 4-5 N=7	20			10			612	
7A	24/24 100%	SS	woh-2 5-13 N=7	20			12	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.		610	
7B				11			▼ 14	Gray (10YR6/1), wet, medium dense, very fine- to very coarse-grained SAND with few silt and trace clay.		608	
8A	24/24 100%	SS	12-9 6-9 N=15	20				Yellow brown (10YR5/6), wet. medium dense, very fine- to very coarse-grained SAND, with little silt and trace gravel.			
9A	18/18 100%	SS	8-30 50 N=80	8			16	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.		606	
	0/9 0%	BD					18			604	

End of boring = 18.2 feet

NOTE(S):

FIELD BORING LOG

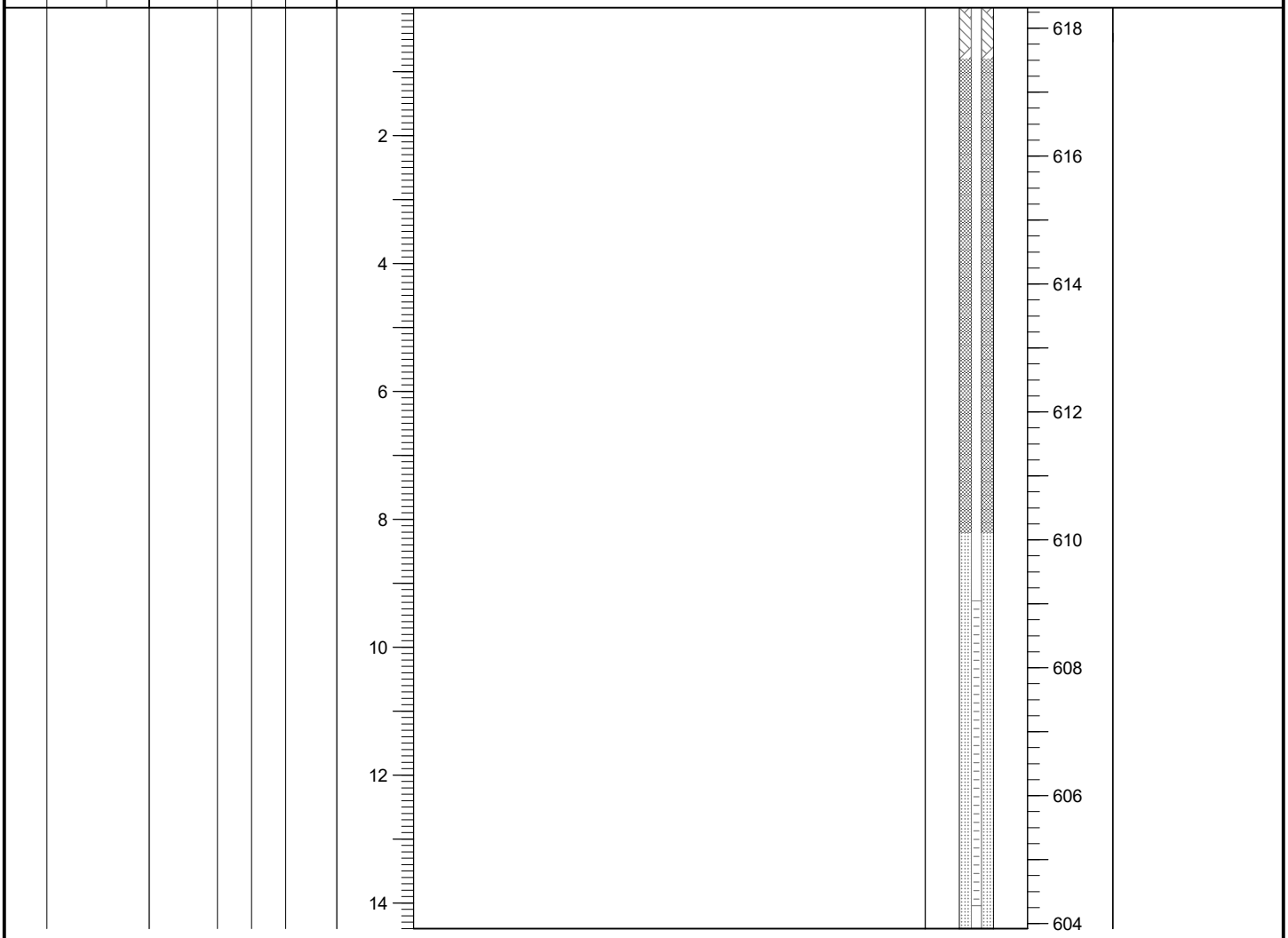
CLIENT: Illinois Power Generating Co.
Site: Coffeen Part 845 Groundwater
Location: Coffeen, Illinois
Project: 20E0111A
DATES: **Start:** 2/5/2021
Finish: 2/5/2021
WEATHER: Clear, cold (20s)

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



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
▼ =
▼ =

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	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
1A	13/24 54%	SS	0-4 4-4 N=8				0	Yellowish brown (10YR5/6), moist, stiff, lean CLAY, with some silt, few very fine- to fine-grained sand, trace small gravel.		618	
2A	24/24 100%	SS	3-4 5-6 N=9				2	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.		616	
3A	24/24 100%	SS	2-4 5-7 N=9				4	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.		614	
4A	24/24 100%	SH					6			612	
5A	18/24 75%	SS	1-2 4-5 N=6				8	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.		610	
6A	24/24 100%	SS	1-3 3-4 N=6				10	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.		608	
7A	24/24 100%	SS	2-6 12-13 N=18				12	Yellowish brown (10YR5/6), moist to wet, medium stiff, lean CLAY, with some very fine- to fine-grained sand, little silt, few small gravel.		606	
8A	24/24 100%	SS	2-6 12-13 N=18				14	Gray (10YR5/1), moist to wet, medium stiff, SILT, with some very fine- to fine-grained sand, few clay, trace small gravel.		604	1" wet, SAND at 13.5 ft.
9A	24/24 100%	SS	6-15 18-22 N=33				16	Yellowish brown (10YR5/6), moist, hard, SILT, with some clay, some to little sand, few small gravel.		602	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	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.		600	
							20				

NOTE(S): G311D installed in borehole.

FIELD BORING LOG

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	TESTING Blows / 6 in / N - Value / RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
11A	24/24 100%	SS	5-15 20-26 N=35							598	
							22				No oxidation below 22 ft.
12A	12/24 50%	SS	2-3 14-17 N=17							596	
							24				Trace medium gravel below 24 ft.
13A	24/24 100%	SS	6-11 14-20 N=25							594	
14A	24/24 100%	SS	4-8 11-16 N=19				26			592	
15A	24/24 100%	SH					28			590	
								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.			
16A	24/24 100%	SS	0-3 5-8 N=8				30			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

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	TESTING Blows / 6 in / N - Value / RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
21A	16/24 67%	SS	3-3 6-8 N=9					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	
22A							42	Greenish gray (GLEY15/1) with 20% dark reddish brown (10YR3/2) mottles, moist, medium stiff, lean CLAY, with some silt.		576	
22B	24/24 100%	SS	3-4 7-8 N=11				44			574	
23A	24/24 100%	SS	1-3 5-7 N=8				46			572	
24A	20/24 83%	SS	3-4 10-8 N=14				48	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.		570	
25A	24/24 100%	SS	3-5 8-13 N=13				50			568	
26A	24/24 100%	SS	2-5 10-12 N=15				52			566	
27A	24/24 100%	SS	2-6 10-14 N=16				54	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.
28A	24/24 100%	SS	4-7 7-11 N=14				56	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	
29A	24/24 100%	SS	2-5 9-11 N=14				58			560	0.5" small to medium GRAVEL.
30A	24/24 100%	SS	3-7 10-13 N=17				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.			

NOTE(S): G311D installed in borehole.

FIELD BORING LOG

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

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	

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Coffeen, IL
Township: East Fork Township
Section 11, **Tier** 7N; **Range** 3W

WATER LEVEL INFORMATION:
▼ = 11.20 - During Drilling
▼ =
▼ =

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/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
1A 1B	17/24 *71%*	SS	*0-2* *3-3* N=5				0	Dark yellowish brown (10YR4/4), wet, stiff, lean CLAY, with some silt, few roots, trace small gravel.			
							1.5	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	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	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	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	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				10	Yellowish brown (10YR5/4), wet, medium dense, very fine- to medium-grained SAND, with some silt, few small gravel.		600	
							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.			

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:
▽ = 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	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
1A	4/24 17%	SS	13-7 4-5 N=11				0	Moist, dense, small to large GRAVEL. [FILL]		610	
	1/24 4%	SS	3-4 5-5 N=9				2	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	
3A	24/24 100%	SS	1-3 4-5 N=7				4			606	
4A	24/24 100%	SS	2-5 15-17 N=20				6	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	
5A	24/24 100%	SS	4-10 12-16 N=22				8			602	
6A	24/24 100%	SS	4-5 14-18 N=19				10	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	1" wet, SAND, with some silt at 11.6 ft.
7A	24/24 100%	SS	3-11 14-18 N=25				12			598	
8A	24/24 100%	SS	3-9 13-18 N=22				14			596	
9A	24/24 100%	SS	1-7 9-13 N=16				16			594	
							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. 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	
							20				

NOTE(S): G314D installed in borehole.

FIELD BORING LOG

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	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
10A	24/24 100%	SS	1-5 10-13 N=15								1" wet, SAND, with some silt at 20 ft.
										590	
							22	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]*			Frequent oxidation below 21.7 ft.
11A	24/24 100%	SS	1-6 9-12 N=15							588	
							24				
12A	24/24 100%	SS	4-7 10-13 N=17							586	
							26				
13A	24/24 100%	SS	3-7 10-13 N=17							584	
							28				
14A	24/24 100%	SS	4-6 10-10 N=16					Dark grayish brown (10YR4/2), moist, hard, lean CLAY, with some silt and very fine- to fine-grained sand, trace small gravel.		582	1 ft vertical fracture with yellowish red (5YR4/6) oxidation at 28.3 ft.
							30				
15A	24/24 100%	SS	3-9 10-12 N=19							580	
							32				
16A	24/24 100%	SS	2-3 7-8 N=10							578	
							34				Trace roots below 34 ft.
17A	24/24 100%	SS	2-4 7-9 N=11					Gray (GLEY15/), moist, stiff, lean CLAY, with some silt.		576	
							36				
18A	21/24 88%	SH								574	
							38	Dark grayish brown (10YR4/2), moist, hard, lean CLAY, with some silt and very fine- to fine-grained sand, trace small gravel and roots.			
			2-5							572	
							40				

NOTE(S): G314D installed in borehole.

FIELD BORING LOG

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	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
19A	24/24 100%	SS	7-12 N=12				42	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	Trace medium gravel below 41.3 ft.
20A	24/24 100%	SS	4-8 10-14 N=18				44			568	
21A	24/24 100%	SS	3-9 13-16 N=22				46			566	
22A 22B	24/24 100%	SS	12-31 14-11 N=45				48	Gray (10YR5/1), wet, dense, SAND, with some silt, few small gravel.		564	
23A	24/24 100%	SS	3-4 6-9 N=10				50	Gray (GLEY15/) with 10% yellowish brown (10YR5/6) mottles, moist, stiff, lean CLAY, with some silt, trace very fine-grained sand.		562	1" SILT, with some sand at 48.2 ft.
24A	24/24 100%	SS	5-11 14-17 N=25				52			560	
25A	24/24 100%	SS	4-6 11-15 N=17				54	Yellowish brown (10YR5/6) with 20% gray (GLEY15/) mottles, moist, stiff, lean CLAY, with some silt, trace very fine-grained sand.		558	
26A	20/24 83%	SS	4-5 18-30 N=23				56			556	
27A	20/24 83%	SS	9-22 33-33 N=55				58	Yellowish brown (10YR5/6), moist, hard, lean CLAY, with some silt, little very fine- to fine-grained sand and small gravel.		554	
28A	24/24 100%	SS	7-19 29-43				60	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. 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

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	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
			N=48								
29A	20/24 83%	SS	13-20 30-38 N=50				62			550	
30A	24/24 100%	SS	8-15 30-34 N=45				64	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	
31A	24/24 100%	SS	5-17 28-29 N=45				66			546	
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.		544	
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.		542	
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.		540	
35A	24/24 100%	SS	5-12 24-24 N=36				74			538	
36A	24/24 100%	SS	14-24 20-33 N=44				76	Dark grayish brown (10YR4/2) with 5% gray (GLEY15/), 5% yellowish brown (10YR5/6), and 5% light gray (10YR7/1) mottles.		536	
							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
▽ =
▽ =

SAMPLE				TESTING					
Number	Recov / Total (in) / % Recovery	Type	Depth ft. BGS	*Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
38A	24/24 *100%*	SS	82	*7-17 21-29* N=38				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	Trace roots at 82 ft.
39A	24/24 *100%*	SS	84	*8-24 26-27* N=50				Very dark gray (10YR3/1), moist, hard, lean CLAY, with some silt.		528	
40A	24/24 *100%*	SS	86	*5-9 10-13* N=19				Dark gray (10YR4/1) with 5% black (10YR2/1) mottles, moist, hard, lean CLAY, with some silt.		526	
41A	24/24 *100%*	SS	88	*6-10 25-33* N=35				Dark greenish gray (GLEY14/1) with 5% yellowish brown (10YR5/6) mottles, moist, hard, lean CLAY, with some silt.		524	Few very fine- to fine-grained sand below 88 ft.
42A	11/11 *100%*	SS	90	*3-50/5"*						522	
43A	5/5 *100%*	SS	92	*50/5"*				Light reddish brown (2.5YR6/3) with 10% gray (GLEY15/), dry, hard, SILT, with few clay and very fine-grained sand.		520	
44A	5/5 *100%*	SS	94	*50/5"*						518	
45A	8/8 *100%*	SS	96	*49-50/2"*						516	
46A	11/11 *100%*	SS	98	*25-50/5"*				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	
			100							512	

NOTE(S): G314D installed in borehole.

FIELD BORING LOG

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			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
▼ =

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	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
1A	15/24 63%	SS	10-9 5-4 N=14				0	Brown (10YR5/3), moist, medium dense, small to large GRAVEL, with some clay and fine to coarse grained sand. [FILL]		599	
2A	10/24 42%	SS	1-3 4-6 N=7				2	Gray (10YR5/1), moist, hard, lean CLAY, with some silt, few small gravel and very fine- to fine-grained sand.		598	
3A	14/24 58%	SS	2-2 3-3 N=5				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.		596	
4A	10/24 42%	SS	0-1 1-2 N=2				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.		594	
5A							8			592	
5B	22/24 92%	SS	1-1 1-2 N=2				▼	Very dark gray (10YR3/1), wet, medium stiff to stiff, SILT, with some clay and very fine- to fine-grained sand.		590	
6A	20/24 83%	SS	1-2 4-7 N=6				10	Brown (10YR4/3), moist, very stiff, lean CLAY, with some silt, little very fine- to fine-grained sand, few small gravel.		588	
7A	22/24 92%	SS	0-2 3-3 N=5				12	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	
8A	21/17 124%	SS	2-2 26-50/3" N=28				▼ 14	Brown (10YR4/3), wet, loose, very fine- to fine-grained SAND, with some silt, trace clay.		584	
8B								Yellowish brown (10YR5/6), moist, hard, SILT, with some very fine- to fine-grained sand, trace small gravel.			
								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	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
1A	16/24 67%	ss	2-2 3-7 N=5	17			0	Dark grayish brown (10YR4/2), moist, soft, CLAY with little silt and trace very fine- to fine-grained sand - FILL.		622	
							2	Yellowish brown (10YR5/6) moist, medium, CLAY with some silt and trace very fine- to coarse-grained sand - FILL.			
2A	21/24 88%	ss	8-11 8-9 N=19	17		1.80		Dark gray (10YR4/1), moist, stiff, SILT with little clay and trace very fine-grained sand.		620	
2B				25			4	Yellowish brown (10YR5/6), moist, stiff, CLAY with some silt and trace very fine- to fine-grained sand.			
3A	23/24 96%	ss	3-4 7-8 N=11	23		2.50		Gray (10YR5/1) with 20% yellowish brown (10YR5/6) mottles, moist, medium, CLAY with some silt and trace very fine- to fine-grained sand.		618	
4A	24/24 100%	ss	8-9 12-14 N=21	21		3.30	6			616	
4B				19		2.80	8	Gray (10YR5/1) with 30% yellowish brown (10YR5/8) mottles, moist, stiff, SILT and very fine-grained SAND with trace clay.			
5A	24/24 100%	ss	2-3 4-5 N=7	21		1.30				614	
6A	24/24 100%	ss	2-4 5-6 N=9	17		2.50	10	Gray (10YR5/1) with 30% yellowish brown (10YR5/6) mottles, moist, medium, CLAY with some silt and trace very fine- to fine-grained sand.		612	
7A	24/24 100%	ss	9-7 8-9 N=15	21		1.40	12			610	
8A	24/24 100%	ss	2-3 2-4 N=5	17		1.30	14	Gray (10YR6/1), moist soft, CLAY with very fine- to fine-grained sand and little silt.		608	
8B				19			16	Yellowish brown (10YR5/6), wet, loose, very fine- to fine-grained SAND with trace silt.			
9A	20/24 83%	ss	5-4 5-10 N=9	21				Yellowish brown (10YR5/6), wet medium, SILT with some very fine-grained sand and little clay.		606	
9B				16				Yellowish brown (10YR5/6), wet, loose, very fine- to medium-grained SAND with trace silt.			
10A	12/16 75%	ss	23-41 50/4"	6		4.50	18	Gray (10YR5/1), moist, very hard, SILT with few clay and little very fine- to very coarse sand.		604	

End of boring = 19.3 feet

NOTE(S): G401 installed in borehole.

FIELD BORING LOG

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	TESTING Blows / 6 in N - Value RQD	Moisture (%)	Dry Den. (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	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	
							1	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	
							3	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	
							14	Brown (10YR5/3), moist, hard, SILT with some clay and little fine- to coarse-grained sand.		604	
8A	24/24 100%	ss	3-7 12-17 N=19	12		4.50		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.			
							▼ 16			602	
9A	24/24 100%	ss	4-9 14-20 N=23	13		4.00		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.			
							18			600	
10A	24/24 100%	ss	2-8 14-19 N=22	14		4.50		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.			
							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

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	TESTING Blows / 6 in / N - Value / RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
1A	14/24 *58%*	SS	*2-3* *1-5* N=4	26.7			0	FILL - Light gray (10YR7/1), moist, loose, very fine- to very coarse-grained SAND with few small to medium gravel.		617	
								Very dark grayish brown (10YR3/2), moist, soft, CLAY with some silt and trace very fine- to fine-grained sand.			
								Yellowish brown (10YR5/4), moist, soft, CLAY with some silt and trace very fine- to fine-grained sand.		616	
2A	15/24 *63%*	SS	*4-4* *4-5* N=8	25.2			2				
								Gray (10YR6/1) with 25% yellowish brown (10YR5/6) mottles, moist, medium,CLAY with some silt and trace very fine- to fine-grained sand.		614	
3A	17/24 *71%*	SS	*2-3* *4-6* N=7	17.9			4 ▽				
										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):

Attachment E
Site Solids Bulk Characterization Analytical Data

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, 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.

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 glovebox

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	Analysis: 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 SiREM	Date 26 Aug 21	Company
	Printed Name Rachel Hallman	Time 12:00 pm.	Printed Name
	Signature		Signature
	Relinquished by:		**Received by:**
	Company	Date 8/31/21	Company PRIMA
	Printed Name	Time 10:40	Printed Name Molly Scott
	Signature		Signature

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, 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.

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

Ice present?	☒	☐	☐
If no, what is temperature? _____			
Samples in good condition?	☒	☐	☐

If no, explain: Ice appears melted.

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	Phone:	(519) 822-2265
Project Name:	Coffeen MNA	Fax:	(519) 822-3151
Job Number:		Email:	mhealey@siremlab.com
Sampler Signature:		TAT:	1 week

SAMPLE ID	Date	Time	Matrix	# Containers	Analysis: 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	Company	PRIMA 8/20/21
	Printed Name	Rachel Hallman	Printed Name	Chris B. 10:00 AM
	Signature		Signature	
	Relinquished by:		Received by:	
	Company		Company	
	Printed Name		Printed Name	
	Signature		Signature	

Date	Time
18 Aug 21	5:30 pm.

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

Catharine Arnold, B.Sc., C.Chem
Project Specialist,
Environment, Health & Safety

OnLine LIMS

0002638711

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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

Catharine Arnold, B.Sc., C.Chem
Project Specialist,
Environment, Health & Safety

OnLine LIMS

0002751323

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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

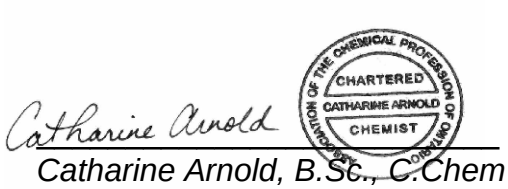
0002638704

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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, B.Sc., C.Chem
Project Specialist,
Environment, Health & Safety

OnLine LIMS

0002638704

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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

00025229990

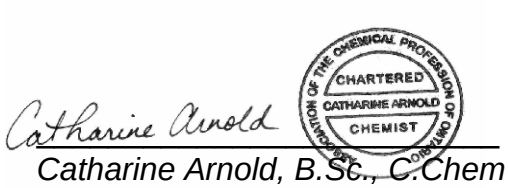
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Test method information available upon request. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples. SGS Canada Inc. Environment-Health & Safety statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

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, B.Sc., C.Chem
Project Specialist,
Environment, Health & Safety

OnLine LIMS

0002522990

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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 Accrédité CCN

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WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted. The findings report on the samples provided by the client and are not intended for commercial or contractual settlement purposes.

- not analysed | -- element not determined | I.S. insufficient sample | L.N.R. listed not received

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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

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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

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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). DiffracPIus 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)

Kim Gibbs, H.B.Sc., P.Geo.
Senior Mineralogist

Huyun Zhou, Ph.D., P.Geo.
Senior Mineralogist

ACCREDITATION: SGS Minerals Services Lakefield is accredited to the requirements of ISO/IEC 17025 for specific tests as listed on our scope of accreditation, including geochemical, mineralogical and trade mineral tests. To view a list of the accredited methods, please visit the following website and search SGS Canada - Minerals Services - Lakefield: http://palcan.scc.ca/SpecsSearch/GLSearchForm.do.

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.

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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

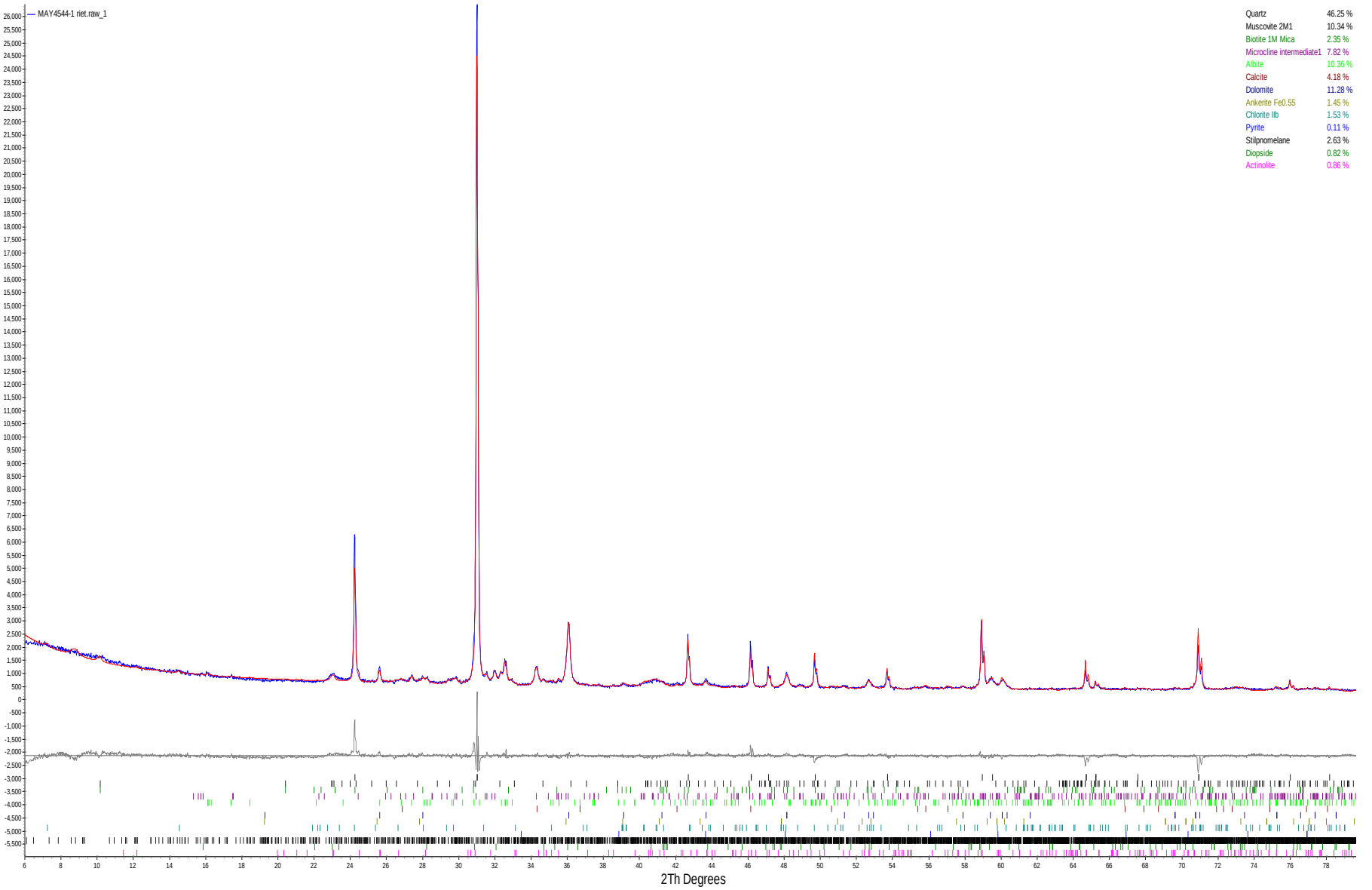
Zero values indicate that the mineral was included in the refinement, but the calculated concentration is below a measurable value.

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.

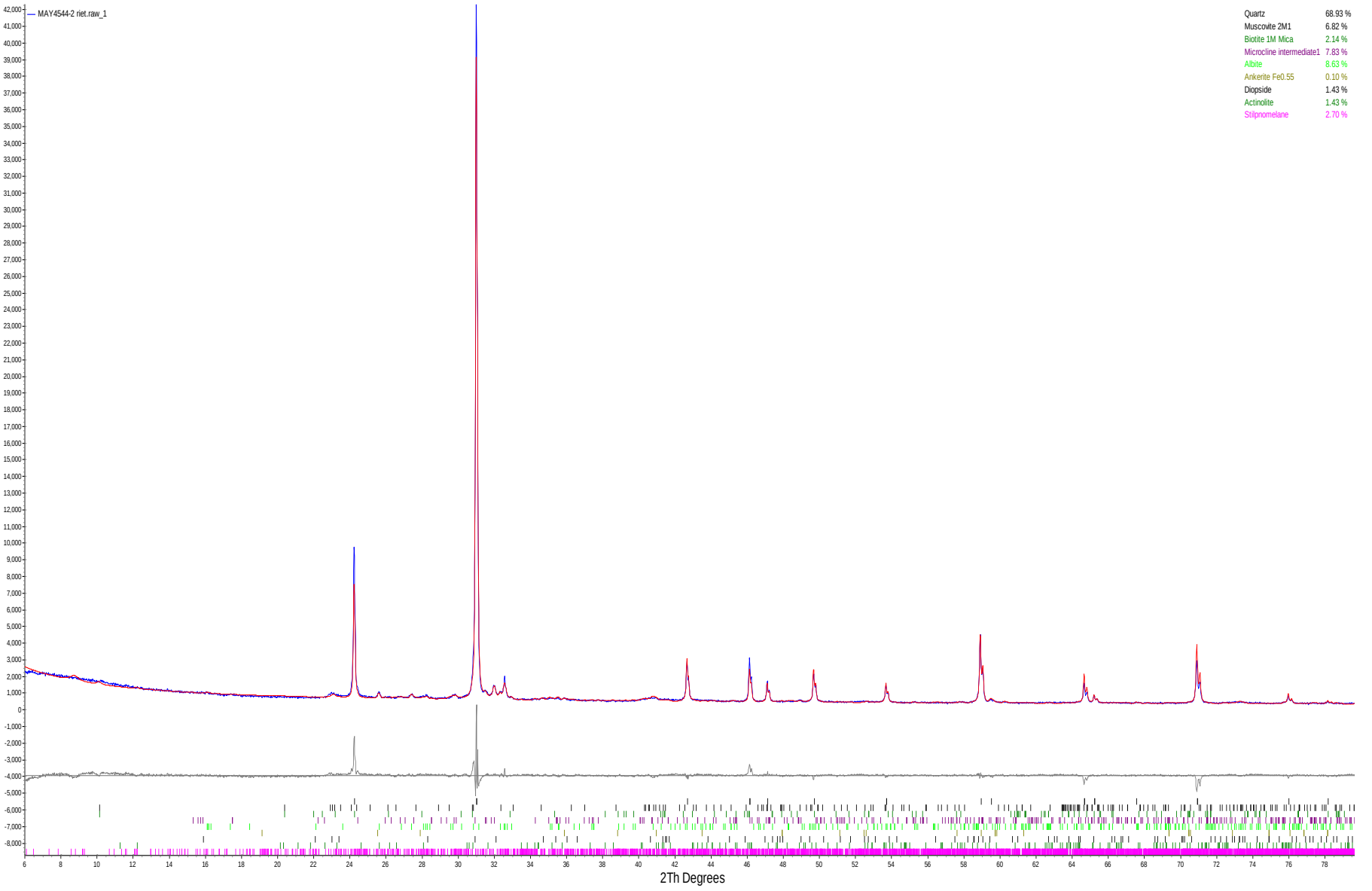
Mineral/Compound	Formula
Quartz	SiO_2
Muscovite	$KAl_2(AlSi_3O_{10})(OH)_2$
Biotite	$K(Mg,Fe)_3(AlSi_3O_{10})(OH)_2$
Microcline	$KAlSi_3O_8$
Albite	$NaAlSi_3O_8$
Calcite	$CaCO_3$
Dolomite	$CaMg(CO_3)_2$
Ankerite	$CaFe(CO_3)_2$
Chlorite	$(Fe,(Mg,Mn)_5,Al)(Si_3Al)O_{10}(OH)_8$
Pyrite	FeS_2
Stilpnomelane	$K(Fe^{2+},Mg,Fe^{3+})_8(Si,Al)_{12}(O,OH)_{27}\cdot n(H_2O)$
Diopside	$CaMgSi_2O_6$
Actinolite	$Ca_2(Mg,Fe)_5Si_8O_{22}(OH)_2$

G1001-(6-11)



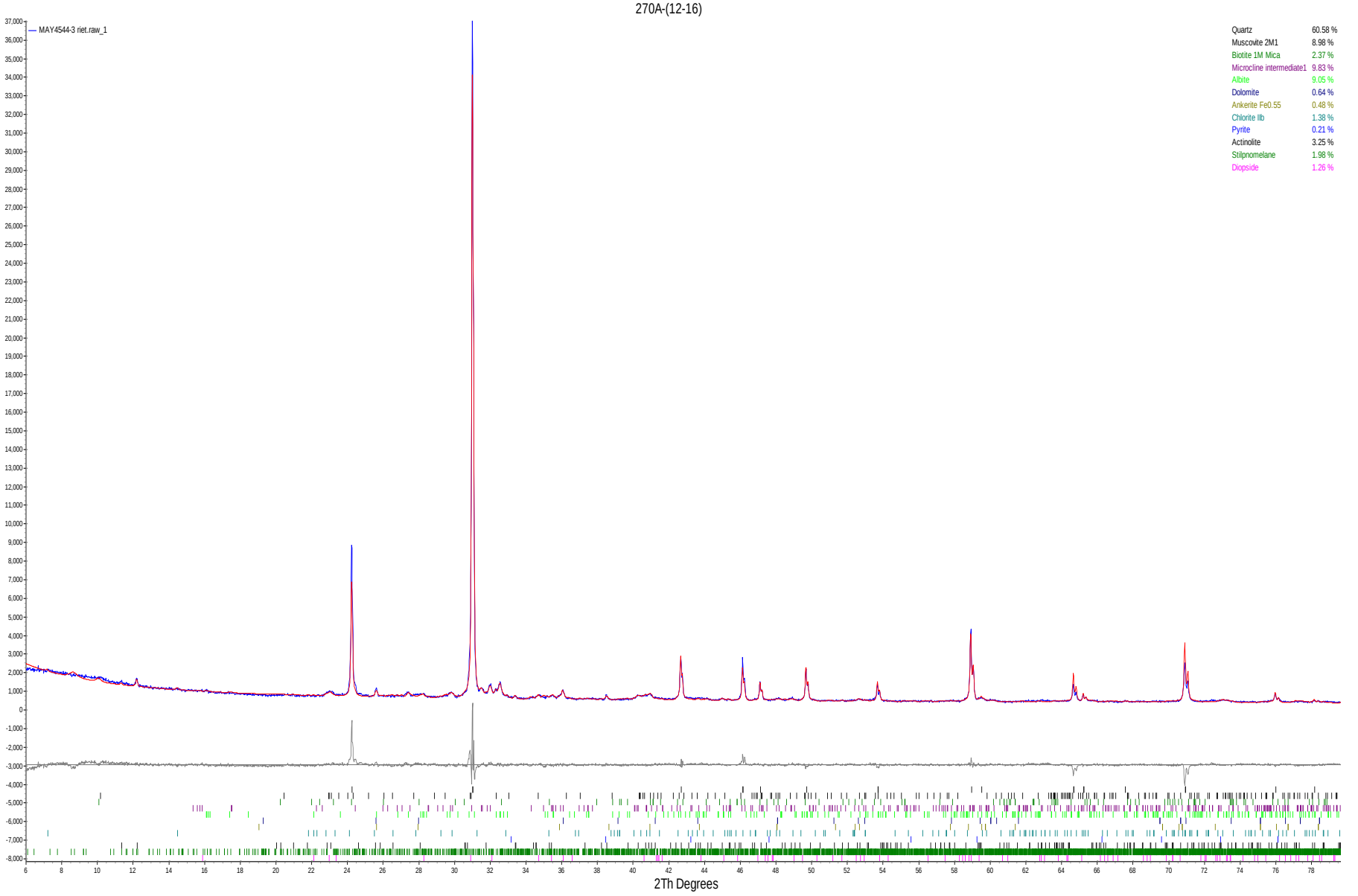
Quartz	46.25 %
Muscovite 2M1	10.34 %
Biotite 1M Mica	2.35 %
Microcline intermediate1	7.82 %
Albite	10.36 %
Calcite	4.18 %
Dolomite	11.28 %
Ankerite Fe0.55	1.45 %
Chlorite IIb	1.53 %
Pyrite	0.11 %
Stilpnomelane	2.63 %
Diopside	0.82 %
Actinolite	0.86 %

401B-(16-20)



Quartz	68.93 %
Muscovite 2M1	6.82 %
Biotite 1M Mica	2.14 %
Microcline intermediate1	7.83 %
Albite	8.63 %
Ankerite Fe0.55	0.10 %
Diopside	1.43 %
Actinolite	1.43 %
Stilpnomelane	2.70 %

270A-(12-16)



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 %

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:

1) Method Summary
2) Quantitative XRD Results
3) XRD Pattern(s)

Kim Gibbs, H.B.Sc., P.Geo.
Senior Mineralogist

Huyun Zhou, Ph.D., P.Geo.
Senior Mineralogist

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Mineral Identification and Interpretation:

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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

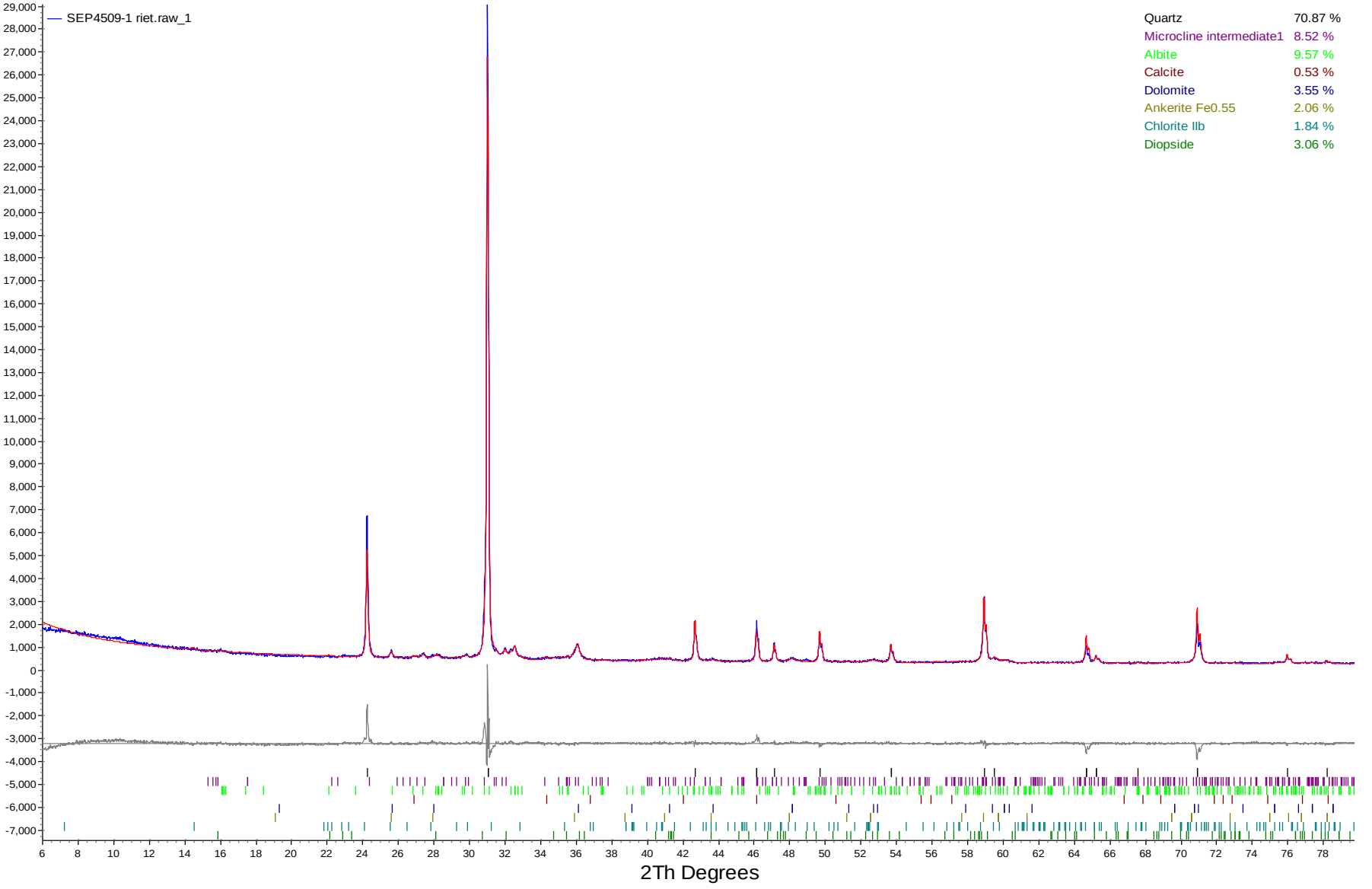
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Dashes indicate that the mineral was not identified by the analyst and not included in the refinement calculation for the sample.

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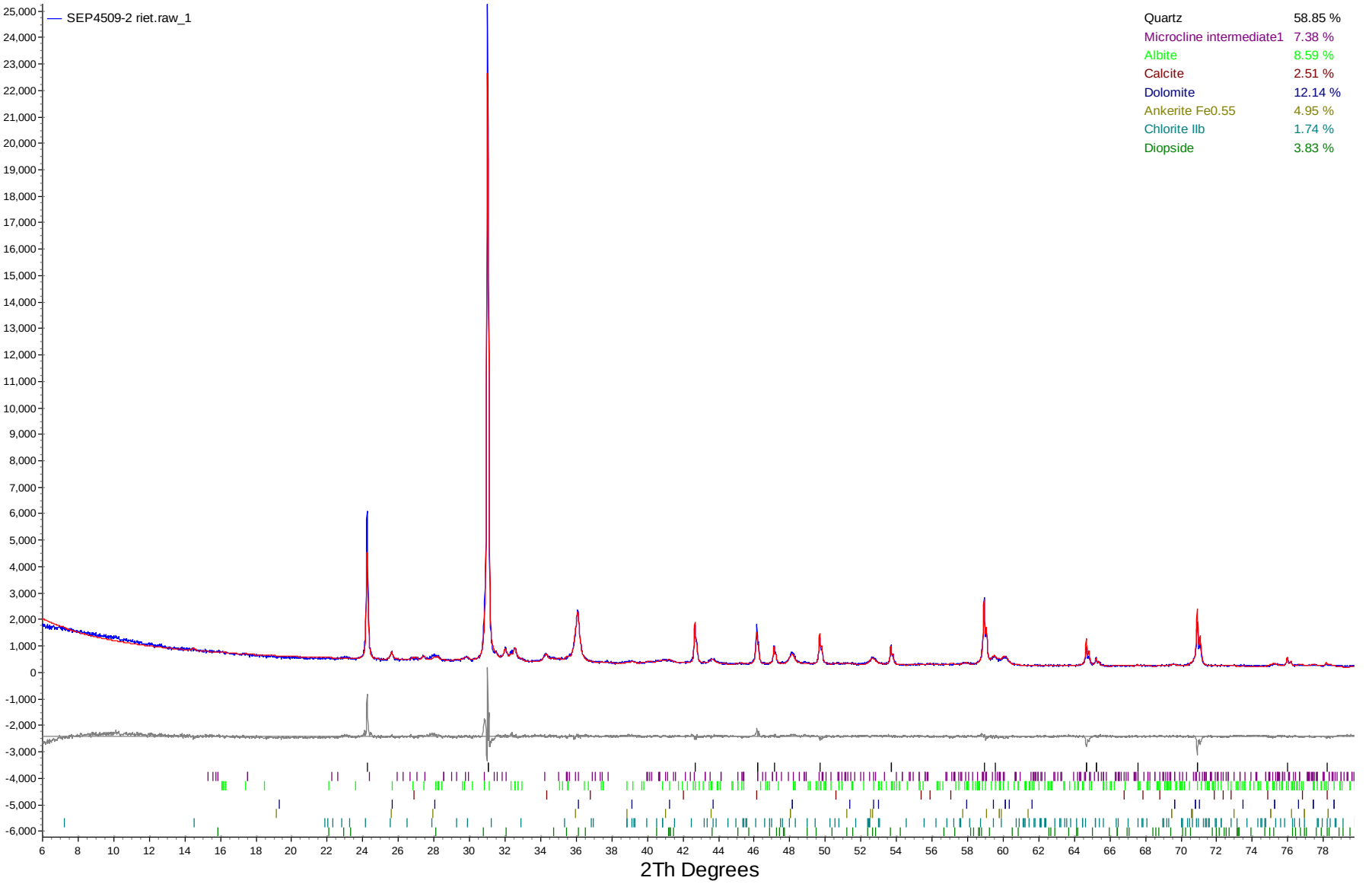
Mineral/Compound	Formula
Quartz	SiO_2
Microcline	$KAlSi_3O_8$
Albite	$NaAlSi_3O_8$
Calcite	$CaCO_3$
Dolomite	$CaMg(CO_3)_2$
Ankerite	$CaFe(CO_3)_2$
Chlorite	$(Fe,(Mg,Mn)_5,Al)(Si_3Al)O_{10}(OH)_8$
Diopside	$CaMgSi_2O_6$
Muscovite	$KAl_2(AlSi_3O_{10})(OH)_2$

SB-306-(14-16)



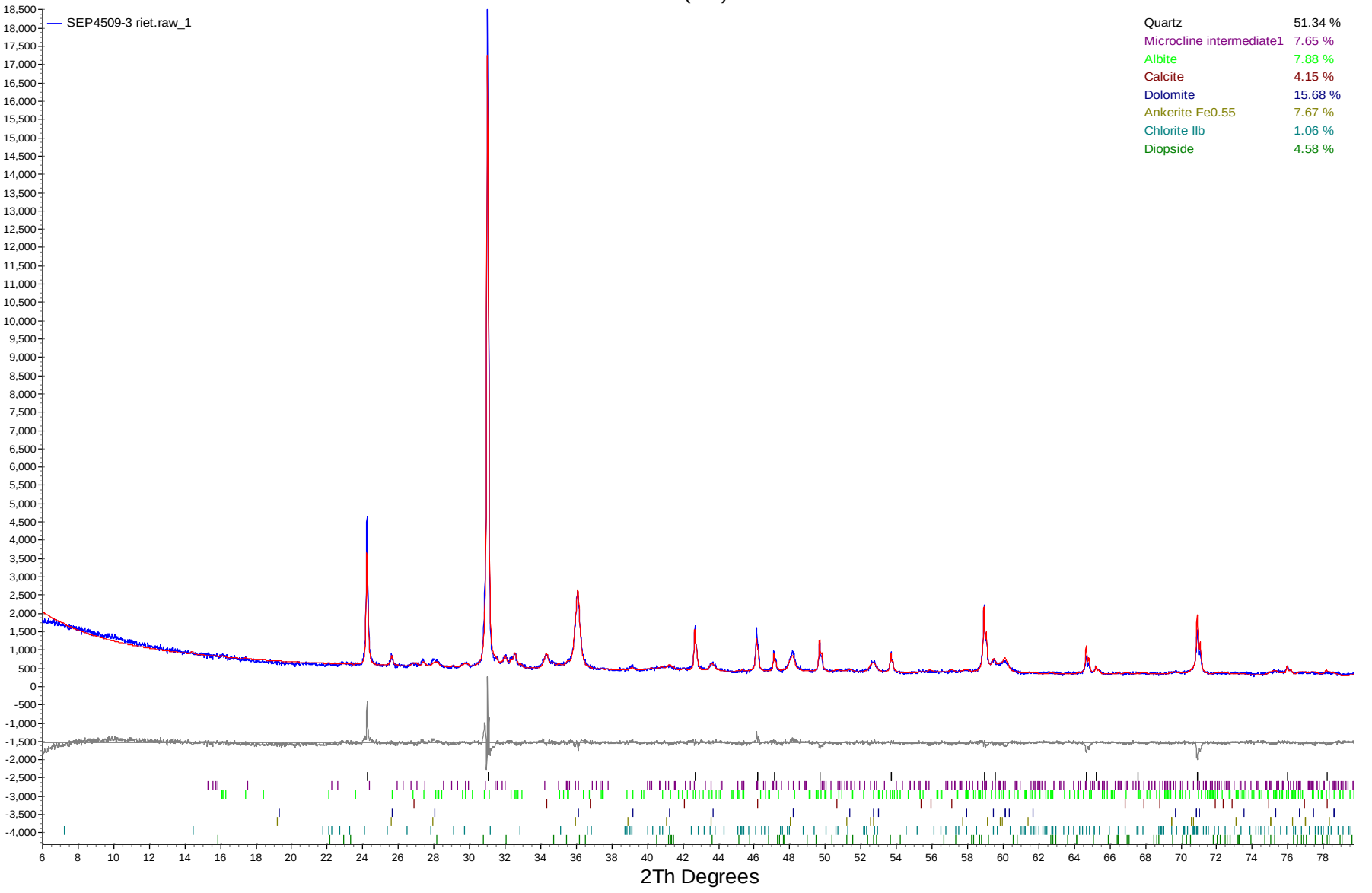
Quartz	70.87 %
Microcline intermediate1	8.52 %
Albite	9.57 %
Calcite	0.53 %
Dolomite	3.55 %
Ankerite Fe0.55	2.06 %
Chlorite IIb	1.84 %
Diopside	3.06 %

SB-311-(14-15)



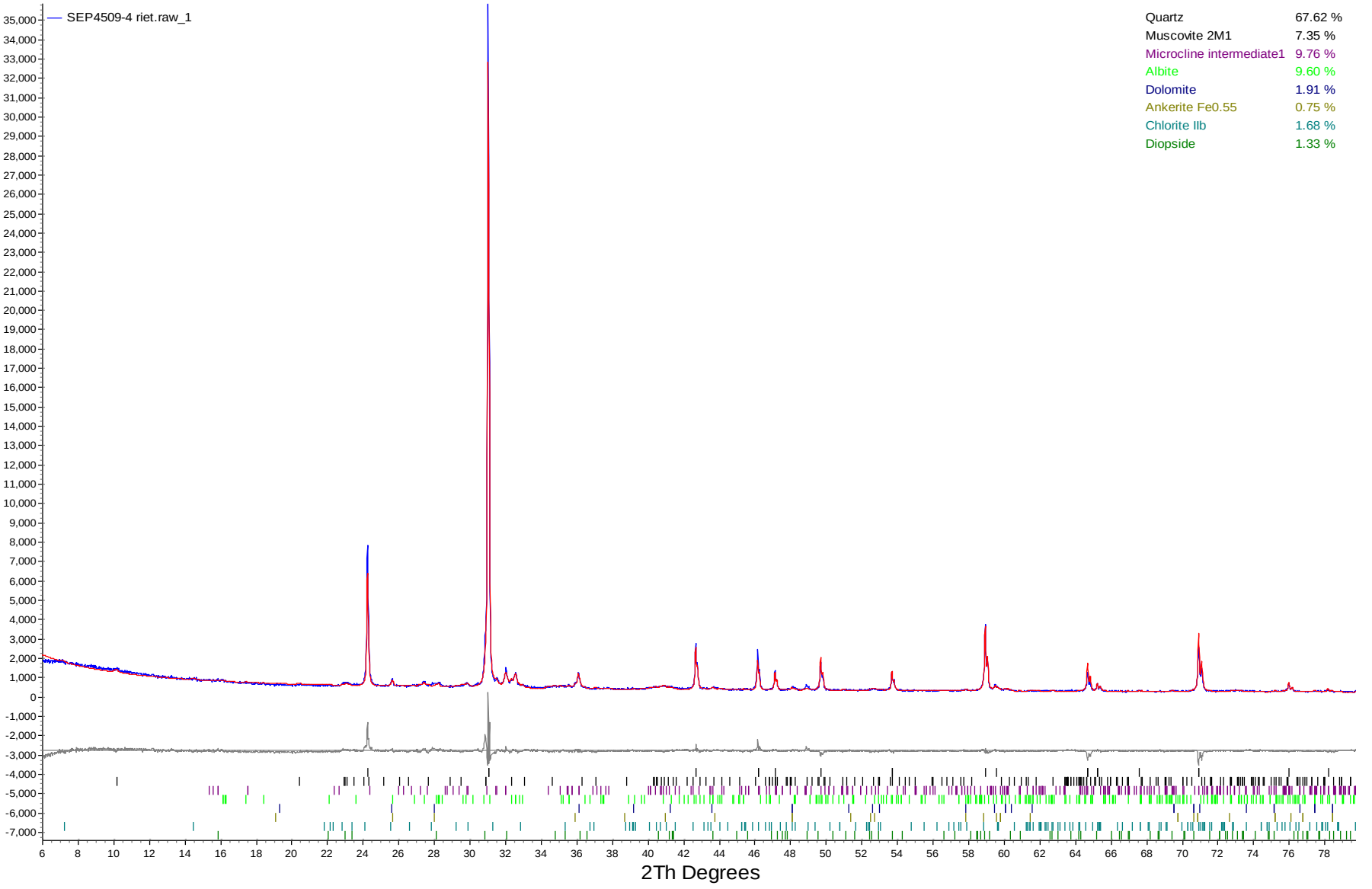
Quartz	58.85 %
Microcline intermediate1	7.38 %
Albite	8.59 %
Calcite	2.51 %
Dolomite	12.14 %
Ankerite Fe0.55	4.95 %
Chlorite IIb	1.74 %
Diopside	3.83 %

SB-313-(8-9)



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 %

SB-316-(13-14,15-16)



Quartz	67.62 %
Muscovite 2M1	7.35 %
Microcline intermediate1	9.76 %
Albite	9.60 %
Dolomite	1.91 %
Ankerite Fe0.55	0.75 %
Chlorite IIb	1.68 %
Diopside	1.33 %

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)

Kim Gibbs, H.B.Sc., P.Geo.
Senior Mineralogist

Huyun Zhou, Ph.D., P.Geo.
Senior Mineralogist

ACCREDITATION: SGS Natural Resources Lakefield is accredited to the requirements of ISO/IEC 17025 for specific tests as listed on our scope of accreditation, including geochemical, mineralogical and trade mineral tests. To view a list of the accredited methods, please visit the following website and search SGS Canada Inc. - Minerals: https://www.scc.ca/en/search/palcan.

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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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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

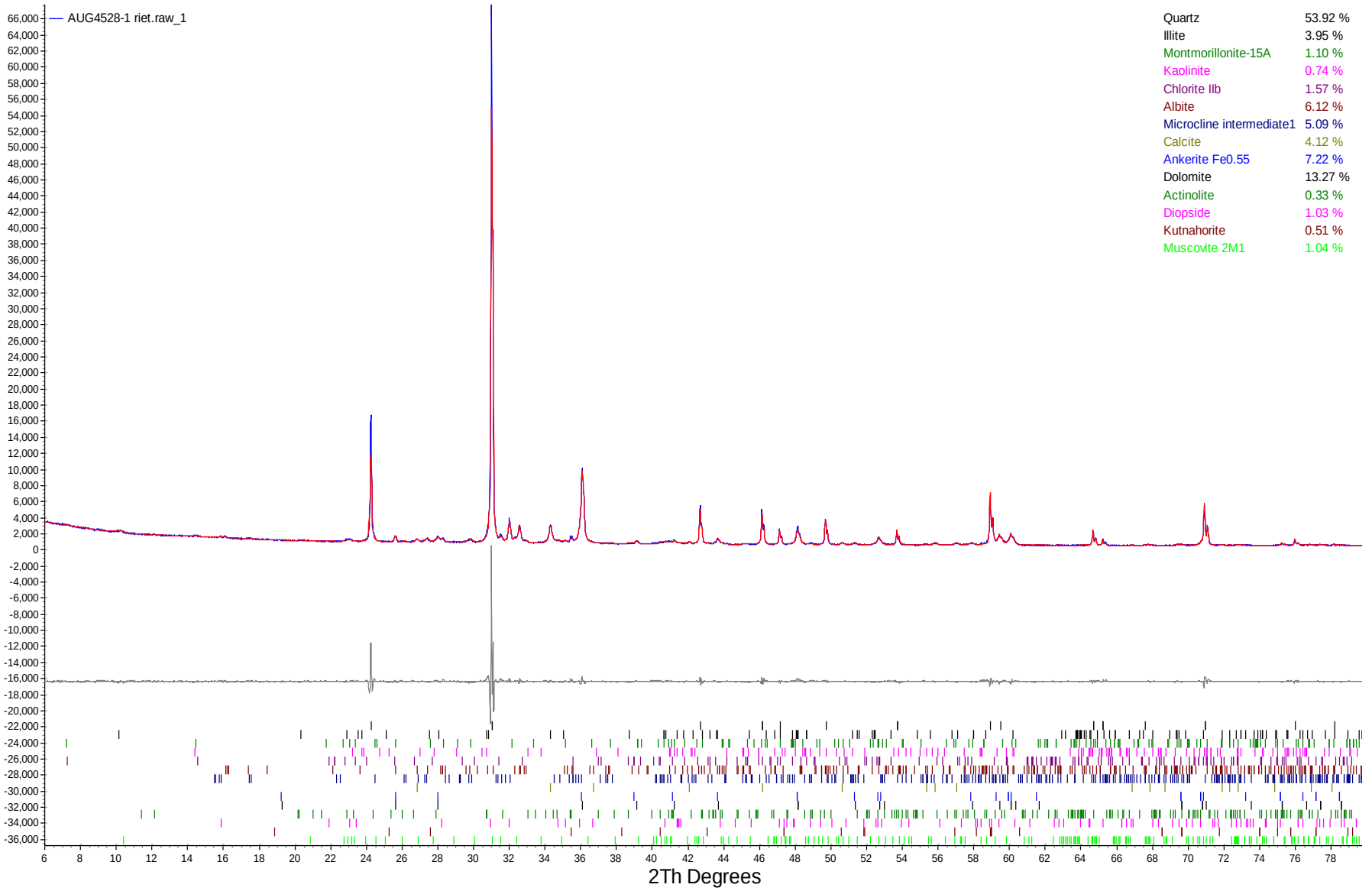
Zero values indicate that the mineral was included in the refinement, but the calculated concentration is below a measurable value.

Dashes indicate that the mineral was not identified by the analyst and not included in the refinement calculation for the sample.

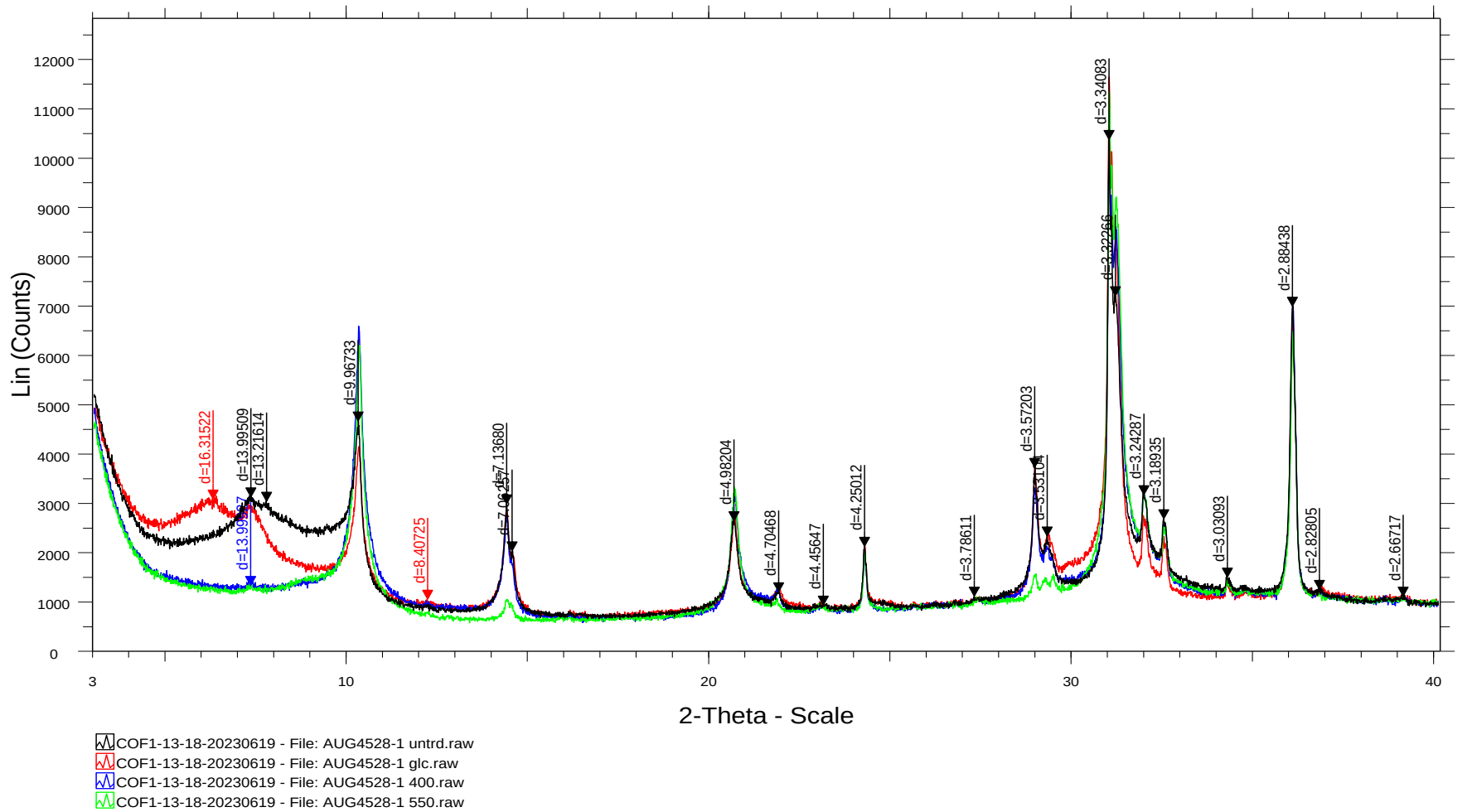
The weight percent quantities indicated have been normalized to a sum of 100%. The quantity of amorphous material has not been determined.

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	$KAl_4(Si,Al)_8O_{20}(OH)_4 \cdot 8H_2O$

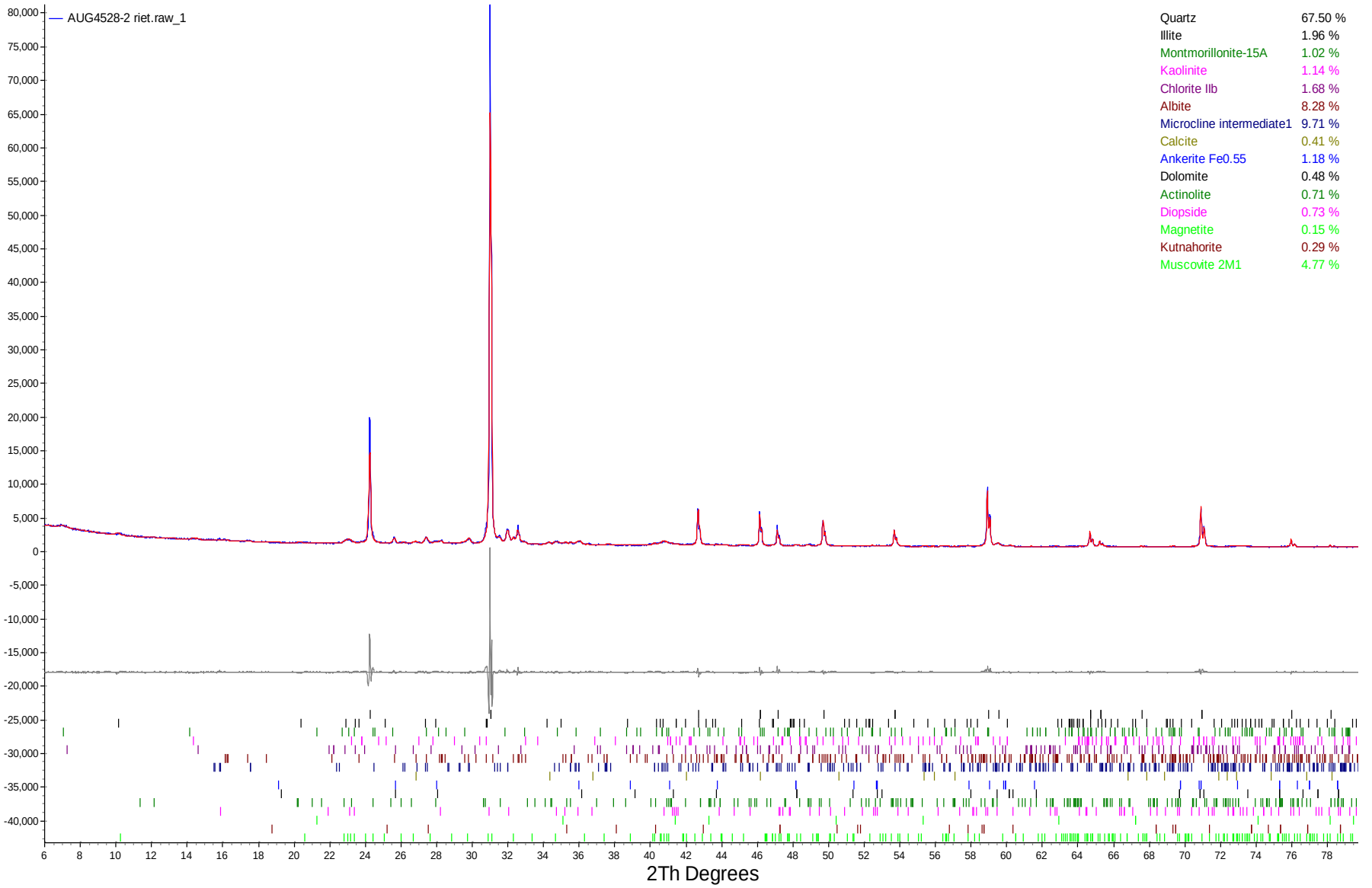
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COF1-13-18-20230619

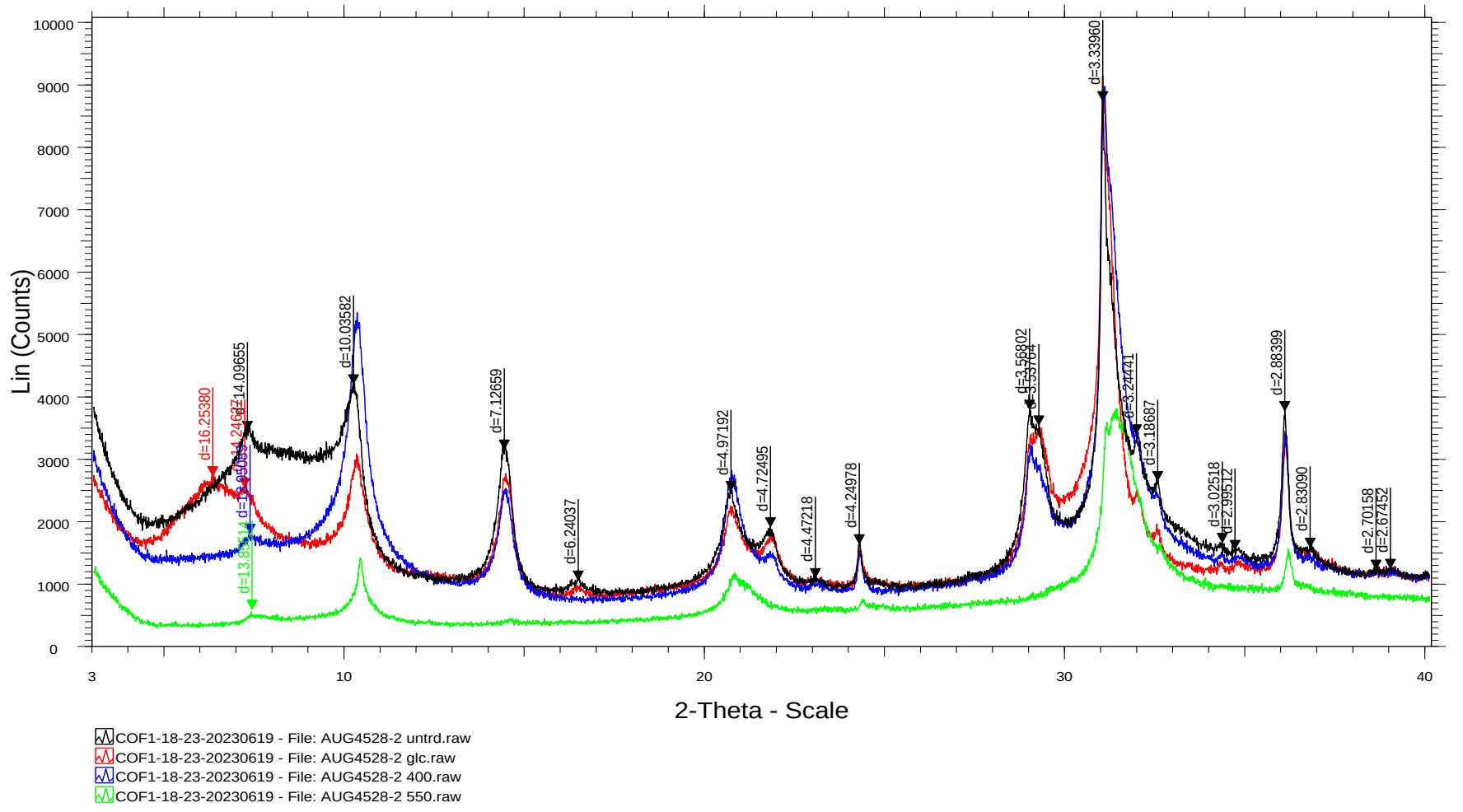


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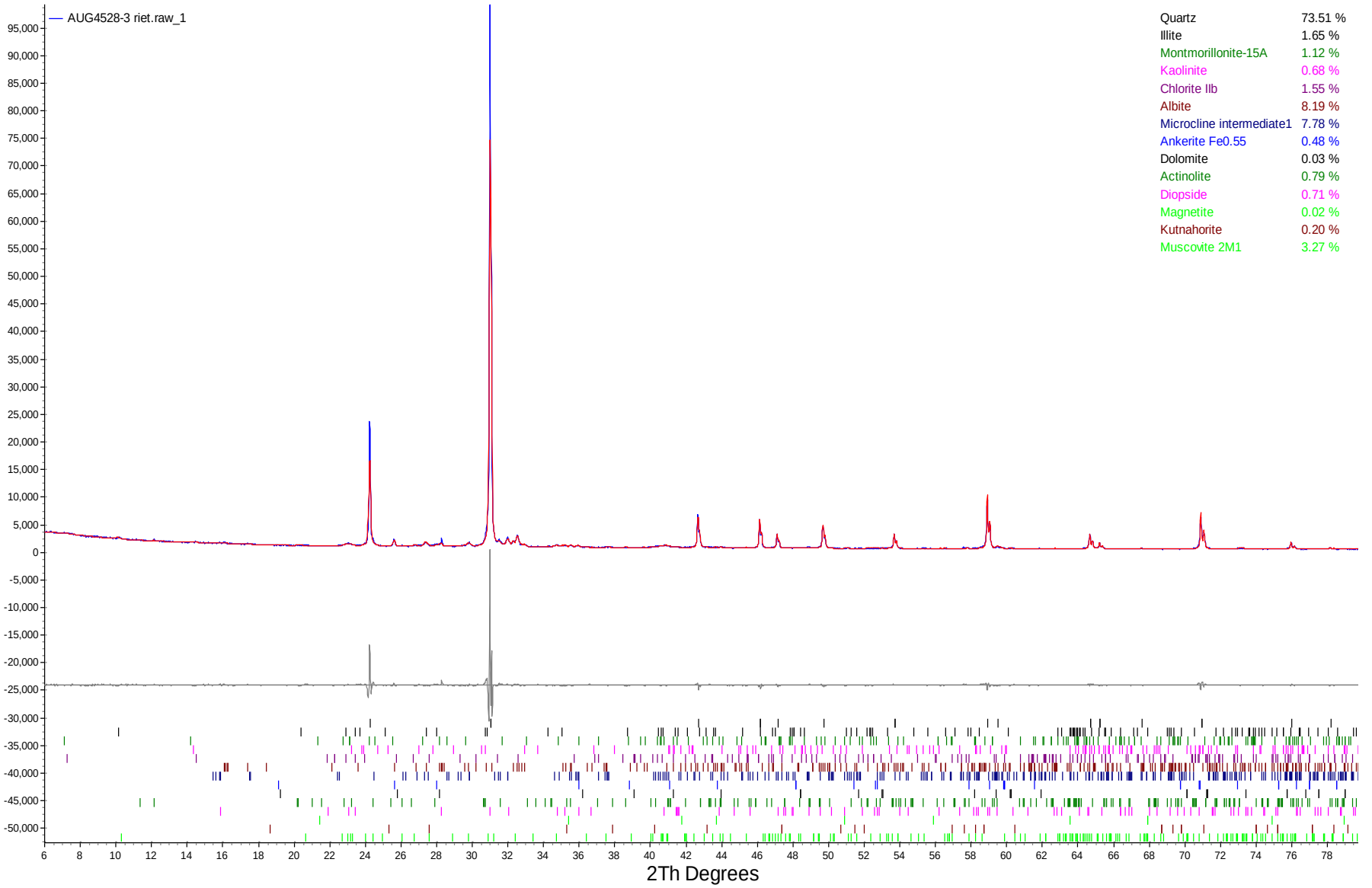


Quartz	67.50 %
Illite	1.96 %
Montmorillonite-15A	1.02 %
Kaolinite	1.14 %
Chlorite IIb	1.68 %
Albite	8.28 %
Microcline intermediate1	9.71 %
Calcite	0.41 %
Ankerite Fe0.55	1.18 %
Dolomite	0.48 %
Actinolite	0.71 %
Diopside	0.73 %
Magnetite	0.15 %
Kutnahorite	0.29 %
Muscovite 2M1	4.77 %

COF1-18-23-20230619

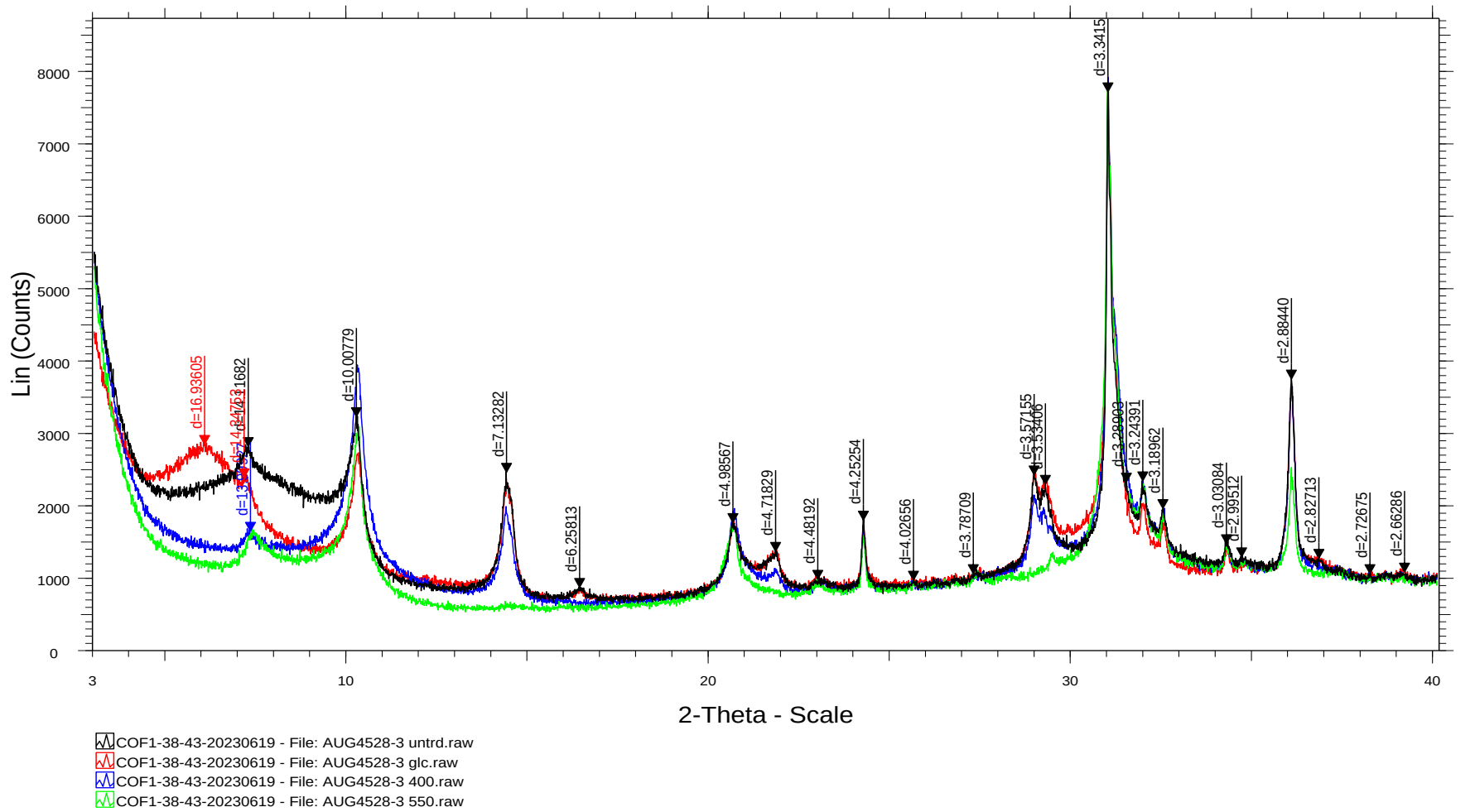


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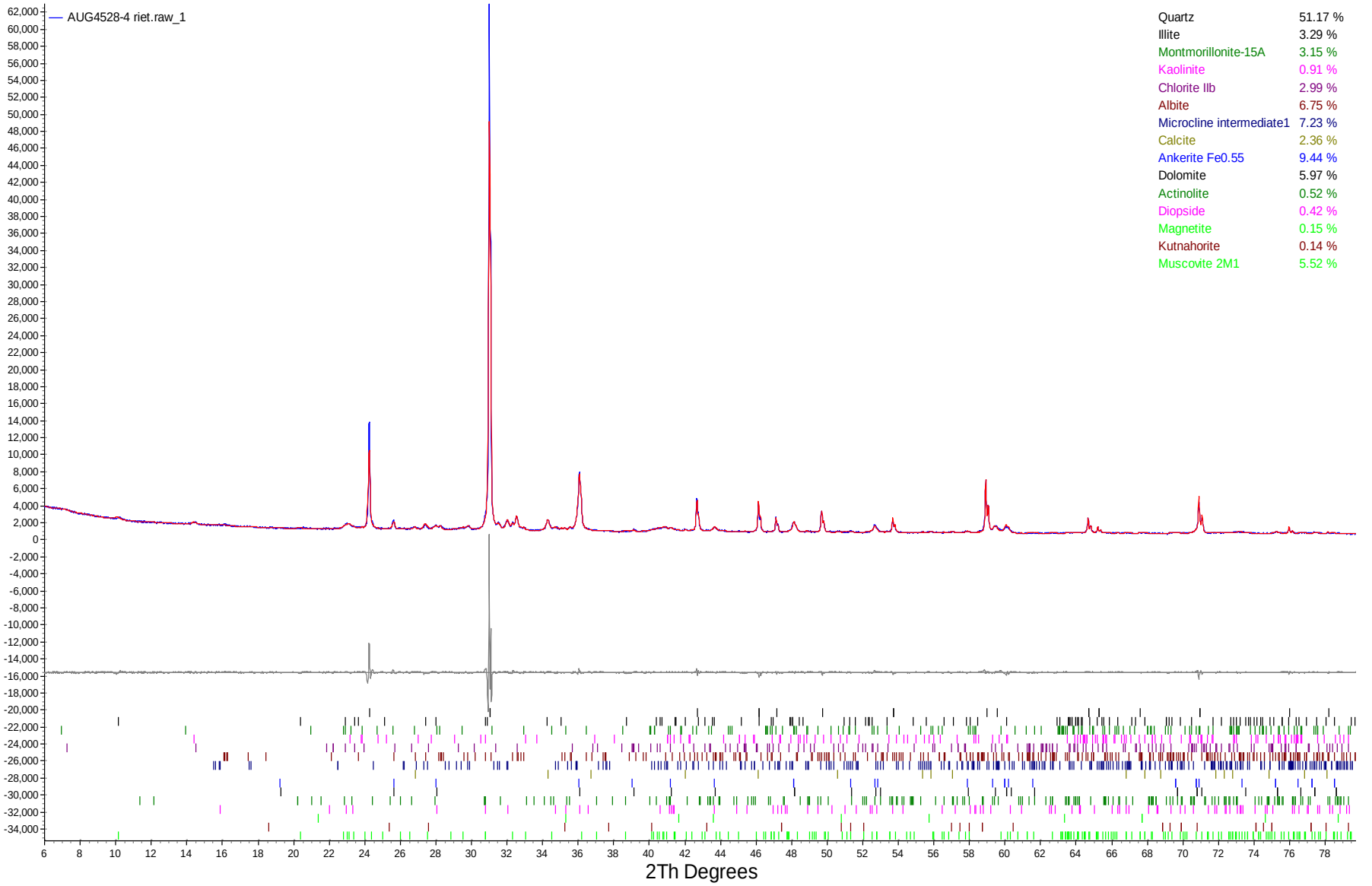


Quartz	73.51 %
Illite	1.65 %
Montmorillonite-15A	1.12 %
Kaolinite	0.68 %
Chlorite IIb	1.55 %
Albite	8.19 %
Microcline intermediate1	7.78 %
Ankerite Fe0.55	0.48 %
Dolomite	0.03 %
Actinolite	0.79 %
Diopside	0.71 %
Magnetite	0.02 %
Kutnahorite	0.20 %
Muscovite 2M1	3.27 %

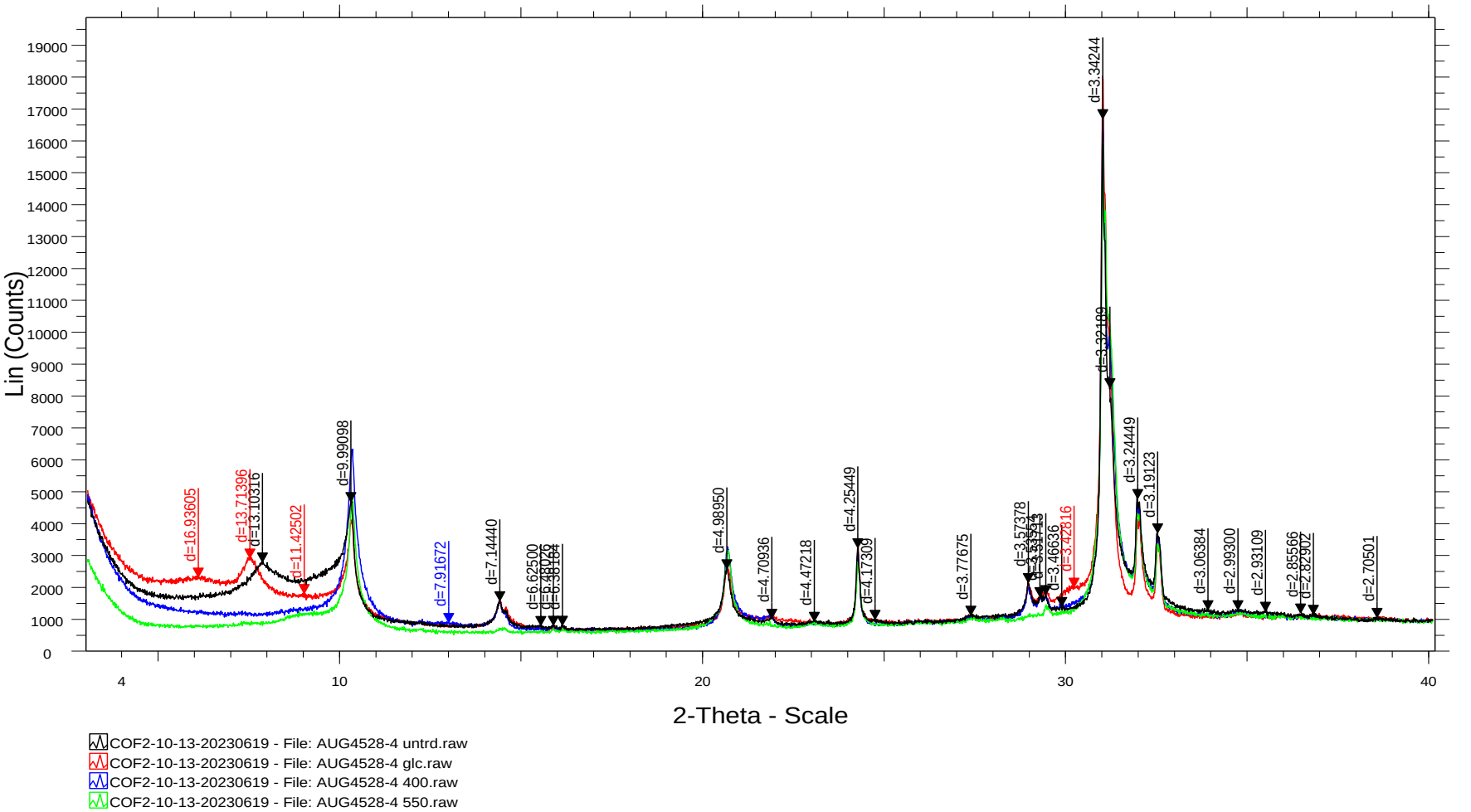
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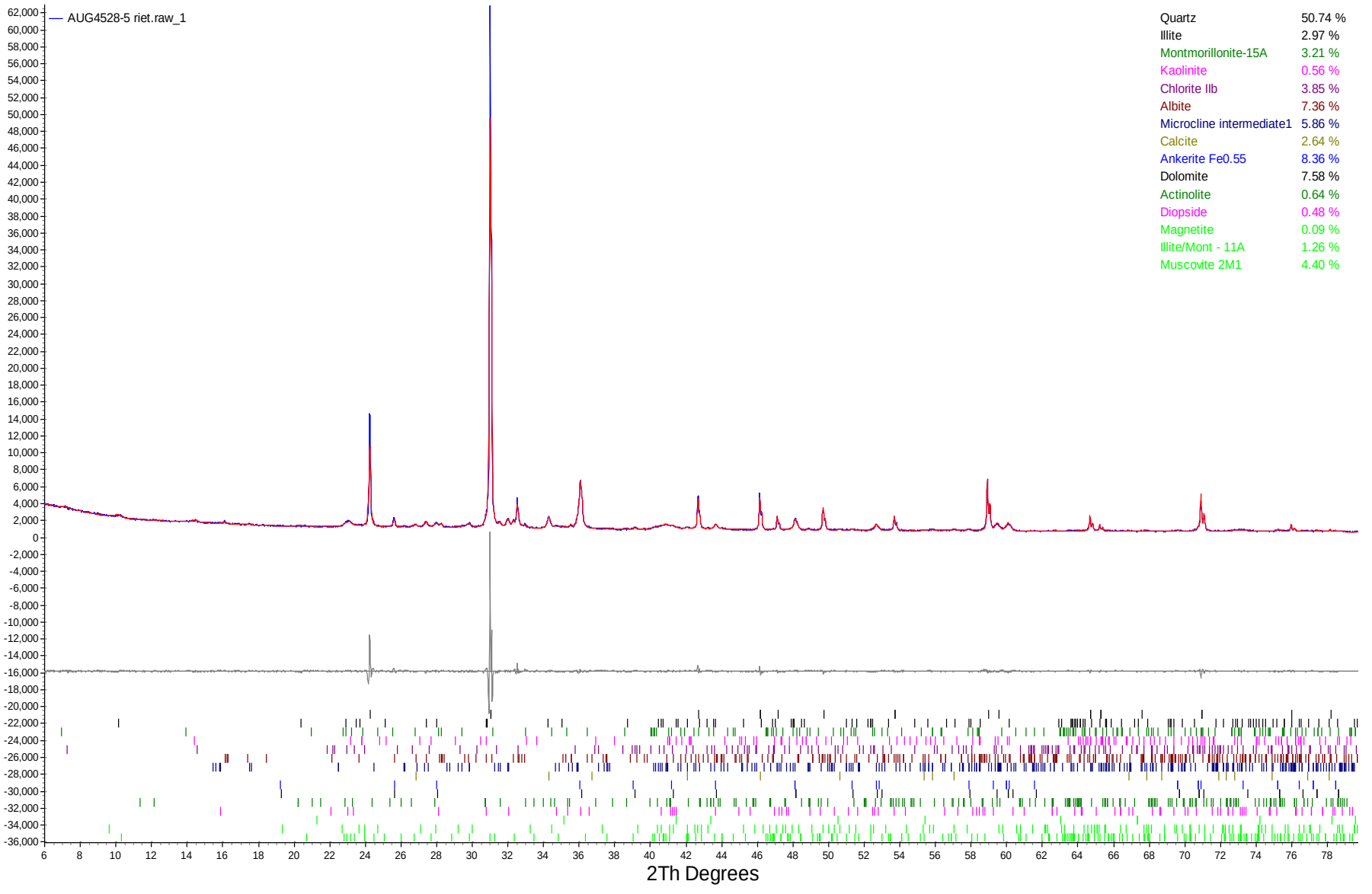
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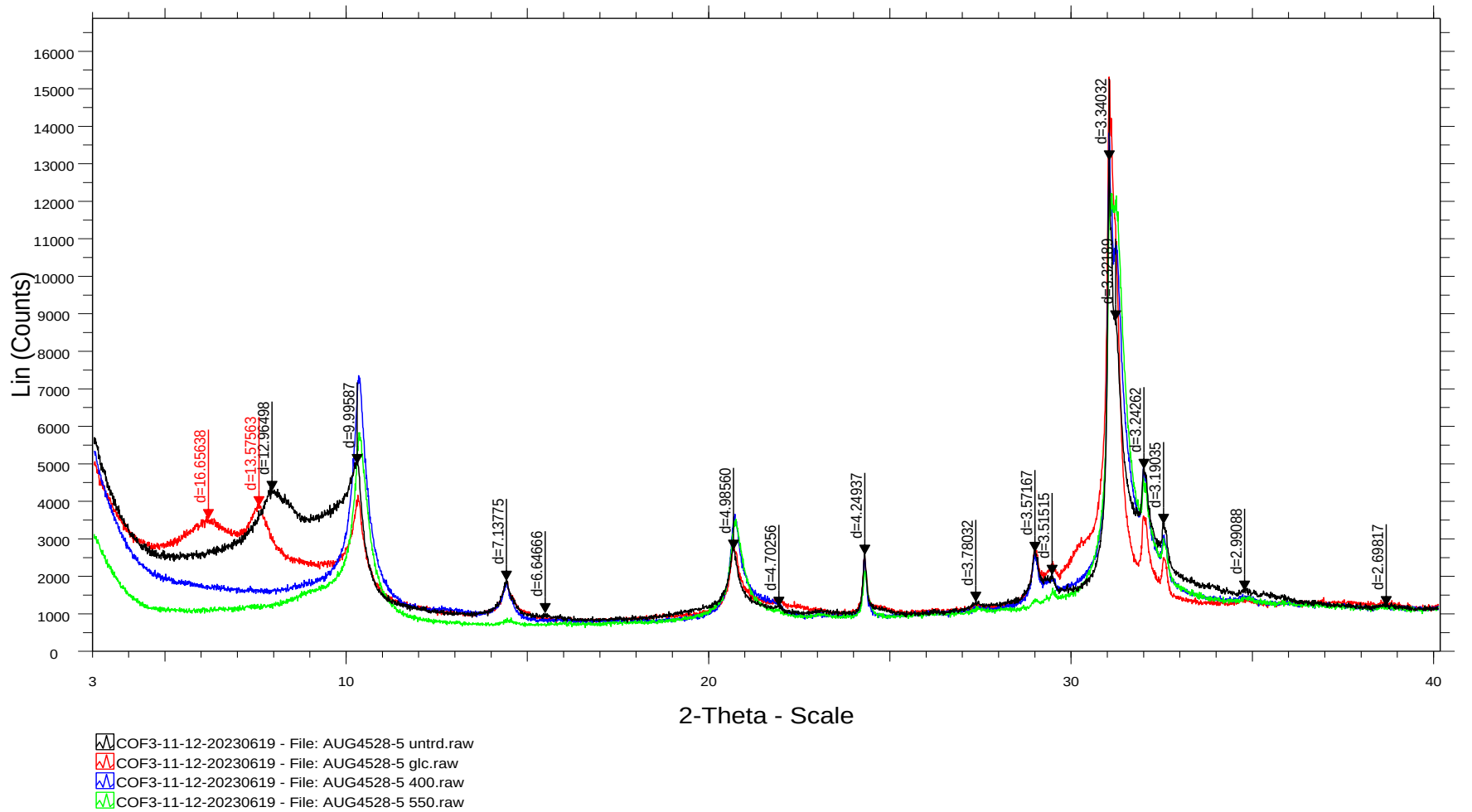
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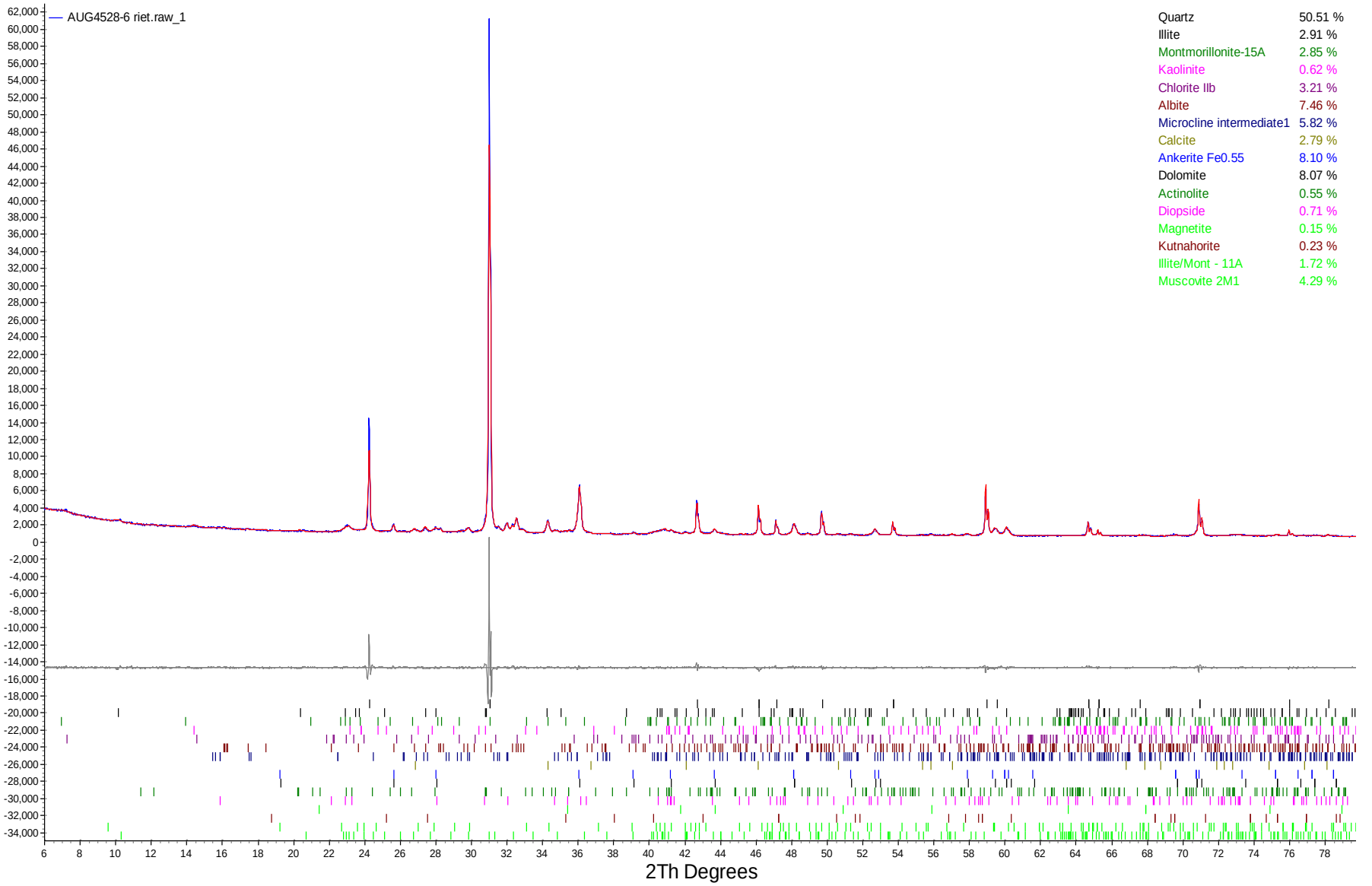
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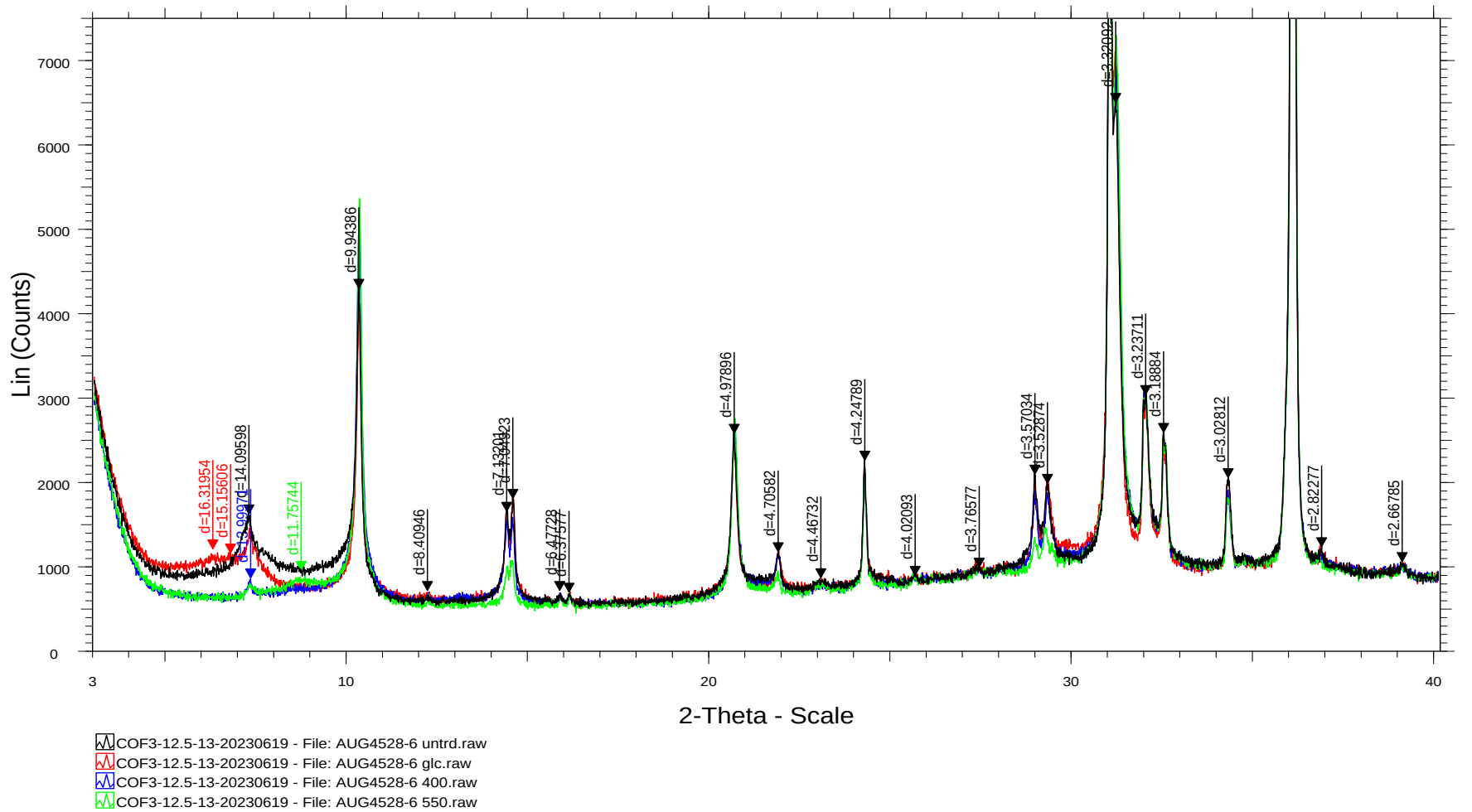
COF3-11-12-20230619



COF3-12.5-13-20230619



COF3-12.5-13-20230619



Attachment H
Site Evaluation Groundwater Data

Attachment H. Site Evaluation Groundwater Data
Geochemical Conceptual Site Model
Coffeen Ash Pond No. 2
Coffeen Power Plant
Coffeen, IL

HSU	Location	Well Type	Date	Parameter	Unit	Result
LCU	G1001	C	2023/02/15	pH (field)	SU	6.8
LCU	G1001	C	2023/06/07	pH (field)	SU	7.0
LCU	G1001	C	2023/11/14	pH (field)	SU	7.0
LCU	G1001	C	2023/02/15	Oxidation Reduction Potential	mV	159
LCU	G1001	C	2023/06/07	Oxidation Reduction Potential	mV	111
LCU	G1001	C	2023/11/14	Oxidation Reduction Potential	mV	<-300
LCU	G1001	C	2023/02/15	Eh	V	0.36
LCU	G1001	C	2023/06/07	Eh	V	0.30
LCU	G1001	C	2023/11/14	Eh	V	-0.11
LCU	G1001	C	2021/05/12	Alkalinity, bicarbonate	mg/L CaCO3	720
LCU	G1001	C	2023/02/15	Alkalinity, bicarbonate	mg/L CaCO3	620
LCU	G1001	C	2023/06/07	Alkalinity, bicarbonate	mg/L CaCO3	580
LCU	G1001	C	2023/11/14	Alkalinity, bicarbonate	mg/L CaCO3	605
LCU	G1001	C	2023/02/15	Barium, total	mg/L	0.200
LCU	G1001	C	2023/06/07	Barium, total	mg/L	0.0710
LCU	G1001	C	2023/11/14	Barium, total	mg/L	0.0917
LCU	G1001	C	2021/05/12	Boron, total	mg/L	1.40
LCU	G1001	C	2023/02/15	Boron, total	mg/L	0.720
LCU	G1001	C	2023/06/07	Boron, total	mg/L	0.950
LCU	G1001	C	2023/11/14	Boron, total	mg/L	1.10
LCU	G1001	C	2021/05/12	Calcium, total	mg/L	160
LCU	G1001	C	2023/02/15	Calcium, total	mg/L	430
LCU	G1001	C	2023/06/07	Calcium, total	mg/L	140
LCU	G1001	C	2023/11/14	Calcium, total	mg/L	131
LCU	G1001	C	2021/05/12	Chloride, total	mg/L	29.0
LCU	G1001	C	2023/02/15	Chloride, total	mg/L	36.0
LCU	G1001	C	2023/06/07	Chloride, total	mg/L	15.0
LCU	G1001	C	2023/11/14	Chloride, total	mg/L	16.0
LCU	G1001	C	2021/05/12	Cobalt, total	mg/L	0.000200
LCU	G1001	C	2023/02/15	Cobalt, total	mg/L	0.0490
LCU	G1001	C	2023/06/07	Cobalt, total	mg/L	<0.00048
LCU	G1001	C	2023/11/14	Cobalt, total	mg/L	0.00190
LCU	G1001	C	2023/06/07	Ferrous Iron, dissolved	mg/L	0.0450
LCU	G1001	C	2021/05/12	Iron, dissolved	mg/L	0.0170
LCU	G1001	C	2023/06/07	Iron, dissolved	mg/L	<0.00072
LCU	G1001	C	2021/05/12	Magnesium, total	mg/L	85.0
LCU	G1001	C	2023/02/15	Magnesium, total	mg/L	160
LCU	G1001	C	2023/06/07	Magnesium, total	mg/L	65.0
LCU	G1001	C	2023/11/14	Magnesium, total	mg/L	61.0
LCU	G1001	C	2021/05/12	Manganese, dissolved	mg/L	0.230
LCU	G1001	C	2023/06/07	Manganese, dissolved	mg/L	0.140
LCU	G1001	C	2021/05/12	Potassium, total	mg/L	6.70
LCU	G1001	C	2023/02/15	Potassium, total	mg/L	6.70
LCU	G1001	C	2023/06/07	Potassium, total	mg/L	2.50
LCU	G1001	C	2023/11/14	Potassium, total	mg/L	2.24
LCU	G1001	C	2023/06/07	Silicon, dissolved	mg/L	8.40
LCU	G1001	C	2021/05/12	Sodium, total	mg/L	34.0
LCU	G1001	C	2023/02/15	Sodium, total	mg/L	67.0
LCU	G1001	C	2023/06/07	Sodium, total	mg/L	94.0
LCU	G1001	C	2023/11/14	Sodium, total	mg/L	84.6
LCU	G1001	C	2021/05/12	Sulfate, total	mg/L	140
LCU	G1001	C	2023/02/15	Sulfate, total	mg/L	630
LCU	G1001	C	2023/06/07	Sulfate, total	mg/L	180
LCU	G1001	C	2023/11/14	Sulfate, total	mg/L	291
LCU	G1001	C	2023/02/15	Temperature (Celsius)	degrees C	10.2
LCU	G1001	C	2023/06/07	Temperature (Celsius)	degrees C	19.1

LCU	G1001	C	2023/11/14	Temperature (Celsius)	degrees C	16.7
LCU	G1001	C	2023/02/15	Total Dissolved Solids	mg/L	1,700
LCU	G1001	C	2023/06/07	Total Dissolved Solids	mg/L	830
LCU	G1001	C	2023/11/14	Total Dissolved Solids	mg/L	900
UA	G270	B	2015/01/20	pH (field)	SU	7.4
UA	G270	B	2015/04/13	pH (field)	SU	6.9
UA	G270	B	2015/07/22	pH (field)	SU	7.4
UA	G270	B	2015/10/05	pH (field)	SU	7.2
UA	G270	B	2015/11/20	pH (field)	SU	6.8
UA	G270	B	2016/02/10	pH (field)	SU	6.7
UA	G270	B	2016/05/12	pH (field)	SU	7.0
UA	G270	B	2016/08/01	pH (field)	SU	7.0
UA	G270	B	2016/11/16	pH (field)	SU	7.1
UA	G270	B	2017/02/10	pH (field)	SU	7.1
UA	G270	B	2017/05/16	pH (field)	SU	7.2
UA	G270	B	2017/07/12	pH (field)	SU	7.0
UA	G270	B	2017/10/25	pH (field)	SU	7.1
UA	G270	B	2018/05/11	pH (field)	SU	7.1
UA	G270	B	2018/08/03	pH (field)	SU	7.1
UA	G270	B	2019/01/21	pH (field)	SU	7.0
UA	G270	B	2019/08/15	pH (field)	SU	7.1
UA	G270	B	2020/01/24	pH (field)	SU	7.3
UA	G270	B	2020/08/12	pH (field)	SU	7.1
UA	G270	B	2020/10/14	pH (field)	SU	6.8
UA	G270	B	2021/01/21	pH (field)	SU	7.1
UA	G270	B	2021/03/30	pH (field)	SU	7.1
UA	G270	B	2021/04/21	pH (field)	SU	7.1
UA	G270	B	2021/05/06	pH (field)	SU	7.0
UA	G270	B	2021/05/19	pH (field)	SU	7.2
UA	G270	B	2021/06/15	pH (field)	SU	7.0
UA	G270	B	2021/06/29	pH (field)	SU	7.0
UA	G270	B	2021/07/12	pH (field)	SU	7.2
UA	G270	B	2021/07/27	pH (field)	SU	7.2
UA	G270	B	2021/08/18	pH (field)	SU	7.1
UA	G270	B	2021/10/26	pH (field)	SU	7.0
UA	G270	B	2022/02/08	pH (field)	SU	7.2
UA	G270	B	2022/05/10	pH (field)	SU	6.9
UA	G270	B	2022/08/24	pH (field)	SU	7.3
UA	G270	B	2022/11/08	pH (field)	SU	7.4
UA	G270	B	2023/02/16	pH (field)	SU	7.5
UA	G270	B	2023/06/08	pH (field)	SU	6.6
UA	G270	B	2023/08/14	pH (field)	SU	6.8
UA	G270	B	2023/11/17	pH (field)	SU	7.1
UA	G270	B	2015/11/20	Oxidation Reduction Potential	mV	-32.0
UA	G270	B	2016/02/10	Oxidation Reduction Potential	mV	180
UA	G270	B	2016/05/12	Oxidation Reduction Potential	mV	81.0
UA	G270	B	2016/08/01	Oxidation Reduction Potential	mV	72.0
UA	G270	B	2016/11/16	Oxidation Reduction Potential	mV	56.0
UA	G270	B	2017/02/10	Oxidation Reduction Potential	mV	56.0
UA	G270	B	2017/05/16	Oxidation Reduction Potential	mV	71.0
UA	G270	B	2017/07/12	Oxidation Reduction Potential	mV	63.0
UA	G270	B	2017/10/25	Oxidation Reduction Potential	mV	62.0
UA	G270	B	2018/05/11	Oxidation Reduction Potential	mV	58.0
UA	G270	B	2018/08/03	Oxidation Reduction Potential	mV	68.0
UA	G270	B	2019/01/21	Oxidation Reduction Potential	mV	75.0
UA	G270	B	2019/08/15	Oxidation Reduction Potential	mV	73.0
UA	G270	B	2020/01/24	Oxidation Reduction Potential	mV	151
UA	G270	B	2020/08/12	Oxidation Reduction Potential	mV	161
UA	G270	B	2020/10/14	Oxidation Reduction Potential	mV	168
UA	G270	B	2021/01/21	Oxidation Reduction Potential	mV	196
UA	G270	B	2021/03/30	Oxidation Reduction Potential	mV	118
UA	G270	B	2021/04/21	Oxidation Reduction Potential	mV	162
UA	G270	B	2021/05/19	Oxidation Reduction Potential	mV	67.5

UA	G270	B	2021/06/15	Oxidation Reduction Potential	mV	83.7
UA	G270	B	2021/06/29	Oxidation Reduction Potential	mV	50.0
UA	G270	B	2021/07/12	Oxidation Reduction Potential	mV	120
UA	G270	B	2021/07/27	Oxidation Reduction Potential	mV	89.3
UA	G270	B	2021/08/18	Oxidation Reduction Potential	mV	150
UA	G270	B	2021/10/26	Oxidation Reduction Potential	mV	7.60
UA	G270	B	2022/02/08	Oxidation Reduction Potential	mV	101
UA	G270	B	2022/05/10	Oxidation Reduction Potential	mV	36.3
UA	G270	B	2022/08/24	Oxidation Reduction Potential	mV	109
UA	G270	B	2022/11/08	Oxidation Reduction Potential	mV	29.2
UA	G270	B	2023/02/16	Oxidation Reduction Potential	mV	171
UA	G270	B	2023/06/08	Oxidation Reduction Potential	mV	61.0
UA	G270	B	2023/08/14	Oxidation Reduction Potential	mV	78.0
UA	G270	B	2023/11/17	Oxidation Reduction Potential	mV	98.0
UA	G270	B	2015/11/20	Eh	V	0.16
UA	G270	B	2016/02/10	Eh	V	0.38
UA	G270	B	2016/05/12	Eh	V	0.28
UA	G270	B	2016/08/01	Eh	V	0.27
UA	G270	B	2016/11/16	Eh	V	0.25
UA	G270	B	2017/02/10	Eh	V	0.25
UA	G270	B	2017/05/16	Eh	V	0.27
UA	G270	B	2017/07/12	Eh	V	0.26
UA	G270	B	2017/10/25	Eh	V	0.26
UA	G270	B	2018/05/11	Eh	V	0.25
UA	G270	B	2018/08/03	Eh	V	0.26
UA	G270	B	2019/01/21	Eh	V	0.27
UA	G270	B	2019/08/15	Eh	V	0.27
UA	G270	B	2020/01/24	Eh	V	0.35
UA	G270	B	2020/08/12	Eh	V	0.35
UA	G270	B	2020/10/14	Eh	V	0.36
UA	G270	B	2021/01/21	Eh	V	0.39
UA	G270	B	2021/03/30	Eh	V	0.32
UA	G270	B	2021/04/21	Eh	V	0.36
UA	G270	B	2021/05/19	Eh	V	0.26
UA	G270	B	2021/06/15	Eh	V	0.28
UA	G270	B	2021/06/29	Eh	V	0.24
UA	G270	B	2021/07/12	Eh	V	0.31
UA	G270	B	2021/07/27	Eh	V	0.28
UA	G270	B	2021/08/18	Eh	V	0.34
UA	G270	B	2022/02/08	Eh	V	0.30
UA	G270	B	2022/05/10	Eh	V	0.23
UA	G270	B	2022/08/24	Eh	V	0.30
UA	G270	B	2022/11/08	Eh	V	0.22
UA	G270	B	2023/02/16	Eh	V	0.37
UA	G270	B	2023/06/08	Eh	V	0.26
UA	G270	B	2023/08/14	Eh	V	0.27
UA	G270	B	2023/11/17	Eh	V	0.29
UA	G270	B	2015/01/20	Alkalinity, bicarbonate	mg/L CaCO3	300
UA	G270	B	2015/04/13	Alkalinity, bicarbonate	mg/L CaCO3	310
UA	G270	B	2016/11/16	Alkalinity, bicarbonate	mg/L CaCO3	300
UA	G270	B	2017/05/16	Alkalinity, bicarbonate	mg/L CaCO3	340
UA	G270	B	2017/07/12	Alkalinity, bicarbonate	mg/L CaCO3	350
UA	G270	B	2020/01/24	Alkalinity, bicarbonate	mg/L CaCO3	360
UA	G270	B	2020/08/12	Alkalinity, bicarbonate	mg/L CaCO3	360
UA	G270	B	2021/01/21	Alkalinity, bicarbonate	mg/L CaCO3	320
UA	G270	B	2021/03/30	Alkalinity, bicarbonate	mg/L CaCO3	320
UA	G270	B	2021/04/21	Alkalinity, bicarbonate	mg/L CaCO3	340
UA	G270	B	2021/05/06	Alkalinity, bicarbonate	mg/L CaCO3	340
UA	G270	B	2021/05/19	Alkalinity, bicarbonate	mg/L CaCO3	310
UA	G270	B	2021/06/15	Alkalinity, bicarbonate	mg/L CaCO3	310
UA	G270	B	2021/06/29	Alkalinity, bicarbonate	mg/L CaCO3	310
UA	G270	B	2021/07/12	Alkalinity, bicarbonate	mg/L CaCO3	340
UA	G270	B	2021/07/27	Alkalinity, bicarbonate	mg/L CaCO3	320

UA	G270	B	2021/08/18	Alkalinity, bicarbonate	mg/L CaCO3	340
UA	G270	B	2022/02/08	Alkalinity, bicarbonate	mg/L CaCO3	340
UA	G270	B	2022/08/24	Alkalinity, bicarbonate	mg/L CaCO3	340
UA	G270	B	2023/02/16	Alkalinity, bicarbonate	mg/L CaCO3	320
UA	G270	B	2023/06/08	Alkalinity, bicarbonate	mg/L CaCO3	350
UA	G270	B	2023/08/14	Alkalinity, bicarbonate	mg/L CaCO3	347
UA	G270	B	2023/11/17	Alkalinity, bicarbonate	mg/L CaCO3	325
UA	G270	B	2022/08/24	Alkalinity, carbonate	mg/L CaCO3	10.0
UA	G270	B	2015/04/13	Barium, total	mg/L	0.0500
UA	G270	B	2015/07/22	Barium, total	mg/L	0.0490
UA	G270	B	2015/10/05	Barium, total	mg/L	0.0370
UA	G270	B	2015/11/20	Barium, total	mg/L	0.0450
UA	G270	B	2016/02/10	Barium, total	mg/L	0.0320
UA	G270	B	2016/05/12	Barium, total	mg/L	0.0340
UA	G270	B	2016/08/01	Barium, total	mg/L	0.0370
UA	G270	B	2016/11/16	Barium, total	mg/L	0.0310
UA	G270	B	2017/02/10	Barium, total	mg/L	0.0360
UA	G270	B	2017/05/16	Barium, total	mg/L	0.0330
UA	G270	B	2017/07/12	Barium, total	mg/L	0.0350
UA	G270	B	2018/05/11	Barium, total	mg/L	0.0380
UA	G270	B	2018/08/03	Barium, total	mg/L	0.0360
UA	G270	B	2019/01/21	Barium, total	mg/L	0.0470
UA	G270	B	2019/08/15	Barium, total	mg/L	0.0400
UA	G270	B	2020/01/24	Barium, total	mg/L	0.0380
UA	G270	B	2020/08/12	Barium, total	mg/L	0.0420
UA	G270	B	2020/10/14	Barium, total	mg/L	0.0430
UA	G270	B	2021/01/21	Barium, total	mg/L	0.0390
UA	G270	B	2021/03/30	Barium, total	mg/L	0.0450
UA	G270	B	2021/04/21	Barium, total	mg/L	0.0360
UA	G270	B	2021/05/06	Barium, total	mg/L	0.0410
UA	G270	B	2021/05/19	Barium, total	mg/L	0.0340
UA	G270	B	2021/06/15	Barium, total	mg/L	0.0340
UA	G270	B	2021/06/29	Barium, total	mg/L	0.0330
UA	G270	B	2021/07/12	Barium, total	mg/L	0.0350
UA	G270	B	2021/07/27	Barium, total	mg/L	0.0330
UA	G270	B	2021/08/18	Barium, total	mg/L	0.0340
UA	G270	B	2021/10/26	Barium, total	mg/L	0.0330
UA	G270	B	2022/02/08	Barium, total	mg/L	0.0330
UA	G270	B	2022/05/10	Barium, total	mg/L	0.0370
UA	G270	B	2022/08/24	Barium, total	mg/L	0.0360
UA	G270	B	2022/11/08	Barium, total	mg/L	0.0380
UA	G270	B	2023/02/16	Barium, total	mg/L	0.0410
UA	G270	B	2023/06/08	Barium, total	mg/L	0.0640
UA	G270	B	2023/08/14	Barium, total	mg/L	0.0467
UA	G270	B	2023/11/17	Barium, total	mg/L	0.0649
UA	G270	B	2015/01/20	Boron, total	mg/L	<0.01
UA	G270	B	2015/04/13	Boron, total	mg/L	0.0470
UA	G270	B	2015/07/22	Boron, total	mg/L	<0.01
UA	G270	B	2015/10/05	Boron, total	mg/L	<0.01
UA	G270	B	2015/11/20	Boron, total	mg/L	<0.0023
UA	G270	B	2016/02/10	Boron, total	mg/L	<0.0023
UA	G270	B	2016/05/12	Boron, total	mg/L	<0.0023
UA	G270	B	2016/08/01	Boron, total	mg/L	<0.0023
UA	G270	B	2016/11/16	Boron, total	mg/L	0.0180
UA	G270	B	2017/02/10	Boron, total	mg/L	<0.0023
UA	G270	B	2017/05/16	Boron, total	mg/L	<0.0023
UA	G270	B	2017/07/12	Boron, total	mg/L	<0.0023
UA	G270	B	2017/10/25	Boron, total	mg/L	0.0110
UA	G270	B	2018/05/11	Boron, total	mg/L	<0.0079
UA	G270	B	2018/08/03	Boron, total	mg/L	<0.0034
UA	G270	B	2019/01/21	Boron, total	mg/L	<0.0034
UA	G270	B	2019/08/15	Boron, total	mg/L	<0.0034
UA	G270	B	2020/01/24	Boron, total	mg/L	0.0150

UA	G270	B	2020/08/12	Boron, total	mg/L	0.100
UA	G270	B	2020/10/14	Boron, total	mg/L	0.0180
UA	G270	B	2021/01/21	Boron, total	mg/L	<0.008
UA	G270	B	2021/03/30	Boron, total	mg/L	0.0200
UA	G270	B	2021/04/21	Boron, total	mg/L	<0.01
UA	G270	B	2021/05/06	Boron, total	mg/L	0.0130
UA	G270	B	2021/05/19	Boron, total	mg/L	<0.008
UA	G270	B	2021/06/15	Boron, total	mg/L	0.0110
UA	G270	B	2021/06/29	Boron, total	mg/L	<0.008
UA	G270	B	2021/07/12	Boron, total	mg/L	0.120
UA	G270	B	2021/07/27	Boron, total	mg/L	<0.008
UA	G270	B	2021/08/18	Boron, total	mg/L	0.0120
UA	G270	B	2021/10/26	Boron, total	mg/L	<0.01
UA	G270	B	2022/02/08	Boron, total	mg/L	0.0120
UA	G270	B	2022/05/10	Boron, total	mg/L	<0.0071
UA	G270	B	2022/08/24	Boron, total	mg/L	<0.0071
UA	G270	B	2022/11/08	Boron, total	mg/L	0.00900
UA	G270	B	2023/02/16	Boron, total	mg/L	<0.0071
UA	G270	B	2023/06/08	Boron, total	mg/L	0.0140
UA	G270	B	2023/08/14	Boron, total	mg/L	<0.0092
UA	G270	B	2023/11/17	Boron, total	mg/L	<0.0125
UA	G270	B	2015/01/20	Calcium, total	mg/L	70.0
UA	G270	B	2015/04/13	Calcium, total	mg/L	70.0
UA	G270	B	2015/11/20	Calcium, total	mg/L	59.0
UA	G270	B	2016/02/10	Calcium, total	mg/L	49.0
UA	G270	B	2016/05/12	Calcium, total	mg/L	57.0
UA	G270	B	2016/08/01	Calcium, total	mg/L	50.0
UA	G270	B	2016/11/16	Calcium, total	mg/L	48.0
UA	G270	B	2017/02/10	Calcium, total	mg/L	53.0
UA	G270	B	2017/05/16	Calcium, total	mg/L	54.0
UA	G270	B	2017/07/12	Calcium, total	mg/L	52.0
UA	G270	B	2017/10/25	Calcium, total	mg/L	56.0
UA	G270	B	2018/05/11	Calcium, total	mg/L	53.0
UA	G270	B	2018/08/03	Calcium, total	mg/L	57.0
UA	G270	B	2019/01/21	Calcium, total	mg/L	56.0
UA	G270	B	2019/08/15	Calcium, total	mg/L	54.0
UA	G270	B	2020/01/24	Calcium, total	mg/L	59.0
UA	G270	B	2020/08/12	Calcium, total	mg/L	58.0
UA	G270	B	2020/10/14	Calcium, total	mg/L	61.0
UA	G270	B	2021/01/21	Calcium, total	mg/L	59.0
UA	G270	B	2021/03/30	Calcium, total	mg/L	58.0
UA	G270	B	2021/04/21	Calcium, total	mg/L	55.0
UA	G270	B	2021/05/06	Calcium, total	mg/L	57.0
UA	G270	B	2021/05/19	Calcium, total	mg/L	53.0
UA	G270	B	2021/06/15	Calcium, total	mg/L	60.0
UA	G270	B	2021/06/29	Calcium, total	mg/L	56.0
UA	G270	B	2021/07/12	Calcium, total	mg/L	55.0
UA	G270	B	2021/07/27	Calcium, total	mg/L	52.0
UA	G270	B	2021/08/18	Calcium, total	mg/L	55.0
UA	G270	B	2021/10/26	Calcium, total	mg/L	49.0
UA	G270	B	2022/02/08	Calcium, total	mg/L	53.0
UA	G270	B	2022/05/10	Calcium, total	mg/L	59.0
UA	G270	B	2022/08/24	Calcium, total	mg/L	56.0
UA	G270	B	2022/11/08	Calcium, total	mg/L	57.0
UA	G270	B	2023/02/16	Calcium, total	mg/L	56.0
UA	G270	B	2023/06/08	Calcium, total	mg/L	57.0
UA	G270	B	2023/08/14	Calcium, total	mg/L	57.9
UA	G270	B	2023/11/17	Calcium, total	mg/L	58.1
UA	G270	B	2015/01/20	Chloride, total	mg/L	18.0
UA	G270	B	2015/04/13	Chloride, total	mg/L	20.0
UA	G270	B	2015/07/22	Chloride, total	mg/L	15.0
UA	G270	B	2015/10/05	Chloride, total	mg/L	11.0
UA	G270	B	2015/11/20	Chloride, total	mg/L	12.0

UA	G270	B	2016/02/10	Chloride, total	mg/L	16.0
UA	G270	B	2016/05/12	Chloride, total	mg/L	12.0
UA	G270	B	2016/08/01	Chloride, total	mg/L	15.0
UA	G270	B	2016/11/16	Chloride, total	mg/L	12.0
UA	G270	B	2017/02/10	Chloride, total	mg/L	11.0
UA	G270	B	2017/05/16	Chloride, total	mg/L	9.70
UA	G270	B	2017/07/12	Chloride, total	mg/L	12.0
UA	G270	B	2017/10/25	Chloride, total	mg/L	13.0
UA	G270	B	2018/05/11	Chloride, total	mg/L	7.90
UA	G270	B	2018/08/03	Chloride, total	mg/L	8.60
UA	G270	B	2019/01/21	Chloride, total	mg/L	9.60
UA	G270	B	2019/08/15	Chloride, total	mg/L	9.80
UA	G270	B	2020/01/24	Chloride, total	mg/L	10.0
UA	G270	B	2020/08/12	Chloride, total	mg/L	12.0
UA	G270	B	2020/10/14	Chloride, total	mg/L	12.0
UA	G270	B	2021/01/21	Chloride, total	mg/L	10.0
UA	G270	B	2021/03/30	Chloride, total	mg/L	14.0
UA	G270	B	2021/04/21	Chloride, total	mg/L	16.0
UA	G270	B	2021/05/06	Chloride, total	mg/L	11.0
UA	G270	B	2021/05/19	Chloride, total	mg/L	10.0
UA	G270	B	2021/06/15	Chloride, total	mg/L	12.0
UA	G270	B	2021/06/29	Chloride, total	mg/L	12.0
UA	G270	B	2021/07/12	Chloride, total	mg/L	11.0
UA	G270	B	2021/07/27	Chloride, total	mg/L	12.0
UA	G270	B	2021/08/18	Chloride, total	mg/L	12.0
UA	G270	B	2021/10/26	Chloride, total	mg/L	9.90
UA	G270	B	2022/02/08	Chloride, total	mg/L	8.70
UA	G270	B	2022/05/10	Chloride, total	mg/L	9.30
UA	G270	B	2022/08/24	Chloride, total	mg/L	9.70
UA	G270	B	2022/11/08	Chloride, total	mg/L	9.00
UA	G270	B	2023/02/16	Chloride, total	mg/L	7.80
UA	G270	B	2023/06/08	Chloride, total	mg/L	8.30
UA	G270	B	2023/08/14	Chloride, total	mg/L	13.0
UA	G270	B	2023/11/17	Chloride, total	mg/L	15.0
UA	G270	B	2015/04/13	Cobalt, total	mg/L	<0.002
UA	G270	B	2015/07/22	Cobalt, total	mg/L	<0.002
UA	G270	B	2015/10/05	Cobalt, total	mg/L	<0.002
UA	G270	B	2015/11/20	Cobalt, total	mg/L	<0.000017
UA	G270	B	2016/02/10	Cobalt, total	mg/L	<0.000017
UA	G270	B	2016/05/12	Cobalt, total	mg/L	<0.000017
UA	G270	B	2016/08/01	Cobalt, total	mg/L	<0.000017
UA	G270	B	2016/11/16	Cobalt, total	mg/L	<0.000017
UA	G270	B	2017/02/10	Cobalt, total	mg/L	<0.000017
UA	G270	B	2017/05/16	Cobalt, total	mg/L	<0.000017
UA	G270	B	2017/07/12	Cobalt, total	mg/L	<0.000017
UA	G270	B	2018/05/11	Cobalt, total	mg/L	<0.00086
UA	G270	B	2018/08/03	Cobalt, total	mg/L	<0.00067
UA	G270	B	2019/01/21	Cobalt, total	mg/L	<0.00067
UA	G270	B	2019/08/15	Cobalt, total	mg/L	<0.00067
UA	G270	B	2020/01/24	Cobalt, total	mg/L	<0.00067
UA	G270	B	2020/08/12	Cobalt, total	mg/L	<0.00022
UA	G270	B	2020/10/14	Cobalt, total	mg/L	<0.002
UA	G270	B	2021/01/21	Cobalt, total	mg/L	<0.00022
UA	G270	B	2021/03/30	Cobalt, total	mg/L	<0.00022
UA	G270	B	2021/04/21	Cobalt, total	mg/L	<0.00022
UA	G270	B	2021/05/06	Cobalt, total	mg/L	<0.00022
UA	G270	B	2021/05/19	Cobalt, total	mg/L	<0.00022
UA	G270	B	2021/06/15	Cobalt, total	mg/L	<0.00022
UA	G270	B	2021/06/29	Cobalt, total	mg/L	<0.00022
UA	G270	B	2021/07/12	Cobalt, total	mg/L	<0.00022
UA	G270	B	2021/07/27	Cobalt, total	mg/L	<0.00022
UA	G270	B	2021/08/18	Cobalt, total	mg/L	<0.00022
UA	G270	B	2021/10/26	Cobalt, total	mg/L	<0.002

UA	G270	B	2022/02/08	Cobalt, total	mg/L	<0.00048
UA	G270	B	2022/05/10	Cobalt, total	mg/L	<0.00048
UA	G270	B	2022/08/24	Cobalt, total	mg/L	<0.00048
UA	G270	B	2022/11/08	Cobalt, total	mg/L	<0.00048
UA	G270	B	2023/02/16	Cobalt, total	mg/L	<0.00048
UA	G270	B	2023/06/08	Cobalt, total	mg/L	0.000640
UA	G270	B	2023/08/14	Cobalt, total	mg/L	0.000300
UA	G270	B	2023/11/17	Cobalt, total	mg/L	0.000200
UA	G270	B	2023/06/08	Ferrous Iron, dissolved	mg/L	0.260
UA	G270	B	2015/01/20	Iron, dissolved	mg/L	<0.01
UA	G270	B	2015/04/13	Iron, dissolved	mg/L	0.0210
UA	G270	B	2015/07/22	Iron, dissolved	mg/L	0.180
UA	G270	B	2015/10/05	Iron, dissolved	mg/L	0.0840
UA	G270	B	2016/02/10	Iron, dissolved	mg/L	0.0180
UA	G270	B	2016/05/12	Iron, dissolved	mg/L	<0.01
UA	G270	B	2016/07/27	Iron, dissolved	mg/L	0.0180
UA	G270	B	2016/11/21	Iron, dissolved	mg/L	<0.01
UA	G270	B	2017/02/08	Iron, dissolved	mg/L	<0.01
UA	G270	B	2017/05/18	Iron, dissolved	mg/L	0.0110
UA	G270	B	2017/07/12	Iron, dissolved	mg/L	0.0760
UA	G270	B	2017/10/25	Iron, dissolved	mg/L	<0.01
UA	G270	B	2018/01/29	Iron, dissolved	mg/L	0.280
UA	G270	B	2018/05/11	Iron, dissolved	mg/L	0.0120
UA	G270	B	2018/08/10	Iron, dissolved	mg/L	0.0570
UA	G270	B	2018/11/06	Iron, dissolved	mg/L	<0.01
UA	G270	B	2019/01/21	Iron, dissolved	mg/L	0.0460
UA	G270	B	2019/05/01	Iron, dissolved	mg/L	<0.01
UA	G270	B	2019/08/15	Iron, dissolved	mg/L	<0.01
UA	G270	B	2019/10/21	Iron, dissolved	mg/L	0.0430
UA	G270	B	2020/01/24	Iron, dissolved	mg/L	<0.01
UA	G270	B	2020/05/07	Iron, dissolved	mg/L	<0.01
UA	G270	B	2020/08/11	Iron, dissolved	mg/L	<0.01
UA	G270	B	2020/10/14	Iron, dissolved	mg/L	<0.01
UA	G270	B	2021/01/21	Iron, dissolved	mg/L	<0.01
UA	G270	B	2021/04/21	Iron, dissolved	mg/L	<0.01
UA	G270	B	2021/08/18	Iron, dissolved	mg/L	<0.01
UA	G270	B	2021/10/26	Iron, dissolved	mg/L	<0.01
UA	G270	B	2022/02/08	Iron, dissolved	mg/L	<0.01
UA	G270	B	2022/05/10	Iron, dissolved	mg/L	0.160
UA	G270	B	2022/08/24	Iron, dissolved	mg/L	<0.00072
UA	G270	B	2022/11/08	Iron, dissolved	mg/L	0.00360
UA	G270	B	2023/02/16	Iron, dissolved	mg/L	<0.00072
UA	G270	B	2023/06/08	Iron, dissolved	mg/L	0.0440
UA	G270	B	2023/08/14	Iron, dissolved	mg/L	0.0190
UA	G270	B	2023/11/17	Iron, dissolved	mg/L	<0.0115
UA	G270	B	2015/04/13	Magnesium, total	mg/L	32.0
UA	G270	B	2016/11/16	Magnesium, total	mg/L	22.0
UA	G270	B	2017/05/16	Magnesium, total	mg/L	27.0
UA	G270	B	2017/07/12	Magnesium, total	mg/L	24.0
UA	G270	B	2020/01/24	Magnesium, total	mg/L	26.0
UA	G270	B	2020/08/12	Magnesium, total	mg/L	25.0
UA	G270	B	2021/01/21	Magnesium, total	mg/L	24.0
UA	G270	B	2021/03/30	Magnesium, total	mg/L	26.0
UA	G270	B	2021/04/21	Magnesium, total	mg/L	26.0
UA	G270	B	2021/05/06	Magnesium, total	mg/L	25.0
UA	G270	B	2021/05/19	Magnesium, total	mg/L	24.0
UA	G270	B	2021/06/15	Magnesium, total	mg/L	25.0
UA	G270	B	2021/06/29	Magnesium, total	mg/L	25.0
UA	G270	B	2021/07/12	Magnesium, total	mg/L	25.0
UA	G270	B	2021/07/27	Magnesium, total	mg/L	24.0
UA	G270	B	2021/08/18	Magnesium, total	mg/L	24.0
UA	G270	B	2022/02/08	Magnesium, total	mg/L	22.0
UA	G270	B	2022/08/24	Magnesium, total	mg/L	25.0

UA	G270	B	2023/02/16	Magnesium, total	mg/L	21.0
UA	G270	B	2023/06/08	Magnesium, total	mg/L	24.0
UA	G270	B	2023/08/14	Magnesium, total	mg/L	23.4
UA	G270	B	2023/11/17	Magnesium, total	mg/L	24.1
UA	G270	B	2015/01/20	Manganese, dissolved	mg/L	0.0110
UA	G270	B	2015/04/13	Manganese, dissolved	mg/L	0.00550
UA	G270	B	2015/07/22	Manganese, dissolved	mg/L	0.470
UA	G270	B	2015/10/05	Manganese, dissolved	mg/L	0.0560
UA	G270	B	2016/02/10	Manganese, dissolved	mg/L	0.0120
UA	G270	B	2016/05/12	Manganese, dissolved	mg/L	0.0290
UA	G270	B	2016/07/27	Manganese, dissolved	mg/L	0.00320
UA	G270	B	2016/11/21	Manganese, dissolved	mg/L	0.0260
UA	G270	B	2017/02/08	Manganese, dissolved	mg/L	0.00110
UA	G270	B	2017/05/18	Manganese, dissolved	mg/L	0.0250
UA	G270	B	2017/07/12	Manganese, dissolved	mg/L	0.400
UA	G270	B	2017/10/25	Manganese, dissolved	mg/L	0.00870
UA	G270	B	2018/01/29	Manganese, dissolved	mg/L	0.0770
UA	G270	B	2018/03/05	Manganese, dissolved	mg/L	0.00240
UA	G270	B	2019/05/01	Manganese, dissolved	mg/L	<0.001
UA	G270	B	2019/08/15	Manganese, dissolved	mg/L	0.00220
UA	G270	B	2020/01/24	Manganese, dissolved	mg/L	<0.001
UA	G270	B	2020/10/14	Manganese, dissolved	mg/L	0.0540
UA	G270	B	2021/01/21	Manganese, dissolved	mg/L	0.00340
UA	G270	B	2021/04/21	Manganese, dissolved	mg/L	<0.001
UA	G270	B	2021/08/18	Manganese, dissolved	mg/L	0.0100
UA	G270	B	2021/10/26	Manganese, dissolved	mg/L	0.0240
UA	G270	B	2022/02/08	Manganese, dissolved	mg/L	<0.001
UA	G270	B	2022/05/10	Manganese, dissolved	mg/L	0.00210
UA	G270	B	2022/08/24	Manganese, dissolved	mg/L	0.00130
UA	G270	B	2022/11/08	Manganese, dissolved	mg/L	0.0150
UA	G270	B	2023/02/16	Manganese, dissolved	mg/L	0.00430
UA	G270	B	2023/06/08	Manganese, dissolved	mg/L	0.0790
UA	G270	B	2023/08/14	Manganese, dissolved	mg/L	0.157
UA	G270	B	2023/11/17	Manganese, dissolved	mg/L	0.0675
UA	G270	B	2023/08/14	Phosphate, dissolved	mg/L	0.0210
UA	G270	B	2015/04/13	Potassium, total	mg/L	0.790
UA	G270	B	2016/11/16	Potassium, total	mg/L	0.720
UA	G270	B	2017/05/16	Potassium, total	mg/L	0.720
UA	G270	B	2017/07/12	Potassium, total	mg/L	0.800
UA	G270	B	2020/01/24	Potassium, total	mg/L	0.880
UA	G270	B	2020/08/12	Potassium, total	mg/L	0.570
UA	G270	B	2021/01/21	Potassium, total	mg/L	1.20
UA	G270	B	2021/03/30	Potassium, total	mg/L	1.00
UA	G270	B	2021/04/21	Potassium, total	mg/L	0.860
UA	G270	B	2021/05/06	Potassium, total	mg/L	0.840
UA	G270	B	2021/05/19	Potassium, total	mg/L	0.500
UA	G270	B	2021/06/15	Potassium, total	mg/L	0.630
UA	G270	B	2021/06/29	Potassium, total	mg/L	0.580
UA	G270	B	2021/07/12	Potassium, total	mg/L	0.630
UA	G270	B	2021/07/27	Potassium, total	mg/L	0.590
UA	G270	B	2021/08/18	Potassium, total	mg/L	0.690
UA	G270	B	2022/02/08	Potassium, total	mg/L	0.580
UA	G270	B	2022/08/24	Potassium, total	mg/L	0.620
UA	G270	B	2023/02/16	Potassium, total	mg/L	0.620
UA	G270	B	2023/06/08	Potassium, total	mg/L	0.670
UA	G270	B	2023/08/14	Potassium, total	mg/L	0.757
UA	G270	B	2023/11/17	Potassium, total	mg/L	0.749
UA	G270	B	2023/06/08	Silicon, dissolved	mg/L	7.40
UA	G270	B	2023/08/14	Silicon, dissolved	mg/L	6.48
UA	G270	B	2015/04/13	Sodium, total	mg/L	91.0
UA	G270	B	2016/11/16	Sodium, total	mg/L	77.0
UA	G270	B	2017/05/16	Sodium, total	mg/L	88.0
UA	G270	B	2017/07/12	Sodium, total	mg/L	78.0

UA	G270	B	2020/01/24	Sodium, total	mg/L	82.0
UA	G270	B	2020/08/12	Sodium, total	mg/L	78.0
UA	G270	B	2021/01/21	Sodium, total	mg/L	87.0
UA	G270	B	2021/03/30	Sodium, total	mg/L	81.0
UA	G270	B	2021/04/21	Sodium, total	mg/L	84.0
UA	G270	B	2021/05/06	Sodium, total	mg/L	88.0
UA	G270	B	2021/05/19	Sodium, total	mg/L	87.0
UA	G270	B	2021/06/15	Sodium, total	mg/L	92.0
UA	G270	B	2021/06/29	Sodium, total	mg/L	85.0
UA	G270	B	2021/07/12	Sodium, total	mg/L	79.0
UA	G270	B	2021/07/27	Sodium, total	mg/L	89.0
UA	G270	B	2021/08/18	Sodium, total	mg/L	100
UA	G270	B	2022/02/08	Sodium, total	mg/L	89.0
UA	G270	B	2022/08/24	Sodium, total	mg/L	98.0
UA	G270	B	2023/02/16	Sodium, total	mg/L	81.0
UA	G270	B	2023/06/08	Sodium, total	mg/L	82.0
UA	G270	B	2023/08/14	Sodium, total	mg/L	80.3
UA	G270	B	2023/11/17	Sodium, total	mg/L	67.1
UA	G270	B	2015/01/20	Sulfate, total	mg/L	140
UA	G270	B	2015/04/13	Sulfate, total	mg/L	120
UA	G270	B	2015/07/22	Sulfate, total	mg/L	110
UA	G270	B	2015/10/05	Sulfate, total	mg/L	82.0
UA	G270	B	2015/11/20	Sulfate, total	mg/L	89.0
UA	G270	B	2016/02/10	Sulfate, total	mg/L	77.0
UA	G270	B	2016/05/12	Sulfate, total	mg/L	76.0
UA	G270	B	2016/08/01	Sulfate, total	mg/L	76.0
UA	G270	B	2016/11/16	Sulfate, total	mg/L	63.0
UA	G270	B	2017/02/10	Sulfate, total	mg/L	55.0
UA	G270	B	2017/05/16	Sulfate, total	mg/L	50.0
UA	G270	B	2017/07/12	Sulfate, total	mg/L	54.0
UA	G270	B	2017/10/25	Sulfate, total	mg/L	55.0
UA	G270	B	2018/05/11	Sulfate, total	mg/L	53.0
UA	G270	B	2018/08/03	Sulfate, total	mg/L	54.0
UA	G270	B	2019/01/21	Sulfate, total	mg/L	49.0
UA	G270	B	2019/08/15	Sulfate, total	mg/L	50.0
UA	G270	B	2020/01/24	Sulfate, total	mg/L	51.0
UA	G270	B	2020/08/12	Sulfate, total	mg/L	53.0
UA	G270	B	2020/10/14	Sulfate, total	mg/L	58.0
UA	G270	B	2021/01/21	Sulfate, total	mg/L	54.0
UA	G270	B	2021/03/30	Sulfate, total	mg/L	55.0
UA	G270	B	2021/04/21	Sulfate, total	mg/L	53.0
UA	G270	B	2021/05/06	Sulfate, total	mg/L	57.0
UA	G270	B	2021/05/19	Sulfate, total	mg/L	58.0
UA	G270	B	2021/06/15	Sulfate, total	mg/L	55.0
UA	G270	B	2021/06/29	Sulfate, total	mg/L	58.0
UA	G270	B	2021/07/12	Sulfate, total	mg/L	56.0
UA	G270	B	2021/07/27	Sulfate, total	mg/L	55.0
UA	G270	B	2021/08/18	Sulfate, total	mg/L	54.0
UA	G270	B	2021/10/26	Sulfate, total	mg/L	52.0
UA	G270	B	2022/02/08	Sulfate, total	mg/L	53.0
UA	G270	B	2022/05/10	Sulfate, total	mg/L	53.0
UA	G270	B	2022/08/24	Sulfate, total	mg/L	53.0
UA	G270	B	2022/11/08	Sulfate, total	mg/L	51.0
UA	G270	B	2023/02/16	Sulfate, total	mg/L	50.0
UA	G270	B	2023/06/08	Sulfate, total	mg/L	54.0
UA	G270	B	2023/08/14	Sulfate, total	mg/L	48.0
UA	G270	B	2023/11/17	Sulfate, total	mg/L	50.0
UA	G270	B	2015/11/20	Temperature (Celsius)	degrees C	16.6
UA	G270	B	2016/02/10	Temperature (Celsius)	degrees C	8.00
UA	G270	B	2016/05/12	Temperature (Celsius)	degrees C	16.8
UA	G270	B	2016/08/01	Temperature (Celsius)	degrees C	17.6
UA	G270	B	2016/11/16	Temperature (Celsius)	degrees C	14.5
UA	G270	B	2017/02/10	Temperature (Celsius)	degrees C	15.0

UA	G270	B	2017/05/16	Temperature (Celsius)	degrees C	15.4
UA	G270	B	2017/07/12	Temperature (Celsius)	degrees C	17.3
UA	G270	B	2017/10/25	Temperature (Celsius)	degrees C	12.7
UA	G270	B	2018/05/11	Temperature (Celsius)	degrees C	13.5
UA	G270	B	2018/08/03	Temperature (Celsius)	degrees C	15.9
UA	G270	B	2019/01/21	Temperature (Celsius)	degrees C	12.0
UA	G270	B	2019/08/15	Temperature (Celsius)	degrees C	17.0
UA	G270	B	2020/01/24	Temperature (Celsius)	degrees C	9.70
UA	G270	B	2020/08/12	Temperature (Celsius)	degrees C	18.5
UA	G270	B	2020/10/14	Temperature (Celsius)	degrees C	16.5
UA	G270	B	2021/01/21	Temperature (Celsius)	degrees C	11.6
UA	G270	B	2021/03/30	Temperature (Celsius)	degrees C	12.2
UA	G270	B	2021/04/21	Temperature (Celsius)	degrees C	11.9
UA	G270	B	2021/05/06	Temperature (Celsius)	degrees C	12.2
UA	G270	B	2021/05/19	Temperature (Celsius)	degrees C	15.2
UA	G270	B	2021/06/15	Temperature (Celsius)	degrees C	19.8
UA	G270	B	2021/06/29	Temperature (Celsius)	degrees C	20.5
UA	G270	B	2021/07/12	Temperature (Celsius)	degrees C	18.5
UA	G270	B	2021/07/27	Temperature (Celsius)	degrees C	20.4
UA	G270	B	2021/08/18	Temperature (Celsius)	degrees C	20.2
UA	G270	B	2022/02/08	Temperature (Celsius)	degrees C	10.4
UA	G270	B	2022/05/10	Temperature (Celsius)	degrees C	14.6
UA	G270	B	2022/08/24	Temperature (Celsius)	degrees C	19.7
UA	G270	B	2022/11/08	Temperature (Celsius)	degrees C	16.4
UA	G270	B	2023/02/16	Temperature (Celsius)	degrees C	8.90
UA	G270	B	2023/06/08	Temperature (Celsius)	degrees C	14.6
UA	G270	B	2023/08/14	Temperature (Celsius)	degrees C	15.2
UA	G270	B	2023/11/17	Temperature (Celsius)	degrees C	15.2
UA	G270	B	2015/01/20	Total Dissolved Solids	mg/L	500
UA	G270	B	2015/04/13	Total Dissolved Solids	mg/L	540
UA	G270	B	2015/07/22	Total Dissolved Solids	mg/L	550
UA	G270	B	2015/10/05	Total Dissolved Solids	mg/L	480
UA	G270	B	2015/11/20	Total Dissolved Solids	mg/L	400
UA	G270	B	2016/02/10	Total Dissolved Solids	mg/L	340
UA	G270	B	2016/05/12	Total Dissolved Solids	mg/L	340
UA	G270	B	2016/08/01	Total Dissolved Solids	mg/L	360
UA	G270	B	2016/11/16	Total Dissolved Solids	mg/L	450
UA	G270	B	2017/02/10	Total Dissolved Solids	mg/L	390
UA	G270	B	2017/05/16	Total Dissolved Solids	mg/L	380
UA	G270	B	2017/07/12	Total Dissolved Solids	mg/L	400
UA	G270	B	2017/10/25	Total Dissolved Solids	mg/L	400
UA	G270	B	2018/05/11	Total Dissolved Solids	mg/L	400
UA	G270	B	2018/08/03	Total Dissolved Solids	mg/L	420
UA	G270	B	2019/01/21	Total Dissolved Solids	mg/L	480
UA	G270	B	2019/08/15	Total Dissolved Solids	mg/L	470
UA	G270	B	2020/01/24	Total Dissolved Solids	mg/L	480
UA	G270	B	2020/08/12	Total Dissolved Solids	mg/L	380
UA	G270	B	2020/10/14	Total Dissolved Solids	mg/L	400
UA	G270	B	2021/01/21	Total Dissolved Solids	mg/L	360
UA	G270	B	2021/03/30	Total Dissolved Solids	mg/L	510
UA	G270	B	2021/04/21	Total Dissolved Solids	mg/L	570
UA	G270	B	2021/05/06	Total Dissolved Solids	mg/L	410
UA	G270	B	2021/05/19	Total Dissolved Solids	mg/L	480
UA	G270	B	2021/06/15	Total Dissolved Solids	mg/L	390
UA	G270	B	2021/06/29	Total Dissolved Solids	mg/L	400
UA	G270	B	2021/07/12	Total Dissolved Solids	mg/L	480
UA	G270	B	2021/07/27	Total Dissolved Solids	mg/L	420
UA	G270	B	2021/08/18	Total Dissolved Solids	mg/L	470
UA	G270	B	2021/10/26	Total Dissolved Solids	mg/L	410
UA	G270	B	2022/02/08	Total Dissolved Solids	mg/L	410
UA	G270	B	2022/05/10	Total Dissolved Solids	mg/L	420
UA	G270	B	2022/08/24	Total Dissolved Solids	mg/L	500
UA	G270	B	2022/11/08	Total Dissolved Solids	mg/L	420

UA	G270	B	2023/02/16	Total Dissolved Solids	mg/L	410
UA	G270	B	2023/06/08	Total Dissolved Solids	mg/L	500
UA	G270	B	2023/08/14	Total Dissolved Solids	mg/L	426
UA	G270	B	2023/11/17	Total Dissolved Solids	mg/L	460
UA	G280	B	2015/01/21	pH (field)	SU	7.6
UA	G280	B	2015/04/13	pH (field)	SU	7.2
UA	G280	B	2015/07/23	pH (field)	SU	7.6
UA	G280	B	2015/10/08	pH (field)	SU	7.7
UA	G280	B	2015/11/24	pH (field)	SU	7.4
UA	G280	B	2016/02/10	pH (field)	SU	6.5
UA	G280	B	2016/05/10	pH (field)	SU	7.2
UA	G280	B	2016/08/03	pH (field)	SU	7.2
UA	G280	B	2016/11/20	pH (field)	SU	7.1
UA	G280	B	2017/02/15	pH (field)	SU	7.0
UA	G280	B	2017/05/20	pH (field)	SU	7.2
UA	G280	B	2017/07/18	pH (field)	SU	7.3
UA	G280	B	2017/11/04	pH (field)	SU	7.2
UA	G280	B	2018/05/16	pH (field)	SU	7.2
UA	G280	B	2018/08/10	pH (field)	SU	7.1
UA	G280	B	2019/01/22	pH (field)	SU	7.1
UA	G280	B	2019/08/26	pH (field)	SU	7.1
UA	G280	B	2020/01/23	pH (field)	SU	7.7
UA	G280	B	2020/08/11	pH (field)	SU	7.3
UA	G280	B	2020/10/14	pH (field)	SU	7.1
UA	G280	B	2021/01/21	pH (field)	SU	7.3
UA	G280	B	2021/01/28	pH (field)	SU	7.3
UA	G280	B	2021/03/30	pH (field)	SU	7.4
UA	G280	B	2021/04/22	pH (field)	SU	7.4
UA	G280	B	2021/05/06	pH (field)	SU	7.2
UA	G280	B	2021/05/19	pH (field)	SU	7.4
UA	G280	B	2021/06/28	pH (field)	SU	7.4
UA	G280	B	2021/07/13	pH (field)	SU	7.4
UA	G280	B	2021/07/27	pH (field)	SU	7.5
UA	G280	B	2021/08/18	pH (field)	SU	7.1
UA	G280	B	2021/10/26	pH (field)	SU	7.3
UA	G280	B	2022/02/08	pH (field)	SU	7.2
UA	G280	B	2022/05/10	pH (field)	SU	7.4
UA	G280	B	2022/08/24	pH (field)	SU	7.2
UA	G280	B	2022/11/09	pH (field)	SU	7.2
UA	G280	B	2023/02/16	pH (field)	SU	6.0
UA	G280	B	2023/06/08	pH (field)	SU	7.3
UA	G280	B	2023/08/14	pH (field)	SU	7.4
UA	G280	B	2023/11/20	pH (field)	SU	7.4
UA	G280	B	2015/11/24	Oxidation Reduction Potential	mV	18.0
UA	G280	B	2016/02/10	Oxidation Reduction Potential	mV	193
UA	G280	B	2016/05/10	Oxidation Reduction Potential	mV	140
UA	G280	B	2016/08/03	Oxidation Reduction Potential	mV	101
UA	G280	B	2016/11/20	Oxidation Reduction Potential	mV	103
UA	G280	B	2017/02/15	Oxidation Reduction Potential	mV	65.0
UA	G280	B	2017/05/20	Oxidation Reduction Potential	mV	89.0
UA	G280	B	2017/07/18	Oxidation Reduction Potential	mV	93.0
UA	G280	B	2017/11/04	Oxidation Reduction Potential	mV	106
UA	G280	B	2018/05/16	Oxidation Reduction Potential	mV	86.0
UA	G280	B	2018/08/10	Oxidation Reduction Potential	mV	102
UA	G280	B	2019/01/22	Oxidation Reduction Potential	mV	107
UA	G280	B	2019/08/26	Oxidation Reduction Potential	mV	99.0
UA	G280	B	2020/01/23	Oxidation Reduction Potential	mV	189
UA	G280	B	2020/08/11	Oxidation Reduction Potential	mV	101
UA	G280	B	2020/10/14	Oxidation Reduction Potential	mV	197
UA	G280	B	2021/01/21	Oxidation Reduction Potential	mV	98.1
UA	G280	B	2021/01/28	Oxidation Reduction Potential	mV	98.1
UA	G280	B	2021/03/30	Oxidation Reduction Potential	mV	119
UA	G280	B	2021/04/22	Oxidation Reduction Potential	mV	107

UA	G280	B	2021/05/06	Oxidation Reduction Potential	mV	149
UA	G280	B	2021/05/19	Oxidation Reduction Potential	mV	82.9
UA	G280	B	2021/06/28	Oxidation Reduction Potential	mV	36.0
UA	G280	B	2021/07/13	Oxidation Reduction Potential	mV	77.4
UA	G280	B	2021/07/27	Oxidation Reduction Potential	mV	178
UA	G280	B	2021/08/18	Oxidation Reduction Potential	mV	63.9
UA	G280	B	2021/10/26	Oxidation Reduction Potential	mV	56.0
UA	G280	B	2022/02/08	Oxidation Reduction Potential	mV	-15.2
UA	G280	B	2022/05/10	Oxidation Reduction Potential	mV	23.2
UA	G280	B	2022/08/24	Oxidation Reduction Potential	mV	64.4
UA	G280	B	2022/11/09	Oxidation Reduction Potential	mV	209
UA	G280	B	2023/02/16	Oxidation Reduction Potential	mV	236
UA	G280	B	2023/06/08	Oxidation Reduction Potential	mV	190
UA	G280	B	2023/08/14	Oxidation Reduction Potential	mV	31.0
UA	G280	B	2023/11/20	Oxidation Reduction Potential	mV	107
UA	G280	B	2015/11/24	Eh	V	0.21
UA	G280	B	2016/02/10	Eh	V	0.39
UA	G280	B	2016/05/10	Eh	V	0.33
UA	G280	B	2016/08/03	Eh	V	0.29
UA	G280	B	2016/11/20	Eh	V	0.30
UA	G280	B	2017/02/15	Eh	V	0.26
UA	G280	B	2017/05/20	Eh	V	0.28
UA	G280	B	2017/07/18	Eh	V	0.28
UA	G280	B	2017/11/04	Eh	V	0.30
UA	G280	B	2018/05/16	Eh	V	0.28
UA	G280	B	2018/08/10	Eh	V	0.30
UA	G280	B	2019/01/22	Eh	V	0.30
UA	G280	B	2019/08/26	Eh	V	0.29
UA	G280	B	2020/01/23	Eh	V	0.39
UA	G280	B	2020/08/11	Eh	V	0.29
UA	G280	B	2020/10/14	Eh	V	0.39
UA	G280	B	2021/01/21	Eh	V	0.30
UA	G280	B	2021/01/28	Eh	V	0.30
UA	G280	B	2021/03/30	Eh	V	0.32
UA	G280	B	2021/04/22	Eh	V	0.30
UA	G280	B	2021/05/06	Eh	V	0.35
UA	G280	B	2021/05/19	Eh	V	0.28
UA	G280	B	2021/06/28	Eh	V	0.23
UA	G280	B	2021/07/13	Eh	V	0.27
UA	G280	B	2021/07/27	Eh	V	0.37
UA	G280	B	2021/08/18	Eh	V	0.26
UA	G280	B	2022/02/08	Eh	V	0.18
UA	G280	B	2022/05/10	Eh	V	0.22
UA	G280	B	2022/08/24	Eh	V	0.26
UA	G280	B	2022/11/09	Eh	V	0.40
UA	G280	B	2023/02/16	Eh	V	0.44
UA	G280	B	2023/06/08	Eh	V	0.39
UA	G280	B	2023/08/14	Eh	V	0.23
UA	G280	B	2023/11/20	Eh	V	0.30
UA	G280	B	2015/01/21	Alkalinity, bicarbonate	mg/L CaCO3	260
UA	G280	B	2015/04/13	Alkalinity, bicarbonate	mg/L CaCO3	250
UA	G280	B	2017/07/18	Alkalinity, bicarbonate	mg/L CaCO3	250
UA	G280	B	2020/01/23	Alkalinity, bicarbonate	mg/L CaCO3	260
UA	G280	B	2021/01/28	Alkalinity, bicarbonate	mg/L CaCO3	250
UA	G280	B	2021/03/30	Alkalinity, bicarbonate	mg/L CaCO3	220
UA	G280	B	2021/04/22	Alkalinity, bicarbonate	mg/L CaCO3	250
UA	G280	B	2021/05/06	Alkalinity, bicarbonate	mg/L CaCO3	240
UA	G280	B	2021/05/19	Alkalinity, bicarbonate	mg/L CaCO3	240
UA	G280	B	2021/06/16	Alkalinity, bicarbonate	mg/L CaCO3	260
UA	G280	B	2021/06/28	Alkalinity, bicarbonate	mg/L CaCO3	220
UA	G280	B	2021/07/13	Alkalinity, bicarbonate	mg/L CaCO3	250
UA	G280	B	2021/07/27	Alkalinity, bicarbonate	mg/L CaCO3	250
UA	G280	B	2022/02/08	Alkalinity, bicarbonate	mg/L CaCO3	220

UA	G280	B	2022/08/24	Alkalinity, bicarbonate	mg/L CaCO3	260
UA	G280	B	2023/02/16	Alkalinity, bicarbonate	mg/L CaCO3	250
UA	G280	B	2023/06/08	Alkalinity, bicarbonate	mg/L CaCO3	260
UA	G280	B	2023/08/14	Alkalinity, bicarbonate	mg/L CaCO3	262
UA	G280	B	2023/11/20	Alkalinity, bicarbonate	mg/L CaCO3	254
UA	G280	B	2022/08/24	Alkalinity, carbonate	mg/L CaCO3	10.0
UA	G280	B	2015/04/13	Barium, total	mg/L	0.0450
UA	G280	B	2015/07/23	Barium, total	mg/L	0.0490
UA	G280	B	2015/10/08	Barium, total	mg/L	0.0560
UA	G280	B	2015/11/24	Barium, total	mg/L	0.110
UA	G280	B	2016/02/10	Barium, total	mg/L	0.0450
UA	G280	B	2016/05/10	Barium, total	mg/L	0.0450
UA	G280	B	2016/08/03	Barium, total	mg/L	0.0450
UA	G280	B	2016/11/20	Barium, total	mg/L	0.0440
UA	G280	B	2017/02/15	Barium, total	mg/L	0.0520
UA	G280	B	2017/05/20	Barium, total	mg/L	0.0420
UA	G280	B	2017/07/18	Barium, total	mg/L	0.0410
UA	G280	B	2018/05/16	Barium, total	mg/L	0.0380
UA	G280	B	2018/08/10	Barium, total	mg/L	0.0380
UA	G280	B	2019/01/22	Barium, total	mg/L	0.0700
UA	G280	B	2019/08/26	Barium, total	mg/L	0.0450
UA	G280	B	2020/01/23	Barium, total	mg/L	0.0410
UA	G280	B	2020/08/11	Barium, total	mg/L	0.210
UA	G280	B	2020/10/14	Barium, total	mg/L	0.0440
UA	G280	B	2021/01/21	Barium, total	mg/L	0.0450
UA	G280	B	2021/01/28	Barium, total	mg/L	0.0430
UA	G280	B	2021/03/30	Barium, total	mg/L	0.0420
UA	G280	B	2021/04/22	Barium, total	mg/L	0.0400
UA	G280	B	2021/05/06	Barium, total	mg/L	0.0400
UA	G280	B	2021/05/19	Barium, total	mg/L	0.0380
UA	G280	B	2021/06/16	Barium, total	mg/L	0.0420
UA	G280	B	2021/06/28	Barium, total	mg/L	0.0430
UA	G280	B	2021/07/13	Barium, total	mg/L	0.0410
UA	G280	B	2021/07/27	Barium, total	mg/L	0.0420
UA	G280	B	2021/08/18	Barium, total	mg/L	0.0460
UA	G280	B	2021/10/26	Barium, total	mg/L	0.0380
UA	G280	B	2022/02/08	Barium, total	mg/L	0.0420
UA	G280	B	2022/05/10	Barium, total	mg/L	0.0400
UA	G280	B	2022/08/24	Barium, total	mg/L	0.0450
UA	G280	B	2022/11/09	Barium, total	mg/L	0.0440
UA	G280	B	2023/02/16	Barium, total	mg/L	0.0420
UA	G280	B	2023/06/08	Barium, total	mg/L	0.0490
UA	G280	B	2023/08/14	Barium, total	mg/L	0.0531
UA	G280	B	2023/11/20	Barium, total	mg/L	0.0611
UA	G280	B	2015/01/21	Boron, total	mg/L	<0.01
UA	G280	B	2015/04/13	Boron, total	mg/L	<0.01
UA	G280	B	2015/07/23	Boron, total	mg/L	<0.01
UA	G280	B	2015/10/08	Boron, total	mg/L	0.0240
UA	G280	B	2015/11/24	Boron, total	mg/L	0.0290
UA	G280	B	2016/02/10	Boron, total	mg/L	<0.0023
UA	G280	B	2016/05/10	Boron, total	mg/L	<0.0023
UA	G280	B	2016/08/03	Boron, total	mg/L	<0.0023
UA	G280	B	2016/11/20	Boron, total	mg/L	<0.0023
UA	G280	B	2017/02/15	Boron, total	mg/L	<0.0023
UA	G280	B	2017/05/20	Boron, total	mg/L	<0.0023
UA	G280	B	2017/07/18	Boron, total	mg/L	<0.0023
UA	G280	B	2017/11/04	Boron, total	mg/L	0.0130
UA	G280	B	2018/05/16	Boron, total	mg/L	<0.0034
UA	G280	B	2018/08/10	Boron, total	mg/L	<0.0034
UA	G280	B	2019/01/22	Boron, total	mg/L	0.0260
UA	G280	B	2019/08/26	Boron, total	mg/L	0.0110
UA	G280	B	2020/01/23	Boron, total	mg/L	0.0150
UA	G280	B	2020/08/11	Boron, total	mg/L	0.520

UA	G280	B	2020/10/14	Boron, total	mg/L	0.0250
UA	G280	B	2021/01/21	Boron, total	mg/L	0.0120
UA	G280	B	2021/01/28	Boron, total	mg/L	<0.008
UA	G280	B	2021/03/30	Boron, total	mg/L	0.0150
UA	G280	B	2021/04/22	Boron, total	mg/L	0.0150
UA	G280	B	2021/05/06	Boron, total	mg/L	0.0570
UA	G280	B	2021/05/19	Boron, total	mg/L	<0.008
UA	G280	B	2021/06/16	Boron, total	mg/L	<0.0046
UA	G280	B	2021/06/28	Boron, total	mg/L	1.00
UA	G280	B	2021/07/13	Boron, total	mg/L	0.0500
UA	G280	B	2021/07/27	Boron, total	mg/L	<0.008
UA	G280	B	2021/08/18	Boron, total	mg/L	0.0280
UA	G280	B	2021/10/26	Boron, total	mg/L	0.0250
UA	G280	B	2022/02/08	Boron, total	mg/L	<0.0046
UA	G280	B	2022/05/10	Boron, total	mg/L	<0.0071
UA	G280	B	2022/08/24	Boron, total	mg/L	0.0230
UA	G280	B	2022/11/09	Boron, total	mg/L	0.0210
UA	G280	B	2023/02/16	Boron, total	mg/L	0.0290
UA	G280	B	2023/06/08	Boron, total	mg/L	0.0200
UA	G280	B	2023/08/14	Boron, total	mg/L	<0.0092
UA	G280	B	2023/11/20	Boron, total	mg/L	0.0100
UA	G280	B	2015/01/21	Calcium, total	mg/L	74.0
UA	G280	B	2015/04/13	Calcium, total	mg/L	71.0
UA	G280	B	2015/11/24	Calcium, total	mg/L	120
UA	G280	B	2016/02/10	Calcium, total	mg/L	60.0
UA	G280	B	2016/05/10	Calcium, total	mg/L	63.0
UA	G280	B	2016/08/03	Calcium, total	mg/L	65.0
UA	G280	B	2016/11/20	Calcium, total	mg/L	63.0
UA	G280	B	2017/02/15	Calcium, total	mg/L	64.0
UA	G280	B	2017/05/20	Calcium, total	mg/L	54.0
UA	G280	B	2017/07/18	Calcium, total	mg/L	67.0
UA	G280	B	2017/11/04	Calcium, total	mg/L	63.0
UA	G280	B	2018/05/16	Calcium, total	mg/L	57.0
UA	G280	B	2018/08/10	Calcium, total	mg/L	62.0
UA	G280	B	2019/01/22	Calcium, total	mg/L	82.0
UA	G280	B	2019/08/26	Calcium, total	mg/L	72.0
UA	G280	B	2020/01/23	Calcium, total	mg/L	73.0
UA	G280	B	2020/08/11	Calcium, total	mg/L	220
UA	G280	B	2020/10/14	Calcium, total	mg/L	78.0
UA	G280	B	2021/01/21	Calcium, total	mg/L	77.0
UA	G280	B	2021/01/28	Calcium, total	mg/L	73.0
UA	G280	B	2021/03/30	Calcium, total	mg/L	62.0
UA	G280	B	2021/04/22	Calcium, total	mg/L	63.0
UA	G280	B	2021/05/06	Calcium, total	mg/L	64.0
UA	G280	B	2021/05/19	Calcium, total	mg/L	64.0
UA	G280	B	2021/06/16	Calcium, total	mg/L	73.0
UA	G280	B	2021/06/28	Calcium, total	mg/L	72.0
UA	G280	B	2021/07/13	Calcium, total	mg/L	70.0
UA	G280	B	2021/07/27	Calcium, total	mg/L	74.0
UA	G280	B	2021/08/18	Calcium, total	mg/L	69.0
UA	G280	B	2021/10/26	Calcium, total	mg/L	65.0
UA	G280	B	2022/02/08	Calcium, total	mg/L	68.0
UA	G280	B	2022/05/10	Calcium, total	mg/L	69.0
UA	G280	B	2022/08/24	Calcium, total	mg/L	80.0
UA	G280	B	2022/11/09	Calcium, total	mg/L	70.0
UA	G280	B	2023/02/16	Calcium, total	mg/L	72.0
UA	G280	B	2023/06/08	Calcium, total	mg/L	79.0
UA	G280	B	2023/08/14	Calcium, total	mg/L	79.5
UA	G280	B	2023/11/20	Calcium, total	mg/L	91.5
UA	G280	B	2015/01/21	Chloride, total	mg/L	62.0
UA	G280	B	2015/04/13	Chloride, total	mg/L	67.0
UA	G280	B	2015/07/23	Chloride, total	mg/L	53.0
UA	G280	B	2015/10/08	Chloride, total	mg/L	54.0

UA	G280	B	2015/11/24	Chloride, total	mg/L	54.0
UA	G280	B	2016/02/10	Chloride, total	mg/L	52.0
UA	G280	B	2016/05/10	Chloride, total	mg/L	50.0
UA	G280	B	2016/08/03	Chloride, total	mg/L	46.0
UA	G280	B	2016/11/20	Chloride, total	mg/L	49.0
UA	G280	B	2017/02/15	Chloride, total	mg/L	46.0
UA	G280	B	2017/05/20	Chloride, total	mg/L	44.0
UA	G280	B	2017/07/18	Chloride, total	mg/L	46.0
UA	G280	B	2017/11/04	Chloride, total	mg/L	48.0
UA	G280	B	2018/05/16	Chloride, total	mg/L	43.0
UA	G280	B	2018/08/10	Chloride, total	mg/L	55.0
UA	G280	B	2019/01/22	Chloride, total	mg/L	52.0
UA	G280	B	2019/08/26	Chloride, total	mg/L	60.0
UA	G280	B	2020/01/23	Chloride, total	mg/L	64.0
UA	G280	B	2020/08/11	Chloride, total	mg/L	68.0
UA	G280	B	2020/10/14	Chloride, total	mg/L	67.0
UA	G280	B	2021/01/21	Chloride, total	mg/L	33.0
UA	G280	B	2021/01/28	Chloride, total	mg/L	64.0
UA	G280	B	2021/03/30	Chloride, total	mg/L	49.0
UA	G280	B	2021/04/22	Chloride, total	mg/L	55.0
UA	G280	B	2021/05/06	Chloride, total	mg/L	43.0
UA	G280	B	2021/05/19	Chloride, total	mg/L	46.0
UA	G280	B	2021/06/16	Chloride, total	mg/L	67.0
UA	G280	B	2021/06/28	Chloride, total	mg/L	65.0
UA	G280	B	2021/07/13	Chloride, total	mg/L	65.0
UA	G280	B	2021/07/27	Chloride, total	mg/L	63.0
UA	G280	B	2021/08/18	Chloride, total	mg/L	59.0
UA	G280	B	2021/10/26	Chloride, total	mg/L	58.0
UA	G280	B	2022/02/08	Chloride, total	mg/L	51.0
UA	G280	B	2022/05/10	Chloride, total	mg/L	58.0
UA	G280	B	2022/08/24	Chloride, total	mg/L	93.0
UA	G280	B	2022/11/09	Chloride, total	mg/L	710
UA	G280	B	2023/02/16	Chloride, total	mg/L	63.0
UA	G280	B	2023/06/08	Chloride, total	mg/L	71.0
UA	G280	B	2023/08/14	Chloride, total	mg/L	70.0
UA	G280	B	2023/11/20	Chloride, total	mg/L	70.0
UA	G280	B	2015/04/13	Cobalt, total	mg/L	<0.002
UA	G280	B	2015/07/23	Cobalt, total	mg/L	<0.002
UA	G280	B	2015/10/08	Cobalt, total	mg/L	<0.002
UA	G280	B	2015/11/24	Cobalt, total	mg/L	0.00590
UA	G280	B	2016/02/10	Cobalt, total	mg/L	<0.000017
UA	G280	B	2016/05/10	Cobalt, total	mg/L	<0.000017
UA	G280	B	2016/08/03	Cobalt, total	mg/L	<0.000017
UA	G280	B	2016/11/20	Cobalt, total	mg/L	<0.000017
UA	G280	B	2017/02/15	Cobalt, total	mg/L	<0.000017
UA	G280	B	2017/05/20	Cobalt, total	mg/L	<0.000017
UA	G280	B	2017/07/18	Cobalt, total	mg/L	<0.000017
UA	G280	B	2018/05/16	Cobalt, total	mg/L	<0.00067
UA	G280	B	2019/01/22	Cobalt, total	mg/L	0.00330
UA	G280	B	2019/08/26	Cobalt, total	mg/L	<0.00067
UA	G280	B	2020/01/23	Cobalt, total	mg/L	<0.00067
UA	G280	B	2020/08/11	Cobalt, total	mg/L	0.00600
UA	G280	B	2020/10/14	Cobalt, total	mg/L	<0.002
UA	G280	B	2021/01/21	Cobalt, total	mg/L	<0.002
UA	G280	B	2021/01/28	Cobalt, total	mg/L	<0.00022
UA	G280	B	2021/03/30	Cobalt, total	mg/L	<0.00022
UA	G280	B	2021/04/22	Cobalt, total	mg/L	<0.00022
UA	G280	B	2021/05/06	Cobalt, total	mg/L	<0.00022
UA	G280	B	2021/05/19	Cobalt, total	mg/L	<0.00022
UA	G280	B	2021/06/16	Cobalt, total	mg/L	<0.00022
UA	G280	B	2021/06/28	Cobalt, total	mg/L	<0.00019
UA	G280	B	2021/07/13	Cobalt, total	mg/L	<0.00022
UA	G280	B	2021/07/27	Cobalt, total	mg/L	<0.00022

UA	G280	B	2021/08/18	Cobalt, total	mg/L	<0.00022
UA	G280	B	2021/10/26	Cobalt, total	mg/L	<0.002
UA	G280	B	2022/02/08	Cobalt, total	mg/L	<0.00019
UA	G280	B	2022/05/10	Cobalt, total	mg/L	<0.00048
UA	G280	B	2022/08/24	Cobalt, total	mg/L	<0.00048
UA	G280	B	2022/11/09	Cobalt, total	mg/L	<0.00048
UA	G280	B	2023/02/16	Cobalt, total	mg/L	<0.00048
UA	G280	B	2023/06/08	Cobalt, total	mg/L	<0.00048
UA	G280	B	2023/08/14	Cobalt, total	mg/L	0.000300
UA	G280	B	2023/11/20	Cobalt, total	mg/L	0.000200
UA	G280	B	2023/06/08	Ferrous Iron, dissolved	mg/L	<0.02
UA	G280	B	2015/01/21	Iron, dissolved	mg/L	0.0180
UA	G280	B	2015/04/13	Iron, dissolved	mg/L	0.270
UA	G280	B	2015/07/23	Iron, dissolved	mg/L	<0.01
UA	G280	B	2015/10/08	Iron, dissolved	mg/L	0.0120
UA	G280	B	2016/02/10	Iron, dissolved	mg/L	0.0200
UA	G280	B	2016/05/13	Iron, dissolved	mg/L	<0.01
UA	G280	B	2016/08/03	Iron, dissolved	mg/L	0.0160
UA	G280	B	2016/11/22	Iron, dissolved	mg/L	0.0520
UA	G280	B	2017/02/14	Iron, dissolved	mg/L	0.0110
UA	G280	B	2017/05/19	Iron, dissolved	mg/L	<0.01
UA	G280	B	2017/07/25	Iron, dissolved	mg/L	0.0120
UA	G280	B	2017/11/04	Iron, dissolved	mg/L	0.400
UA	G280	B	2018/01/30	Iron, dissolved	mg/L	0.130
UA	G280	B	2018/05/16	Iron, dissolved	mg/L	<0.01
UA	G280	B	2018/08/10	Iron, dissolved	mg/L	0.0120
UA	G280	B	2018/11/06	Iron, dissolved	mg/L	<0.01
UA	G280	B	2019/01/22	Iron, dissolved	mg/L	0.0530
UA	G280	B	2019/05/01	Iron, dissolved	mg/L	<0.01
UA	G280	B	2019/08/26	Iron, dissolved	mg/L	<0.01
UA	G280	B	2019/10/22	Iron, dissolved	mg/L	<0.01
UA	G280	B	2020/01/23	Iron, dissolved	mg/L	0.0110
UA	G280	B	2020/05/07	Iron, dissolved	mg/L	<0.01
UA	G280	B	2020/10/14	Iron, dissolved	mg/L	<0.01
UA	G280	B	2021/01/21	Iron, dissolved	mg/L	<0.01
UA	G280	B	2021/01/28	Iron, dissolved	mg/L	<0.01
UA	G280	B	2021/04/22	Iron, dissolved	mg/L	<0.01
UA	G280	B	2021/08/18	Iron, dissolved	mg/L	<0.01
UA	G280	B	2021/10/26	Iron, dissolved	mg/L	0.0180
UA	G280	B	2022/02/08	Iron, dissolved	mg/L	<0.01
UA	G280	B	2022/05/10	Iron, dissolved	mg/L	<0.00072
UA	G280	B	2022/08/24	Iron, dissolved	mg/L	0.0180
UA	G280	B	2022/11/09	Iron, dissolved	mg/L	0.00780
UA	G280	B	2023/02/16	Iron, dissolved	mg/L	0.00470
UA	G280	B	2023/06/08	Iron, dissolved	mg/L	0.00610
UA	G280	B	2023/08/14	Iron, dissolved	mg/L	<0.0175
UA	G280	B	2023/11/20	Iron, dissolved	mg/L	<0.0115
UA	G280	B	2015/04/13	Magnesium, total	mg/L	36.0
UA	G280	B	2017/07/18	Magnesium, total	mg/L	31.0
UA	G280	B	2020/01/23	Magnesium, total	mg/L	36.0
UA	G280	B	2021/01/28	Magnesium, total	mg/L	37.0
UA	G280	B	2021/03/30	Magnesium, total	mg/L	32.0
UA	G280	B	2021/04/22	Magnesium, total	mg/L	33.0
UA	G280	B	2021/05/06	Magnesium, total	mg/L	31.0
UA	G280	B	2021/05/19	Magnesium, total	mg/L	33.0
UA	G280	B	2021/06/16	Magnesium, total	mg/L	36.0
UA	G280	B	2021/06/28	Magnesium, total	mg/L	38.0
UA	G280	B	2021/07/13	Magnesium, total	mg/L	37.0
UA	G280	B	2021/07/27	Magnesium, total	mg/L	36.0
UA	G280	B	2022/02/08	Magnesium, total	mg/L	30.0
UA	G280	B	2022/08/24	Magnesium, total	mg/L	41.0
UA	G280	B	2023/06/08	Magnesium, total	mg/L	38.0
UA	G280	B	2023/08/14	Magnesium, total	mg/L	36.6

UA	G280	B	2023/11/20	Magnesium, total	mg/L	42.7
UA	G280	B	2015/01/21	Manganese, dissolved	mg/L	<0.001
UA	G280	B	2015/04/13	Manganese, dissolved	mg/L	0.0260
UA	G280	B	2015/07/23	Manganese, dissolved	mg/L	0.0740
UA	G280	B	2015/10/08	Manganese, dissolved	mg/L	0.00350
UA	G280	B	2016/02/10	Manganese, dissolved	mg/L	<0.001
UA	G280	B	2016/05/13	Manganese, dissolved	mg/L	<0.001
UA	G280	B	2016/08/03	Manganese, dissolved	mg/L	0.00760
UA	G280	B	2016/11/22	Manganese, dissolved	mg/L	0.0690
UA	G280	B	2017/02/14	Manganese, dissolved	mg/L	<0.001
UA	G280	B	2017/05/19	Manganese, dissolved	mg/L	0.00460
UA	G280	B	2017/07/25	Manganese, dissolved	mg/L	0.00230
UA	G280	B	2017/11/04	Manganese, dissolved	mg/L	0.0590
UA	G280	B	2018/01/30	Manganese, dissolved	mg/L	0.00670
UA	G280	B	2018/03/01	Manganese, dissolved	mg/L	<0.001
UA	G280	B	2018/05/16	Manganese, dissolved	mg/L	<0.001
UA	G280	B	2019/05/01	Manganese, dissolved	mg/L	<0.001
UA	G280	B	2019/08/26	Manganese, dissolved	mg/L	0.00190
UA	G280	B	2020/01/23	Manganese, dissolved	mg/L	<0.001
UA	G280	B	2020/05/07	Manganese, dissolved	mg/L	<0.001
UA	G280	B	2020/10/14	Manganese, dissolved	mg/L	0.00360
UA	G280	B	2021/01/21	Manganese, dissolved	mg/L	<0.001
UA	G280	B	2021/01/28	Manganese, dissolved	mg/L	<0.001
UA	G280	B	2021/04/22	Manganese, dissolved	mg/L	<0.001
UA	G280	B	2021/08/18	Manganese, dissolved	mg/L	<0.001
UA	G280	B	2021/10/26	Manganese, dissolved	mg/L	0.00180
UA	G280	B	2022/02/08	Manganese, dissolved	mg/L	0.00120
UA	G280	B	2022/05/10	Manganese, dissolved	mg/L	<0.00023
UA	G280	B	2022/08/24	Manganese, dissolved	mg/L	0.00100
UA	G280	B	2022/11/09	Manganese, dissolved	mg/L	0.00550
UA	G280	B	2023/02/16	Manganese, dissolved	mg/L	0.00200
UA	G280	B	2023/06/08	Manganese, dissolved	mg/L	0.00140
UA	G280	B	2023/08/14	Manganese, dissolved	mg/L	0.00320
UA	G280	B	2023/11/20	Manganese, dissolved	mg/L	0.0123
UA	G280	B	2023/08/14	Phosphate, dissolved	mg/L	0.0370
UA	G280	B	2015/04/13	Potassium, total	mg/L	0.580
UA	G280	B	2017/07/18	Potassium, total	mg/L	0.580
UA	G280	B	2020/01/23	Potassium, total	mg/L	0.440
UA	G280	B	2021/01/28	Potassium, total	mg/L	0.540
UA	G280	B	2021/03/30	Potassium, total	mg/L	0.570
UA	G280	B	2021/04/22	Potassium, total	mg/L	0.470
UA	G280	B	2021/05/06	Potassium, total	mg/L	0.470
UA	G280	B	2021/05/19	Potassium, total	mg/L	0.350
UA	G280	B	2021/06/16	Potassium, total	mg/L	0.340
UA	G280	B	2021/06/28	Potassium, total	mg/L	0.460
UA	G280	B	2021/07/13	Potassium, total	mg/L	0.330
UA	G280	B	2021/07/27	Potassium, total	mg/L	0.360
UA	G280	B	2022/02/08	Potassium, total	mg/L	6.70
UA	G280	B	2022/08/24	Potassium, total	mg/L	0.420
UA	G280	B	2023/02/16	Potassium, total	mg/L	0.520
UA	G280	B	2023/06/08	Potassium, total	mg/L	0.580
UA	G280	B	2023/08/14	Potassium, total	mg/L	0.539
UA	G280	B	2023/11/20	Potassium, total	mg/L	0.644
UA	G280	B	2023/06/08	Silicon, dissolved	mg/L	8.20
UA	G280	B	2023/08/14	Silicon, dissolved	mg/L	7.33
UA	G280	B	2015/04/13	Sodium, total	mg/L	65.0
UA	G280	B	2017/07/18	Sodium, total	mg/L	49.0
UA	G280	B	2020/01/23	Sodium, total	mg/L	60.0
UA	G280	B	2021/01/28	Sodium, total	mg/L	60.0
UA	G280	B	2021/03/30	Sodium, total	mg/L	61.0
UA	G280	B	2021/04/22	Sodium, total	mg/L	60.0
UA	G280	B	2021/05/06	Sodium, total	mg/L	60.0
UA	G280	B	2021/05/19	Sodium, total	mg/L	61.0

UA	G280	B	2021/06/16	Sodium, total	mg/L	50.0
UA	G280	B	2021/06/28	Sodium, total	mg/L	53.0
UA	G280	B	2021/07/13	Sodium, total	mg/L	54.0
UA	G280	B	2021/07/27	Sodium, total	mg/L	52.0
UA	G280	B	2022/02/08	Sodium, total	mg/L	53.0
UA	G280	B	2022/08/24	Sodium, total	mg/L	62.0
UA	G280	B	2023/02/16	Sodium, total	mg/L	61.0
UA	G280	B	2023/06/08	Sodium, total	mg/L	56.0
UA	G280	B	2023/08/14	Sodium, total	mg/L	58.5
UA	G280	B	2023/11/20	Sodium, total	mg/L	60.7
UA	G280	B	2015/01/21	Sulfate, total	mg/L	87.0
UA	G280	B	2015/04/13	Sulfate, total	mg/L	86.0
UA	G280	B	2015/07/23	Sulfate, total	mg/L	74.0
UA	G280	B	2015/10/08	Sulfate, total	mg/L	92.0
UA	G280	B	2015/11/24	Sulfate, total	mg/L	94.0
UA	G280	B	2016/02/10	Sulfate, total	mg/L	84.0
UA	G280	B	2016/05/10	Sulfate, total	mg/L	80.0
UA	G280	B	2016/08/03	Sulfate, total	mg/L	55.0
UA	G280	B	2016/11/20	Sulfate, total	mg/L	67.0
UA	G280	B	2017/02/15	Sulfate, total	mg/L	94.0
UA	G280	B	2017/05/20	Sulfate, total	mg/L	84.0
UA	G280	B	2017/07/18	Sulfate, total	mg/L	58.0
UA	G280	B	2017/11/04	Sulfate, total	mg/L	57.0
UA	G280	B	2018/05/16	Sulfate, total	mg/L	52.0
UA	G280	B	2018/08/10	Sulfate, total	mg/L	63.0
UA	G280	B	2019/01/22	Sulfate, total	mg/L	69.0
UA	G280	B	2019/08/26	Sulfate, total	mg/L	81.0
UA	G280	B	2020/01/23	Sulfate, total	mg/L	84.0
UA	G280	B	2020/08/11	Sulfate, total	mg/L	86.0
UA	G280	B	2020/10/14	Sulfate, total	mg/L	84.0
UA	G280	B	2021/01/21	Sulfate, total	mg/L	43.0
UA	G280	B	2021/01/28	Sulfate, total	mg/L	86.0
UA	G280	B	2021/03/30	Sulfate, total	mg/L	84.0
UA	G280	B	2021/04/22	Sulfate, total	mg/L	89.0
UA	G280	B	2021/05/06	Sulfate, total	mg/L	92.0
UA	G280	B	2021/05/19	Sulfate, total	mg/L	81.0
UA	G280	B	2021/06/16	Sulfate, total	mg/L	82.0
UA	G280	B	2021/06/28	Sulfate, total	mg/L	79.0
UA	G280	B	2021/07/13	Sulfate, total	mg/L	81.0
UA	G280	B	2021/07/27	Sulfate, total	mg/L	77.0
UA	G280	B	2021/08/18	Sulfate, total	mg/L	74.0
UA	G280	B	2021/10/26	Sulfate, total	mg/L	74.0
UA	G280	B	2022/02/08	Sulfate, total	mg/L	82.0
UA	G280	B	2022/05/10	Sulfate, total	mg/L	79.0
UA	G280	B	2022/08/24	Sulfate, total	mg/L	82.0
UA	G280	B	2022/11/09	Sulfate, total	mg/L	910
UA	G280	B	2023/02/16	Sulfate, total	mg/L	81.0
UA	G280	B	2023/06/08	Sulfate, total	mg/L	91.0
UA	G280	B	2023/08/14	Sulfate, total	mg/L	91.0
UA	G280	B	2023/11/20	Sulfate, total	mg/L	113
UA	G280	B	2015/11/24	Temperature (Celsius)	degrees C	16.0
UA	G280	B	2016/02/10	Temperature (Celsius)	degrees C	8.20
UA	G280	B	2016/05/10	Temperature (Celsius)	degrees C	16.0
UA	G280	B	2016/08/03	Temperature (Celsius)	degrees C	17.7
UA	G280	B	2016/11/20	Temperature (Celsius)	degrees C	14.7
UA	G280	B	2017/02/15	Temperature (Celsius)	degrees C	15.5
UA	G280	B	2017/05/20	Temperature (Celsius)	degrees C	14.9
UA	G280	B	2017/07/18	Temperature (Celsius)	degrees C	22.4
UA	G280	B	2017/11/04	Temperature (Celsius)	degrees C	13.5
UA	G280	B	2018/05/16	Temperature (Celsius)	degrees C	14.9
UA	G280	B	2018/08/10	Temperature (Celsius)	degrees C	15.9
UA	G280	B	2019/01/22	Temperature (Celsius)	degrees C	11.6
UA	G280	B	2019/08/26	Temperature (Celsius)	degrees C	17.0

UA	G280	B	2020/01/23	Temperature (Celsius)	degrees C	10.4
UA	G280	B	2020/08/11	Temperature (Celsius)	degrees C	19.0
UA	G280	B	2020/10/14	Temperature (Celsius)	degrees C	16.5
UA	G280	B	2021/01/21	Temperature (Celsius)	degrees C	12.1
UA	G280	B	2021/01/28	Temperature (Celsius)	degrees C	12.1
UA	G280	B	2021/03/30	Temperature (Celsius)	degrees C	13.4
UA	G280	B	2021/04/22	Temperature (Celsius)	degrees C	13.1
UA	G280	B	2021/05/06	Temperature (Celsius)	degrees C	12.9
UA	G280	B	2021/05/19	Temperature (Celsius)	degrees C	15.0
UA	G280	B	2021/06/28	Temperature (Celsius)	degrees C	20.9
UA	G280	B	2021/07/13	Temperature (Celsius)	degrees C	18.1
UA	G280	B	2021/07/27	Temperature (Celsius)	degrees C	20.2
UA	G280	B	2021/08/18	Temperature (Celsius)	degrees C	19.8
UA	G280	B	2022/02/08	Temperature (Celsius)	degrees C	9.90
UA	G280	B	2022/05/10	Temperature (Celsius)	degrees C	17.8
UA	G280	B	2022/08/24	Temperature (Celsius)	degrees C	19.1
UA	G280	B	2022/11/09	Temperature (Celsius)	degrees C	16.4
UA	G280	B	2023/02/16	Temperature (Celsius)	degrees C	9.90
UA	G280	B	2023/06/08	Temperature (Celsius)	degrees C	15.4
UA	G280	B	2023/08/14	Temperature (Celsius)	degrees C	15.5
UA	G280	B	2023/11/20	Temperature (Celsius)	degrees C	14.7
UA	G280	B	2015/01/21	Total Dissolved Solids	mg/L	540
UA	G280	B	2015/04/13	Total Dissolved Solids	mg/L	480
UA	G280	B	2015/07/23	Total Dissolved Solids	mg/L	480
UA	G280	B	2015/10/08	Total Dissolved Solids	mg/L	450
UA	G280	B	2015/11/24	Total Dissolved Solids	mg/L	460
UA	G280	B	2016/02/10	Total Dissolved Solids	mg/L	400
UA	G280	B	2016/05/10	Total Dissolved Solids	mg/L	350
UA	G280	B	2016/08/03	Total Dissolved Solids	mg/L	350
UA	G280	B	2016/11/20	Total Dissolved Solids	mg/L	430
UA	G280	B	2017/02/15	Total Dissolved Solids	mg/L	440
UA	G280	B	2017/05/20	Total Dissolved Solids	mg/L	420
UA	G280	B	2017/07/18	Total Dissolved Solids	mg/L	400
UA	G280	B	2017/11/04	Total Dissolved Solids	mg/L	350
UA	G280	B	2018/05/16	Total Dissolved Solids	mg/L	360
UA	G280	B	2018/08/10	Total Dissolved Solids	mg/L	400
UA	G280	B	2019/01/22	Total Dissolved Solids	mg/L	500
UA	G280	B	2019/08/26	Total Dissolved Solids	mg/L	480
UA	G280	B	2020/01/23	Total Dissolved Solids	mg/L	1,100
UA	G280	B	2020/08/11	Total Dissolved Solids	mg/L	440
UA	G280	B	2020/10/14	Total Dissolved Solids	mg/L	490
UA	G280	B	2021/01/21	Total Dissolved Solids	mg/L	490
UA	G280	B	2021/01/28	Total Dissolved Solids	mg/L	430
UA	G280	B	2021/03/30	Total Dissolved Solids	mg/L	460
UA	G280	B	2021/04/22	Total Dissolved Solids	mg/L	470
UA	G280	B	2021/05/06	Total Dissolved Solids	mg/L	440
UA	G280	B	2021/05/19	Total Dissolved Solids	mg/L	400
UA	G280	B	2021/06/16	Total Dissolved Solids	mg/L	530
UA	G280	B	2021/06/28	Total Dissolved Solids	mg/L	420
UA	G280	B	2021/07/13	Total Dissolved Solids	mg/L	510
UA	G280	B	2021/07/27	Total Dissolved Solids	mg/L	470
UA	G280	B	2021/08/18	Total Dissolved Solids	mg/L	460
UA	G280	B	2021/10/26	Total Dissolved Solids	mg/L	400
UA	G280	B	2022/02/08	Total Dissolved Solids	mg/L	440
UA	G280	B	2022/05/10	Total Dissolved Solids	mg/L	450
UA	G280	B	2022/08/24	Total Dissolved Solids	mg/L	580
UA	G280	B	2022/11/09	Total Dissolved Solids	mg/L	500
UA	G280	B	2023/02/16	Total Dissolved Solids	mg/L	470
UA	G280	B	2023/06/08	Total Dissolved Solids	mg/L	590
UA	G280	B	2023/08/14	Total Dissolved Solids	mg/L	594
UA	G280	B	2023/11/20	Total Dissolved Solids	mg/L	608
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	2015/11/20	Cobalt, total	mg/L	0.00560
UA	G281	B	2016/02/11	Cobalt, total	mg/L	<0.000017
UA	G281	B	2016/05/10	Cobalt, total	mg/L	<0.000017
UA	G281	B	2016/08/01	Cobalt, total	mg/L	<0.000017
UA	G281	B	2016/11/16	Cobalt, total	mg/L	<0.000017
UA	G281	B	2017/02/10	Cobalt, total	mg/L	<0.000017
UA	G281	B	2017/05/16	Cobalt, total	mg/L	<0.000017
UA	G281	B	2017/07/12	Cobalt, total	mg/L	<0.000017
UA	G281	B	2018/05/11	Cobalt, total	mg/L	0.00230
UA	G281	B	2018/08/03	Cobalt, total	mg/L	0.00360
UA	G281	B	2019/01/23	Cobalt, total	mg/L	<0.00067
UA	G281	B	2019/08/13	Cobalt, total	mg/L	<0.00067
UA	G281	B	2020/01/24	Cobalt, total	mg/L	<0.00067
UA	G281	B	2020/08/12	Cobalt, total	mg/L	<0.00022
UA	G281	B	2020/10/14	Cobalt, total	mg/L	<0.002
UA	G281	B	2021/01/29	Cobalt, total	mg/L	<0.00022
UA	G281	B	2021/03/31	Cobalt, total	mg/L	<0.00022
UA	G281	B	2021/04/21	Cobalt, total	mg/L	<0.00022
UA	G281	B	2021/05/05	Cobalt, total	mg/L	<0.00022
UA	G281	B	2021/05/17	Cobalt, total	mg/L	0.00260
UA	G281	B	2021/06/14	Cobalt, total	mg/L	<0.00022
UA	G281	B	2021/06/28	Cobalt, total	mg/L	<0.00019
UA	G281	B	2021/07/12	Cobalt, total	mg/L	<0.00022
UA	G281	B	2021/07/27	Cobalt, total	mg/L	<0.00022
UA	G281	B	2021/08/17	Cobalt, total	mg/L	<0.00022
UA	G281	B	2021/10/26	Cobalt, total	mg/L	<0.002
UA	G281	B	2022/02/08	Cobalt, total	mg/L	<0.00019
UA	G281	B	2022/05/10	Cobalt, total	mg/L	<0.00048
UA	G281	B	2022/08/25	Cobalt, total	mg/L	0.000740
UA	G281	B	2022/11/08	Cobalt, total	mg/L	<0.00048
UA	G281	B	2023/02/16	Cobalt, total	mg/L	<0.00048
UA	G281	B	2023/06/08	Cobalt, total	mg/L	0.000990
UA	G281	B	2023/08/14	Cobalt, total	mg/L	0.000400
UA	G281	B	2023/11/20	Cobalt, total	mg/L	0.000600
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	G401	C	2015/11/21	pH (field)	SU	6.0
UA	G401	C	2016/02/22	pH (field)	SU	5.8
UA	G401	C	2016/05/19	pH (field)	SU	6.0
UA	G401	C	2016/08/01	pH (field)	SU	6.2
UA	G401	C	2016/11/17	pH (field)	SU	6.2
UA	G401	C	2017/02/16	pH (field)	SU	6.2
UA	G401	C	2017/05/17	pH (field)	SU	6.3
UA	G401	C	2017/07/13	pH (field)	SU	6.2
UA	G401	C	2017/10/27	pH (field)	SU	6.3
UA	G401	C	2018/05/12	pH (field)	SU	6.2
UA	G401	C	2018/08/04	pH (field)	SU	6.2
UA	G401	C	2019/01/24	pH (field)	SU	6.3
UA	G401	C	2019/08/16	pH (field)	SU	6.4
UA	G401	C	2020/01/22	pH (field)	SU	6.0
UA	G401	C	2020/05/06	pH (field)	SU	5.8
UA	G401	C	2020/08/12	pH (field)	SU	5.8
UA	G401	C	2020/10/14	pH (field)	SU	5.7
UA	G401	C	2021/01/29	pH (field)	SU	5.9
UA	G401	C	2021/05/20	pH (field)	SU	5.9
UA	G401	C	2021/08/17	pH (field)	SU	5.9
UA	G401	C	2021/10/26	pH (field)	SU	5.6
UA	G401	C	2021/11/29	pH (field)	SU	5.8
UA	G401	C	2022/02/09	pH (field)	SU	5.8
UA	G401	C	2022/05/10	pH (field)	SU	5.9
UA	G401	C	2022/09/20	pH (field)	SU	6.1
UA	G401	C	2022/11/08	pH (field)	SU	6.2
UA	G401	C	2023/02/15	pH (field)	SU	5.9
UA	G401	C	2023/06/07	pH (field)	SU	6.2
UA	G401	C	2023/08/11	pH (field)	SU	6.0
UA	G401	C	2023/11/21	pH (field)	SU	5.9
UA	G401	C	2015/11/21	Oxidation Reduction Potential	mV	-16.0
UA	G401	C	2016/02/22	Oxidation Reduction Potential	mV	27.0
UA	G401	C	2016/05/19	Oxidation Reduction Potential	mV	-23.0
UA	G401	C	2016/08/01	Oxidation Reduction Potential	mV	-37.0
UA	G401	C	2016/11/17	Oxidation Reduction Potential	mV	-44.0
UA	G401	C	2017/02/16	Oxidation Reduction Potential	mV	-59.0
UA	G401	C	2017/05/17	Oxidation Reduction Potential	mV	-68.0
UA	G401	C	2017/07/13	Oxidation Reduction Potential	mV	-48.0
UA	G401	C	2017/10/27	Oxidation Reduction Potential	mV	-41.0
UA	G401	C	2018/05/12	Oxidation Reduction Potential	mV	-50.0
UA	G401	C	2018/08/04	Oxidation Reduction Potential	mV	-55.0
UA	G401	C	2019/01/24	Oxidation Reduction Potential	mV	-52.0
UA	G401	C	2019/08/16	Oxidation Reduction Potential	mV	-51.0
UA	G401	C	2020/01/22	Oxidation Reduction Potential	mV	111
UA	G401	C	2020/05/06	Oxidation Reduction Potential	mV	94.1
UA	G401	C	2020/08/12	Oxidation Reduction Potential	mV	38.8
UA	G401	C	2020/10/14	Oxidation Reduction Potential	mV	40.2
UA	G401	C	2021/01/29	Oxidation Reduction Potential	mV	44.0
UA	G401	C	2021/05/20	Oxidation Reduction Potential	mV	25.0
UA	G401	C	2021/08/17	Oxidation Reduction Potential	mV	29.6
UA	G401	C	2021/10/26	Oxidation Reduction Potential	mV	28.3
UA	G401	C	2021/11/29	Oxidation Reduction Potential	mV	41.2
UA	G401	C	2022/02/09	Oxidation Reduction Potential	mV	78.1
UA	G401	C	2022/05/10	Oxidation Reduction Potential	mV	38.4
UA	G401	C	2022/09/20	Oxidation Reduction Potential	mV	4.70
UA	G401	C	2022/11/08	Oxidation Reduction Potential	mV	-18.0
UA	G401	C	2023/02/15	Oxidation Reduction Potential	mV	22.0
UA	G401	C	2023/06/07	Oxidation Reduction Potential	mV	-32.0
UA	G401	C	2023/08/11	Oxidation Reduction Potential	mV	-30.0

UA	G401	C	2023/11/21	Oxidation Reduction Potential	mV	15.0
UA	G401	C	2015/11/21	Eh	V	0.18
UA	G401	C	2016/02/22	Eh	V	0.22
UA	G401	C	2016/05/19	Eh	V	0.17
UA	G401	C	2016/08/01	Eh	V	0.16
UA	G401	C	2016/11/17	Eh	V	0.15
UA	G401	C	2017/02/16	Eh	V	0.14
UA	G401	C	2017/05/17	Eh	V	0.13
UA	G401	C	2017/07/13	Eh	V	0.15
UA	G401	C	2017/10/27	Eh	V	0.16
UA	G401	C	2018/05/12	Eh	V	0.15
UA	G401	C	2018/08/04	Eh	V	0.14
UA	G401	C	2019/01/24	Eh	V	0.15
UA	G401	C	2019/08/16	Eh	V	0.14
UA	G401	C	2020/01/22	Eh	V	0.31
UA	G401	C	2020/05/06	Eh	V	0.29
UA	G401	C	2020/08/12	Eh	V	0.23
UA	G401	C	2020/10/14	Eh	V	0.23
UA	G401	C	2021/01/29	Eh	V	0.24
UA	G401	C	2021/05/20	Eh	V	0.22
UA	G401	C	2021/08/17	Eh	V	0.22
UA	G401	C	2021/10/26	Eh	V	0.22
UA	G401	C	2021/11/29	Eh	V	0.24
UA	G401	C	2022/02/09	Eh	V	0.27
UA	G401	C	2022/05/10	Eh	V	0.23
UA	G401	C	2022/09/20	Eh	V	0.19
UA	G401	C	2022/11/08	Eh	V	0.18
UA	G401	C	2023/02/15	Eh	V	0.22
UA	G401	C	2023/06/07	Eh	V	0.17
UA	G401	C	2023/08/11	Eh	V	0.16
UA	G401	C	2023/11/21	Eh	V	0.21
UA	G401	C	2020/01/22	Alkalinity, bicarbonate	mg/L CaCO3	110
UA	G401	C	2021/01/29	Alkalinity, bicarbonate	mg/L CaCO3	50.0
UA	G401	C	2021/08/17	Alkalinity, bicarbonate	mg/L CaCO3	88.0
UA	G401	C	2022/02/09	Alkalinity, bicarbonate	mg/L CaCO3	75.0
UA	G401	C	2022/09/20	Alkalinity, bicarbonate	mg/L CaCO3	60.0
UA	G401	C	2023/02/15	Alkalinity, bicarbonate	mg/L CaCO3	80.0
UA	G401	C	2023/06/07	Alkalinity, bicarbonate	mg/L CaCO3	140
UA	G401	C	2023/08/11	Alkalinity, bicarbonate	mg/L CaCO3	96.0
UA	G401	C	2023/11/21	Alkalinity, bicarbonate	mg/L CaCO3	99.0
UA	G401	C	2022/09/20	Alkalinity, carbonate	mg/L CaCO3	10.0
UA	G401	C	2015/11/21	Barium, total	mg/L	0.0370
UA	G401	C	2016/02/22	Barium, total	mg/L	0.0150
UA	G401	C	2016/05/19	Barium, total	mg/L	0.0140
UA	G401	C	2016/08/01	Barium, total	mg/L	0.0530
UA	G401	C	2016/11/17	Barium, total	mg/L	0.0210
UA	G401	C	2017/02/16	Barium, total	mg/L	0.420
UA	G401	C	2017/05/17	Barium, total	mg/L	0.300
UA	G401	C	2017/07/13	Barium, total	mg/L	0.570
UA	G401	C	2018/05/12	Barium, total	mg/L	0.140
UA	G401	C	2018/08/04	Barium, total	mg/L	1.50
UA	G401	C	2019/01/24	Barium, total	mg/L	0.300
UA	G401	C	2019/08/16	Barium, total	mg/L	0.190
UA	G401	C	2020/01/22	Barium, total	mg/L	0.0120
UA	G401	C	2020/08/12	Barium, total	mg/L	0.0100
UA	G401	C	2020/10/14	Barium, total	mg/L	0.0120
UA	G401	C	2021/01/29	Barium, total	mg/L	0.0130
UA	G401	C	2021/05/20	Barium, total	mg/L	0.0120
UA	G401	C	2021/08/17	Barium, total	mg/L	0.00970
UA	G401	C	2021/10/26	Barium, total	mg/L	0.0100
UA	G401	C	2022/02/09	Barium, total	mg/L	0.0110
UA	G401	C	2022/05/10	Barium, total	mg/L	0.0140
UA	G401	C	2022/09/20	Barium, total	mg/L	0.0110

UA	G401	C	2022/11/08	Barium, total	mg/L	0.00920
UA	G401	C	2023/02/15	Barium, total	mg/L	0.0110
UA	G401	C	2023/06/07	Barium, total	mg/L	0.0100
UA	G401	C	2023/08/11	Barium, total	mg/L	0.0118
UA	G401	C	2023/11/21	Barium, total	mg/L	0.0132
UA	G401	C	2015/11/21	Boron, total	mg/L	3.30
UA	G401	C	2016/02/22	Boron, total	mg/L	3.40
UA	G401	C	2016/05/19	Boron, total	mg/L	3.50
UA	G401	C	2016/08/01	Boron, total	mg/L	4.10
UA	G401	C	2016/11/17	Boron, total	mg/L	4.00
UA	G401	C	2017/02/16	Boron, total	mg/L	3.70
UA	G401	C	2017/05/17	Boron, total	mg/L	3.20
UA	G401	C	2017/07/13	Boron, total	mg/L	3.60
UA	G401	C	2017/10/27	Boron, total	mg/L	4.40
UA	G401	C	2018/05/12	Boron, total	mg/L	3.70
UA	G401	C	2018/08/04	Boron, total	mg/L	3.90
UA	G401	C	2019/01/24	Boron, total	mg/L	3.80
UA	G401	C	2019/08/16	Boron, total	mg/L	4.00
UA	G401	C	2020/01/22	Boron, total	mg/L	1.10
UA	G401	C	2020/08/12	Boron, total	mg/L	4.20
UA	G401	C	2020/10/14	Boron, total	mg/L	4.10
UA	G401	C	2021/01/29	Boron, total	mg/L	3.70
UA	G401	C	2021/05/20	Boron, total	mg/L	3.90
UA	G401	C	2021/08/17	Boron, total	mg/L	4.20
UA	G401	C	2021/10/26	Boron, total	mg/L	3.40
UA	G401	C	2022/02/09	Boron, total	mg/L	3.50
UA	G401	C	2022/05/10	Boron, total	mg/L	3.20
UA	G401	C	2022/09/20	Boron, total	mg/L	4.30
UA	G401	C	2022/11/08	Boron, total	mg/L	4.00
UA	G401	C	2023/02/15	Boron, total	mg/L	3.90
UA	G401	C	2023/06/07	Boron, total	mg/L	3.90
UA	G401	C	2023/08/11	Boron, total	mg/L	4.24
UA	G401	C	2023/11/21	Boron, total	mg/L	5.37
UA	G401	C	2015/11/21	Calcium, total	mg/L	440
UA	G401	C	2016/02/22	Calcium, total	mg/L	330
UA	G401	C	2016/05/19	Calcium, total	mg/L	380
UA	G401	C	2016/08/01	Calcium, total	mg/L	450
UA	G401	C	2016/11/17	Calcium, total	mg/L	400
UA	G401	C	2017/02/16	Calcium, total	mg/L	440
UA	G401	C	2017/05/17	Calcium, total	mg/L	470
UA	G401	C	2017/07/13	Calcium, total	mg/L	470
UA	G401	C	2017/10/27	Calcium, total	mg/L	490
UA	G401	C	2018/05/12	Calcium, total	mg/L	450
UA	G401	C	2018/08/04	Calcium, total	mg/L	690
UA	G401	C	2019/01/24	Calcium, total	mg/L	560
UA	G401	C	2019/08/16	Calcium, total	mg/L	550
UA	G401	C	2020/01/22	Calcium, total	mg/L	210
UA	G401	C	2020/08/12	Calcium, total	mg/L	520
UA	G401	C	2020/10/14	Calcium, total	mg/L	530
UA	G401	C	2021/01/29	Calcium, total	mg/L	490
UA	G401	C	2021/05/20	Calcium, total	mg/L	480
UA	G401	C	2021/08/17	Calcium, total	mg/L	550
UA	G401	C	2021/10/26	Calcium, total	mg/L	440
UA	G401	C	2022/02/09	Calcium, total	mg/L	450
UA	G401	C	2022/05/10	Calcium, total	mg/L	410
UA	G401	C	2022/09/20	Calcium, total	mg/L	490
UA	G401	C	2022/11/08	Calcium, total	mg/L	450
UA	G401	C	2023/02/15	Calcium, total	mg/L	480
UA	G401	C	2023/06/07	Calcium, total	mg/L	490
UA	G401	C	2023/08/11	Calcium, total	mg/L	509
UA	G401	C	2023/11/21	Calcium, total	mg/L	553
UA	G401	C	2015/11/21	Chloride, total	mg/L	3.60
UA	G401	C	2016/02/22	Chloride, total	mg/L	6.00

UA	G401	C	2016/05/19	Chloride, total	mg/L	3.00
UA	G401	C	2016/08/01	Chloride, total	mg/L	5.30
UA	G401	C	2016/11/17	Chloride, total	mg/L	<0.1
UA	G401	C	2017/02/16	Chloride, total	mg/L	2.40
UA	G401	C	2017/05/17	Chloride, total	mg/L	3.40
UA	G401	C	2017/07/13	Chloride, total	mg/L	2.60
UA	G401	C	2017/10/27	Chloride, total	mg/L	3.20
UA	G401	C	2018/05/12	Chloride, total	mg/L	2.20
UA	G401	C	2018/08/04	Chloride, total	mg/L	2.10
UA	G401	C	2019/01/24	Chloride, total	mg/L	3.10
UA	G401	C	2019/08/16	Chloride, total	mg/L	2.50
UA	G401	C	2020/01/22	Chloride, total	mg/L	8.60
UA	G401	C	2020/08/12	Chloride, total	mg/L	2.70
UA	G401	C	2020/10/14	Chloride, total	mg/L	4.40
UA	G401	C	2021/01/29	Chloride, total	mg/L	2.30
UA	G401	C	2021/05/20	Chloride, total	mg/L	5.90
UA	G401	C	2021/08/17	Chloride, total	mg/L	14.0
UA	G401	C	2021/10/26	Chloride, total	mg/L	12.0
UA	G401	C	2022/02/09	Chloride, total	mg/L	6.40
UA	G401	C	2022/05/10	Chloride, total	mg/L	6.00
UA	G401	C	2022/09/20	Chloride, total	mg/L	2.90
UA	G401	C	2022/11/08	Chloride, total	mg/L	2.60
UA	G401	C	2023/02/15	Chloride, total	mg/L	4.60
UA	G401	C	2023/06/07	Chloride, total	mg/L	3.60
UA	G401	C	2023/08/11	Chloride, total	mg/L	3.00
UA	G401	C	2023/11/21	Chloride, total	mg/L	3.00
UA	G401	C	2015/11/21	Cobalt, total	mg/L	0.250
UA	G401	C	2016/02/22	Cobalt, total	mg/L	0.240
UA	G401	C	2016/05/19	Cobalt, total	mg/L	0.270
UA	G401	C	2016/08/01	Cobalt, total	mg/L	0.280
UA	G401	C	2016/11/17	Cobalt, total	mg/L	0.270
UA	G401	C	2017/02/16	Cobalt, total	mg/L	0.280
UA	G401	C	2017/05/17	Cobalt, total	mg/L	0.290
UA	G401	C	2017/07/13	Cobalt, total	mg/L	0.360
UA	G401	C	2018/05/12	Cobalt, total	mg/L	0.300
UA	G401	C	2018/08/04	Cobalt, total	mg/L	0.420
UA	G401	C	2019/01/24	Cobalt, total	mg/L	0.310
UA	G401	C	2019/08/16	Cobalt, total	mg/L	0.300
UA	G401	C	2020/01/22	Cobalt, total	mg/L	0.0460
UA	G401	C	2020/08/12	Cobalt, total	mg/L	0.260
UA	G401	C	2020/10/14	Cobalt, total	mg/L	0.280
UA	G401	C	2021/01/29	Cobalt, total	mg/L	0.240
UA	G401	C	2021/05/20	Cobalt, total	mg/L	0.190
UA	G401	C	2021/08/17	Cobalt, total	mg/L	0.170
UA	G401	C	2021/10/26	Cobalt, total	mg/L	0.140
UA	G401	C	2022/02/09	Cobalt, total	mg/L	0.150
UA	G401	C	2022/05/10	Cobalt, total	mg/L	0.110
UA	G401	C	2022/09/20	Cobalt, total	mg/L	0.140
UA	G401	C	2022/11/08	Cobalt, total	mg/L	0.110
UA	G401	C	2023/02/15	Cobalt, total	mg/L	0.120
UA	G401	C	2023/06/07	Cobalt, total	mg/L	0.110
UA	G401	C	2023/08/11	Cobalt, total	mg/L	0.156
UA	G401	C	2023/11/21	Cobalt, total	mg/L	0.206
UA	G401	C	2023/06/07	Ferrous Iron, dissolved	mg/L	6.00
UA	G401	C	2020/08/12	Iron, dissolved	mg/L	190
UA	G401	C	2020/10/14	Iron, dissolved	mg/L	190
UA	G401	C	2021/01/29	Iron, dissolved	mg/L	120
UA	G401	C	2021/05/20	Iron, dissolved	mg/L	130
UA	G401	C	2021/08/17	Iron, dissolved	mg/L	130
UA	G401	C	2021/10/26	Iron, dissolved	mg/L	98.0
UA	G401	C	2022/02/09	Iron, dissolved	mg/L	71.0
UA	G401	C	2022/05/10	Iron, dissolved	mg/L	62.0
UA	G401	C	2022/09/20	Iron, dissolved	mg/L	92.0

UA	G401	C	2022/11/08	Iron, dissolved	mg/L	66.0
UA	G401	C	2023/02/15	Iron, dissolved	mg/L	56.0
UA	G401	C	2023/06/07	Iron, dissolved	mg/L	84.0
UA	G401	C	2023/08/11	Iron, dissolved	mg/L	93.8
UA	G401	C	2023/11/21	Iron, dissolved	mg/L	95.2
UA	G401	C	2017/07/13	Magnesium, total	mg/L	160
UA	G401	C	2020/01/22	Magnesium, total	mg/L	64.0
UA	G401	C	2021/01/29	Magnesium, total	mg/L	140
UA	G401	C	2021/08/17	Magnesium, total	mg/L	160
UA	G401	C	2022/02/09	Magnesium, total	mg/L	140
UA	G401	C	2022/09/20	Magnesium, total	mg/L	160
UA	G401	C	2023/02/15	Magnesium, total	mg/L	140
UA	G401	C	2023/06/07	Magnesium, total	mg/L	150
UA	G401	C	2023/08/11	Magnesium, total	mg/L	141
UA	G401	C	2023/11/21	Magnesium, total	mg/L	142
UA	G401	C	2018/03/03	Manganese, dissolved	mg/L	38.0
UA	G401	C	2018/05/12	Manganese, dissolved	mg/L	32.0
UA	G401	C	2018/08/13	Manganese, dissolved	mg/L	30.0
UA	G401	C	2018/11/07	Manganese, dissolved	mg/L	38.0
UA	G401	C	2019/01/24	Manganese, dissolved	mg/L	45.0
UA	G401	C	2019/05/02	Manganese, dissolved	mg/L	10.0
UA	G401	C	2019/08/13	Manganese, dissolved	mg/L	40.0
UA	G401	C	2019/10/22	Manganese, dissolved	mg/L	39.0
UA	G401	C	2020/01/22	Manganese, dissolved	mg/L	17.0
UA	G401	C	2020/05/06	Manganese, dissolved	mg/L	38.0
UA	G401	C	2020/08/12	Manganese, dissolved	mg/L	44.0
UA	G401	C	2020/10/14	Manganese, dissolved	mg/L	47.0
UA	G401	C	2021/01/29	Manganese, dissolved	mg/L	45.0
UA	G401	C	2021/05/20	Manganese, dissolved	mg/L	43.0
UA	G401	C	2021/08/17	Manganese, dissolved	mg/L	38.0
UA	G401	C	2021/10/26	Manganese, dissolved	mg/L	33.0
UA	G401	C	2022/02/09	Manganese, dissolved	mg/L	27.0
UA	G401	C	2022/05/10	Manganese, dissolved	mg/L	21.0
UA	G401	C	2022/09/20	Manganese, dissolved	mg/L	31.0
UA	G401	C	2022/11/08	Manganese, dissolved	mg/L	28.0
UA	G401	C	2023/02/15	Manganese, dissolved	mg/L	24.0
UA	G401	C	2023/06/07	Manganese, dissolved	mg/L	27.0
UA	G401	C	2023/08/11	Manganese, dissolved	mg/L	36.0
UA	G401	C	2023/11/21	Manganese, dissolved	mg/L	24.5
UA	G401	C	2023/08/11	Phosphate, dissolved	mg/L	0.0610
UA	G401	C	2017/07/13	Potassium, total	mg/L	12.0
UA	G401	C	2020/01/22	Potassium, total	mg/L	2.00
UA	G401	C	2021/01/29	Potassium, total	mg/L	3.90
UA	G401	C	2021/08/17	Potassium, total	mg/L	3.60
UA	G401	C	2022/02/09	Potassium, total	mg/L	3.20
UA	G401	C	2022/09/20	Potassium, total	mg/L	3.00
UA	G401	C	2023/02/15	Potassium, total	mg/L	2.50
UA	G401	C	2023/06/07	Potassium, total	mg/L	2.20
UA	G401	C	2023/08/11	Potassium, total	mg/L	2.86
UA	G401	C	2023/11/21	Potassium, total	mg/L	2.80
UA	G401	C	2023/06/07	Silicon, dissolved	mg/L	16.0
UA	G401	C	2023/08/11	Silicon, dissolved	mg/L	15.2
UA	G401	C	2017/07/13	Sodium, total	mg/L	47.0
UA	G401	C	2020/01/22	Sodium, total	mg/L	79.0
UA	G401	C	2021/01/29	Sodium, total	mg/L	69.0
UA	G401	C	2021/08/17	Sodium, total	mg/L	83.0
UA	G401	C	2022/02/09	Sodium, total	mg/L	81.0
UA	G401	C	2022/09/20	Sodium, total	mg/L	77.0
UA	G401	C	2023/02/15	Sodium, total	mg/L	74.0
UA	G401	C	2023/06/07	Sodium, total	mg/L	71.0
UA	G401	C	2023/08/11	Sodium, total	mg/L	71.4
UA	G401	C	2023/11/21	Sodium, total	mg/L	64.0
UA	G401	C	2015/11/21	Sulfate, total	mg/L	2,300

UA	G401	C	2016/02/22	Sulfate, total	mg/L	2,500
UA	G401	C	2016/05/19	Sulfate, total	mg/L	2,200
UA	G401	C	2016/08/01	Sulfate, total	mg/L	2,100
UA	G401	C	2016/11/17	Sulfate, total	mg/L	3,400
UA	G401	C	2017/02/16	Sulfate, total	mg/L	3,900
UA	G401	C	2017/05/17	Sulfate, total	mg/L	2,000
UA	G401	C	2017/07/13	Sulfate, total	mg/L	2,100
UA	G401	C	2017/10/27	Sulfate, total	mg/L	2,000
UA	G401	C	2018/05/12	Sulfate, total	mg/L	2,200
UA	G401	C	2018/08/04	Sulfate, total	mg/L	2,200
UA	G401	C	2019/01/24	Sulfate, total	mg/L	4,600
UA	G401	C	2019/08/16	Sulfate, total	mg/L	4,300
UA	G401	C	2020/01/22	Sulfate, total	mg/L	870
UA	G401	C	2020/08/12	Sulfate, total	mg/L	2,000
UA	G401	C	2020/10/14	Sulfate, total	mg/L	2,400
UA	G401	C	2021/01/29	Sulfate, total	mg/L	2,500
UA	G401	C	2021/05/20	Sulfate, total	mg/L	2,400
UA	G401	C	2021/08/17	Sulfate, total	mg/L	1,900
UA	G401	C	2021/10/26	Sulfate, total	mg/L	1,800
UA	G401	C	2022/02/09	Sulfate, total	mg/L	2,000
UA	G401	C	2022/05/10	Sulfate, total	mg/L	1,900
UA	G401	C	2022/09/20	Sulfate, total	mg/L	2,100
UA	G401	C	2022/11/08	Sulfate, total	mg/L	2,100
UA	G401	C	2023/02/15	Sulfate, total	mg/L	1,900
UA	G401	C	2023/06/07	Sulfate, total	mg/L	2,100
UA	G401	C	2023/08/11	Sulfate, total	mg/L	1,900
UA	G401	C	2023/11/21	Sulfate, total	mg/L	1,980
UA	G401	C	2015/11/21	Temperature (Celsius)	degrees C	17.0
UA	G401	C	2016/02/22	Temperature (Celsius)	degrees C	13.5
UA	G401	C	2016/05/19	Temperature (Celsius)	degrees C	20.0
UA	G401	C	2016/08/01	Temperature (Celsius)	degrees C	18.9
UA	G401	C	2016/11/17	Temperature (Celsius)	degrees C	13.6
UA	G401	C	2017/02/16	Temperature (Celsius)	degrees C	14.3
UA	G401	C	2017/05/17	Temperature (Celsius)	degrees C	15.2
UA	G401	C	2017/07/13	Temperature (Celsius)	degrees C	17.3
UA	G401	C	2017/10/27	Temperature (Celsius)	degrees C	13.7
UA	G401	C	2018/05/12	Temperature (Celsius)	degrees C	14.7
UA	G401	C	2018/08/04	Temperature (Celsius)	degrees C	17.0
UA	G401	C	2019/01/24	Temperature (Celsius)	degrees C	11.7
UA	G401	C	2019/08/16	Temperature (Celsius)	degrees C	17.1
UA	G401	C	2020/01/22	Temperature (Celsius)	degrees C	12.3
UA	G401	C	2020/05/06	Temperature (Celsius)	degrees C	14.8
UA	G401	C	2020/08/12	Temperature (Celsius)	degrees C	21.0
UA	G401	C	2020/10/14	Temperature (Celsius)	degrees C	18.1
UA	G401	C	2021/01/29	Temperature (Celsius)	degrees C	10.2
UA	G401	C	2021/05/20	Temperature (Celsius)	degrees C	16.6
UA	G401	C	2021/08/17	Temperature (Celsius)	degrees C	21.2
UA	G401	C	2021/10/26	Temperature (Celsius)	degrees C	15.0
UA	G401	C	2021/11/29	Temperature (Celsius)	degrees C	14.0
UA	G401	C	2022/02/09	Temperature (Celsius)	degrees C	13.1
UA	G401	C	2022/05/10	Temperature (Celsius)	degrees C	17.4
UA	G401	C	2022/09/20	Temperature (Celsius)	degrees C	23.4
UA	G401	C	2022/11/08	Temperature (Celsius)	degrees C	18.1
UA	G401	C	2023/02/15	Temperature (Celsius)	degrees C	15.4
UA	G401	C	2023/06/07	Temperature (Celsius)	degrees C	12.3
UA	G401	C	2023/08/11	Temperature (Celsius)	degrees C	17.5
UA	G401	C	2023/11/21	Temperature (Celsius)	degrees C	12.9
UA	G401	C	2015/11/21	Total Dissolved Solids	mg/L	3,000
UA	G401	C	2016/02/22	Total Dissolved Solids	mg/L	3,000
UA	G401	C	2016/05/19	Total Dissolved Solids	mg/L	2,800
UA	G401	C	2016/08/01	Total Dissolved Solids	mg/L	2,900
UA	G401	C	2016/11/17	Total Dissolved Solids	mg/L	3,200
UA	G401	C	2017/02/16	Total Dissolved Solids	mg/L	3,000

UA	G401	C	2017/05/17	Total Dissolved Solids	mg/L	3,000
UA	G401	C	2017/07/13	Total Dissolved Solids	mg/L	2,600
UA	G401	C	2017/10/27	Total Dissolved Solids	mg/L	2,900
UA	G401	C	2018/05/12	Total Dissolved Solids	mg/L	2,700
UA	G401	C	2018/08/04	Total Dissolved Solids	mg/L	2,900
UA	G401	C	2019/01/24	Total Dissolved Solids	mg/L	2,900
UA	G401	C	2019/08/16	Total Dissolved Solids	mg/L	3,400
UA	G401	C	2020/01/22	Total Dissolved Solids	mg/L	1,200
UA	G401	C	2020/08/12	Total Dissolved Solids	mg/L	2,800
UA	G401	C	2020/10/14	Total Dissolved Solids	mg/L	3,300
UA	G401	C	2021/01/29	Total Dissolved Solids	mg/L	3,300
UA	G401	C	2021/05/20	Total Dissolved Solids	mg/L	3,000
UA	G401	C	2021/08/17	Total Dissolved Solids	mg/L	3,100
UA	G401	C	2021/10/26	Total Dissolved Solids	mg/L	2,800
UA	G401	C	2022/02/09	Total Dissolved Solids	mg/L	2,800
UA	G401	C	2022/05/10	Total Dissolved Solids	mg/L	2,700
UA	G401	C	2022/09/20	Total Dissolved Solids	mg/L	2,900
UA	G401	C	2022/11/08	Total Dissolved Solids	mg/L	3,200
UA	G401	C	2023/02/15	Total Dissolved Solids	mg/L	2,800
UA	G401	C	2023/06/07	Total Dissolved Solids	mg/L	6,600
UA	G401	C	2023/08/11	Total Dissolved Solids	mg/L	3,040
UA	G401	C	2023/11/21	Total Dissolved Solids	mg/L	2,940
UA	G402	C	2015/11/21	pH (field)	SU	6.8
UA	G402	C	2016/02/22	pH (field)	SU	6.7
UA	G402	C	2016/05/19	pH (field)	SU	6.8
UA	G402	C	2016/08/02	pH (field)	SU	6.6
UA	G402	C	2016/11/17	pH (field)	SU	6.6
UA	G402	C	2017/02/16	pH (field)	SU	6.5
UA	G402	C	2017/05/17	pH (field)	SU	6.4
UA	G402	C	2017/07/13	pH (field)	SU	6.6
UA	G402	C	2017/10/27	pH (field)	SU	6.7
UA	G402	C	2018/05/12	pH (field)	SU	6.6
UA	G402	C	2018/08/04	pH (field)	SU	6.7
UA	G402	C	2019/01/22	pH (field)	SU	6.8
UA	G402	C	2019/08/16	pH (field)	SU	6.8
UA	G402	C	2020/01/22	pH (field)	SU	7.0
UA	G402	C	2020/08/12	pH (field)	SU	6.8
UA	G402	C	2020/10/14	pH (field)	SU	6.8
UA	G402	C	2021/01/28	pH (field)	SU	6.9
UA	G402	C	2021/04/27	pH (field)	SU	6.9
UA	G402	C	2021/08/17	pH (field)	SU	6.9
UA	G402	C	2021/10/26	pH (field)	SU	6.7
UA	G402	C	2022/02/09	pH (field)	SU	7.0
UA	G402	C	2022/05/10	pH (field)	SU	6.7
UA	G402	C	2022/08/24	pH (field)	SU	6.8
UA	G402	C	2022/11/08	pH (field)	SU	6.9
UA	G402	C	2023/02/15	pH (field)	SU	6.8
UA	G402	C	2023/06/06	pH (field)	SU	6.6
UA	G402	C	2023/08/11	pH (field)	SU	7.3
UA	G402	C	2023/11/21	pH (field)	SU	6.7
UA	G402	C	2015/11/21	Oxidation Reduction Potential	mV	89.0
UA	G402	C	2016/05/19	Oxidation Reduction Potential	mV	2.00
UA	G402	C	2016/08/02	Oxidation Reduction Potential	mV	-45.0
UA	G402	C	2016/11/17	Oxidation Reduction Potential	mV	-49.0
UA	G402	C	2017/02/16	Oxidation Reduction Potential	mV	-82.0
UA	G402	C	2017/05/17	Oxidation Reduction Potential	mV	-85.0
UA	G402	C	2017/07/13	Oxidation Reduction Potential	mV	-49.0
UA	G402	C	2017/10/27	Oxidation Reduction Potential	mV	-52.0
UA	G402	C	2018/05/12	Oxidation Reduction Potential	mV	-38.0
UA	G402	C	2018/08/04	Oxidation Reduction Potential	mV	-62.0
UA	G402	C	2019/01/22	Oxidation Reduction Potential	mV	-60.0
UA	G402	C	2019/08/16	Oxidation Reduction Potential	mV	-61.0
UA	G402	C	2020/01/22	Oxidation Reduction Potential	mV	172

UA	G402	C	2020/08/12	Oxidation Reduction Potential	mV	74.4
UA	G402	C	2020/10/14	Oxidation Reduction Potential	mV	201
UA	G402	C	2021/01/28	Oxidation Reduction Potential	mV	391
UA	G402	C	2021/04/27	Oxidation Reduction Potential	mV	127
UA	G402	C	2021/08/17	Oxidation Reduction Potential	mV	178
UA	G402	C	2021/10/26	Oxidation Reduction Potential	mV	22.2
UA	G402	C	2022/02/09	Oxidation Reduction Potential	mV	95.8
UA	G402	C	2022/05/10	Oxidation Reduction Potential	mV	34.4
UA	G402	C	2022/08/24	Oxidation Reduction Potential	mV	138
UA	G402	C	2022/11/08	Oxidation Reduction Potential	mV	214
UA	G402	C	2023/02/15	Oxidation Reduction Potential	mV	265
UA	G402	C	2023/06/06	Oxidation Reduction Potential	mV	182
UA	G402	C	2023/08/11	Oxidation Reduction Potential	mV	23.0
UA	G402	C	2023/11/21	Oxidation Reduction Potential	mV	158
UA	G402	C	2015/11/21	Eh	V	0.28
UA	G402	C	2016/05/19	Eh	V	0.19
UA	G402	C	2016/08/02	Eh	V	0.15
UA	G402	C	2016/11/17	Eh	V	0.15
UA	G402	C	2017/02/16	Eh	V	0.11
UA	G402	C	2017/05/17	Eh	V	0.11
UA	G402	C	2017/07/13	Eh	V	0.14
UA	G402	C	2017/10/27	Eh	V	0.14
UA	G402	C	2018/05/12	Eh	V	0.16
UA	G402	C	2018/08/04	Eh	V	0.13
UA	G402	C	2019/01/22	Eh	V	0.14
UA	G402	C	2019/08/16	Eh	V	0.13
UA	G402	C	2020/01/22	Eh	V	0.37
UA	G402	C	2020/08/12	Eh	V	0.27
UA	G402	C	2020/10/14	Eh	V	0.39
UA	G402	C	2021/01/28	Eh	V	0.59
UA	G402	C	2021/04/27	Eh	V	0.32
UA	G402	C	2021/08/17	Eh	V	0.37
UA	G402	C	2021/10/26	Eh	V	0.22
UA	G402	C	2022/02/09	Eh	V	0.29
UA	G402	C	2022/05/10	Eh	V	0.23
UA	G402	C	2022/08/24	Eh	V	0.33
UA	G402	C	2022/11/08	Eh	V	0.41
UA	G402	C	2023/02/15	Eh	V	0.46
UA	G402	C	2023/06/06	Eh	V	0.37
UA	G402	C	2023/08/11	Eh	V	0.22
UA	G402	C	2023/11/21	Eh	V	0.35
UA	G402	C	2017/07/13	Alkalinity, bicarbonate	mg/L CaCO3	480
UA	G402	C	2020/01/22	Alkalinity, bicarbonate	mg/L CaCO3	500
UA	G402	C	2021/01/28	Alkalinity, bicarbonate	mg/L CaCO3	490
UA	G402	C	2021/08/17	Alkalinity, bicarbonate	mg/L CaCO3	500
UA	G402	C	2022/02/09	Alkalinity, bicarbonate	mg/L CaCO3	490
UA	G402	C	2022/08/24	Alkalinity, bicarbonate	mg/L CaCO3	490
UA	G402	C	2023/02/15	Alkalinity, bicarbonate	mg/L CaCO3	490
UA	G402	C	2023/06/06	Alkalinity, bicarbonate	mg/L CaCO3	500
UA	G402	C	2023/08/11	Alkalinity, bicarbonate	mg/L CaCO3	508
UA	G402	C	2023/11/21	Alkalinity, bicarbonate	mg/L CaCO3	486
UA	G402	C	2022/08/24	Alkalinity, carbonate	mg/L CaCO3	10.0
UA	G402	C	2015/11/21	Barium, total	mg/L	0.0820
UA	G402	C	2016/02/22	Barium, total	mg/L	0.110
UA	G402	C	2016/05/19	Barium, total	mg/L	0.0850
UA	G402	C	2016/08/02	Barium, total	mg/L	0.0470
UA	G402	C	2016/11/17	Barium, total	mg/L	0.0540
UA	G402	C	2017/02/16	Barium, total	mg/L	0.0280
UA	G402	C	2017/05/17	Barium, total	mg/L	0.0290
UA	G402	C	2017/07/13	Barium, total	mg/L	0.0760
UA	G402	C	2018/05/12	Barium, total	mg/L	0.0410
UA	G402	C	2018/08/04	Barium, total	mg/L	0.0620
UA	G402	C	2019/01/22	Barium, total	mg/L	0.0420

UA	G402	C	2019/08/16	Barium, total	mg/L	0.0360
UA	G402	C	2020/01/22	Barium, total	mg/L	0.0250
UA	G402	C	2020/08/12	Barium, total	mg/L	0.0240
UA	G402	C	2020/10/14	Barium, total	mg/L	0.0300
UA	G402	C	2021/01/28	Barium, total	mg/L	0.0200
UA	G402	C	2021/04/27	Barium, total	mg/L	0.0190
UA	G402	C	2021/08/17	Barium, total	mg/L	0.0240
UA	G402	C	2021/10/26	Barium, total	mg/L	0.0190
UA	G402	C	2022/02/09	Barium, total	mg/L	0.0270
UA	G402	C	2022/05/10	Barium, total	mg/L	0.0310
UA	G402	C	2022/08/24	Barium, total	mg/L	0.0310
UA	G402	C	2022/11/08	Barium, total	mg/L	0.0200
UA	G402	C	2023/02/15	Barium, total	mg/L	0.0240
UA	G402	C	2023/06/06	Barium, total	mg/L	0.0260
UA	G402	C	2023/08/11	Barium, total	mg/L	0.0290
UA	G402	C	2023/11/21	Barium, total	mg/L	0.0281
UA	G402	C	2015/11/21	Boron, total	mg/L	6.60
UA	G402	C	2016/02/22	Boron, total	mg/L	5.70
UA	G402	C	2016/05/19	Boron, total	mg/L	6.30
UA	G402	C	2016/08/02	Boron, total	mg/L	7.40
UA	G402	C	2016/11/17	Boron, total	mg/L	6.90
UA	G402	C	2017/02/16	Boron, total	mg/L	4.60
UA	G402	C	2017/05/17	Boron, total	mg/L	5.80
UA	G402	C	2017/07/13	Boron, total	mg/L	6.80
UA	G402	C	2017/10/27	Boron, total	mg/L	7.30
UA	G402	C	2018/05/12	Boron, total	mg/L	5.90
UA	G402	C	2018/08/04	Boron, total	mg/L	5.70
UA	G402	C	2019/01/22	Boron, total	mg/L	5.40
UA	G402	C	2019/08/16	Boron, total	mg/L	5.90
UA	G402	C	2020/01/22	Boron, total	mg/L	5.00
UA	G402	C	2020/08/12	Boron, total	mg/L	6.00
UA	G402	C	2020/10/14	Boron, total	mg/L	5.40
UA	G402	C	2021/01/28	Boron, total	mg/L	4.90
UA	G402	C	2021/04/27	Boron, total	mg/L	5.40
UA	G402	C	2021/08/17	Boron, total	mg/L	6.10
UA	G402	C	2021/10/26	Boron, total	mg/L	5.10
UA	G402	C	2022/02/09	Boron, total	mg/L	5.20
UA	G402	C	2022/05/10	Boron, total	mg/L	5.30
UA	G402	C	2022/08/24	Boron, total	mg/L	5.70
UA	G402	C	2022/11/08	Boron, total	mg/L	5.20
UA	G402	C	2023/02/15	Boron, total	mg/L	5.10
UA	G402	C	2023/06/06	Boron, total	mg/L	4.90
UA	G402	C	2023/08/11	Boron, total	mg/L	5.71
UA	G402	C	2023/11/21	Boron, total	mg/L	8.13
UA	G402	C	2015/11/21	Calcium, total	mg/L	270
UA	G402	C	2016/02/22	Calcium, total	mg/L	220
UA	G402	C	2016/05/19	Calcium, total	mg/L	270
UA	G402	C	2016/08/02	Calcium, total	mg/L	240
UA	G402	C	2016/11/17	Calcium, total	mg/L	240
UA	G402	C	2017/02/16	Calcium, total	mg/L	240
UA	G402	C	2017/05/17	Calcium, total	mg/L	240
UA	G402	C	2017/07/13	Calcium, total	mg/L	250
UA	G402	C	2017/10/27	Calcium, total	mg/L	260
UA	G402	C	2018/05/12	Calcium, total	mg/L	240
UA	G402	C	2018/08/04	Calcium, total	mg/L	270
UA	G402	C	2019/01/22	Calcium, total	mg/L	260
UA	G402	C	2019/08/16	Calcium, total	mg/L	270
UA	G402	C	2020/01/22	Calcium, total	mg/L	250
UA	G402	C	2020/08/12	Calcium, total	mg/L	250
UA	G402	C	2020/10/14	Calcium, total	mg/L	250
UA	G402	C	2021/01/28	Calcium, total	mg/L	230
UA	G402	C	2021/04/27	Calcium, total	mg/L	230
UA	G402	C	2021/08/17	Calcium, total	mg/L	240

UA	G402	C	2021/10/26	Calcium, total	mg/L	200
UA	G402	C	2022/02/09	Calcium, total	mg/L	230
UA	G402	C	2022/05/10	Calcium, total	mg/L	230
UA	G402	C	2022/08/24	Calcium, total	mg/L	230
UA	G402	C	2022/11/08	Calcium, total	mg/L	180
UA	G402	C	2023/02/15	Calcium, total	mg/L	210
UA	G402	C	2023/06/06	Calcium, total	mg/L	210
UA	G402	C	2023/08/11	Calcium, total	mg/L	212
UA	G402	C	2023/11/21	Calcium, total	mg/L	213
UA	G402	C	2015/11/21	Chloride, total	mg/L	2.80
UA	G402	C	2016/02/22	Chloride, total	mg/L	2.80
UA	G402	C	2016/05/19	Chloride, total	mg/L	1.50
UA	G402	C	2016/08/02	Chloride, total	mg/L	2.20
UA	G402	C	2016/11/17	Chloride, total	mg/L	2.60
UA	G402	C	2017/02/16	Chloride, total	mg/L	2.50
UA	G402	C	2017/05/17	Chloride, total	mg/L	2.50
UA	G402	C	2017/07/13	Chloride, total	mg/L	2.50
UA	G402	C	2017/10/27	Chloride, total	mg/L	3.50
UA	G402	C	2018/05/12	Chloride, total	mg/L	2.20
UA	G402	C	2018/08/04	Chloride, total	mg/L	2.30
UA	G402	C	2019/01/22	Chloride, total	mg/L	1.90
UA	G402	C	2019/08/16	Chloride, total	mg/L	2.20
UA	G402	C	2020/01/22	Chloride, total	mg/L	<0.36
UA	G402	C	2020/08/12	Chloride, total	mg/L	1.10
UA	G402	C	2020/10/14	Chloride, total	mg/L	1.90
UA	G402	C	2021/01/28	Chloride, total	mg/L	<0.96
UA	G402	C	2021/04/27	Chloride, total	mg/L	<1
UA	G402	C	2021/08/17	Chloride, total	mg/L	2.40
UA	G402	C	2021/10/26	Chloride, total	mg/L	<5
UA	G402	C	2022/02/09	Chloride, total	mg/L	2.50
UA	G402	C	2022/05/10	Chloride, total	mg/L	1.90
UA	G402	C	2022/08/24	Chloride, total	mg/L	3.00
UA	G402	C	2022/11/08	Chloride, total	mg/L	1.60
UA	G402	C	2023/02/15	Chloride, total	mg/L	2.10
UA	G402	C	2023/06/06	Chloride, total	mg/L	3.40
UA	G402	C	2023/08/11	Chloride, total	mg/L	3.00
UA	G402	C	2023/11/21	Chloride, total	mg/L	2.00
UA	G402	C	2015/11/21	Cobalt, total	mg/L	0.0140
UA	G402	C	2016/02/22	Cobalt, total	mg/L	0.0150
UA	G402	C	2016/05/19	Cobalt, total	mg/L	0.0190
UA	G402	C	2016/08/02	Cobalt, total	mg/L	0.00740
UA	G402	C	2016/11/17	Cobalt, total	mg/L	0.00700
UA	G402	C	2017/02/16	Cobalt, total	mg/L	0.00470
UA	G402	C	2017/05/17	Cobalt, total	mg/L	0.00690
UA	G402	C	2017/07/13	Cobalt, total	mg/L	0.0170
UA	G402	C	2018/05/12	Cobalt, total	mg/L	0.00770
UA	G402	C	2018/08/04	Cobalt, total	mg/L	0.0100
UA	G402	C	2019/01/22	Cobalt, total	mg/L	0.00760
UA	G402	C	2019/08/16	Cobalt, total	mg/L	0.00450
UA	G402	C	2020/01/22	Cobalt, total	mg/L	0.00210
UA	G402	C	2020/08/12	Cobalt, total	mg/L	<0.00022
UA	G402	C	2020/10/14	Cobalt, total	mg/L	0.00300
UA	G402	C	2021/01/28	Cobalt, total	mg/L	<0.00022
UA	G402	C	2021/04/27	Cobalt, total	mg/L	<0.002
UA	G402	C	2021/08/17	Cobalt, total	mg/L	<0.00022
UA	G402	C	2021/10/26	Cobalt, total	mg/L	<0.002
UA	G402	C	2022/02/09	Cobalt, total	mg/L	0.00440
UA	G402	C	2022/05/10	Cobalt, total	mg/L	0.00370
UA	G402	C	2022/08/24	Cobalt, total	mg/L	0.00360
UA	G402	C	2022/11/08	Cobalt, total	mg/L	0.000930
UA	G402	C	2023/02/15	Cobalt, total	mg/L	0.00260
UA	G402	C	2023/06/06	Cobalt, total	mg/L	0.00350
UA	G402	C	2023/08/11	Cobalt, total	mg/L	0.00240

UA	G402	C	2023/11/21	Cobalt, total	mg/L	0.00150
UA	G402	C	2023/06/06	Ferrous Iron, dissolved	mg/L	0.260
UA	G402	C	2020/08/12	Iron, dissolved	mg/L	<0.01
UA	G402	C	2020/10/14	Iron, dissolved	mg/L	0.0110
UA	G402	C	2021/01/28	Iron, dissolved	mg/L	<0.01
UA	G402	C	2021/04/27	Iron, dissolved	mg/L	<0.01
UA	G402	C	2021/08/17	Iron, dissolved	mg/L	<0.01
UA	G402	C	2021/10/26	Iron, dissolved	mg/L	0.0120
UA	G402	C	2022/02/09	Iron, dissolved	mg/L	<0.01
UA	G402	C	2022/05/10	Iron, dissolved	mg/L	0.00790
UA	G402	C	2022/08/24	Iron, dissolved	mg/L	0.00580
UA	G402	C	2022/11/08	Iron, dissolved	mg/L	0.00860
UA	G402	C	2023/02/15	Iron, dissolved	mg/L	0.00110
UA	G402	C	2023/06/06	Iron, dissolved	mg/L	0.00330
UA	G402	C	2023/08/11	Iron, dissolved	mg/L	<0.0115
UA	G402	C	2023/11/21	Iron, dissolved	mg/L	0.0170
UA	G402	C	2017/07/13	Magnesium, total	mg/L	170
UA	G402	C	2020/01/22	Magnesium, total	mg/L	170
UA	G402	C	2021/01/28	Magnesium, total	mg/L	150
UA	G402	C	2021/08/17	Magnesium, total	mg/L	150
UA	G402	C	2022/02/09	Magnesium, total	mg/L	140
UA	G402	C	2022/08/24	Magnesium, total	mg/L	140
UA	G402	C	2023/02/15	Magnesium, total	mg/L	120
UA	G402	C	2023/06/06	Magnesium, total	mg/L	130
UA	G402	C	2023/08/11	Magnesium, total	mg/L	128
UA	G402	C	2023/11/21	Magnesium, total	mg/L	130
UA	G402	C	2018/03/03	Manganese, dissolved	mg/L	1.90
UA	G402	C	2018/05/12	Manganese, dissolved	mg/L	0.180
UA	G402	C	2018/08/13	Manganese, dissolved	mg/L	0.760
UA	G402	C	2018/11/07	Manganese, dissolved	mg/L	0.620
UA	G402	C	2019/01/24	Manganese, dissolved	mg/L	0.580
UA	G402	C	2019/05/02	Manganese, dissolved	mg/L	0.870
UA	G402	C	2019/08/16	Manganese, dissolved	mg/L	0.790
UA	G402	C	2019/10/22	Manganese, dissolved	mg/L	0.890
UA	G402	C	2020/01/22	Manganese, dissolved	mg/L	1.00
UA	G402	C	2020/05/06	Manganese, dissolved	mg/L	1.00
UA	G402	C	2020/08/12	Manganese, dissolved	mg/L	0.860
UA	G402	C	2020/10/14	Manganese, dissolved	mg/L	0.870
UA	G402	C	2021/01/28	Manganese, dissolved	mg/L	0.610
UA	G402	C	2021/04/27	Manganese, dissolved	mg/L	0.710
UA	G402	C	2021/08/17	Manganese, dissolved	mg/L	0.980
UA	G402	C	2021/10/26	Manganese, dissolved	mg/L	0.910
UA	G402	C	2022/02/09	Manganese, dissolved	mg/L	0.510
UA	G402	C	2022/05/10	Manganese, dissolved	mg/L	0.700
UA	G402	C	2022/08/24	Manganese, dissolved	mg/L	0.890
UA	G402	C	2022/11/08	Manganese, dissolved	mg/L	0.800
UA	G402	C	2023/02/15	Manganese, dissolved	mg/L	0.400
UA	G402	C	2023/06/06	Manganese, dissolved	mg/L	0.860
UA	G402	C	2023/08/11	Manganese, dissolved	mg/L	0.867
UA	G402	C	2023/11/21	Manganese, dissolved	mg/L	0.718
UA	G402	C	2023/08/11	Phosphate, dissolved	mg/L	0.141
UA	G402	C	2017/07/13	Potassium, total	mg/L	3.00
UA	G402	C	2020/01/22	Potassium, total	mg/L	1.10
UA	G402	C	2021/01/28	Potassium, total	mg/L	1.00
UA	G402	C	2021/08/17	Potassium, total	mg/L	1.10
UA	G402	C	2022/02/09	Potassium, total	mg/L	1.20
UA	G402	C	2022/08/24	Potassium, total	mg/L	1.70
UA	G402	C	2023/02/15	Potassium, total	mg/L	0.790
UA	G402	C	2023/06/06	Potassium, total	mg/L	1.00
UA	G402	C	2023/08/11	Potassium, total	mg/L	1.27
UA	G402	C	2023/11/21	Potassium, total	mg/L	0.996
UA	G402	C	2023/06/06	Silicon, dissolved	mg/L	14.0
UA	G402	C	2023/08/11	Silicon, dissolved	mg/L	13.9

UA	G402	C	2017/07/13	Sodium, total	mg/L	55.0
UA	G402	C	2020/01/22	Sodium, total	mg/L	66.0
UA	G402	C	2021/01/28	Sodium, total	mg/L	54.0
UA	G402	C	2021/08/17	Sodium, total	mg/L	54.0
UA	G402	C	2022/02/09	Sodium, total	mg/L	53.0
UA	G402	C	2022/08/24	Sodium, total	mg/L	50.0
UA	G402	C	2023/02/15	Sodium, total	mg/L	45.0
UA	G402	C	2023/06/06	Sodium, total	mg/L	44.0
UA	G402	C	2023/08/11	Sodium, total	mg/L	45.9
UA	G402	C	2023/11/21	Sodium, total	mg/L	43.6
UA	G402	C	2015/11/21	Sulfate, total	mg/L	1,200
UA	G402	C	2016/02/22	Sulfate, total	mg/L	1,000
UA	G402	C	2016/05/19	Sulfate, total	mg/L	960
UA	G402	C	2016/08/02	Sulfate, total	mg/L	890
UA	G402	C	2016/11/17	Sulfate, total	mg/L	1,100
UA	G402	C	2017/02/16	Sulfate, total	mg/L	1,100
UA	G402	C	2017/05/17	Sulfate, total	mg/L	960
UA	G402	C	2017/07/13	Sulfate, total	mg/L	1,000
UA	G402	C	2017/10/27	Sulfate, total	mg/L	1,000
UA	G402	C	2018/05/12	Sulfate, total	mg/L	1,000
UA	G402	C	2018/08/04	Sulfate, total	mg/L	940
UA	G402	C	2019/01/22	Sulfate, total	mg/L	940
UA	G402	C	2019/08/16	Sulfate, total	mg/L	990
UA	G402	C	2020/01/22	Sulfate, total	mg/L	890
UA	G402	C	2020/08/12	Sulfate, total	mg/L	400
UA	G402	C	2020/10/14	Sulfate, total	mg/L	790
UA	G402	C	2021/01/28	Sulfate, total	mg/L	770
UA	G402	C	2021/04/27	Sulfate, total	mg/L	78.0
UA	G402	C	2021/08/17	Sulfate, total	mg/L	700
UA	G402	C	2021/10/26	Sulfate, total	mg/L	640
UA	G402	C	2022/02/09	Sulfate, total	mg/L	690
UA	G402	C	2022/05/10	Sulfate, total	mg/L	600
UA	G402	C	2022/08/24	Sulfate, total	mg/L	600
UA	G402	C	2022/11/08	Sulfate, total	mg/L	550
UA	G402	C	2023/02/15	Sulfate, total	mg/L	550
UA	G402	C	2023/06/06	Sulfate, total	mg/L	580
UA	G402	C	2023/08/11	Sulfate, total	mg/L	601
UA	G402	C	2023/11/21	Sulfate, total	mg/L	599
UA	G402	C	2015/11/21	Temperature (Celsius)	degrees C	17.5
UA	G402	C	2016/02/22	Temperature (Celsius)	degrees C	12.3
UA	G402	C	2016/05/19	Temperature (Celsius)	degrees C	18.9
UA	G402	C	2016/08/02	Temperature (Celsius)	degrees C	19.0
UA	G402	C	2016/11/17	Temperature (Celsius)	degrees C	14.3
UA	G402	C	2017/02/16	Temperature (Celsius)	degrees C	14.9
UA	G402	C	2017/05/17	Temperature (Celsius)	degrees C	15.4
UA	G402	C	2017/07/13	Temperature (Celsius)	degrees C	17.3
UA	G402	C	2017/10/27	Temperature (Celsius)	degrees C	13.0
UA	G402	C	2018/05/12	Temperature (Celsius)	degrees C	13.6
UA	G402	C	2018/08/04	Temperature (Celsius)	degrees C	15.0
UA	G402	C	2019/01/22	Temperature (Celsius)	degrees C	11.2
UA	G402	C	2019/08/16	Temperature (Celsius)	degrees C	17.2
UA	G402	C	2020/01/22	Temperature (Celsius)	degrees C	11.2
UA	G402	C	2020/08/12	Temperature (Celsius)	degrees C	21.6
UA	G402	C	2020/10/14	Temperature (Celsius)	degrees C	17.6
UA	G402	C	2021/01/28	Temperature (Celsius)	degrees C	10.2
UA	G402	C	2021/04/27	Temperature (Celsius)	degrees C	15.1
UA	G402	C	2021/08/17	Temperature (Celsius)	degrees C	19.5
UA	G402	C	2021/10/26	Temperature (Celsius)	degrees C	18.2
UA	G402	C	2022/02/09	Temperature (Celsius)	degrees C	12.1
UA	G402	C	2022/05/10	Temperature (Celsius)	degrees C	15.5
UA	G402	C	2022/08/24	Temperature (Celsius)	degrees C	19.8
UA	G402	C	2022/11/08	Temperature (Celsius)	degrees C	16.7
UA	G402	C	2023/02/15	Temperature (Celsius)	degrees C	12.5

UA	G402	C	2023/06/06	Temperature (Celsius)	degrees C	23.2
UA	G402	C	2023/08/11	Temperature (Celsius)	degrees C	18.1
UA	G402	C	2023/11/21	Temperature (Celsius)	degrees C	15.0
UA	G402	C	2015/11/21	Total Dissolved Solids	mg/L	1,700
UA	G402	C	2016/02/22	Total Dissolved Solids	mg/L	1,700
UA	G402	C	2016/05/19	Total Dissolved Solids	mg/L	1,500
UA	G402	C	2016/08/02	Total Dissolved Solids	mg/L	1,500
UA	G402	C	2016/11/17	Total Dissolved Solids	mg/L	1,700
UA	G402	C	2017/02/16	Total Dissolved Solids	mg/L	1,700
UA	G402	C	2017/05/17	Total Dissolved Solids	mg/L	1,700
UA	G402	C	2017/07/13	Total Dissolved Solids	mg/L	1,600
UA	G402	C	2017/10/27	Total Dissolved Solids	mg/L	1,700
UA	G402	C	2018/05/12	Total Dissolved Solids	mg/L	1,700
UA	G402	C	2018/08/04	Total Dissolved Solids	mg/L	1,700
UA	G402	C	2019/01/22	Total Dissolved Solids	mg/L	1,800
UA	G402	C	2019/08/16	Total Dissolved Solids	mg/L	1,600
UA	G402	C	2020/01/22	Total Dissolved Solids	mg/L	1,600
UA	G402	C	2020/08/12	Total Dissolved Solids	mg/L	1,600
UA	G402	C	2020/10/14	Total Dissolved Solids	mg/L	1,600
UA	G402	C	2021/01/28	Total Dissolved Solids	mg/L	1,600
UA	G402	C	2021/04/27	Total Dissolved Solids	mg/L	1,600
UA	G402	C	2021/08/17	Total Dissolved Solids	mg/L	1,600
UA	G402	C	2021/10/26	Total Dissolved Solids	mg/L	1,300
UA	G402	C	2022/02/09	Total Dissolved Solids	mg/L	1,300
UA	G402	C	2022/05/10	Total Dissolved Solids	mg/L	1,500
UA	G402	C	2022/08/24	Total Dissolved Solids	mg/L	1,400
UA	G402	C	2022/11/08	Total Dissolved Solids	mg/L	1,300
UA	G402	C	2023/02/15	Total Dissolved Solids	mg/L	1,400
UA	G402	C	2023/06/06	Total Dissolved Solids	mg/L	1,400
UA	G402	C	2023/08/11	Total Dissolved Solids	mg/L	1,340
UA	G402	C	2023/11/21	Total Dissolved Solids	mg/L	1,360
UA	G403	C	2015/11/23	pH (field)	SU	7.2
UA	G403	C	2016/02/22	pH (field)	SU	7.0
UA	G403	C	2016/05/18	pH (field)	SU	6.9
UA	G403	C	2016/08/01	pH (field)	SU	6.9
UA	G403	C	2016/11/17	pH (field)	SU	6.7
UA	G403	C	2017/02/18	pH (field)	SU	7.0
UA	G403	C	2017/05/17	pH (field)	SU	6.9
UA	G403	C	2017/07/13	pH (field)	SU	6.8
UA	G403	C	2017/10/28	pH (field)	SU	7.2
UA	G403	C	2018/05/12	pH (field)	SU	6.9
UA	G403	C	2018/08/04	pH (field)	SU	7.0
UA	G403	C	2019/01/24	pH (field)	SU	6.9
UA	G403	C	2019/08/19	pH (field)	SU	7.0
UA	G403	C	2020/01/22	pH (field)	SU	7.3
UA	G403	C	2020/08/12	pH (field)	SU	7.0
UA	G403	C	2020/10/13	pH (field)	SU	6.7
UA	G403	C	2021/01/21	pH (field)	SU	6.9
UA	G403	C	2021/04/26	pH (field)	SU	7.0
UA	G403	C	2021/08/17	pH (field)	SU	6.9
UA	G403	C	2021/10/26	pH (field)	SU	6.7
UA	G403	C	2022/02/08	pH (field)	SU	7.0
UA	G403	C	2022/05/10	pH (field)	SU	6.6
UA	G403	C	2022/08/24	pH (field)	SU	6.7
UA	G403	C	2022/11/09	pH (field)	SU	6.5
UA	G403	C	2023/02/15	pH (field)	SU	7.0
UA	G403	C	2023/06/07	pH (field)	SU	7.0
UA	G403	C	2023/08/11	pH (field)	SU	7.1
UA	G403	C	2023/11/20	pH (field)	SU	6.9
UA	G403	C	2015/11/23	Oxidation Reduction Potential	mV	-23.0
UA	G403	C	2016/02/22	Oxidation Reduction Potential	mV	62.0
UA	G403	C	2016/05/18	Oxidation Reduction Potential	mV	-118
UA	G403	C	2016/08/01	Oxidation Reduction Potential	mV	-99.0

UA	G403	C	2016/11/17	Oxidation Reduction Potential	mV	-80.0
UA	G403	C	2017/02/18	Oxidation Reduction Potential	mV	-119
UA	G403	C	2017/05/17	Oxidation Reduction Potential	mV	-125
UA	G403	C	2017/07/13	Oxidation Reduction Potential	mV	-105
UA	G403	C	2017/10/28	Oxidation Reduction Potential	mV	-89.0
UA	G403	C	2018/05/12	Oxidation Reduction Potential	mV	-81.0
UA	G403	C	2018/08/04	Oxidation Reduction Potential	mV	-96.0
UA	G403	C	2019/01/24	Oxidation Reduction Potential	mV	-95.0
UA	G403	C	2019/08/19	Oxidation Reduction Potential	mV	-91.0
UA	G403	C	2020/01/22	Oxidation Reduction Potential	mV	192
UA	G403	C	2020/08/12	Oxidation Reduction Potential	mV	145
UA	G403	C	2020/10/13	Oxidation Reduction Potential	mV	85.6
UA	G403	C	2021/01/21	Oxidation Reduction Potential	mV	128
UA	G403	C	2021/04/26	Oxidation Reduction Potential	mV	81.7
UA	G403	C	2021/08/17	Oxidation Reduction Potential	mV	-17.1
UA	G403	C	2021/10/26	Oxidation Reduction Potential	mV	17.0
UA	G403	C	2022/02/08	Oxidation Reduction Potential	mV	19.5
UA	G403	C	2022/05/10	Oxidation Reduction Potential	mV	101
UA	G403	C	2022/08/24	Oxidation Reduction Potential	mV	11.0
UA	G403	C	2022/11/09	Oxidation Reduction Potential	mV	20.0
UA	G403	C	2023/02/15	Oxidation Reduction Potential	mV	102
UA	G403	C	2023/06/07	Oxidation Reduction Potential	mV	40.7
UA	G403	C	2023/08/11	Oxidation Reduction Potential	mV	-8.00
UA	G403	C	2023/11/20	Oxidation Reduction Potential	mV	112
UA	G403	C	2015/11/23	Eh	V	0.17
UA	G403	C	2016/02/22	Eh	V	0.26
UA	G403	C	2016/05/18	Eh	V	0.076
UA	G403	C	2016/08/01	Eh	V	0.094
UA	G403	C	2016/11/17	Eh	V	0.12
UA	G403	C	2017/02/18	Eh	V	0.077
UA	G403	C	2017/05/17	Eh	V	0.070
UA	G403	C	2017/07/13	Eh	V	0.089
UA	G403	C	2017/10/28	Eh	V	0.11
UA	G403	C	2018/05/12	Eh	V	0.11
UA	G403	C	2018/08/04	Eh	V	0.099
UA	G403	C	2019/01/24	Eh	V	0.10
UA	G403	C	2019/08/19	Eh	V	0.10
UA	G403	C	2020/01/22	Eh	V	0.39
UA	G403	C	2020/08/12	Eh	V	0.34
UA	G403	C	2020/10/13	Eh	V	0.28
UA	G403	C	2021/01/21	Eh	V	0.33
UA	G403	C	2021/04/26	Eh	V	0.28
UA	G403	C	2021/08/17	Eh	V	0.17
UA	G403	C	2021/10/26	Eh	V	0.21
UA	G403	C	2022/02/08	Eh	V	0.22
UA	G403	C	2022/05/10	Eh	V	0.29
UA	G403	C	2022/08/24	Eh	V	0.20
UA	G403	C	2022/11/09	Eh	V	0.21
UA	G403	C	2023/02/15	Eh	V	0.30
UA	G403	C	2023/06/07	Eh	V	0.24
UA	G403	C	2023/08/11	Eh	V	0.18
UA	G403	C	2023/11/20	Eh	V	0.31
UA	G403	C	2017/07/13	Alkalinity, bicarbonate	mg/L CaCO3	300
UA	G403	C	2020/01/22	Alkalinity, bicarbonate	mg/L CaCO3	320
UA	G403	C	2021/01/21	Alkalinity, bicarbonate	mg/L CaCO3	310
UA	G403	C	2021/08/17	Alkalinity, bicarbonate	mg/L CaCO3	320
UA	G403	C	2022/02/08	Alkalinity, bicarbonate	mg/L CaCO3	310
UA	G403	C	2022/08/24	Alkalinity, bicarbonate	mg/L CaCO3	300
UA	G403	C	2023/02/15	Alkalinity, bicarbonate	mg/L CaCO3	310
UA	G403	C	2023/06/07	Alkalinity, bicarbonate	mg/L CaCO3	340
UA	G403	C	2023/08/11	Alkalinity, bicarbonate	mg/L CaCO3	315
UA	G403	C	2023/11/20	Alkalinity, bicarbonate	mg/L CaCO3	323
UA	G403	C	2022/08/24	Alkalinity, carbonate	mg/L CaCO3	10.0

UA	G403	C	2015/11/23	Barium, total	mg/L	0.140
UA	G403	C	2016/02/22	Barium, total	mg/L	0.130
UA	G403	C	2016/05/18	Barium, total	mg/L	0.160
UA	G403	C	2016/08/01	Barium, total	mg/L	0.240
UA	G403	C	2016/11/17	Barium, total	mg/L	0.200
UA	G403	C	2017/02/18	Barium, total	mg/L	0.150
UA	G403	C	2017/05/17	Barium, total	mg/L	0.140
UA	G403	C	2017/07/13	Barium, total	mg/L	0.170
UA	G403	C	2018/05/12	Barium, total	mg/L	0.150
UA	G403	C	2018/08/04	Barium, total	mg/L	0.150
UA	G403	C	2019/01/24	Barium, total	mg/L	0.140
UA	G403	C	2019/08/19	Barium, total	mg/L	0.140
UA	G403	C	2020/01/22	Barium, total	mg/L	0.130
UA	G403	C	2020/08/12	Barium, total	mg/L	0.120
UA	G403	C	2020/10/13	Barium, total	mg/L	0.110
UA	G403	C	2021/01/21	Barium, total	mg/L	0.110
UA	G403	C	2021/04/26	Barium, total	mg/L	0.110
UA	G403	C	2021/08/17	Barium, total	mg/L	0.120
UA	G403	C	2021/10/26	Barium, total	mg/L	0.110
UA	G403	C	2022/02/08	Barium, total	mg/L	0.130
UA	G403	C	2022/05/10	Barium, total	mg/L	0.120
UA	G403	C	2022/08/24	Barium, total	mg/L	0.110
UA	G403	C	2022/11/09	Barium, total	mg/L	0.0950
UA	G403	C	2023/02/15	Barium, total	mg/L	0.120
UA	G403	C	2023/06/07	Barium, total	mg/L	0.120
UA	G403	C	2023/08/11	Barium, total	mg/L	0.118
UA	G403	C	2023/11/20	Barium, total	mg/L	0.139
UA	G403	C	2015/11/23	Boron, total	mg/L	0.0390
UA	G403	C	2016/02/22	Boron, total	mg/L	0.0640
UA	G403	C	2016/05/18	Boron, total	mg/L	0.0140
UA	G403	C	2016/08/01	Boron, total	mg/L	0.0270
UA	G403	C	2016/11/17	Boron, total	mg/L	0.0420
UA	G403	C	2017/02/18	Boron, total	mg/L	<0.0023
UA	G403	C	2017/05/17	Boron, total	mg/L	0.0170
UA	G403	C	2017/07/13	Boron, total	mg/L	0.0270
UA	G403	C	2017/10/28	Boron, total	mg/L	0.0600
UA	G403	C	2018/05/12	Boron, total	mg/L	0.0100
UA	G403	C	2018/08/04	Boron, total	mg/L	0.0370
UA	G403	C	2019/01/24	Boron, total	mg/L	0.0710
UA	G403	C	2019/08/19	Boron, total	mg/L	0.0220
UA	G403	C	2020/01/22	Boron, total	mg/L	0.0790
UA	G403	C	2020/08/12	Boron, total	mg/L	0.0330
UA	G403	C	2020/10/13	Boron, total	mg/L	<0.01
UA	G403	C	2021/01/21	Boron, total	mg/L	<0.008
UA	G403	C	2021/04/26	Boron, total	mg/L	<0.01
UA	G403	C	2021/08/17	Boron, total	mg/L	0.110
UA	G403	C	2021/10/26	Boron, total	mg/L	0.0880
UA	G403	C	2022/02/08	Boron, total	mg/L	<0.0046
UA	G403	C	2022/05/10	Boron, total	mg/L	0.0500
UA	G403	C	2022/08/24	Boron, total	mg/L	0.100
UA	G403	C	2022/11/09	Boron, total	mg/L	0.0140
UA	G403	C	2023/02/15	Boron, total	mg/L	0.0630
UA	G403	C	2023/06/07	Boron, total	mg/L	0.0350
UA	G403	C	2023/08/11	Boron, total	mg/L	0.0287
UA	G403	C	2023/11/20	Boron, total	mg/L	0.0200
UA	G403	C	2015/11/23	Calcium, total	mg/L	78.0
UA	G403	C	2016/02/22	Calcium, total	mg/L	69.0
UA	G403	C	2016/05/18	Calcium, total	mg/L	71.0
UA	G403	C	2016/08/01	Calcium, total	mg/L	140
UA	G403	C	2016/11/17	Calcium, total	mg/L	72.0
UA	G403	C	2017/02/18	Calcium, total	mg/L	63.0
UA	G403	C	2017/05/17	Calcium, total	mg/L	63.0
UA	G403	C	2017/07/13	Calcium, total	mg/L	67.0

UA	G403	C	2017/10/28	Calcium, total	mg/L	67.0
UA	G403	C	2018/05/12	Calcium, total	mg/L	70.0
UA	G403	C	2018/08/04	Calcium, total	mg/L	71.0
UA	G403	C	2019/01/24	Calcium, total	mg/L	71.0
UA	G403	C	2019/08/19	Calcium, total	mg/L	77.0
UA	G403	C	2020/01/22	Calcium, total	mg/L	74.0
UA	G403	C	2020/08/12	Calcium, total	mg/L	76.0
UA	G403	C	2020/10/13	Calcium, total	mg/L	70.0
UA	G403	C	2021/01/21	Calcium, total	mg/L	77.0
UA	G403	C	2021/04/26	Calcium, total	mg/L	79.0
UA	G403	C	2021/08/17	Calcium, total	mg/L	84.0
UA	G403	C	2021/10/26	Calcium, total	mg/L	70.0
UA	G403	C	2022/02/08	Calcium, total	mg/L	76.0
UA	G403	C	2022/05/10	Calcium, total	mg/L	82.0
UA	G403	C	2022/08/24	Calcium, total	mg/L	80.0
UA	G403	C	2022/11/09	Calcium, total	mg/L	70.0
UA	G403	C	2023/02/15	Calcium, total	mg/L	79.0
UA	G403	C	2023/06/07	Calcium, total	mg/L	78.0
UA	G403	C	2023/08/11	Calcium, total	mg/L	77.7
UA	G403	C	2023/11/20	Calcium, total	mg/L	85.9
UA	G403	C	2015/11/23	Chloride, total	mg/L	6.80
UA	G403	C	2016/02/22	Chloride, total	mg/L	4.10
UA	G403	C	2016/05/18	Chloride, total	mg/L	2.70
UA	G403	C	2016/08/01	Chloride, total	mg/L	4.50
UA	G403	C	2016/11/17	Chloride, total	mg/L	4.00
UA	G403	C	2017/02/18	Chloride, total	mg/L	3.40
UA	G403	C	2017/05/17	Chloride, total	mg/L	3.30
UA	G403	C	2017/07/13	Chloride, total	mg/L	5.80
UA	G403	C	2017/10/28	Chloride, total	mg/L	4.10
UA	G403	C	2018/05/12	Chloride, total	mg/L	3.70
UA	G403	C	2018/08/04	Chloride, total	mg/L	3.90
UA	G403	C	2019/01/24	Chloride, total	mg/L	4.60
UA	G403	C	2019/08/19	Chloride, total	mg/L	3.90
UA	G403	C	2020/01/22	Chloride, total	mg/L	4.60
UA	G403	C	2020/08/12	Chloride, total	mg/L	3.60
UA	G403	C	2020/10/13	Chloride, total	mg/L	4.10
UA	G403	C	2021/01/21	Chloride, total	mg/L	4.50
UA	G403	C	2021/04/26	Chloride, total	mg/L	4.70
UA	G403	C	2021/08/17	Chloride, total	mg/L	4.50
UA	G403	C	2021/10/26	Chloride, total	mg/L	4.70
UA	G403	C	2022/02/08	Chloride, total	mg/L	5.00
UA	G403	C	2022/05/10	Chloride, total	mg/L	5.70
UA	G403	C	2022/08/24	Chloride, total	mg/L	6.00
UA	G403	C	2022/11/09	Chloride, total	mg/L	4.00
UA	G403	C	2023/02/15	Chloride, total	mg/L	5.70
UA	G403	C	2023/06/07	Chloride, total	mg/L	6.20
UA	G403	C	2023/08/11	Chloride, total	mg/L	5.00
UA	G403	C	2023/11/20	Chloride, total	mg/L	5.00
UA	G403	C	2015/11/23	Cobalt, total	mg/L	<0.000017
UA	G403	C	2016/02/22	Cobalt, total	mg/L	<0.000017
UA	G403	C	2016/05/18	Cobalt, total	mg/L	<0.000017
UA	G403	C	2016/08/01	Cobalt, total	mg/L	0.00290
UA	G403	C	2016/11/17	Cobalt, total	mg/L	0.00240
UA	G403	C	2017/02/18	Cobalt, total	mg/L	0.00200
UA	G403	C	2017/05/17	Cobalt, total	mg/L	0.00210
UA	G403	C	2017/07/13	Cobalt, total	mg/L	0.00220
UA	G403	C	2018/05/12	Cobalt, total	mg/L	0.00310
UA	G403	C	2018/08/04	Cobalt, total	mg/L	0.00340
UA	G403	C	2019/01/24	Cobalt, total	mg/L	0.00310
UA	G403	C	2019/08/19	Cobalt, total	mg/L	0.00270
UA	G403	C	2020/01/22	Cobalt, total	mg/L	<0.00067
UA	G403	C	2020/08/12	Cobalt, total	mg/L	<0.00022
UA	G403	C	2020/10/13	Cobalt, total	mg/L	<0.002

UA	G403	C	2021/01/21	Cobalt, total	mg/L	<0.00022
UA	G403	C	2021/04/26	Cobalt, total	mg/L	<0.002
UA	G403	C	2021/08/17	Cobalt, total	mg/L	<0.00022
UA	G403	C	2021/10/26	Cobalt, total	mg/L	<0.002
UA	G403	C	2022/02/08	Cobalt, total	mg/L	0.00230
UA	G403	C	2022/05/10	Cobalt, total	mg/L	0.000790
UA	G403	C	2022/08/24	Cobalt, total	mg/L	<0.00048
UA	G403	C	2022/11/09	Cobalt, total	mg/L	<0.00048
UA	G403	C	2023/02/15	Cobalt, total	mg/L	<0.00048
UA	G403	C	2023/06/07	Cobalt, total	mg/L	0.000760
UA	G403	C	2023/08/11	Cobalt, total	mg/L	0.00250
UA	G403	C	2023/11/20	Cobalt, total	mg/L	0.00260
UA	G403	C	2023/06/07	Ferrous Iron, dissolved	mg/L	<0.02
UA	G403	C	2020/08/12	Iron, dissolved	mg/L	0.0540
UA	G403	C	2020/10/13	Iron, dissolved	mg/L	0.0310
UA	G403	C	2021/01/21	Iron, dissolved	mg/L	<0.01
UA	G403	C	2021/04/26	Iron, dissolved	mg/L	<0.01
UA	G403	C	2021/08/17	Iron, dissolved	mg/L	<0.01
UA	G403	C	2021/10/26	Iron, dissolved	mg/L	0.0500
UA	G403	C	2022/02/08	Iron, dissolved	mg/L	<0.01
UA	G403	C	2022/05/10	Iron, dissolved	mg/L	<0.00072
UA	G403	C	2022/08/24	Iron, dissolved	mg/L	0.00310
UA	G403	C	2022/11/09	Iron, dissolved	mg/L	0.00440
UA	G403	C	2023/02/15	Iron, dissolved	mg/L	<0.00072
UA	G403	C	2023/06/07	Iron, dissolved	mg/L	0.0110
UA	G403	C	2023/08/11	Iron, dissolved	mg/L	0.0763
UA	G403	C	2023/11/20	Iron, dissolved	mg/L	0.0373
UA	G403	C	2017/07/13	Magnesium, total	mg/L	34.0
UA	G403	C	2020/01/22	Magnesium, total	mg/L	36.0
UA	G403	C	2021/01/21	Magnesium, total	mg/L	33.0
UA	G403	C	2021/08/17	Magnesium, total	mg/L	39.0
UA	G403	C	2022/02/08	Magnesium, total	mg/L	35.0
UA	G403	C	2022/08/24	Magnesium, total	mg/L	37.0
UA	G403	C	2023/02/15	Magnesium, total	mg/L	34.0
UA	G403	C	2023/06/07	Magnesium, total	mg/L	37.0
UA	G403	C	2023/08/11	Magnesium, total	mg/L	36.2
UA	G403	C	2023/11/20	Magnesium, total	mg/L	40.2
UA	G403	C	2018/03/03	Manganese, dissolved	mg/L	0.420
UA	G403	C	2018/05/12	Manganese, dissolved	mg/L	0.180
UA	G403	C	2018/08/13	Manganese, dissolved	mg/L	1.40
UA	G403	C	2018/11/07	Manganese, dissolved	mg/L	0.850
UA	G403	C	2019/01/24	Manganese, dissolved	mg/L	0.270
UA	G403	C	2019/05/02	Manganese, dissolved	mg/L	0.180
UA	G403	C	2019/08/19	Manganese, dissolved	mg/L	1.10
UA	G403	C	2019/10/22	Manganese, dissolved	mg/L	1.10
UA	G403	C	2020/01/22	Manganese, dissolved	mg/L	0.00790
UA	G403	C	2020/05/07	Manganese, dissolved	mg/L	0.0360
UA	G403	C	2020/08/12	Manganese, dissolved	mg/L	0.440
UA	G403	C	2020/10/13	Manganese, dissolved	mg/L	0.200
UA	G403	C	2021/01/21	Manganese, dissolved	mg/L	0.00460
UA	G403	C	2021/04/26	Manganese, dissolved	mg/L	0.00440
UA	G403	C	2021/08/17	Manganese, dissolved	mg/L	0.340
UA	G403	C	2021/10/26	Manganese, dissolved	mg/L	0.790
UA	G403	C	2022/02/08	Manganese, dissolved	mg/L	0.00390
UA	G403	C	2022/05/10	Manganese, dissolved	mg/L	0.00350
UA	G403	C	2022/08/24	Manganese, dissolved	mg/L	0.160
UA	G403	C	2022/11/09	Manganese, dissolved	mg/L	0.200
UA	G403	C	2023/02/15	Manganese, dissolved	mg/L	0.000280
UA	G403	C	2023/06/07	Manganese, dissolved	mg/L	0.360
UA	G403	C	2023/08/11	Manganese, dissolved	mg/L	0.376
UA	G403	C	2023/11/20	Manganese, dissolved	mg/L	0.264
UA	G403	C	2023/08/11	Phosphate, dissolved	mg/L	0.0680
UA	G403	C	2017/07/13	Potassium, total	mg/L	0.760

UA	G403	C	2020/01/22	Potassium, total	mg/L	0.710
UA	G403	C	2021/01/21	Potassium, total	mg/L	0.450
UA	G403	C	2021/08/17	Potassium, total	mg/L	0.460
UA	G403	C	2022/02/08	Potassium, total	mg/L	0.760
UA	G403	C	2022/08/24	Potassium, total	mg/L	0.550
UA	G403	C	2023/02/15	Potassium, total	mg/L	0.410
UA	G403	C	2023/06/07	Potassium, total	mg/L	0.450
UA	G403	C	2023/08/11	Potassium, total	mg/L	0.562
UA	G403	C	2023/11/20	Potassium, total	mg/L	0.573
UA	G403	C	2023/06/07	Silicon, dissolved	mg/L	9.20
UA	G403	C	2023/08/11	Silicon, dissolved	mg/L	8.36
UA	G403	C	2017/07/13	Sodium, total	mg/L	22.0
UA	G403	C	2020/01/22	Sodium, total	mg/L	23.0
UA	G403	C	2021/01/21	Sodium, total	mg/L	24.0
UA	G403	C	2021/08/17	Sodium, total	mg/L	26.0
UA	G403	C	2022/02/08	Sodium, total	mg/L	25.0
UA	G403	C	2022/08/24	Sodium, total	mg/L	28.0
UA	G403	C	2023/02/15	Sodium, total	mg/L	29.0
UA	G403	C	2023/06/07	Sodium, total	mg/L	27.0
UA	G403	C	2023/08/11	Sodium, total	mg/L	25.4
UA	G403	C	2023/11/20	Sodium, total	mg/L	26.3
UA	G403	C	2015/11/23	Sulfate, total	mg/L	35.0
UA	G403	C	2016/02/22	Sulfate, total	mg/L	17.0
UA	G403	C	2016/05/18	Sulfate, total	mg/L	11.0
UA	G403	C	2016/08/01	Sulfate, total	mg/L	9.90
UA	G403	C	2016/11/17	Sulfate, total	mg/L	8.90
UA	G403	C	2017/02/18	Sulfate, total	mg/L	7.40
UA	G403	C	2017/05/17	Sulfate, total	mg/L	7.10
UA	G403	C	2017/07/13	Sulfate, total	mg/L	4.90
UA	G403	C	2017/10/28	Sulfate, total	mg/L	7.00
UA	G403	C	2018/05/12	Sulfate, total	mg/L	15.0
UA	G403	C	2018/08/04	Sulfate, total	mg/L	20.0
UA	G403	C	2019/01/24	Sulfate, total	mg/L	32.0
UA	G403	C	2019/08/19	Sulfate, total	mg/L	26.0
UA	G403	C	2020/01/22	Sulfate, total	mg/L	33.0
UA	G403	C	2020/08/12	Sulfate, total	mg/L	34.0
UA	G403	C	2020/10/13	Sulfate, total	mg/L	36.0
UA	G403	C	2021/01/21	Sulfate, total	mg/L	37.0
UA	G403	C	2021/04/26	Sulfate, total	mg/L	39.0
UA	G403	C	2021/08/17	Sulfate, total	mg/L	51.0
UA	G403	C	2021/10/26	Sulfate, total	mg/L	51.0
UA	G403	C	2022/02/08	Sulfate, total	mg/L	53.0
UA	G403	C	2022/05/10	Sulfate, total	mg/L	59.0
UA	G403	C	2022/08/24	Sulfate, total	mg/L	58.0
UA	G403	C	2022/11/09	Sulfate, total	mg/L	57.0
UA	G403	C	2023/02/15	Sulfate, total	mg/L	63.0
UA	G403	C	2023/06/07	Sulfate, total	mg/L	66.0
UA	G403	C	2023/08/11	Sulfate, total	mg/L	60.0
UA	G403	C	2023/11/20	Sulfate, total	mg/L	74.0
UA	G403	C	2015/11/23	Temperature (Celsius)	degrees C	15.8
UA	G403	C	2016/02/22	Temperature (Celsius)	degrees C	11.0
UA	G403	C	2016/05/18	Temperature (Celsius)	degrees C	17.8
UA	G403	C	2016/08/01	Temperature (Celsius)	degrees C	17.9
UA	G403	C	2016/11/17	Temperature (Celsius)	degrees C	14.5
UA	G403	C	2017/02/18	Temperature (Celsius)	degrees C	14.9
UA	G403	C	2017/05/17	Temperature (Celsius)	degrees C	15.2
UA	G403	C	2017/07/13	Temperature (Celsius)	degrees C	17.8
UA	G403	C	2017/10/28	Temperature (Celsius)	degrees C	13.8
UA	G403	C	2018/05/12	Temperature (Celsius)	degrees C	15.7
UA	G403	C	2018/08/04	Temperature (Celsius)	degrees C	15.9
UA	G403	C	2019/01/24	Temperature (Celsius)	degrees C	11.8
UA	G403	C	2019/08/19	Temperature (Celsius)	degrees C	16.9
UA	G403	C	2020/01/22	Temperature (Celsius)	degrees C	9.70

UA	G403	C	2020/08/12	Temperature (Celsius)	degrees C	21.6
UA	G403	C	2020/10/13	Temperature (Celsius)	degrees C	17.0
UA	G403	C	2021/01/21	Temperature (Celsius)	degrees C	12.6
UA	G403	C	2021/04/26	Temperature (Celsius)	degrees C	16.2
UA	G403	C	2021/08/17	Temperature (Celsius)	degrees C	20.7
UA	G403	C	2021/10/26	Temperature (Celsius)	degrees C	16.8
UA	G403	C	2022/02/08	Temperature (Celsius)	degrees C	11.1
UA	G403	C	2022/05/10	Temperature (Celsius)	degrees C	17.4
UA	G403	C	2022/08/24	Temperature (Celsius)	degrees C	19.2
UA	G403	C	2022/11/09	Temperature (Celsius)	degrees C	19.0
UA	G403	C	2023/02/15	Temperature (Celsius)	degrees C	13.4
UA	G403	C	2023/06/07	Temperature (Celsius)	degrees C	15.8
UA	G403	C	2023/08/11	Temperature (Celsius)	degrees C	18.7
UA	G403	C	2023/11/20	Temperature (Celsius)	degrees C	15.1
UA	G403	C	2015/11/23	Total Dissolved Solids	mg/L	320
UA	G403	C	2016/02/22	Total Dissolved Solids	mg/L	340
UA	G403	C	2016/05/18	Total Dissolved Solids	mg/L	320
UA	G403	C	2016/08/01	Total Dissolved Solids	mg/L	320
UA	G403	C	2016/11/17	Total Dissolved Solids	mg/L	350
UA	G403	C	2017/02/18	Total Dissolved Solids	mg/L	320
UA	G403	C	2017/05/17	Total Dissolved Solids	mg/L	330
UA	G403	C	2017/07/13	Total Dissolved Solids	mg/L	320
UA	G403	C	2017/10/28	Total Dissolved Solids	mg/L	340
UA	G403	C	2018/05/12	Total Dissolved Solids	mg/L	310
UA	G403	C	2018/08/04	Total Dissolved Solids	mg/L	360
UA	G403	C	2019/01/24	Total Dissolved Solids	mg/L	360
UA	G403	C	2019/08/19	Total Dissolved Solids	mg/L	360
UA	G403	C	2020/01/22	Total Dissolved Solids	mg/L	270
UA	G403	C	2020/08/12	Total Dissolved Solids	mg/L	330
UA	G403	C	2020/10/13	Total Dissolved Solids	mg/L	400
UA	G403	C	2021/01/21	Total Dissolved Solids	mg/L	330
UA	G403	C	2021/04/26	Total Dissolved Solids	mg/L	320
UA	G403	C	2021/08/17	Total Dissolved Solids	mg/L	470
UA	G403	C	2021/10/26	Total Dissolved Solids	mg/L	360
UA	G403	C	2022/02/08	Total Dissolved Solids	mg/L	400
UA	G403	C	2022/05/10	Total Dissolved Solids	mg/L	470
UA	G403	C	2022/08/24	Total Dissolved Solids	mg/L	400
UA	G403	C	2022/11/09	Total Dissolved Solids	mg/L	430
UA	G403	C	2023/02/15	Total Dissolved Solids	mg/L	480
UA	G403	C	2023/06/07	Total Dissolved Solids	mg/L	400
UA	G403	C	2023/08/11	Total Dissolved Solids	mg/L	412
UA	G403	C	2023/11/20	Total Dissolved Solids	mg/L	508
UA	G404	C	2015/11/21	pH (field)	SU	6.7
UA	G404	C	2016/02/15	pH (field)	SU	7.2
UA	G404	C	2016/05/19	pH (field)	SU	6.8
UA	G404	C	2016/08/02	pH (field)	SU	7.1
UA	G404	C	2016/11/22	pH (field)	SU	7.1
UA	G404	C	2017/02/18	pH (field)	SU	7.1
UA	G404	C	2017/05/16	pH (field)	SU	7.2
UA	G404	C	2017/07/14	pH (field)	SU	7.1
UA	G404	C	2017/10/28	pH (field)	SU	6.9
UA	G404	C	2018/05/12	pH (field)	SU	7.1
UA	G404	C	2018/08/04	pH (field)	SU	7.2
UA	G404	C	2019/01/24	pH (field)	SU	7.1
UA	G404	C	2019/08/16	pH (field)	SU	7.1
UA	G404	C	2020/01/22	pH (field)	SU	7.2
UA	G404	C	2020/08/12	pH (field)	SU	6.8
UA	G404	C	2020/10/13	pH (field)	SU	6.7
UA	G404	C	2021/01/21	pH (field)	SU	6.6
UA	G404	C	2021/04/27	pH (field)	SU	6.8
UA	G404	C	2021/08/17	pH (field)	SU	6.7
UA	G404	C	2021/10/26	pH (field)	SU	6.6
UA	G404	C	2022/02/08	pH (field)	SU	6.9

UA	G404	C	2022/05/10	pH (field)	SU	6.6
UA	G404	C	2022/08/24	pH (field)	SU	6.5
UA	G404	C	2022/11/09	pH (field)	SU	6.4
UA	G404	C	2023/02/14	pH (field)	SU	6.8
UA	G404	C	2023/06/07	pH (field)	SU	6.8
UA	G404	C	2023/08/14	pH (field)	SU	6.8
UA	G404	C	2023/11/21	pH (field)	SU	6.7
UA	G404	C	2015/10/07	pH (field)	SU	7.5
UA	G404	C	2015/11/21	Oxidation Reduction Potential	mV	28.0
UA	G404	C	2016/02/15	Oxidation Reduction Potential	mV	83.0
UA	G404	C	2016/05/19	Oxidation Reduction Potential	mV	-10.0
UA	G404	C	2016/08/02	Oxidation Reduction Potential	mV	-63.0
UA	G404	C	2016/11/22	Oxidation Reduction Potential	mV	-60.0
UA	G404	C	2017/02/18	Oxidation Reduction Potential	mV	-68.0
UA	G404	C	2017/05/16	Oxidation Reduction Potential	mV	-61.0
UA	G404	C	2017/07/14	Oxidation Reduction Potential	mV	-74.0
UA	G404	C	2017/10/28	Oxidation Reduction Potential	mV	-58.0
UA	G404	C	2018/05/12	Oxidation Reduction Potential	mV	-50.0
UA	G404	C	2018/08/04	Oxidation Reduction Potential	mV	-59.0
UA	G404	C	2019/01/24	Oxidation Reduction Potential	mV	-71.0
UA	G404	C	2019/08/16	Oxidation Reduction Potential	mV	-64.0
UA	G404	C	2020/01/22	Oxidation Reduction Potential	mV	200
UA	G404	C	2020/08/12	Oxidation Reduction Potential	mV	108
UA	G404	C	2020/10/13	Oxidation Reduction Potential	mV	95.2
UA	G404	C	2021/01/21	Oxidation Reduction Potential	mV	139
UA	G404	C	2021/04/27	Oxidation Reduction Potential	mV	116
UA	G404	C	2021/08/17	Oxidation Reduction Potential	mV	59.0
UA	G404	C	2021/10/26	Oxidation Reduction Potential	mV	43.2
UA	G404	C	2022/02/08	Oxidation Reduction Potential	mV	229
UA	G404	C	2022/05/10	Oxidation Reduction Potential	mV	92.3
UA	G404	C	2022/08/24	Oxidation Reduction Potential	mV	26.0
UA	G404	C	2022/11/09	Oxidation Reduction Potential	mV	108
UA	G404	C	2023/02/14	Oxidation Reduction Potential	mV	304
UA	G404	C	2023/06/07	Oxidation Reduction Potential	mV	79.2
UA	G404	C	2023/08/14	Oxidation Reduction Potential	mV	66.0
UA	G404	C	2023/11/21	Oxidation Reduction Potential	mV	85.0
UA	G404	C	2015/11/21	Eh	V	0.22
UA	G404	C	2016/02/15	Eh	V	0.28
UA	G404	C	2016/05/19	Eh	V	0.18
UA	G404	C	2016/08/02	Eh	V	0.13
UA	G404	C	2016/11/22	Eh	V	0.13
UA	G404	C	2017/02/18	Eh	V	0.13
UA	G404	C	2017/05/16	Eh	V	0.13
UA	G404	C	2017/07/14	Eh	V	0.12
UA	G404	C	2017/10/28	Eh	V	0.14
UA	G404	C	2018/05/12	Eh	V	0.15
UA	G404	C	2018/08/04	Eh	V	0.14
UA	G404	C	2019/01/24	Eh	V	0.13
UA	G404	C	2019/08/16	Eh	V	0.13
UA	G404	C	2020/01/22	Eh	V	0.40
UA	G404	C	2020/08/12	Eh	V	0.30
UA	G404	C	2020/10/13	Eh	V	0.29
UA	G404	C	2021/01/21	Eh	V	0.34
UA	G404	C	2021/04/27	Eh	V	0.31
UA	G404	C	2021/08/17	Eh	V	0.25
UA	G404	C	2021/10/26	Eh	V	0.24
UA	G404	C	2022/02/08	Eh	V	0.43
UA	G404	C	2022/05/10	Eh	V	0.29
UA	G404	C	2022/08/24	Eh	V	0.22
UA	G404	C	2022/11/09	Eh	V	0.30
UA	G404	C	2023/02/14	Eh	V	0.50
UA	G404	C	2023/06/07	Eh	V	0.27
UA	G404	C	2023/08/14	Eh	V	0.26

UA	G404	C	2023/11/21	Eh	V	0.28
UA	G404	C	2017/07/14	Alkalinity, bicarbonate	mg/L CaCO3	420
UA	G404	C	2020/01/22	Alkalinity, bicarbonate	mg/L CaCO3	330
UA	G404	C	2021/01/21	Alkalinity, bicarbonate	mg/L CaCO3	320
UA	G404	C	2021/08/17	Alkalinity, bicarbonate	mg/L CaCO3	350
UA	G404	C	2022/02/08	Alkalinity, bicarbonate	mg/L CaCO3	310
UA	G404	C	2022/08/24	Alkalinity, bicarbonate	mg/L CaCO3	390
UA	G404	C	2023/02/14	Alkalinity, bicarbonate	mg/L CaCO3	290
UA	G404	C	2023/06/07	Alkalinity, bicarbonate	mg/L CaCO3	390
UA	G404	C	2023/08/14	Alkalinity, bicarbonate	mg/L CaCO3	348
UA	G404	C	2023/11/21	Alkalinity, bicarbonate	mg/L CaCO3	326
UA	G404	C	2022/08/24	Alkalinity, carbonate	mg/L CaCO3	10.0
UA	G404	C	2015/11/21	Barium, total	mg/L	0.0500
UA	G404	C	2016/02/15	Barium, total	mg/L	0.0430
UA	G404	C	2016/05/19	Barium, total	mg/L	0.0410
UA	G404	C	2016/08/02	Barium, total	mg/L	0.0550
UA	G404	C	2016/11/22	Barium, total	mg/L	0.0520
UA	G404	C	2017/02/18	Barium, total	mg/L	0.0440
UA	G404	C	2017/05/16	Barium, total	mg/L	0.0610
UA	G404	C	2017/07/14	Barium, total	mg/L	0.0420
UA	G404	C	2018/05/12	Barium, total	mg/L	0.0420
UA	G404	C	2018/08/04	Barium, total	mg/L	0.0360
UA	G404	C	2019/01/24	Barium, total	mg/L	0.0370
UA	G404	C	2019/08/16	Barium, total	mg/L	0.0500
UA	G404	C	2020/01/22	Barium, total	mg/L	0.0330
UA	G404	C	2020/08/12	Barium, total	mg/L	0.0370
UA	G404	C	2020/10/13	Barium, total	mg/L	0.0370
UA	G404	C	2021/01/21	Barium, total	mg/L	0.0420
UA	G404	C	2021/04/27	Barium, total	mg/L	0.0400
UA	G404	C	2021/08/17	Barium, total	mg/L	0.0480
UA	G404	C	2021/10/26	Barium, total	mg/L	0.0360
UA	G404	C	2022/02/08	Barium, total	mg/L	0.0280
UA	G404	C	2022/05/10	Barium, total	mg/L	0.0270
UA	G404	C	2022/08/24	Barium, total	mg/L	0.0290
UA	G404	C	2022/11/09	Barium, total	mg/L	0.0220
UA	G404	C	2023/02/14	Barium, total	mg/L	0.0170
UA	G404	C	2023/06/07	Barium, total	mg/L	0.0190
UA	G404	C	2023/08/14	Barium, total	mg/L	0.0420
UA	G404	C	2023/11/21	Barium, total	mg/L	0.0369
UA	G404	C	2015/10/07	Barium, total	mg/L	0.0450
UA	G404	C	2015/11/21	Boron, total	mg/L	2.10
UA	G404	C	2016/02/15	Boron, total	mg/L	1.60
UA	G404	C	2016/05/19	Boron, total	mg/L	1.40
UA	G404	C	2016/08/02	Boron, total	mg/L	3.20
UA	G404	C	2016/11/22	Boron, total	mg/L	3.40
UA	G404	C	2017/02/18	Boron, total	mg/L	2.80
UA	G404	C	2017/05/16	Boron, total	mg/L	1.60
UA	G404	C	2017/07/14	Boron, total	mg/L	5.50
UA	G404	C	2017/10/28	Boron, total	mg/L	5.80
UA	G404	C	2018/05/12	Boron, total	mg/L	4.10
UA	G404	C	2018/08/04	Boron, total	mg/L	4.80
UA	G404	C	2019/01/24	Boron, total	mg/L	2.80
UA	G404	C	2019/08/16	Boron, total	mg/L	2.90
UA	G404	C	2020/01/22	Boron, total	mg/L	2.90
UA	G404	C	2020/08/12	Boron, total	mg/L	2.80
UA	G404	C	2020/10/13	Boron, total	mg/L	3.90
UA	G404	C	2021/01/21	Boron, total	mg/L	2.60
UA	G404	C	2021/04/27	Boron, total	mg/L	3.00
UA	G404	C	2021/08/17	Boron, total	mg/L	5.40
UA	G404	C	2021/10/26	Boron, total	mg/L	5.00
UA	G404	C	2022/02/08	Boron, total	mg/L	5.00
UA	G404	C	2022/05/10	Boron, total	mg/L	5.60
UA	G404	C	2022/08/24	Boron, total	mg/L	13.0

UA	G404	C	2022/11/09	Boron, total	mg/L	15.0
UA	G404	C	2023/02/14	Boron, total	mg/L	9.00
UA	G404	C	2023/06/07	Boron, total	mg/L	9.30
UA	G404	C	2023/08/14	Boron, total	mg/L	14.4
UA	G404	C	2023/11/21	Boron, total	mg/L	21.2
UA	G404	C	2015/10/07	Boron, total	mg/L	4.70
UA	G404	C	2015/11/21	Calcium, total	mg/L	110
UA	G404	C	2016/02/15	Calcium, total	mg/L	110
UA	G404	C	2016/05/19	Calcium, total	mg/L	89.0
UA	G404	C	2016/08/02	Calcium, total	mg/L	120
UA	G404	C	2016/11/22	Calcium, total	mg/L	120
UA	G404	C	2017/02/18	Calcium, total	mg/L	120
UA	G404	C	2017/05/16	Calcium, total	mg/L	110
UA	G404	C	2017/07/14	Calcium, total	mg/L	160
UA	G404	C	2017/10/28	Calcium, total	mg/L	160
UA	G404	C	2018/05/12	Calcium, total	mg/L	150
UA	G404	C	2018/08/04	Calcium, total	mg/L	180
UA	G404	C	2019/01/24	Calcium, total	mg/L	120
UA	G404	C	2019/08/16	Calcium, total	mg/L	110
UA	G404	C	2020/01/22	Calcium, total	mg/L	150
UA	G404	C	2020/08/12	Calcium, total	mg/L	140
UA	G404	C	2020/10/13	Calcium, total	mg/L	170
UA	G404	C	2021/01/21	Calcium, total	mg/L	160
UA	G404	C	2021/04/27	Calcium, total	mg/L	180
UA	G404	C	2021/08/17	Calcium, total	mg/L	240
UA	G404	C	2021/10/26	Calcium, total	mg/L	200
UA	G404	C	2022/02/08	Calcium, total	mg/L	200
UA	G404	C	2022/05/10	Calcium, total	mg/L	230
UA	G404	C	2022/08/24	Calcium, total	mg/L	290
UA	G404	C	2022/11/09	Calcium, total	mg/L	250
UA	G404	C	2023/02/14	Calcium, total	mg/L	180
UA	G404	C	2023/06/07	Calcium, total	mg/L	230
UA	G404	C	2023/08/14	Calcium, total	mg/L	216
UA	G404	C	2023/11/21	Calcium, total	mg/L	273
UA	G404	C	2015/11/21	Chloride, total	mg/L	53.0
UA	G404	C	2016/02/15	Chloride, total	mg/L	49.0
UA	G404	C	2016/05/19	Chloride, total	mg/L	46.0
UA	G404	C	2016/08/02	Chloride, total	mg/L	62.0
UA	G404	C	2016/11/22	Chloride, total	mg/L	61.0
UA	G404	C	2017/02/18	Chloride, total	mg/L	62.0
UA	G404	C	2017/05/16	Chloride, total	mg/L	64.0
UA	G404	C	2017/07/14	Chloride, total	mg/L	68.0
UA	G404	C	2017/10/28	Chloride, total	mg/L	57.0
UA	G404	C	2018/05/12	Chloride, total	mg/L	82.0
UA	G404	C	2018/08/04	Chloride, total	mg/L	69.0
UA	G404	C	2019/01/24	Chloride, total	mg/L	100
UA	G404	C	2019/08/16	Chloride, total	mg/L	100
UA	G404	C	2020/01/22	Chloride, total	mg/L	190
UA	G404	C	2020/08/12	Chloride, total	mg/L	170
UA	G404	C	2020/10/13	Chloride, total	mg/L	160
UA	G404	C	2021/01/21	Chloride, total	mg/L	190
UA	G404	C	2021/04/27	Chloride, total	mg/L	200
UA	G404	C	2021/08/17	Chloride, total	mg/L	190
UA	G404	C	2021/10/26	Chloride, total	mg/L	190
UA	G404	C	2022/02/08	Chloride, total	mg/L	160
UA	G404	C	2022/05/10	Chloride, total	mg/L	150
UA	G404	C	2022/08/24	Chloride, total	mg/L	120
UA	G404	C	2022/11/09	Chloride, total	mg/L	110
UA	G404	C	2023/02/14	Chloride, total	mg/L	74.0
UA	G404	C	2023/06/07	Chloride, total	mg/L	140
UA	G404	C	2023/08/14	Chloride, total	mg/L	73.0
UA	G404	C	2023/11/21	Chloride, total	mg/L	71.0
UA	G404	C	2015/10/07	Chloride, total	mg/L	33.0

UA	G404	C	2015/11/21	Cobalt, total	mg/L	<0.000017
UA	G404	C	2016/02/15	Cobalt, total	mg/L	<0.000017
UA	G404	C	2016/05/19	Cobalt, total	mg/L	<0.000017
UA	G404	C	2016/08/02	Cobalt, total	mg/L	<0.000017
UA	G404	C	2016/11/22	Cobalt, total	mg/L	<0.000017
UA	G404	C	2017/02/18	Cobalt, total	mg/L	<0.000017
UA	G404	C	2017/05/16	Cobalt, total	mg/L	<0.000017
UA	G404	C	2017/07/14	Cobalt, total	mg/L	<0.000017
UA	G404	C	2018/05/12	Cobalt, total	mg/L	<0.00086
UA	G404	C	2018/08/04	Cobalt, total	mg/L	<0.00067
UA	G404	C	2019/01/24	Cobalt, total	mg/L	<0.00067
UA	G404	C	2019/08/16	Cobalt, total	mg/L	0.00290
UA	G404	C	2020/01/22	Cobalt, total	mg/L	<0.00067
UA	G404	C	2020/08/12	Cobalt, total	mg/L	<0.00022
UA	G404	C	2020/10/13	Cobalt, total	mg/L	<0.002
UA	G404	C	2021/01/21	Cobalt, total	mg/L	<0.00022
UA	G404	C	2021/04/27	Cobalt, total	mg/L	<0.002
UA	G404	C	2021/08/17	Cobalt, total	mg/L	<0.00022
UA	G404	C	2021/10/26	Cobalt, total	mg/L	<0.002
UA	G404	C	2022/02/08	Cobalt, total	mg/L	<0.00019
UA	G404	C	2022/05/10	Cobalt, total	mg/L	<0.00048
UA	G404	C	2022/08/24	Cobalt, total	mg/L	<0.00048
UA	G404	C	2022/11/09	Cobalt, total	mg/L	<0.00048
UA	G404	C	2023/02/14	Cobalt, total	mg/L	<0.00048
UA	G404	C	2023/06/07	Cobalt, total	mg/L	<0.00048
UA	G404	C	2023/08/14	Cobalt, total	mg/L	0.00330
UA	G404	C	2023/11/21	Cobalt, total	mg/L	0.000600
UA	G404	C	2015/10/07	Cobalt, total	mg/L	<0.002
UA	G404	C	2023/06/07	Ferrous Iron, dissolved	mg/L	0.100
UA	G404	C	2020/08/12	Iron, dissolved	mg/L	0.0330
UA	G404	C	2020/10/13	Iron, dissolved	mg/L	0.130
UA	G404	C	2021/01/21	Iron, dissolved	mg/L	0.0300
UA	G404	C	2021/04/27	Iron, dissolved	mg/L	<0.01
UA	G404	C	2021/08/17	Iron, dissolved	mg/L	0.160
UA	G404	C	2021/10/26	Iron, dissolved	mg/L	0.820
UA	G404	C	2022/02/08	Iron, dissolved	mg/L	0.210
UA	G404	C	2022/05/10	Iron, dissolved	mg/L	0.400
UA	G404	C	2022/08/24	Iron, dissolved	mg/L	0.750
UA	G404	C	2022/11/09	Iron, dissolved	mg/L	0.0490
UA	G404	C	2023/02/14	Iron, dissolved	mg/L	<0.00072
UA	G404	C	2023/06/07	Iron, dissolved	mg/L	0.0580
UA	G404	C	2023/08/14	Iron, dissolved	mg/L	0.0718
UA	G404	C	2023/11/21	Iron, dissolved	mg/L	0.0944
UA	G404	C	2015/10/07	Iron, dissolved	mg/L	0.530
UA	G404	C	2017/07/14	Magnesium, total	mg/L	89.0
UA	G404	C	2020/01/22	Magnesium, total	mg/L	73.0
UA	G404	C	2021/01/21	Magnesium, total	mg/L	71.0
UA	G404	C	2021/08/17	Magnesium, total	mg/L	110
UA	G404	C	2022/02/08	Magnesium, total	mg/L	97.0
UA	G404	C	2022/08/24	Magnesium, total	mg/L	130
UA	G404	C	2023/02/14	Magnesium, total	mg/L	80.0
UA	G404	C	2023/06/07	Magnesium, total	mg/L	110
UA	G404	C	2023/08/14	Magnesium, total	mg/L	95.7
UA	G404	C	2023/11/21	Magnesium, total	mg/L	124
UA	G404	C	2018/03/03	Manganese, dissolved	mg/L	0.520
UA	G404	C	2018/05/12	Manganese, dissolved	mg/L	0.0220
UA	G404	C	2018/08/11	Manganese, dissolved	mg/L	1.50
UA	G404	C	2018/11/06	Manganese, dissolved	mg/L	0.290
UA	G404	C	2019/01/24	Manganese, dissolved	mg/L	0.0610
UA	G404	C	2019/05/02	Manganese, dissolved	mg/L	0.00960
UA	G404	C	2019/08/16	Manganese, dissolved	mg/L	0.170
UA	G404	C	2019/10/21	Manganese, dissolved	mg/L	0.300
UA	G404	C	2020/01/22	Manganese, dissolved	mg/L	0.0320

UA	G404	C	2020/05/06	Manganese, dissolved	mg/L	0.0820
UA	G404	C	2020/08/12	Manganese, dissolved	mg/L	0.330
UA	G404	C	2020/10/13	Manganese, dissolved	mg/L	0.300
UA	G404	C	2021/01/21	Manganese, dissolved	mg/L	0.150
UA	G404	C	2021/04/27	Manganese, dissolved	mg/L	0.200
UA	G404	C	2021/08/17	Manganese, dissolved	mg/L	0.920
UA	G404	C	2021/10/26	Manganese, dissolved	mg/L	1.20
UA	G404	C	2022/02/08	Manganese, dissolved	mg/L	0.100
UA	G404	C	2022/05/10	Manganese, dissolved	mg/L	0.180
UA	G404	C	2022/08/24	Manganese, dissolved	mg/L	1.40
UA	G404	C	2022/11/09	Manganese, dissolved	mg/L	1.80
UA	G404	C	2023/02/14	Manganese, dissolved	mg/L	0.330
UA	G404	C	2023/06/07	Manganese, dissolved	mg/L	1.20
UA	G404	C	2023/08/14	Manganese, dissolved	mg/L	2.85
UA	G404	C	2023/11/21	Manganese, dissolved	mg/L	1.46
UA	G404	C	2015/10/07	Manganese, dissolved	mg/L	0.330
UA	G404	C	2023/08/14	Phosphate, dissolved	mg/L	<0.005
UA	G404	C	2017/07/14	Potassium, total	mg/L	1.20
UA	G404	C	2020/01/22	Potassium, total	mg/L	0.330
UA	G404	C	2021/01/21	Potassium, total	mg/L	0.280
UA	G404	C	2021/08/17	Potassium, total	mg/L	0.480
UA	G404	C	2022/02/08	Potassium, total	mg/L	0.420
UA	G404	C	2022/08/24	Potassium, total	mg/L	0.720
UA	G404	C	2023/02/14	Potassium, total	mg/L	0.230
UA	G404	C	2023/06/07	Potassium, total	mg/L	0.430
UA	G404	C	2023/08/14	Potassium, total	mg/L	0.627
UA	G404	C	2023/11/21	Potassium, total	mg/L	0.594
UA	G404	C	2023/06/07	Silicon, dissolved	mg/L	11.0
UA	G404	C	2023/08/14	Silicon, dissolved	mg/L	10.2
UA	G404	C	2017/07/14	Sodium, total	mg/L	64.0
UA	G404	C	2020/01/22	Sodium, total	mg/L	58.0
UA	G404	C	2021/01/21	Sodium, total	mg/L	56.0
UA	G404	C	2021/08/17	Sodium, total	mg/L	87.0
UA	G404	C	2022/02/08	Sodium, total	mg/L	72.0
UA	G404	C	2022/08/24	Sodium, total	mg/L	96.0
UA	G404	C	2023/02/14	Sodium, total	mg/L	70.0
UA	G404	C	2023/06/07	Sodium, total	mg/L	81.0
UA	G404	C	2023/08/14	Sodium, total	mg/L	78.6
UA	G404	C	2023/11/21	Sodium, total	mg/L	94.0
UA	G404	C	2015/11/21	Sulfate, total	mg/L	180
UA	G404	C	2016/02/15	Sulfate, total	mg/L	150
UA	G404	C	2016/05/19	Sulfate, total	mg/L	140
UA	G404	C	2016/08/02	Sulfate, total	mg/L	190
UA	G404	C	2016/11/22	Sulfate, total	mg/L	380
UA	G404	C	2017/02/18	Sulfate, total	mg/L	230
UA	G404	C	2017/05/16	Sulfate, total	mg/L	160
UA	G404	C	2017/07/14	Sulfate, total	mg/L	310
UA	G404	C	2017/10/28	Sulfate, total	mg/L	390
UA	G404	C	2018/05/12	Sulfate, total	mg/L	370
UA	G404	C	2018/08/04	Sulfate, total	mg/L	410
UA	G404	C	2019/01/24	Sulfate, total	mg/L	220
UA	G404	C	2019/08/16	Sulfate, total	mg/L	170
UA	G404	C	2020/01/22	Sulfate, total	mg/L	200
UA	G404	C	2020/08/12	Sulfate, total	mg/L	190
UA	G404	C	2020/10/13	Sulfate, total	mg/L	280
UA	G404	C	2021/01/21	Sulfate, total	mg/L	200
UA	G404	C	2021/04/27	Sulfate, total	mg/L	250
UA	G404	C	2021/08/17	Sulfate, total	mg/L	470
UA	G404	C	2021/10/26	Sulfate, total	mg/L	500
UA	G404	C	2022/02/08	Sulfate, total	mg/L	480
UA	G404	C	2022/05/10	Sulfate, total	mg/L	520
UA	G404	C	2022/08/24	Sulfate, total	mg/L	810
UA	G404	C	2022/11/09	Sulfate, total	mg/L	840

UA	G404	C	2023/02/14	Sulfate, total	mg/L	510
UA	G404	C	2023/06/07	Sulfate, total	mg/L	700
UA	G404	C	2023/08/14	Sulfate, total	mg/L	678
UA	G404	C	2023/11/21	Sulfate, total	mg/L	647
UA	G404	C	2015/10/07	Sulfate, total	mg/L	290
UA	G404	C	2015/11/21	Temperature (Celsius)	degrees C	17.0
UA	G404	C	2016/02/15	Temperature (Celsius)	degrees C	8.10
UA	G404	C	2016/05/19	Temperature (Celsius)	degrees C	18.7
UA	G404	C	2016/08/02	Temperature (Celsius)	degrees C	19.5
UA	G404	C	2016/11/22	Temperature (Celsius)	degrees C	16.0
UA	G404	C	2017/02/18	Temperature (Celsius)	degrees C	15.9
UA	G404	C	2017/05/16	Temperature (Celsius)	degrees C	15.4
UA	G404	C	2017/07/14	Temperature (Celsius)	degrees C	18.7
UA	G404	C	2017/10/28	Temperature (Celsius)	degrees C	13.6
UA	G404	C	2018/05/12	Temperature (Celsius)	degrees C	14.4
UA	G404	C	2018/08/04	Temperature (Celsius)	degrees C	15.5
UA	G404	C	2019/01/24	Temperature (Celsius)	degrees C	11.3
UA	G404	C	2019/08/16	Temperature (Celsius)	degrees C	17.0
UA	G404	C	2020/01/22	Temperature (Celsius)	degrees C	7.60
UA	G404	C	2020/08/12	Temperature (Celsius)	degrees C	22.9
UA	G404	C	2020/10/13	Temperature (Celsius)	degrees C	18.8
UA	G404	C	2021/01/21	Temperature (Celsius)	degrees C	10.7
UA	G404	C	2021/04/27	Temperature (Celsius)	degrees C	17.6
UA	G404	C	2021/08/17	Temperature (Celsius)	degrees C	24.4
UA	G404	C	2021/10/26	Temperature (Celsius)	degrees C	18.6
UA	G404	C	2022/02/08	Temperature (Celsius)	degrees C	8.90
UA	G404	C	2022/05/10	Temperature (Celsius)	degrees C	18.1
UA	G404	C	2022/08/24	Temperature (Celsius)	degrees C	22.7
UA	G404	C	2022/11/09	Temperature (Celsius)	degrees C	19.8
UA	G404	C	2023/02/14	Temperature (Celsius)	degrees C	10.7
UA	G404	C	2023/06/07	Temperature (Celsius)	degrees C	17.3
UA	G404	C	2023/08/14	Temperature (Celsius)	degrees C	19.4
UA	G404	C	2023/11/21	Temperature (Celsius)	degrees C	13.7
UA	G404	C	2015/11/21	Total Dissolved Solids	mg/L	580
UA	G404	C	2016/02/15	Total Dissolved Solids	mg/L	560
UA	G404	C	2016/05/19	Total Dissolved Solids	mg/L	460
UA	G404	C	2016/08/02	Total Dissolved Solids	mg/L	620
UA	G404	C	2016/11/22	Total Dissolved Solids	mg/L	880
UA	G404	C	2017/02/18	Total Dissolved Solids	mg/L	740
UA	G404	C	2017/05/16	Total Dissolved Solids	mg/L	640
UA	G404	C	2017/07/14	Total Dissolved Solids	mg/L	860
UA	G404	C	2017/10/28	Total Dissolved Solids	mg/L	950
UA	G404	C	2018/05/12	Total Dissolved Solids	mg/L	1,000
UA	G404	C	2018/08/04	Total Dissolved Solids	mg/L	1,000
UA	G404	C	2019/01/24	Total Dissolved Solids	mg/L	720
UA	G404	C	2019/08/16	Total Dissolved Solids	mg/L	600
UA	G404	C	2020/01/22	Total Dissolved Solids	mg/L	700
UA	G404	C	2020/08/12	Total Dissolved Solids	mg/L	720
UA	G404	C	2020/10/13	Total Dissolved Solids	mg/L	1,200
UA	G404	C	2021/01/21	Total Dissolved Solids	mg/L	910
UA	G404	C	2021/04/27	Total Dissolved Solids	mg/L	1,200
UA	G404	C	2021/08/17	Total Dissolved Solids	mg/L	1,500
UA	G404	C	2021/10/26	Total Dissolved Solids	mg/L	1,400
UA	G404	C	2022/02/08	Total Dissolved Solids	mg/L	1,300
UA	G404	C	2022/05/10	Total Dissolved Solids	mg/L	1,500
UA	G404	C	2022/08/24	Total Dissolved Solids	mg/L	1,800
UA	G404	C	2022/11/09	Total Dissolved Solids	mg/L	1,900
UA	G404	C	2023/02/14	Total Dissolved Solids	mg/L	1,200
UA	G404	C	2023/06/07	Total Dissolved Solids	mg/L	1,300
UA	G404	C	2023/08/14	Total Dissolved Solids	mg/L	1,600
UA	G404	C	2023/11/21	Total Dissolved Solids	mg/L	1,370
UA	G404	C	2015/10/07	Total Dissolved Solids	mg/L	860
UA	G405	C	2015/11/21	pH (field)	SU	6.8

UA	G405	C	2016/02/15	pH (field)	SU	7.1
UA	G405	C	2016/05/18	pH (field)	SU	6.9
UA	G405	C	2016/08/02	pH (field)	SU	6.8
UA	G405	C	2016/11/22	pH (field)	SU	6.9
UA	G405	C	2017/02/18	pH (field)	SU	7.0
UA	G405	C	2017/05/16	pH (field)	SU	7.1
UA	G405	C	2017/07/14	pH (field)	SU	6.8
UA	G405	C	2017/10/28	pH (field)	SU	7.0
UA	G405	C	2018/05/12	pH (field)	SU	6.9
UA	G405	C	2018/08/04	pH (field)	SU	6.6
UA	G405	C	2019/01/25	pH (field)	SU	6.6
UA	G405	C	2019/08/20	pH (field)	SU	6.7
UA	G405	C	2020/01/22	pH (field)	SU	7.0
UA	G405	C	2020/08/12	pH (field)	SU	7.0
UA	G405	C	2020/10/13	pH (field)	SU	7.0
UA	G405	C	2021/01/21	pH (field)	SU	6.9
UA	G405	C	2021/04/27	pH (field)	SU	7.0
UA	G405	C	2021/08/17	pH (field)	SU	7.0
UA	G405	C	2021/10/26	pH (field)	SU	6.9
UA	G405	C	2022/02/08	pH (field)	SU	7.0
UA	G405	C	2022/05/10	pH (field)	SU	7.0
UA	G405	C	2022/08/24	pH (field)	SU	6.7
UA	G405	C	2022/11/09	pH (field)	SU	6.8
UA	G405	C	2023/02/14	pH (field)	SU	7.0
UA	G405	C	2023/06/06	pH (field)	SU	6.8
UA	G405	C	2023/08/11	pH (field)	SU	7.1
UA	G405	C	2023/11/21	pH (field)	SU	7.0
UA	G405	C	2015/10/07	pH (field)	SU	7.4
UA	G405	C	2015/11/21	Oxidation Reduction Potential	mV	23.0
UA	G405	C	2016/02/15	Oxidation Reduction Potential	mV	93.0
UA	G405	C	2016/05/18	Oxidation Reduction Potential	mV	5.00
UA	G405	C	2016/08/02	Oxidation Reduction Potential	mV	23.0
UA	G405	C	2016/11/22	Oxidation Reduction Potential	mV	34.0
UA	G405	C	2017/02/18	Oxidation Reduction Potential	mV	50.0
UA	G405	C	2017/05/16	Oxidation Reduction Potential	mV	57.0
UA	G405	C	2017/07/14	Oxidation Reduction Potential	mV	30.0
UA	G405	C	2017/10/28	Oxidation Reduction Potential	mV	18.0
UA	G405	C	2018/05/12	Oxidation Reduction Potential	mV	21.0
UA	G405	C	2018/08/04	Oxidation Reduction Potential	mV	57.0
UA	G405	C	2019/01/25	Oxidation Reduction Potential	mV	58.0
UA	G405	C	2019/08/20	Oxidation Reduction Potential	mV	62.0
UA	G405	C	2020/01/22	Oxidation Reduction Potential	mV	120
UA	G405	C	2020/08/12	Oxidation Reduction Potential	mV	48.5
UA	G405	C	2020/10/13	Oxidation Reduction Potential	mV	83.9
UA	G405	C	2021/01/21	Oxidation Reduction Potential	mV	75.6
UA	G405	C	2021/04/27	Oxidation Reduction Potential	mV	59.4
UA	G405	C	2021/08/17	Oxidation Reduction Potential	mV	57.2
UA	G405	C	2021/10/26	Oxidation Reduction Potential	mV	43.0
UA	G405	C	2022/02/08	Oxidation Reduction Potential	mV	152
UA	G405	C	2022/05/10	Oxidation Reduction Potential	mV	86.4
UA	G405	C	2022/08/24	Oxidation Reduction Potential	mV	38.0
UA	G405	C	2022/11/09	Oxidation Reduction Potential	mV	25.0
UA	G405	C	2023/02/14	Oxidation Reduction Potential	mV	295
UA	G405	C	2023/06/06	Oxidation Reduction Potential	mV	68.0
UA	G405	C	2023/08/11	Oxidation Reduction Potential	mV	-21.0
UA	G405	C	2023/11/21	Oxidation Reduction Potential	mV	76.0
UA	G405	C	2015/11/21	Eh	V	0.22
UA	G405	C	2016/02/15	Eh	V	0.29
UA	G405	C	2016/05/18	Eh	V	0.20
UA	G405	C	2016/08/02	Eh	V	0.22
UA	G405	C	2016/11/22	Eh	V	0.23
UA	G405	C	2017/02/18	Eh	V	0.25
UA	G405	C	2017/05/16	Eh	V	0.25

UA	G405	C	2017/07/14	Eh	V	0.22
UA	G405	C	2017/10/28	Eh	V	0.21
UA	G405	C	2018/05/12	Eh	V	0.22
UA	G405	C	2018/08/04	Eh	V	0.25
UA	G405	C	2019/01/25	Eh	V	0.26
UA	G405	C	2019/08/20	Eh	V	0.26
UA	G405	C	2020/01/22	Eh	V	0.32
UA	G405	C	2020/08/12	Eh	V	0.24
UA	G405	C	2020/10/13	Eh	V	0.28
UA	G405	C	2021/01/21	Eh	V	0.27
UA	G405	C	2021/04/27	Eh	V	0.25
UA	G405	C	2021/08/17	Eh	V	0.25
UA	G405	C	2021/10/26	Eh	V	0.24
UA	G405	C	2022/02/08	Eh	V	0.35
UA	G405	C	2022/05/10	Eh	V	0.28
UA	G405	C	2022/08/24	Eh	V	0.23
UA	G405	C	2022/11/09	Eh	V	0.22
UA	G405	C	2023/02/14	Eh	V	0.49
UA	G405	C	2023/06/06	Eh	V	0.26
UA	G405	C	2023/08/11	Eh	V	0.17
UA	G405	C	2023/11/21	Eh	V	0.27
UA	G405	C	2017/07/14	Alkalinity, bicarbonate	mg/L CaCO3	280
UA	G405	C	2020/01/22	Alkalinity, bicarbonate	mg/L CaCO3	280
UA	G405	C	2021/01/21	Alkalinity, bicarbonate	mg/L CaCO3	280
UA	G405	C	2021/08/17	Alkalinity, bicarbonate	mg/L CaCO3	270
UA	G405	C	2022/02/08	Alkalinity, bicarbonate	mg/L CaCO3	250
UA	G405	C	2022/08/24	Alkalinity, bicarbonate	mg/L CaCO3	260
UA	G405	C	2023/02/14	Alkalinity, bicarbonate	mg/L CaCO3	280
UA	G405	C	2023/06/06	Alkalinity, bicarbonate	mg/L CaCO3	280
UA	G405	C	2023/08/11	Alkalinity, bicarbonate	mg/L CaCO3	286
UA	G405	C	2023/11/21	Alkalinity, bicarbonate	mg/L CaCO3	286
UA	G405	C	2022/08/24	Alkalinity, carbonate	mg/L CaCO3	10.0
UA	G405	C	2015/11/21	Barium, total	mg/L	0.0510
UA	G405	C	2016/02/15	Barium, total	mg/L	0.0180
UA	G405	C	2016/05/18	Barium, total	mg/L	0.0200
UA	G405	C	2016/08/02	Barium, total	mg/L	0.0280
UA	G405	C	2016/11/22	Barium, total	mg/L	0.0220
UA	G405	C	2017/02/18	Barium, total	mg/L	0.0210
UA	G405	C	2017/05/16	Barium, total	mg/L	0.0240
UA	G405	C	2017/07/14	Barium, total	mg/L	0.0350
UA	G405	C	2018/05/12	Barium, total	mg/L	0.0260
UA	G405	C	2018/08/04	Barium, total	mg/L	0.0200
UA	G405	C	2019/01/25	Barium, total	mg/L	0.0410
UA	G405	C	2019/08/20	Barium, total	mg/L	0.0360
UA	G405	C	2020/01/22	Barium, total	mg/L	0.0300
UA	G405	C	2020/08/12	Barium, total	mg/L	0.0220
UA	G405	C	2020/10/13	Barium, total	mg/L	0.0220
UA	G405	C	2021/01/21	Barium, total	mg/L	0.0200
UA	G405	C	2021/04/27	Barium, total	mg/L	0.0140
UA	G405	C	2021/08/17	Barium, total	mg/L	0.0150
UA	G405	C	2021/10/26	Barium, total	mg/L	0.0150
UA	G405	C	2022/02/08	Barium, total	mg/L	0.0150
UA	G405	C	2022/05/10	Barium, total	mg/L	0.0150
UA	G405	C	2022/08/24	Barium, total	mg/L	0.0160
UA	G405	C	2022/11/09	Barium, total	mg/L	0.0140
UA	G405	C	2023/02/14	Barium, total	mg/L	0.0200
UA	G405	C	2023/06/06	Barium, total	mg/L	0.0130
UA	G405	C	2023/08/11	Barium, total	mg/L	0.0158
UA	G405	C	2023/11/21	Barium, total	mg/L	0.0259
UA	G405	C	2015/10/07	Barium, total	mg/L	0.0690
UA	G405	C	2015/11/21	Boron, total	mg/L	17.0
UA	G405	C	2016/02/15	Boron, total	mg/L	16.0
UA	G405	C	2016/05/18	Boron, total	mg/L	15.0

UA	G405	C	2016/08/02	Boron, total	mg/L	17.0
UA	G405	C	2016/11/22	Boron, total	mg/L	13.0
UA	G405	C	2017/02/18	Boron, total	mg/L	12.0
UA	G405	C	2017/05/16	Boron, total	mg/L	4.00
UA	G405	C	2017/07/14	Boron, total	mg/L	15.0
UA	G405	C	2017/10/28	Boron, total	mg/L	11.0
UA	G405	C	2018/05/12	Boron, total	mg/L	9.10
UA	G405	C	2018/08/04	Boron, total	mg/L	7.80
UA	G405	C	2019/01/25	Boron, total	mg/L	7.80
UA	G405	C	2019/08/20	Boron, total	mg/L	4.80
UA	G405	C	2020/01/22	Boron, total	mg/L	8.50
UA	G405	C	2020/08/12	Boron, total	mg/L	8.90
UA	G405	C	2020/10/13	Boron, total	mg/L	11.0
UA	G405	C	2021/01/21	Boron, total	mg/L	11.0
UA	G405	C	2021/04/27	Boron, total	mg/L	9.60
UA	G405	C	2021/08/17	Boron, total	mg/L	12.0
UA	G405	C	2021/10/26	Boron, total	mg/L	12.0
UA	G405	C	2022/02/08	Boron, total	mg/L	10.0
UA	G405	C	2022/05/10	Boron, total	mg/L	10.0
UA	G405	C	2022/08/24	Boron, total	mg/L	9.40
UA	G405	C	2022/11/09	Boron, total	mg/L	9.10
UA	G405	C	2023/02/14	Boron, total	mg/L	10.0
UA	G405	C	2023/06/06	Boron, total	mg/L	9.50
UA	G405	C	2023/08/11	Boron, total	mg/L	10.8
UA	G405	C	2023/11/21	Boron, total	mg/L	15.4
UA	G405	C	2015/10/07	Boron, total	mg/L	20.0
UA	G405	C	2015/11/21	Calcium, total	mg/L	330
UA	G405	C	2016/02/15	Calcium, total	mg/L	320
UA	G405	C	2016/05/18	Calcium, total	mg/L	320
UA	G405	C	2016/08/02	Calcium, total	mg/L	280
UA	G405	C	2016/11/22	Calcium, total	mg/L	250
UA	G405	C	2017/02/18	Calcium, total	mg/L	270
UA	G405	C	2017/05/16	Calcium, total	mg/L	190
UA	G405	C	2017/07/14	Calcium, total	mg/L	320
UA	G405	C	2017/10/28	Calcium, total	mg/L	300
UA	G405	C	2018/05/12	Calcium, total	mg/L	260
UA	G405	C	2018/08/04	Calcium, total	mg/L	220
UA	G405	C	2019/01/25	Calcium, total	mg/L	220
UA	G405	C	2019/08/20	Calcium, total	mg/L	140
UA	G405	C	2020/01/22	Calcium, total	mg/L	240
UA	G405	C	2020/08/12	Calcium, total	mg/L	220
UA	G405	C	2020/10/13	Calcium, total	mg/L	220
UA	G405	C	2021/01/21	Calcium, total	mg/L	250
UA	G405	C	2021/04/27	Calcium, total	mg/L	210
UA	G405	C	2021/08/17	Calcium, total	mg/L	250
UA	G405	C	2021/10/26	Calcium, total	mg/L	230
UA	G405	C	2022/02/08	Calcium, total	mg/L	260
UA	G405	C	2022/05/10	Calcium, total	mg/L	280
UA	G405	C	2022/08/24	Calcium, total	mg/L	250
UA	G405	C	2022/11/09	Calcium, total	mg/L	220
UA	G405	C	2023/02/14	Calcium, total	mg/L	260
UA	G405	C	2023/06/06	Calcium, total	mg/L	250
UA	G405	C	2023/08/11	Calcium, total	mg/L	253
UA	G405	C	2023/11/21	Calcium, total	mg/L	248
UA	G405	C	2015/11/21	Chloride, total	mg/L	14.0
UA	G405	C	2016/02/15	Chloride, total	mg/L	11.0
UA	G405	C	2016/05/18	Chloride, total	mg/L	9.30
UA	G405	C	2016/08/02	Chloride, total	mg/L	3.40
UA	G405	C	2016/11/22	Chloride, total	mg/L	19.0
UA	G405	C	2017/02/18	Chloride, total	mg/L	21.0
UA	G405	C	2017/05/16	Chloride, total	mg/L	47.0
UA	G405	C	2017/07/14	Chloride, total	mg/L	20.0
UA	G405	C	2017/10/28	Chloride, total	mg/L	26.0

UA	G405	C	2018/05/12	Chloride, total	mg/L	23.0
UA	G405	C	2018/08/04	Chloride, total	mg/L	22.0
UA	G405	C	2019/01/25	Chloride, total	mg/L	14.0
UA	G405	C	2019/08/20	Chloride, total	mg/L	17.0
UA	G405	C	2020/01/22	Chloride, total	mg/L	10.0
UA	G405	C	2020/08/12	Chloride, total	mg/L	13.0
UA	G405	C	2020/10/13	Chloride, total	mg/L	12.0
UA	G405	C	2021/01/21	Chloride, total	mg/L	5.90
UA	G405	C	2021/04/27	Chloride, total	mg/L	7.00
UA	G405	C	2021/08/17	Chloride, total	mg/L	7.80
UA	G405	C	2021/10/26	Chloride, total	mg/L	11.0
UA	G405	C	2022/02/08	Chloride, total	mg/L	6.20
UA	G405	C	2022/05/10	Chloride, total	mg/L	5.80
UA	G405	C	2022/08/24	Chloride, total	mg/L	6.90
UA	G405	C	2022/11/09	Chloride, total	mg/L	9.10
UA	G405	C	2023/02/14	Chloride, total	mg/L	9.90
UA	G405	C	2023/06/06	Chloride, total	mg/L	8.90
UA	G405	C	2023/08/11	Chloride, total	mg/L	14.0
UA	G405	C	2023/11/21	Chloride, total	mg/L	17.0
UA	G405	C	2015/10/07	Chloride, total	mg/L	7.10
UA	G405	C	2015/11/21	Cobalt, total	mg/L	0.00340
UA	G405	C	2016/02/15	Cobalt, total	mg/L	<0.000017
UA	G405	C	2016/05/18	Cobalt, total	mg/L	<0.000017
UA	G405	C	2016/08/02	Cobalt, total	mg/L	0.00380
UA	G405	C	2016/11/22	Cobalt, total	mg/L	0.00210
UA	G405	C	2017/02/18	Cobalt, total	mg/L	<0.000017
UA	G405	C	2017/05/16	Cobalt, total	mg/L	<0.000017
UA	G405	C	2017/07/14	Cobalt, total	mg/L	0.00260
UA	G405	C	2018/05/12	Cobalt, total	mg/L	0.00300
UA	G405	C	2018/08/04	Cobalt, total	mg/L	<0.00067
UA	G405	C	2019/01/25	Cobalt, total	mg/L	0.00380
UA	G405	C	2019/08/20	Cobalt, total	mg/L	<0.00067
UA	G405	C	2020/01/22	Cobalt, total	mg/L	<0.00067
UA	G405	C	2020/08/12	Cobalt, total	mg/L	<0.00022
UA	G405	C	2020/10/13	Cobalt, total	mg/L	<0.002
UA	G405	C	2021/01/21	Cobalt, total	mg/L	<0.00022
UA	G405	C	2021/04/27	Cobalt, total	mg/L	<0.002
UA	G405	C	2021/08/17	Cobalt, total	mg/L	<0.00022
UA	G405	C	2021/10/26	Cobalt, total	mg/L	<0.002
UA	G405	C	2022/02/08	Cobalt, total	mg/L	<0.00019
UA	G405	C	2022/05/10	Cobalt, total	mg/L	0.00110
UA	G405	C	2022/08/24	Cobalt, total	mg/L	0.00100
UA	G405	C	2022/11/09	Cobalt, total	mg/L	0.000790
UA	G405	C	2023/02/14	Cobalt, total	mg/L	0.00160
UA	G405	C	2023/06/06	Cobalt, total	mg/L	0.000870
UA	G405	C	2023/08/11	Cobalt, total	mg/L	0.00110
UA	G405	C	2023/11/21	Cobalt, total	mg/L	0.00150
UA	G405	C	2015/10/07	Cobalt, total	mg/L	0.00440
UA	G405	C	2023/06/06	Ferrous Iron, dissolved	mg/L	0.250
UA	G405	C	2020/08/12	Iron, dissolved	mg/L	0.0290
UA	G405	C	2020/10/13	Iron, dissolved	mg/L	0.0520
UA	G405	C	2021/01/21	Iron, dissolved	mg/L	0.0390
UA	G405	C	2021/04/27	Iron, dissolved	mg/L	0.0720
UA	G405	C	2021/08/17	Iron, dissolved	mg/L	0.0690
UA	G405	C	2021/10/26	Iron, dissolved	mg/L	0.0690
UA	G405	C	2022/02/08	Iron, dissolved	mg/L	0.0520
UA	G405	C	2022/05/10	Iron, dissolved	mg/L	0.0630
UA	G405	C	2022/08/24	Iron, dissolved	mg/L	0.0950
UA	G405	C	2022/11/09	Iron, dissolved	mg/L	0.120
UA	G405	C	2023/02/14	Iron, dissolved	mg/L	0.110
UA	G405	C	2023/06/06	Iron, dissolved	mg/L	0.130
UA	G405	C	2023/08/11	Iron, dissolved	mg/L	0.165
UA	G405	C	2023/11/21	Iron, dissolved	mg/L	0.0788

UA	G405	C	2015/10/07	Iron, dissolved	mg/L	<0.01
UA	G405	C	2017/07/14	Magnesium, total	mg/L	160
UA	G405	C	2020/01/22	Magnesium, total	mg/L	110
UA	G405	C	2021/01/21	Magnesium, total	mg/L	100
UA	G405	C	2021/08/17	Magnesium, total	mg/L	110
UA	G405	C	2022/02/08	Magnesium, total	mg/L	120
UA	G405	C	2022/08/24	Magnesium, total	mg/L	100
UA	G405	C	2023/02/14	Magnesium, total	mg/L	110
UA	G405	C	2023/06/06	Magnesium, total	mg/L	110
UA	G405	C	2023/08/11	Magnesium, total	mg/L	110
UA	G405	C	2023/11/21	Magnesium, total	mg/L	107
UA	G405	C	2018/03/03	Manganese, dissolved	mg/L	1.10
UA	G405	C	2018/05/12	Manganese, dissolved	mg/L	<0.001
UA	G405	C	2018/08/11	Manganese, dissolved	mg/L	0.490
UA	G405	C	2018/11/06	Manganese, dissolved	mg/L	0.0690
UA	G405	C	2019/01/25	Manganese, dissolved	mg/L	0.130
UA	G405	C	2019/05/02	Manganese, dissolved	mg/L	0.290
UA	G405	C	2019/08/16	Manganese, dissolved	mg/L	0.580
UA	G405	C	2019/10/21	Manganese, dissolved	mg/L	0.910
UA	G405	C	2020/01/22	Manganese, dissolved	mg/L	1.00
UA	G405	C	2020/05/06	Manganese, dissolved	mg/L	0.870
UA	G405	C	2020/08/12	Manganese, dissolved	mg/L	0.810
UA	G405	C	2020/10/13	Manganese, dissolved	mg/L	0.800
UA	G405	C	2021/01/21	Manganese, dissolved	mg/L	0.880
UA	G405	C	2021/04/27	Manganese, dissolved	mg/L	0.950
UA	G405	C	2021/08/17	Manganese, dissolved	mg/L	1.10
UA	G405	C	2021/10/26	Manganese, dissolved	mg/L	0.990
UA	G405	C	2022/02/08	Manganese, dissolved	mg/L	0.920
UA	G405	C	2022/05/10	Manganese, dissolved	mg/L	1.00
UA	G405	C	2022/08/24	Manganese, dissolved	mg/L	1.20
UA	G405	C	2022/11/09	Manganese, dissolved	mg/L	1.10
UA	G405	C	2023/02/14	Manganese, dissolved	mg/L	1.30
UA	G405	C	2023/06/06	Manganese, dissolved	mg/L	1.10
UA	G405	C	2023/08/11	Manganese, dissolved	mg/L	1.07
UA	G405	C	2023/11/21	Manganese, dissolved	mg/L	0.868
UA	G405	C	2015/10/07	Manganese, dissolved	mg/L	2.00
UA	G405	C	2023/08/11	Phosphate, dissolved	mg/L	0.0520
UA	G405	C	2017/07/14	Potassium, total	mg/L	0.950
UA	G405	C	2020/01/22	Potassium, total	mg/L	0.430
UA	G405	C	2021/01/21	Potassium, total	mg/L	0.460
UA	G405	C	2021/08/17	Potassium, total	mg/L	0.500
UA	G405	C	2022/02/08	Potassium, total	mg/L	0.460
UA	G405	C	2022/08/24	Potassium, total	mg/L	0.560
UA	G405	C	2023/02/14	Potassium, total	mg/L	0.510
UA	G405	C	2023/06/06	Potassium, total	mg/L	0.410
UA	G405	C	2023/08/11	Potassium, total	mg/L	0.566
UA	G405	C	2023/11/21	Potassium, total	mg/L	0.594
UA	G405	C	2023/06/06	Silicon, dissolved	mg/L	8.00
UA	G405	C	2023/08/11	Silicon, dissolved	mg/L	7.81
UA	G405	C	2017/07/14	Sodium, total	mg/L	120
UA	G405	C	2020/01/22	Sodium, total	mg/L	100
UA	G405	C	2021/01/21	Sodium, total	mg/L	110
UA	G405	C	2021/08/17	Sodium, total	mg/L	120
UA	G405	C	2022/02/08	Sodium, total	mg/L	110
UA	G405	C	2022/08/24	Sodium, total	mg/L	100
UA	G405	C	2023/02/14	Sodium, total	mg/L	100
UA	G405	C	2023/06/06	Sodium, total	mg/L	110
UA	G405	C	2023/08/11	Sodium, total	mg/L	109
UA	G405	C	2023/11/21	Sodium, total	mg/L	103
UA	G405	C	2015/11/21	Sulfate, total	mg/L	1,700
UA	G405	C	2016/02/15	Sulfate, total	mg/L	1,700
UA	G405	C	2016/05/18	Sulfate, total	mg/L	1,800
UA	G405	C	2016/08/02	Sulfate, total	mg/L	1,600

UA	G405	C	2016/11/22	Sulfate, total	mg/L	1,400
UA	G405	C	2017/02/18	Sulfate, total	mg/L	1,300
UA	G405	C	2017/05/16	Sulfate, total	mg/L	680
UA	G405	C	2017/07/14	Sulfate, total	mg/L	1,600
UA	G405	C	2017/10/28	Sulfate, total	mg/L	1,300
UA	G405	C	2018/05/12	Sulfate, total	mg/L	1,200
UA	G405	C	2018/08/04	Sulfate, total	mg/L	790
UA	G405	C	2019/01/25	Sulfate, total	mg/L	890
UA	G405	C	2019/08/20	Sulfate, total	mg/L	340
UA	G405	C	2020/01/22	Sulfate, total	mg/L	910
UA	G405	C	2020/08/12	Sulfate, total	mg/L	460
UA	G405	C	2020/10/13	Sulfate, total	mg/L	980
UA	G405	C	2021/01/21	Sulfate, total	mg/L	960
UA	G405	C	2021/04/27	Sulfate, total	mg/L	800
UA	G405	C	2021/08/17	Sulfate, total	mg/L	760
UA	G405	C	2021/10/26	Sulfate, total	mg/L	1,000
UA	G405	C	2022/02/08	Sulfate, total	mg/L	1,000
UA	G405	C	2022/05/10	Sulfate, total	mg/L	1,000
UA	G405	C	2022/08/24	Sulfate, total	mg/L	1,000
UA	G405	C	2022/11/09	Sulfate, total	mg/L	910
UA	G405	C	2023/02/14	Sulfate, total	mg/L	950
UA	G405	C	2023/06/06	Sulfate, total	mg/L	1,000
UA	G405	C	2023/08/11	Sulfate, total	mg/L	916
UA	G405	C	2023/11/21	Sulfate, total	mg/L	897
UA	G405	C	2015/10/07	Sulfate, total	mg/L	1,900
UA	G405	C	2015/11/21	Temperature (Celsius)	degrees C	16.7
UA	G405	C	2016/02/15	Temperature (Celsius)	degrees C	9.40
UA	G405	C	2016/05/18	Temperature (Celsius)	degrees C	17.1
UA	G405	C	2016/08/02	Temperature (Celsius)	degrees C	18.9
UA	G405	C	2016/11/22	Temperature (Celsius)	degrees C	13.8
UA	G405	C	2017/02/18	Temperature (Celsius)	degrees C	15.0
UA	G405	C	2017/05/16	Temperature (Celsius)	degrees C	15.1
UA	G405	C	2017/07/14	Temperature (Celsius)	degrees C	17.8
UA	G405	C	2017/10/28	Temperature (Celsius)	degrees C	13.0
UA	G405	C	2018/05/12	Temperature (Celsius)	degrees C	15.1
UA	G405	C	2018/08/04	Temperature (Celsius)	degrees C	16.0
UA	G405	C	2019/01/25	Temperature (Celsius)	degrees C	12.1
UA	G405	C	2019/08/20	Temperature (Celsius)	degrees C	17.2
UA	G405	C	2020/01/22	Temperature (Celsius)	degrees C	7.60
UA	G405	C	2020/08/12	Temperature (Celsius)	degrees C	24.1
UA	G405	C	2020/10/13	Temperature (Celsius)	degrees C	19.6
UA	G405	C	2021/01/21	Temperature (Celsius)	degrees C	11.9
UA	G405	C	2021/04/27	Temperature (Celsius)	degrees C	17.4
UA	G405	C	2021/08/17	Temperature (Celsius)	degrees C	22.7
UA	G405	C	2021/10/26	Temperature (Celsius)	degrees C	17.7
UA	G405	C	2022/02/08	Temperature (Celsius)	degrees C	9.60
UA	G405	C	2022/05/10	Temperature (Celsius)	degrees C	18.8
UA	G405	C	2022/08/24	Temperature (Celsius)	degrees C	22.8
UA	G405	C	2022/11/09	Temperature (Celsius)	degrees C	19.8
UA	G405	C	2023/02/14	Temperature (Celsius)	degrees C	10.6
UA	G405	C	2023/06/06	Temperature (Celsius)	degrees C	19.7
UA	G405	C	2023/08/11	Temperature (Celsius)	degrees C	18.2
UA	G405	C	2023/11/21	Temperature (Celsius)	degrees C	15.3
UA	G405	C	2015/11/21	Total Dissolved Solids	mg/L	2,400
UA	G405	C	2016/02/15	Total Dissolved Solids	mg/L	2,500
UA	G405	C	2016/05/18	Total Dissolved Solids	mg/L	2,200
UA	G405	C	2016/08/02	Total Dissolved Solids	mg/L	2,200
UA	G405	C	2016/11/22	Total Dissolved Solids	mg/L	2,100
UA	G405	C	2017/02/18	Total Dissolved Solids	mg/L	1,800
UA	G405	C	2017/05/16	Total Dissolved Solids	mg/L	1,300
UA	G405	C	2017/07/14	Total Dissolved Solids	mg/L	2,100
UA	G405	C	2017/10/28	Total Dissolved Solids	mg/L	2,000
UA	G405	C	2018/05/12	Total Dissolved Solids	mg/L	1,900

UA	G405	C	2018/08/04	Total Dissolved Solids	mg/L	1,400
UA	G405	C	2019/01/25	Total Dissolved Solids	mg/L	1,500
UA	G405	C	2019/08/20	Total Dissolved Solids	mg/L	720
UA	G405	C	2020/01/22	Total Dissolved Solids	mg/L	1,400
UA	G405	C	2020/08/12	Total Dissolved Solids	mg/L	1,200
UA	G405	C	2020/10/13	Total Dissolved Solids	mg/L	1,600
UA	G405	C	2021/01/21	Total Dissolved Solids	mg/L	1,600
UA	G405	C	2021/04/27	Total Dissolved Solids	mg/L	1,600
UA	G405	C	2021/08/17	Total Dissolved Solids	mg/L	1,400
UA	G405	C	2021/10/26	Total Dissolved Solids	mg/L	1,600
UA	G405	C	2022/02/08	Total Dissolved Solids	mg/L	1,400
UA	G405	C	2022/05/10	Total Dissolved Solids	mg/L	1,700
UA	G405	C	2022/08/24	Total Dissolved Solids	mg/L	1,900
UA	G405	C	2022/11/09	Total Dissolved Solids	mg/L	1,700
UA	G405	C	2023/02/14	Total Dissolved Solids	mg/L	1,900
UA	G405	C	2023/06/06	Total Dissolved Solids	mg/L	1,700
UA	G405	C	2023/08/11	Total Dissolved Solids	mg/L	1,790
UA	G405	C	2023/11/21	Total Dissolved Solids	mg/L	1,610
UA	G405	C	2015/10/07	Total Dissolved Solids	mg/L	2,900
UA	G406	C	2020/10/14	pH (field)	SU	6.5
UA	G406	C	2021/01/28	pH (field)	SU	6.6
UA	G406	C	2021/05/20	pH (field)	SU	7.0
UA	G406	C	2021/08/17	pH (field)	SU	6.7
UA	G406	C	2021/10/26	pH (field)	SU	6.6
UA	G406	C	2022/02/08	pH (field)	SU	6.5
UA	G406	C	2022/05/10	pH (field)	SU	6.5
UA	G406	C	2022/08/24	pH (field)	SU	6.4
UA	G406	C	2022/11/09	pH (field)	SU	6.5
UA	G406	C	2023/02/14	pH (field)	SU	6.7
UA	G406	C	2023/05/31	pH (field)	SU	6.5
UA	G406	C	2023/08/11	pH (field)	SU	6.7
UA	G406	C	2023/11/20	pH (field)	SU	6.6
UA	G406	C	2020/10/14	Oxidation Reduction Potential	mV	186
UA	G406	C	2021/01/28	Oxidation Reduction Potential	mV	194
UA	G406	C	2021/05/20	Oxidation Reduction Potential	mV	-110
UA	G406	C	2021/08/17	Oxidation Reduction Potential	mV	95.7
UA	G406	C	2021/10/26	Oxidation Reduction Potential	mV	29.4
UA	G406	C	2022/02/08	Oxidation Reduction Potential	mV	174
UA	G406	C	2022/05/10	Oxidation Reduction Potential	mV	132
UA	G406	C	2022/08/24	Oxidation Reduction Potential	mV	165
UA	G406	C	2022/11/09	Oxidation Reduction Potential	mV	225
UA	G406	C	2023/02/14	Oxidation Reduction Potential	mV	284
UA	G406	C	2023/05/31	Oxidation Reduction Potential	mV	166
UA	G406	C	2023/08/11	Oxidation Reduction Potential	mV	81.0
UA	G406	C	2023/11/20	Oxidation Reduction Potential	mV	127
UA	G406	C	2020/10/14	Eh	V	0.38
UA	G406	C	2021/01/28	Eh	V	0.39
UA	G406	C	2021/05/20	Eh	V	0.078
UA	G406	C	2021/08/17	Eh	V	0.29
UA	G406	C	2021/10/26	Eh	V	0.22
UA	G406	C	2022/02/08	Eh	V	0.37
UA	G406	C	2022/05/10	Eh	V	0.33
UA	G406	C	2022/08/24	Eh	V	0.36
UA	G406	C	2022/11/09	Eh	V	0.42
UA	G406	C	2023/02/14	Eh	V	0.48
UA	G406	C	2023/05/31	Eh	V	0.36
UA	G406	C	2023/08/11	Eh	V	0.28
UA	G406	C	2023/11/20	Eh	V	0.32
UA	G406	C	2023/02/14	Alkalinity, bicarbonate	mg/L CaCO3	350
UA	G406	C	2023/05/31	Alkalinity, bicarbonate	mg/L CaCO3	360
UA	G406	C	2023/08/11	Alkalinity, bicarbonate	mg/L CaCO3	347
UA	G406	C	2023/11/20	Alkalinity, bicarbonate	mg/L CaCO3	289
UA	G406	C	2020/10/14	Barium, total	mg/L	0.0130

UA	G406	C	2021/01/28	Barium, total	mg/L	0.0120
UA	G406	C	2021/05/20	Barium, total	mg/L	0.730
UA	G406	C	2021/08/17	Barium, total	mg/L	0.0140
UA	G406	C	2021/10/26	Barium, total	mg/L	0.0140
UA	G406	C	2022/02/08	Barium, total	mg/L	0.0160
UA	G406	C	2022/05/10	Barium, total	mg/L	0.0150
UA	G406	C	2022/08/24	Barium, total	mg/L	0.0130
UA	G406	C	2022/11/09	Barium, total	mg/L	0.0120
UA	G406	C	2023/02/14	Barium, total	mg/L	0.0150
UA	G406	C	2023/05/31	Barium, total	mg/L	0.0130
UA	G406	C	2023/08/11	Barium, total	mg/L	0.0139
UA	G406	C	2023/11/20	Barium, total	mg/L	0.0201
UA	G406	C	2020/10/14	Boron, total	mg/L	1.60
UA	G406	C	2021/01/28	Boron, total	mg/L	1.50
UA	G406	C	2021/05/20	Boron, total	mg/L	0.170
UA	G406	C	2021/08/17	Boron, total	mg/L	1.50
UA	G406	C	2021/10/26	Boron, total	mg/L	1.50
UA	G406	C	2022/02/08	Boron, total	mg/L	1.40
UA	G406	C	2022/05/10	Boron, total	mg/L	1.40
UA	G406	C	2022/08/24	Boron, total	mg/L	1.50
UA	G406	C	2022/11/09	Boron, total	mg/L	1.40
UA	G406	C	2023/02/14	Boron, total	mg/L	1.50
UA	G406	C	2023/05/31	Boron, total	mg/L	1.40
UA	G406	C	2023/08/11	Boron, total	mg/L	1.54
UA	G406	C	2023/11/20	Boron, total	mg/L	2.29
UA	G406	C	2020/10/14	Calcium, total	mg/L	230
UA	G406	C	2021/01/28	Calcium, total	mg/L	210
UA	G406	C	2021/05/20	Calcium, total	mg/L	190
UA	G406	C	2021/08/17	Calcium, total	mg/L	210
UA	G406	C	2021/10/26	Calcium, total	mg/L	190
UA	G406	C	2022/02/08	Calcium, total	mg/L	210
UA	G406	C	2022/05/10	Calcium, total	mg/L	210
UA	G406	C	2022/08/24	Calcium, total	mg/L	220
UA	G406	C	2022/11/09	Calcium, total	mg/L	180
UA	G406	C	2023/02/14	Calcium, total	mg/L	200
UA	G406	C	2023/05/31	Calcium, total	mg/L	190
UA	G406	C	2023/08/11	Calcium, total	mg/L	193
UA	G406	C	2023/11/20	Calcium, total	mg/L	206
UA	G406	C	2020/10/14	Chloride, total	mg/L	3.70
UA	G406	C	2021/01/28	Chloride, total	mg/L	2.40
UA	G406	C	2021/05/20	Chloride, total	mg/L	5.50
UA	G406	C	2021/08/17	Chloride, total	mg/L	3.90
UA	G406	C	2021/10/26	Chloride, total	mg/L	3.50
UA	G406	C	2022/02/08	Chloride, total	mg/L	4.80
UA	G406	C	2022/05/10	Chloride, total	mg/L	<4.8
UA	G406	C	2022/08/24	Chloride, total	mg/L	3.00
UA	G406	C	2022/11/09	Chloride, total	mg/L	2.70
UA	G406	C	2023/02/14	Chloride, total	mg/L	4.10
UA	G406	C	2023/05/31	Chloride, total	mg/L	<4.8
UA	G406	C	2023/08/11	Chloride, total	mg/L	4.00
UA	G406	C	2023/11/20	Chloride, total	mg/L	5.00
UA	G406	C	2020/10/14	Cobalt, total	mg/L	<0.002
UA	G406	C	2021/01/28	Cobalt, total	mg/L	<0.002
UA	G406	C	2021/05/20	Cobalt, total	mg/L	<0.002
UA	G406	C	2021/08/17	Cobalt, total	mg/L	<0.002
UA	G406	C	2021/10/26	Cobalt, total	mg/L	<0.002
UA	G406	C	2022/02/08	Cobalt, total	mg/L	<0.002
UA	G406	C	2022/05/10	Cobalt, total	mg/L	<0.00048
UA	G406	C	2022/08/24	Cobalt, total	mg/L	<0.00048
UA	G406	C	2022/11/09	Cobalt, total	mg/L	<0.00048
UA	G406	C	2023/02/14	Cobalt, total	mg/L	<0.00048
UA	G406	C	2023/05/31	Cobalt, total	mg/L	0.000520
UA	G406	C	2023/08/11	Cobalt, total	mg/L	0.000800

UA	G406	C	2023/11/20	Cobalt, total	mg/L	0.000800
UA	G406	C	2023/05/31	Ferrous Iron, dissolved	mg/L	0.180
UA	G406	C	2020/08/11	Iron, dissolved	mg/L	0.0170
UA	G406	C	2020/10/14	Iron, dissolved	mg/L	<0.01
UA	G406	C	2021/01/28	Iron, dissolved	mg/L	<0.01
UA	G406	C	2021/05/20	Iron, dissolved	mg/L	7.90
UA	G406	C	2021/08/17	Iron, dissolved	mg/L	<0.01
UA	G406	C	2021/10/26	Iron, dissolved	mg/L	<0.01
UA	G406	C	2022/02/08	Iron, dissolved	mg/L	<0.01
UA	G406	C	2022/05/10	Iron, dissolved	mg/L	0.000980
UA	G406	C	2022/08/24	Iron, dissolved	mg/L	0.00580
UA	G406	C	2022/11/09	Iron, dissolved	mg/L	0.00270
UA	G406	C	2023/02/14	Iron, dissolved	mg/L	<0.00072
UA	G406	C	2023/05/31	Iron, dissolved	mg/L	<0.00072
UA	G406	C	2023/08/11	Iron, dissolved	mg/L	<0.0115
UA	G406	C	2023/11/20	Iron, dissolved	mg/L	<0.0115
UA	G406	C	2023/02/14	Magnesium, total	mg/L	76.0
UA	G406	C	2023/05/31	Magnesium, total	mg/L	65.0
UA	G406	C	2023/08/11	Magnesium, total	mg/L	65.7
UA	G406	C	2023/11/20	Magnesium, total	mg/L	60.1
UA	G406	C	2018/07/16	Manganese, dissolved	mg/L	4.80
UA	G406	C	2018/08/13	Manganese, dissolved	mg/L	3.90
UA	G406	C	2019/05/02	Manganese, dissolved	mg/L	4.20
UA	G406	C	2019/08/19	Manganese, dissolved	mg/L	4.50
UA	G406	C	2019/10/22	Manganese, dissolved	mg/L	4.60
UA	G406	C	2020/01/23	Manganese, dissolved	mg/L	4.00
UA	G406	C	2020/05/06	Manganese, dissolved	mg/L	4.50
UA	G406	C	2020/08/11	Manganese, dissolved	mg/L	5.10
UA	G406	C	2020/10/14	Manganese, dissolved	mg/L	5.50
UA	G406	C	2021/01/28	Manganese, dissolved	mg/L	4.30
UA	G406	C	2021/05/20	Manganese, dissolved	mg/L	0.170
UA	G406	C	2021/08/17	Manganese, dissolved	mg/L	4.90
UA	G406	C	2021/10/26	Manganese, dissolved	mg/L	4.10
UA	G406	C	2022/02/08	Manganese, dissolved	mg/L	2.20
UA	G406	C	2022/05/10	Manganese, dissolved	mg/L	2.20
UA	G406	C	2022/08/24	Manganese, dissolved	mg/L	4.20
UA	G406	C	2022/11/09	Manganese, dissolved	mg/L	4.60
UA	G406	C	2023/02/14	Manganese, dissolved	mg/L	2.10
UA	G406	C	2023/05/31	Manganese, dissolved	mg/L	4.40
UA	G406	C	2023/08/11	Manganese, dissolved	mg/L	4.45
UA	G406	C	2023/11/20	Manganese, dissolved	mg/L	4.55
UA	G406	C	2023/08/11	Phosphate, dissolved	mg/L	0.0430
UA	G406	C	2023/02/14	Potassium, total	mg/L	0.160
UA	G406	C	2023/05/31	Potassium, total	mg/L	0.150
UA	G406	C	2023/08/11	Potassium, total	mg/L	0.263
UA	G406	C	2023/11/20	Potassium, total	mg/L	0.255
UA	G406	C	2023/05/31	Silicon, dissolved	mg/L	14.0
UA	G406	C	2023/08/11	Silicon, dissolved	mg/L	11.9
UA	G406	C	2023/02/14	Sodium, total	mg/L	43.0
UA	G406	C	2023/05/31	Sodium, total	mg/L	38.0
UA	G406	C	2023/08/11	Sodium, total	mg/L	37.2
UA	G406	C	2023/11/20	Sodium, total	mg/L	32.5
UA	G406	C	2020/10/14	Sulfate, total	mg/L	610
UA	G406	C	2021/01/28	Sulfate, total	mg/L	580
UA	G406	C	2021/05/20	Sulfate, total	mg/L	25.0
UA	G406	C	2021/08/17	Sulfate, total	mg/L	540
UA	G406	C	2021/10/26	Sulfate, total	mg/L	480
UA	G406	C	2022/02/08	Sulfate, total	mg/L	490
UA	G406	C	2022/05/10	Sulfate, total	mg/L	510
UA	G406	C	2022/08/24	Sulfate, total	mg/L	470
UA	G406	C	2022/11/09	Sulfate, total	mg/L	470
UA	G406	C	2023/02/14	Sulfate, total	mg/L	450
UA	G406	C	2023/05/31	Sulfate, total	mg/L	480

UA	G406	C	2023/08/11	Sulfate, total	mg/L	482
UA	G406	C	2023/11/20	Sulfate, total	mg/L	450
UA	G406	C	2020/10/14	Temperature (Celsius)	degrees C	17.5
UA	G406	C	2021/01/28	Temperature (Celsius)	degrees C	12.1
UA	G406	C	2021/05/20	Temperature (Celsius)	degrees C	26
UA	G406	C	2021/08/17	Temperature (Celsius)	degrees C	18.9
UA	G406	C	2021/10/26	Temperature (Celsius)	degrees C	16.8
UA	G406	C	2022/02/08	Temperature (Celsius)	degrees C	12.3
UA	G406	C	2022/05/10	Temperature (Celsius)	degrees C	16.2
UA	G406	C	2022/08/24	Temperature (Celsius)	degrees C	20.5
UA	G406	C	2022/11/09	Temperature (Celsius)	degrees C	19.1
UA	G406	C	2023/02/14	Temperature (Celsius)	degrees C	12.6
UA	G406	C	2023/05/31	Temperature (Celsius)	degrees C	21.2
UA	G406	C	2023/08/11	Temperature (Celsius)	degrees C	16.9
UA	G406	C	2023/11/20	Temperature (Celsius)	degrees C	15.7
UA	G406	C	2020/10/14	Total Dissolved Solids	mg/L	1,200
UA	G406	C	2021/01/28	Total Dissolved Solids	mg/L	1,200
UA	G406	C	2021/05/20	Total Dissolved Solids	mg/L	920
UA	G406	C	2021/08/17	Total Dissolved Solids	mg/L	1,200
UA	G406	C	2021/10/26	Total Dissolved Solids	mg/L	1,000
UA	G406	C	2022/02/08	Total Dissolved Solids	mg/L	990
UA	G406	C	2022/05/10	Total Dissolved Solids	mg/L	1,000
UA	G406	C	2022/08/24	Total Dissolved Solids	mg/L	1,100
UA	G406	C	2022/11/09	Total Dissolved Solids	mg/L	980
UA	G406	C	2023/02/14	Total Dissolved Solids	mg/L	1,200
UA	G406	C	2023/05/31	Total Dissolved Solids	mg/L	1,100
UA	G406	C	2023/08/11	Total Dissolved Solids	mg/L	1,070
UA	G406	C	2023/11/20	Total Dissolved Solids	mg/L	1,060
UA	G407	C	2020/10/14	pH (field)	SU	6.6
UA	G407	C	2021/01/28	pH (field)	SU	6.9
UA	G407	C	2021/04/26	pH (field)	SU	6.7
UA	G407	C	2021/08/17	pH (field)	SU	6.7
UA	G407	C	2021/10/26	pH (field)	SU	6.7
UA	G407	C	2022/02/08	pH (field)	SU	6.7
UA	G407	C	2022/05/10	pH (field)	SU	6.6
UA	G407	C	2022/08/24	pH (field)	SU	6.4
UA	G407	C	2022/11/08	pH (field)	SU	6.7
UA	G407	C	2023/02/14	pH (field)	SU	6.5
UA	G407	C	2023/05/31	pH (field)	SU	6.6
UA	G407	C	2023/08/10	pH (field)	SU	6.8
UA	G407	C	2023/11/20	pH (field)	SU	6.6
UA	G407	C	2020/10/14	Oxidation Reduction Potential	mV	119
UA	G407	C	2021/01/28	Oxidation Reduction Potential	mV	104
UA	G407	C	2021/04/26	Oxidation Reduction Potential	mV	116
UA	G407	C	2021/08/17	Oxidation Reduction Potential	mV	113
UA	G407	C	2021/10/26	Oxidation Reduction Potential	mV	25.1
UA	G407	C	2022/02/08	Oxidation Reduction Potential	mV	146
UA	G407	C	2022/05/10	Oxidation Reduction Potential	mV	185
UA	G407	C	2022/08/24	Oxidation Reduction Potential	mV	122
UA	G407	C	2022/11/08	Oxidation Reduction Potential	mV	82.0
UA	G407	C	2023/02/14	Oxidation Reduction Potential	mV	265
UA	G407	C	2023/05/31	Oxidation Reduction Potential	mV	162
UA	G407	C	2023/08/10	Oxidation Reduction Potential	mV	12.0
UA	G407	C	2023/11/20	Oxidation Reduction Potential	mV	124
UA	G407	C	2020/10/14	Eh	V	0.31
UA	G407	C	2021/01/28	Eh	V	0.30
UA	G407	C	2021/04/26	Eh	V	0.31
UA	G407	C	2021/08/17	Eh	V	0.30
UA	G407	C	2021/10/26	Eh	V	0.22
UA	G407	C	2022/02/08	Eh	V	0.34
UA	G407	C	2022/05/10	Eh	V	0.38
UA	G407	C	2022/08/24	Eh	V	0.31
UA	G407	C	2022/11/08	Eh	V	0.28

UA	G407	C	2023/02/14	Eh	V	0.46
UA	G407	C	2023/05/31	Eh	V	0.35
UA	G407	C	2023/08/10	Eh	V	0.20
UA	G407	C	2023/11/20	Eh	V	0.32
UA	G407	C	2023/02/14	Alkalinity, bicarbonate	mg/L CaCO3	460
UA	G407	C	2023/05/31	Alkalinity, bicarbonate	mg/L CaCO3	510
UA	G407	C	2023/08/10	Alkalinity, bicarbonate	mg/L CaCO3	502
UA	G407	C	2023/11/20	Alkalinity, bicarbonate	mg/L CaCO3	550
UA	G407	C	2020/10/14	Barium, total	mg/L	0.0140
UA	G407	C	2021/01/28	Barium, total	mg/L	0.0120
UA	G407	C	2021/04/26	Barium, total	mg/L	0.0130
UA	G407	C	2021/08/17	Barium, total	mg/L	0.0120
UA	G407	C	2021/10/26	Barium, total	mg/L	0.0120
UA	G407	C	2022/02/08	Barium, total	mg/L	0.0470
UA	G407	C	2022/05/10	Barium, total	mg/L	0.0120
UA	G407	C	2022/08/24	Barium, total	mg/L	0.0110
UA	G407	C	2022/11/08	Barium, total	mg/L	0.0120
UA	G407	C	2023/02/14	Barium, total	mg/L	0.0130
UA	G407	C	2023/05/31	Barium, total	mg/L	0.0120
UA	G407	C	2023/08/10	Barium, total	mg/L	0.0132
UA	G407	C	2023/11/20	Barium, total	mg/L	0.0193
UA	G407	C	2020/10/14	Boron, total	mg/L	0.100
UA	G407	C	2021/01/28	Boron, total	mg/L	0.0630
UA	G407	C	2021/04/26	Boron, total	mg/L	0.0650
UA	G407	C	2021/08/17	Boron, total	mg/L	0.0900
UA	G407	C	2021/10/26	Boron, total	mg/L	0.150
UA	G407	C	2022/02/08	Boron, total	mg/L	0.100
UA	G407	C	2022/05/10	Boron, total	mg/L	0.100
UA	G407	C	2022/08/24	Boron, total	mg/L	0.0760
UA	G407	C	2022/11/08	Boron, total	mg/L	0.0770
UA	G407	C	2023/02/14	Boron, total	mg/L	0.150
UA	G407	C	2023/05/31	Boron, total	mg/L	0.0900
UA	G407	C	2023/08/10	Boron, total	mg/L	0.0614
UA	G407	C	2023/11/20	Boron, total	mg/L	0.139
UA	G407	C	2020/10/14	Calcium, total	mg/L	250
UA	G407	C	2021/01/28	Calcium, total	mg/L	270
UA	G407	C	2021/04/26	Calcium, total	mg/L	340
UA	G407	C	2021/08/17	Calcium, total	mg/L	290
UA	G407	C	2021/10/26	Calcium, total	mg/L	280
UA	G407	C	2022/02/08	Calcium, total	mg/L	400
UA	G407	C	2022/05/10	Calcium, total	mg/L	280
UA	G407	C	2022/08/24	Calcium, total	mg/L	300
UA	G407	C	2022/11/08	Calcium, total	mg/L	290
UA	G407	C	2023/02/14	Calcium, total	mg/L	270
UA	G407	C	2023/05/31	Calcium, total	mg/L	270
UA	G407	C	2023/08/10	Calcium, total	mg/L	230
UA	G407	C	2023/11/20	Calcium, total	mg/L	397
UA	G407	C	2020/10/14	Chloride, total	mg/L	12.0
UA	G407	C	2021/01/28	Chloride, total	mg/L	11.0
UA	G407	C	2021/04/26	Chloride, total	mg/L	15.0
UA	G407	C	2021/08/17	Chloride, total	mg/L	16.0
UA	G407	C	2021/10/26	Chloride, total	mg/L	15.0
UA	G407	C	2022/02/08	Chloride, total	mg/L	12.0
UA	G407	C	2022/05/10	Chloride, total	mg/L	13.0
UA	G407	C	2022/08/24	Chloride, total	mg/L	11.0
UA	G407	C	2022/11/08	Chloride, total	mg/L	11.0
UA	G407	C	2023/02/14	Chloride, total	mg/L	12.0
UA	G407	C	2023/05/31	Chloride, total	mg/L	17.0
UA	G407	C	2023/08/10	Chloride, total	mg/L	11.0
UA	G407	C	2023/11/20	Chloride, total	mg/L	12.0
UA	G407	C	2020/10/14	Cobalt, total	mg/L	<0.002
UA	G407	C	2021/01/28	Cobalt, total	mg/L	<0.002
UA	G407	C	2021/04/26	Cobalt, total	mg/L	<0.002

UA	G407	C	2021/08/17	Cobalt, total	mg/L	<0.002
UA	G407	C	2021/10/26	Cobalt, total	mg/L	<0.002
UA	G407	C	2022/02/08	Cobalt, total	mg/L	0.00620
UA	G407	C	2022/05/10	Cobalt, total	mg/L	0.000490
UA	G407	C	2022/08/24	Cobalt, total	mg/L	0.000930
UA	G407	C	2022/11/08	Cobalt, total	mg/L	<0.00048
UA	G407	C	2023/02/14	Cobalt, total	mg/L	<0.00048
UA	G407	C	2023/05/31	Cobalt, total	mg/L	0.000700
UA	G407	C	2023/08/10	Cobalt, total	mg/L	0.000800
UA	G407	C	2023/11/20	Cobalt, total	mg/L	0.00200
UA	G407	C	2023/05/31	Ferrous Iron, dissolved	mg/L	0.270
UA	G407	C	2020/08/11	Iron, dissolved	mg/L	0.0150
UA	G407	C	2020/10/14	Iron, dissolved	mg/L	<0.01
UA	G407	C	2021/01/28	Iron, dissolved	mg/L	<0.01
UA	G407	C	2021/04/26	Iron, dissolved	mg/L	0.0170
UA	G407	C	2021/08/17	Iron, dissolved	mg/L	0.0460
UA	G407	C	2021/10/26	Iron, dissolved	mg/L	<0.01
UA	G407	C	2022/02/08	Iron, dissolved	mg/L	<0.01
UA	G407	C	2022/05/10	Iron, dissolved	mg/L	0.0140
UA	G407	C	2022/08/24	Iron, dissolved	mg/L	0.0130
UA	G407	C	2022/11/08	Iron, dissolved	mg/L	0.0310
UA	G407	C	2023/02/14	Iron, dissolved	mg/L	0.0190
UA	G407	C	2023/05/31	Iron, dissolved	mg/L	0.0100
UA	G407	C	2023/08/10	Iron, dissolved	mg/L	0.0150
UA	G407	C	2023/11/20	Iron, dissolved	mg/L	0.0279
UA	G407	C	2023/02/14	Magnesium, total	mg/L	170
UA	G407	C	2023/05/31	Magnesium, total	mg/L	170
UA	G407	C	2023/08/10	Magnesium, total	mg/L	151
UA	G407	C	2023/11/20	Magnesium, total	mg/L	250
UA	G407	C	2018/03/05	Manganese, dissolved	mg/L	0.0770
UA	G407	C	2018/07/16	Manganese, dissolved	mg/L	1.30
UA	G407	C	2018/08/13	Manganese, dissolved	mg/L	0.0740
UA	G407	C	2018/11/07	Manganese, dissolved	mg/L	0.400
UA	G407	C	2019/01/25	Manganese, dissolved	mg/L	0.280
UA	G407	C	2019/05/03	Manganese, dissolved	mg/L	1.20
UA	G407	C	2019/08/19	Manganese, dissolved	mg/L	0.240
UA	G407	C	2019/10/22	Manganese, dissolved	mg/L	1.20
UA	G407	C	2020/01/23	Manganese, dissolved	mg/L	0.430
UA	G407	C	2020/05/07	Manganese, dissolved	mg/L	0.590
UA	G407	C	2020/08/11	Manganese, dissolved	mg/L	0.450
UA	G407	C	2020/10/14	Manganese, dissolved	mg/L	0.160
UA	G407	C	2021/01/28	Manganese, dissolved	mg/L	0.290
UA	G407	C	2021/04/26	Manganese, dissolved	mg/L	0.220
UA	G407	C	2021/08/17	Manganese, dissolved	mg/L	0.260
UA	G407	C	2021/10/26	Manganese, dissolved	mg/L	0.320
UA	G407	C	2022/02/08	Manganese, dissolved	mg/L	0.310
UA	G407	C	2022/05/10	Manganese, dissolved	mg/L	0.220
UA	G407	C	2022/08/24	Manganese, dissolved	mg/L	0.360
UA	G407	C	2022/11/08	Manganese, dissolved	mg/L	0.260
UA	G407	C	2023/02/14	Manganese, dissolved	mg/L	0.210
UA	G407	C	2023/05/31	Manganese, dissolved	mg/L	0.380
UA	G407	C	2023/08/10	Manganese, dissolved	mg/L	0.445
UA	G407	C	2023/11/20	Manganese, dissolved	mg/L	0.316
UA	G407	C	2023/08/10	Phosphate, dissolved	mg/L	<0.005
UA	G407	C	2023/02/14	Potassium, total	mg/L	2.90
UA	G407	C	2023/05/31	Potassium, total	mg/L	2.70
UA	G407	C	2023/08/10	Potassium, total	mg/L	2.76
UA	G407	C	2023/11/20	Potassium, total	mg/L	4.14
UA	G407	C	2023/05/31	Silicon, dissolved	mg/L	9.80
UA	G407	C	2023/08/10	Silicon, dissolved	mg/L	8.89
UA	G407	C	2023/02/14	Sodium, total	mg/L	90.0
UA	G407	C	2023/05/31	Sodium, total	mg/L	88.0
UA	G407	C	2023/08/10	Sodium, total	mg/L	85.8

UA	G407	C	2023/11/20	Sodium, total	mg/L	106
UA	G407	C	2020/10/14	Sulfate, total	mg/L	830
UA	G407	C	2021/01/28	Sulfate, total	mg/L	990
UA	G407	C	2021/04/26	Sulfate, total	mg/L	960
UA	G407	C	2021/08/17	Sulfate, total	mg/L	400
UA	G407	C	2021/10/26	Sulfate, total	mg/L	960
UA	G407	C	2022/02/08	Sulfate, total	mg/L	1,100
UA	G407	C	2022/05/10	Sulfate, total	mg/L	1,000
UA	G407	C	2022/08/24	Sulfate, total	mg/L	970
UA	G407	C	2022/11/08	Sulfate, total	mg/L	440
UA	G407	C	2023/02/14	Sulfate, total	mg/L	950
UA	G407	C	2023/05/31	Sulfate, total	mg/L	1,100
UA	G407	C	2023/08/10	Sulfate, total	mg/L	956
UA	G407	C	2023/11/20	Sulfate, total	mg/L	1,010
UA	G407	C	2020/10/14	Temperature (Celsius)	degrees C	18.3
UA	G407	C	2021/01/28	Temperature (Celsius)	degrees C	9.90
UA	G407	C	2021/04/26	Temperature (Celsius)	degrees C	17.1
UA	G407	C	2021/08/17	Temperature (Celsius)	degrees C	20.5
UA	G407	C	2021/10/26	Temperature (Celsius)	degrees C	17.6
UA	G407	C	2022/02/08	Temperature (Celsius)	degrees C	11.2
UA	G407	C	2022/05/10	Temperature (Celsius)	degrees C	15.2
UA	G407	C	2022/08/24	Temperature (Celsius)	degrees C	21.2
UA	G407	C	2022/11/08	Temperature (Celsius)	degrees C	18.0
UA	G407	C	2023/02/14	Temperature (Celsius)	degrees C	11.5
UA	G407	C	2023/05/31	Temperature (Celsius)	degrees C	19.2
UA	G407	C	2023/08/10	Temperature (Celsius)	degrees C	19.2
UA	G407	C	2023/11/20	Temperature (Celsius)	degrees C	14.2
UA	G407	C	2020/10/14	Total Dissolved Solids	mg/L	1,800
UA	G407	C	2021/01/28	Total Dissolved Solids	mg/L	2,000
UA	G407	C	2021/04/26	Total Dissolved Solids	mg/L	1,800
UA	G407	C	2021/08/17	Total Dissolved Solids	mg/L	2,200
UA	G407	C	2021/10/26	Total Dissolved Solids	mg/L	2,000
UA	G407	C	2022/02/08	Total Dissolved Solids	mg/L	2,000
UA	G407	C	2022/05/10	Total Dissolved Solids	mg/L	2,200
UA	G407	C	2022/08/24	Total Dissolved Solids	mg/L	2,200
UA	G407	C	2022/11/08	Total Dissolved Solids	mg/L	2,100
UA	G407	C	2023/02/14	Total Dissolved Solids	mg/L	2,100
UA	G407	C	2023/05/31	Total Dissolved Solids	mg/L	2,000
UA	G407	C	2023/08/10	Total Dissolved Solids	mg/L	1,870
UA	G407	C	2023/11/20	Total Dissolved Solids	mg/L	2,010

Notes:

< = results is less than detection limit

B = Background

C = Compliance

HSU = Hydrostratigraphic Unit

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:

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Engineering | Planning | Allied Services

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Appendix A EcoCAT Report

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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.

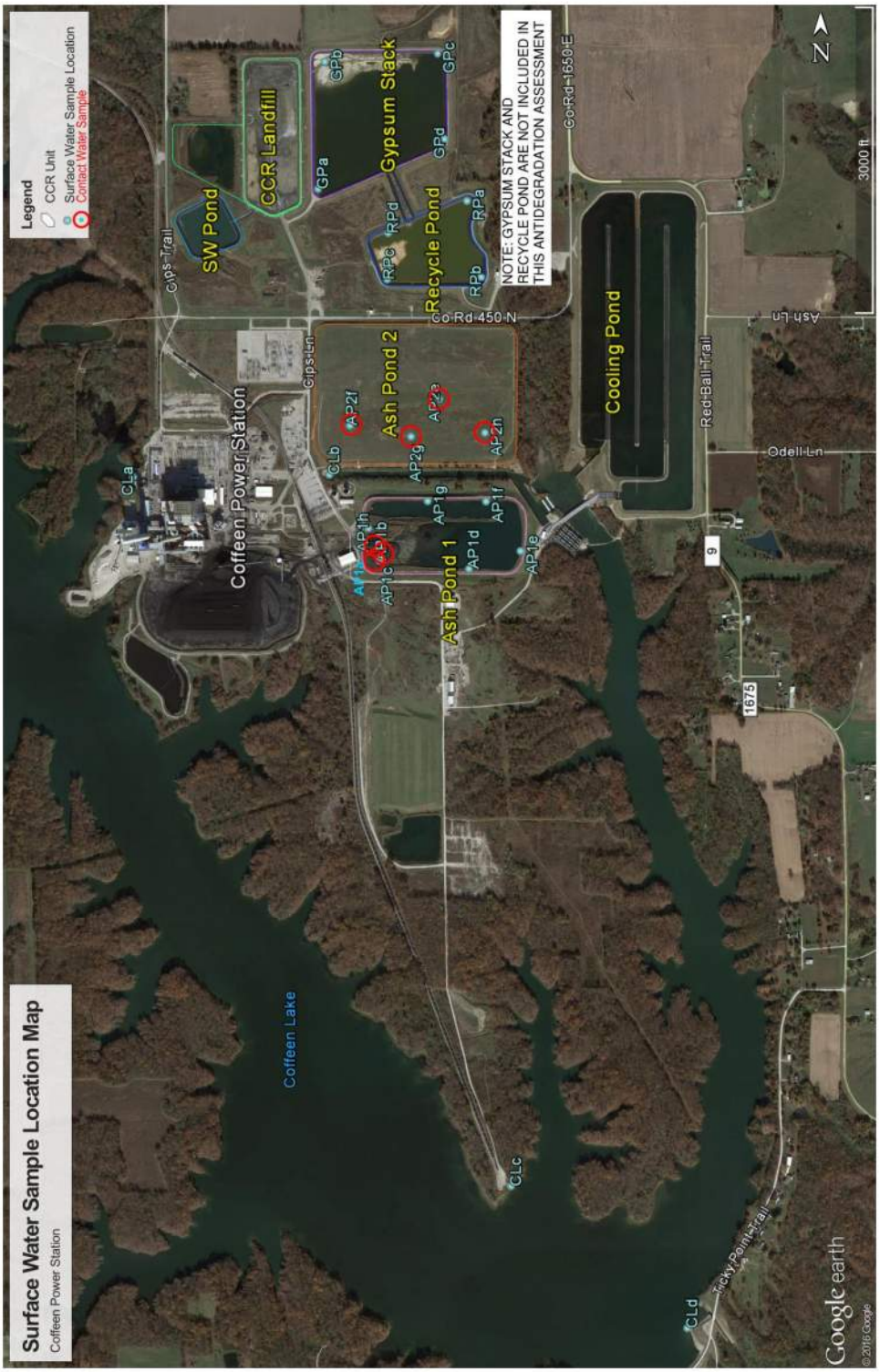
The closure plan for the Coffeen ash ponds includes removal of open water from the ash ponds, referred to as "unwatering;" partial removal of pore water contained in CCR-filled portions of the ash ponds, referred to as "dewatering;" grading and shaping the dewatered CCR surface to facilitate storm water 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.

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

			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						Coffeen Lake				
Sample Date		General Effluent Standards	10/24/2016	10/24/2016	10/24/2016	10/24/2016	10/24/2016	Representative Unwaters Concentrations	10/24/2016	10/24/2016	10/24/2016	10/24/2016	Representative Lake Concentrations
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

			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.																	
		General Effluent Standards	Ash Pond 1						Ash Pond 1 Representative Average Dewater Concentrations	Ash Pond 2								Ash Pond 2 Representative Average Dewater Concentrations	Combined Ash Ponds Representative Average Dewater Concentrations
Sample Date			10/24/2016	1/26/2017	10/24/2016	1/26/2017	10/24/2016	1/26/2017		10/24/2016	1/26/2017	10/24/2016	1/26/2017	10/24/2016	1/26/2017	10/24/2016	1/26/2017		
Sample ID	Units	35 IAC 304	AP1a	AP1a	AP1b	AP1b	AP1c	AP1c		AP2e	AP2e	AP2f	AP2f	AP2g	AP2g	AP2h	AP2h		
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 Treatment Flowrate (gpm) = 347 Total Volume (gallons) = 40,000,000					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	**0.05**	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.

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

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

Applicant: Hanson Professional Services Inc.
Contact: Doug Dorsey
Address: 1525 S. 6th St.
Springfield, IL 62703

Project: Coffeen Lake
Address: 134 CIPS Lane, Coffeen

IDNR Project Number: 1704719
Date: 11/25/2016

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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