October 2021
Plant Barry

Groundwater Remedy Selection Report

Prepared for Alabama Power Company

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Prepared for
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Engineer's Certification

This *Groundwater Remedy Selection Report* has been prepared in accordance with the U.S. Environmental Protection Agency's coal combustion residuals rule (40 Code of Federal Regulations Part 257, Subpart D) and the Alabama Department of Environmental Management Administrative Code Ch. 335-13-15. This report was prepared under the supervision and direction of the undersigned, whose seal as a registered professional engineer is affixed below. The undersigned is practicing through Anchor QEA, LLC, which is an authorized engineering business in the State of Alabama (Certificate of Authorization license number 5073; a copy of this license is provided in Appendix A).

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ABBREVIATIONS

ACM	*Assessment of Corrective Measures*
ADEM	Alabama Department of Environmental Management
Admin. Code	Administrative Code
APC	Alabama Power Company
ASM	adaptive site management
CAS	corrective action system
CCR	coal combustion residuals
CFR	Code of Federal Regulations
cm/sec	centimeter per second
COI	constituent of interest
EPRI	Electric Power Research Institute
Facility Plan	*Facility Plan for Groundwater Investigation*
GWPS	groundwater protection standard
MNA	monitored natural attenuation
Plant Barry	James M. Barry Electric Generating Plant
PRB	permeable reactive barrier
RCRA	Resource Conservation and Recovery Act
Site	Plant Barry Ash Pond
SSE	selective sequential extraction
SSI	statistically significant increase
SSL	statistically significant level
UIC	Underground Injection Control
USEPA	U.S. Environmental Protection Agency

Executive Summary

Since submittal of the *Assessment of Corrective Measures* in June 2019 (Anchor QEA 2019a), extensive investigations have been performed to select effective corrective measures for arsenic and cobalt, also known as constituents of interest (COIs), in groundwater at the Plant Barry Ash Pond (Site). The following corrective measures were selected:

- Source control to include dewatering, consolidation, and capping of the Site
- Geochemical manipulation via injections in areas of relatively high concentrations of COIs to remove them from groundwater and immobilize them in situ
- Monitored natural attenuation (MNA) over the entire Site

Closure of the Site—including dewatering, consolidation, and capping—will greatly reduce source contributions to groundwater. Geochemical manipulation was selected because of its effectiveness, ease of implementation, versatility (ability to treat more than one COI with the same treatment solution), ability to implement in areas with limited working space, and no byproducts that would require further treatment or disposal. MNA was selected because substantial evidence indicates that it is currently occurring at the Site.

Effective injection treatment has been performed for arsenic in groundwater under variable geochemical conditions using iron-based treatment solutions (Anchor QEA 2017, 2018, 2019b, 2019c). In laboratory treatability studies conducted for the Electric Power Research Institute and large utility companies, mixed oxides of iron, manganese, and magnesium in solution were proven effective for arsenic, cobalt, and other constituents (EPRI 2021). Site-specific laboratory treatability studies using Site aquifer media and impacted groundwater will be performed prior to field implementation of injection treatment. These studies will evaluate multiple viable treatment solutions and a range of doses. After selection of the optimum treatment reagents and doses, areas with the highest concentrations of arsenic or cobalt will be treated with a line of injection points.

Extensive site-specific geochemical studies performed in 2020 and 2021 demonstrate that MNA is a viable corrective action for COIs in groundwater at the Site (Anchor QEA 2020a, 2020b, 2021). The preponderance of evidence indicates that Site conditions meet the U.S. Environmental Protection Agency's evaluation criteria for the use of MNA, specifically: area of impacts stable or shrinking, identified mechanisms for attenuation, stability of the attenuating mechanisms, sufficient aquifer capacity for attenuation, and time to achieve groundwater protection standards considered reasonable when compared to other corrective action alternatives. The Assessment of Corrective Measures identified other corrective measures that could be used in conjunction with MNA. One of these corrective measures, geochemical manipulation via injections, is planned for the Site.

Investigations performed to support MNA included preparation of concentration versus time and concentration versus distance graphs for COIs in groundwater; groundwater, well solids (precipitates), and soil sampling; laboratory analysis of solid samples for bulk chemistry (X-ray diffraction), mineralogy (X-ray diffraction and scanning electron microscopy), and cation exchange capacity; geochemical modeling; selective sequential extraction (SSE) to determine associations of COIs with attenuating solids; and column studies to assess aquifer capacity for attenuation.

The trends observed in concentration versus time and concentration versus distance graphs provide evidence that natural attenuation is occurring at the Site. Concentration versus time graphs indicate that arsenic concentrations are generally stable in several areas, even without source control. Also, concentration versus distance graphs along downgradient transects indicate that arsenic and cobalt are generally decreasing with distance from the Site.

Based on the geochemical investigations, multiple lines of evidence support multiple attenuating mechanisms, depending upon the COI. The major attenuating mechanisms include sorption on iron oxides (for arsenic and cobalt), cation exchange on clays (for cobalt), coprecipitation in crystalline iron oxides (for cobalt), and precipitation in barium arsenate (for arsenic). All COIs are subject to physical attenuation mechanisms such as dispersion and flushing, which will contribute to decreased concentrations with time and distance from the Site.

Column studies indicate that arsenic and cobalt are attenuated by aquifer media. The column attenuation capacity was extrapolated to the entire mass of the aquifer downgradient of the consolidated Site. The extrapolation showed that the aquifer has an attenuating capacity of many more times the mass of arsenic and cobalt requiring attenuation.

SSE was performed on samples of well solids (precipitates) and soils used in the column studies to assess the stability of the attenuated COIs and their host minerals. Most of the mass of arsenic and cobalt is bound in stable fractions, specifically: F3 (reducible), F4 (oxidizable), and F5 (residual). Attenuated arsenic and cobalt are therefore not expected to remobilize back into groundwater.

Depending on the COI and well (area), the estimated time to achieve natural attenuation ranges from 7 to 78 years, not considering source control. Most of this range is reasonable compared to durations of other corrective action technologies. However, attenuation capacity will likely need to be enhanced in some areas (e.g., via injection treatment) to reduce the upper end of the time frame for achieving GWPS for both COIs sitewide.

Extensive sitewide monitoring will be performed to evaluate the remedial effectiveness of individual corrective actions such as injection treatment, as well as the cumulative effects of closure (source control), injections, and MNA. The monitoring plan for injections will be developed after treatability studies because those studies are needed to select treatment solutions and the associated monitoring parameters. Monitoring parameters may include COIs and other indicator parameters based on the composition of the treatment solutions. Monitoring frequency will be based on the hydraulics of the aquifer in the areas of interest and distance of the monitoring wells from the line of injection.

The certified compliance monitoring network will be supplemented to establish a comprehensive corrective action groundwater monitoring program meeting the requirements of coal combustion residuals Rule 40 CFR § 257.98(a) and ADEM Admin. Code r. 335-13-15-.06(9)(a). The corrective action groundwater monitoring program will be submitted within 90 days of this *Groundwater Remedy Selection Report* and will include the following: 1) the certified CCR compliance monitoring that meets the assessment monitoring requirements of 40 CFR § 257.95 and ADEM Admin. Code r. 335-13-15-.06(6); 2) additional wells that document the effectiveness of the remedy; and 3) sample locations and data evaluation that demonstrate compliance with the GWPS and protection of potential human and ecological receptors.

Alabama Power Company will employ an adaptive site management approach to perform ongoing remedy system evaluation, consider adjustments to the remedy, and ensure achievement of corrective action objectives at the Site. Adaptive triggers will be developed, and additional actions (monitoring, analysis, and supplemental corrective action measures) will be implemented as needed. Details on the sitewide corrective action groundwater monitoring program, including adaptive triggers, will be provided in a detailed monitoring plan to be submitted within 90 days of this *Groundwater Remedy Selection Report*.

1 Introduction

1.1 Purpose

This *Groundwater Remedy Selection Report* was prepared to meet the requirements of the U.S. Environmental Protection Agency's (USEPA's) coal combustion residuals (CCR) Rule 40 Code of Federal Regulations (CFR) § 257.97, the Alabama Department of Environmental Management's (ADEM's) Administrative Code (Admin. Code) r. 335-13-15-.06(8), and Part C of Administrative Order No. 18-094-GW at Alabama Power Company's (APC's) James M. Barry Electric Generating Plant (Plant Barry) Ash Pond (Site). Specifically, this report has been prepared to present a groundwater corrective action plan to address the occurrence of arsenic and cobalt in groundwater at the Site.

Prior to preparing this final *Groundwater Remedy Selection Report*, semiannual progress reports were prepared to describe the progress made in evaluating the viable remedies (Anchor QEA 2019d, 2020a, 2020b, 2021).

1.2 Site Location and Description

Plant Barry is located in northeastern Mobile County, Alabama. The physical address is 15300 U.S. Highway 43 North, Bucks, Alabama 36512. Plant Barry lies in Section 36 of Township 1 North, Range 1 West, Sections 31 and 32 of Township 1 North, Range 1 East, Section 1 of Township 1 South, Range 1 West, and Sections 5 and 6 of Township 1 South, Range 1 East. The Ash Pond is located east-southeast of the main plant, between the Mobile River and the Site barge canal. Figure 1 depicts the location of the Site with respect to the surrounding area.

The Site was originally constructed in 1965 and was designed to receive and store CCR produced during the coal-fired electric generating process at Plant Barry. It also served as a low-volume waste treatment pond for the plant, receiving process water and stormwater from various plant sources, sluiced ash, and decant water from the gypsum pond. It currently stores approximately 21.7 million cubic yards of CCR. The Site is approximately 597 acres. The pond was formed with the creation of dikes on the east, south, and west sides of the impoundment. The north side of the impoundment is natural ground that ties into the east and west dikes.

1.3 Site Closure

The Site will be closed by removing free liquid from the CCR, consolidating the area of the CCR footprint (from 597 to 330 acres), constructing a soil containment berm to contain the CCR and provide separation between the consolidated footprint and areas where CCR will be excavated and relocated to the consolidated footprint, and capping the CCR in place to prevent further stormwater infiltration.

Closure of the Site will require excavation, moisture conditioning, placement, compaction, and grading of approximately 9 million cubic yards of CCR and underlying soil. Completion of closure activities is expected to take approximately 10 additional years and is planned to be complete in 2031. The planned closure schedule of major milestones and approximate time frames are shown in Figure 2. Additional information on Site closure is included in Section 3.1.

1.4 Geology, Hydrogeology, and Surface Water Hydrology

Shallow groundwater flow at the Site is primarily determined by topography and flows generally north, northeast, and east toward the Mobile River (Appendix B). Shallow groundwater flow velocity is on the order of 8.0×10^{-3} feet per day and is influenced heavily by low hydraulic gradients across the Site (SCS 2019).

As shown in Figures 3 through 6, the shallow geology consists of interbedded clays, silts, and sands with relatively low permeability. Units 1 and 2 separate CCR from the uppermost aquifer, Unit 3. The low-permeability clays in Units 1 and 2 likely retard vertical groundwater flow.

Characteristics of the major hydrogeologic units at the Site are as follows (SCS 2021):

- Units 1 and 2: Units 1 and 2 are predominantly low-permeability clays with interbedded sands in Unit 2. Their combined thickness is generally between 20 and 35 feet with vertical hydraulic conductivities ranging from 1.1×10^{-7} to 7.08×10^{-9} centimeters per second (cm/sec). These units provide upper confining or leaky confining conditions for the uppermost aquifer (Unit 3 Sand).
- Unit 3 Sand (Uppermost Aquifer): Unit 3 is a well-sorted (poorly graded) sand aquifer underlain by a clay confining bed. Described locally as the Watercourse Aquifer, this unit is located 45 to 70 feet beneath the top of the dike (20 to 45 feet beneath the top of natural ground), and is 50 to 60 feet thick and composed of silty sand with clay lenses in upper sections and fine gravel toward the base. Horizontal hydraulic conductivities in Unit 3 average 3.3×10^{-3} cm/sec (9.4 feet per day) as determined from pump testing. As depicted in Figures 3 through 6, water-bearing zones are observed within this unit.
- Unit 4 (Clay Aquitard): Unit 4 (approximately 90 to 120 feet below ground surface) consists of interbedded fat clay, lean clay, and silty sands, corresponding to transitional Miocene Series sediments. Unit 4 horizontal hydraulic conductivities range from 3.78×10^{-8} to 2.13×10^{-7} cm/sec and provide laterally extensive lower confining conditions to the uppermost aquifer.

Groundwater elevations fluctuate in response to rainfall and Mobile River stage. Seasonal variations of 5 to 7 feet are typical at the Site. These fluctuations are consistent in monitoring wells across the Site, indicating a relatively uniform response to rainfall events and fluctuations of the discharge canal and Mobile River. Potentiometric surface maps are available in Appendix B. Typical potentiometric surface maps indicate that water levels tend to be higher in the early spring and lower during the fall and winter seasons.

1.5 Nature and Extent of Groundwater Exceedances

Based on groundwater monitoring performed pursuant to the federal CCR rule and ADEM's rules, arsenic and cobalt have been identified in Site groundwater at concentrations exceeding the groundwater protection standard (GWPS).

As shown in Figure 7, arsenic concentrations greater than the GWPS occur across much of the Site but are constrained within its perimeter. In contrast, the occurrence of cobalt above the GWPS is constrained to smaller areas. Geologic cross sections presented in Appendix C include isoconcentration lines depicting GWPS exceedances referenced to Site stratigraphy. GWPS exceedances occur within the Unit 3 aquifer and are identified in water-bearing zones in the overlying stratum. The Unit 4 clay underlying the Unit 3 aquifer impedes the downward vertical migration of constituents (Appendix C).

Background groundwater sampling at the Site occurred between March 2016 and June 2017. Compliance detection sampling began in September 2017. Statistically significant increases (SSIs) of Appendix III to 40 CFR Part 257 constituents were noted during the September 2017 compliance detection sampling event as described in the *2017 Annual Groundwater Monitoring and Corrective Action Report* (SCS 2018a). The Appendix III SSIs triggered assessment sampling for Appendix IV constituents, with the first assessment sampling event occurring in January 2018.

A *Facility Plan for Groundwater Investigation* (Facility Plan) (SCS 2018b) at the Site was completed to meet the requirements of Order No. 18-094-GW issued to APC by ADEM on August 15, 2018. Part B of the order required completion of a Facility Plan by November 13, 2018. The Facility Plan included the following elements:

- Installing additional wells as necessary to define the extent of groundwater impacts, specifically Appendix IV constituents that statistically exceed GWPSs
- Collecting data on the nature and estimated quantity of material released
- Installing at least one additional well at the facility boundary
- Establishing an Assessment Monitoring Program
- If necessary, scheduling the notification of persons who own or reside on land that overlies areas where Appendix IV constituents statistically exceed GWPSs

The Facility Plan summarized the proposed approach for completing the tasks necessary to satisfy Part B of the order.

Details on groundwater data evaluation and monitoring well abandonments and installations (including wells installed for delineation) are provided in annual groundwater monitoring and corrective action reports (SCS 2018a, 2019, 2020, 2021). During the most recent reporting period, the Appendix IV constituents arsenic and cobalt were noted at statistically significant levels (SSLs) above the GWPS as follows:

- Arsenic at monitoring wells BY-AP-MW-1, BY-AP-MW-5, BY-AP-MW-7, BY-AP-MW-8, BY-AP-MW-9, BY-AP-MW-10, BY-AP-MW-11, BY-AP-MW-12, BY-AP-MW-13, BY-AP-MW-14, BY-AP-MW-15, and BY-AP-MW-16
- Cobalt at monitoring well BY-AP-MW-15

Several phases of investigation have been completed at the Site to delineate the extent of Appendix IV constituents exceeding GWPSs (SCS 2019, 2020, 2021). Delineation wells were installed to characterize the horizontal and vertical extent of arsenic and cobalt exceedances identified during assessment monitoring. Horizontal delineation wells were installed using a stepping-out approach based on groundwater flow direction relative to monitoring wells exhibiting exceedances. Two phases of delineation field activities, beginning in December 2018, were performed at the Site.

2 Remedy Selection Process and Performance Standards

Groundwater remedy selection has occurred in two stages: completing an Assessment of Corrective Measures (ACM) to identify potentially feasible remedies for the Site after the initial determination that GWPSs had been exceeded, followed by an evaluation of potential remedies to develop this specific remedy plan.

2.1 Assessment of Corrective Measures

In June 2019, the ACM was prepared pursuant to USEPA's CCR rule (40 CFR Part 257 Subpart D), ADEM's Admin. Code r. 335-13-15, and an Administrative Order issued by ADEM (AO 18-094-GW) to evaluate potential groundwater corrective measures for the occurrence of arsenic and cobalt in groundwater at SSLs at the Site (Anchor QEA 2019a). This ACM was the first step in developing a long-term corrective action plan to address GWPS exceedances identified at the Site.

As described in the ACM, the following remedies were considered as potential groundwater corrective measures for the Site:

- Geochemical manipulation via injection of treatment solutions
- Monitored natural attenuation (MNA)
- Hydraulic containment (pump-and-treat)
- Permeable reactive barrier (PRB) walls
- Vertical barrier walls

As part of the ACM, some potential remedies were eliminated from consideration because they were technically infeasible. Since submittal of the ACM, desktop studies, field work, and laboratory studies have been performed to evaluate potential corrective measures for the Site. Results of these studies are summarized in the semiannual remedy selection progress reports (Anchor QEA 2019d, 2020a, 2020b, 2021).

2.2 Remedy Performance Standards

The ACM was only the first step in the process for developing a groundwater remedy. The CCR rule contemplated that multiple potential remedies would be identified as potentially effective at achieving the corrective action objectives outlined in 40 CFR § 257.97(b) and ADEM Admin. Code r. 335-13-15-.06(8)(b). Thus, following the ACM, remedial options were evaluated to identify a remedy plan that meets the following five performance criteria in 40 CFR § 257.97(b) and ADEM Admin. Code r. 335-13-15-.06(8)(b). As required in the rules, a remedy must do the following:

1. Be protective of human health and the environment.
2. Attain applicable GWPSs as specified in the CCR rule.

3. Control the source(s) of the release so as to reduce or eliminate, to the extent feasible, further releases of Appendix IV to 40 CFR Part 257 constituents into the environment.
4. Remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible, taking into account factors such as avoiding inappropriate disturbances of sensitive ecosystems.[1]
5. Comply with any relevant standards (i.e., all applicable Resource Conservation and Recovery Act [RCRA] requirements) for management of wastes generated by the remedial actions.

2.3 Remedy Selection Considerations

In selecting a remedy plan to meet the above performance criteria, several factors are set forth in 40 CFR § 257.97(c) and ADEM Admin. Code r. 335-13-15-.06(8)(c) to weigh which option(s) may be most appropriate based on site-specific conditions. These factors include the following:

1. The long- and short-term effectiveness and protectiveness of the potential remedy(s), along with the degree of certainty that the remedy will prove successful based on consideration of the following
   i. Magnitude of reduction of existing risks
   ii. Magnitude of residual risks in terms of likelihood of further releases due to CCR remaining following implementation of a remedy
   iii. The type and degree of long-term management required, including monitoring, operation, and maintenance
   iv. Short-term risks that might be posed to the community or the environment during implementation of such a remedy, including potential threats to human health and the environment associated with excavation, transportation, and re-disposal of contaminant
   v. Time until full protection is achieved
   vi. Potential for exposure of humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, re-disposal, or containment
   vii. Long-term reliability of the engineering and institutional controls
   viii. Potential need for replacement of the remedy
2. The effectiveness of the remedy in controlling the source to reduce further releases based on consideration of the following factors:
   i. The extent to which containment practices will reduce further releases
   ii. The extent to which treatment technologies may be used

[1] The preamble to the CCR rule explains that this requirement is "more directly related to remediation of contamination associated with a release, such as from a collapse or structural failure of a CCR unit," not a release to groundwater (80 Federal Register 21302, 21407 [April 17, 2015]). The 40 CFR § 257.97(b)(4) remedial objective is not applicable to the groundwater corrective action for the Site, but it is included here for completeness when referencing the rule requirements. Because there was no release of material as contemplated by the rule, this requirement is not evaluated as a performance standard for the proposed remedy.

3. The ease or difficulty of implementing a potential remedy(s) based on consideration of the following types of factors
    i. Degree of difficulty associated with constructing the technology
    ii. Expected operational reliability of the technologies
    iii. Need to coordinate with and obtain necessary approvals and permits from other agencies
    iv. Availability of necessary equipment and specialists
    v. Available capacity and location of needed treatment, storage, and disposal services
4. The degree to which community concerns are addressed by a potential remedy(s)

None of the factors identified in the list above are given greater weight over others, nor is a formula or balancing process prescribed by the rules. After considering the various factors, the rules provide facilities with discretion in selecting the final remedy plan, so long as it will achieve the remedial objectives in 40 CFR § 257.97(b) and ADEM Admin. Code r. 335-13-15-.06(8)(b). Therefore, more technically or mechanically complex and aggressive approaches may not always make up the most suitable remedy option.

The CCR rules do not establish a set time frame for a facility to evaluate potential remedies and develop a final remedy plan. 40 CFR § 257.97(a) and ADEM Admin. Code r. 335-13-15-.06(a) require an owner or operator to select a remedy "as soon as feasible," and 80 Federal Register 21407 explains USEPA declined to set a specific time frame for selecting a remedy because sites vary in complexity.

2.4 Remedy Evaluation

As discussed in Section 2.1, the ACM identified potentially feasible remedies for groundwater corrective measures for the Site. Sections 2.4.1 through 2.4.5 provide details regarding the evaluation of each remedy relative to the considerations listed in 40 CFR § 257.97(c) and ADEM Admin. Code r. 335-13-15-.06(c).

2.4.1 Geochemical Manipulation via Injection of Treatment Solutions

Geochemical manipulation was evaluated relative to the considerations listed in 40 CFR § 257.97(c) and ADEM Admin. Code r. 335-13-15-.06(c) and is retained as part of the planned remedy for the following reasons:

- Proven effectiveness for arsenic in field applications and effective for cobalt in laboratory treatability studies on CCR-impacted groundwater
- Ability to treat more than one COI with the same treatment solution
- Suitability for spot (isolated area) treatment or creation of a linear treatment zone perpendicular to groundwater flow
- Compatibility with and ability to enhance natural attenuation processes

- Ability to implement in areas with limited working space
- Lack of byproducts that would require further treatment or disposal

Typical steps in a geochemical manipulation treatment include the following:

- Laboratory treatability studies to determine the optimum reagents, concentration, and dose
- Design, including spacing and depth of injection points, injection rates, travel time, and radius of influence (considerations largely based on site hydrogeological characteristics and injection logistics)
- Additional fine-scale delineation of the impacted area in the field
- Implementation of field pilot tests and remedial effectiveness monitoring

Effective injection treatment has been performed for arsenic in groundwater under variable geochemical conditions using iron-based treatment solutions (Anchor QEA 2017, 2018, 2019b, 2019c). In laboratory treatability studies conducted for the Electric Power Research Institute (EPRI) and large utility companies, mixed oxides of iron, manganese, and magnesium in solution were proven effective for arsenic, cobalt, and other constituents (EPRI 2021).

2.4.2 Monitored Natural Attenuation

MNA was evaluated relative to the considerations listed in 40 CFR § 257.97(c) and ADEM Admin. Code r. 335-13-15-.06(c) and is retained as part of the planned remedy. Extensive geochemical and related studies demonstrate that MNA is a viable corrective action for groundwater impacts associated with the Site. The preponderance of evidence indicates that Site conditions meet USEPA's evaluation criteria for the use of MNA, specifically: area of impacts stable or shrinking, identified mechanisms for attenuation, stability of the attenuating mechanisms, sufficient aquifer capacity for attenuation, and time to achieve GWPSs reasonable as compared to other corrective action alternatives. The ACM identified alternative corrective measures, which is the last criterion should MNA not perform as expected. Injection treatments will be performed in areas with higher concentrations of COIs in groundwater; therefore, MNA is one component of corrective action, rather than a stand-alone remedy. The *Monitored Natural Attenuation Demonstration* report is included as Appendix D.

2.4.3 Hydraulic Containment (Pump-and-Treat)

Hydraulic containment is not recommended for the following reasons:

- Inefficiency due to groundwater not requiring treatment (e.g., river water) being drawn to the pumping wells
- High operation and maintenance requirements
- Long time required to achieve GWPS, likely beyond the post-closure period of 30 years (based on pore volume calculations)

- Low sustainability (excessive use of resources)

The Site is bounded by the Mobile River on three sides and a discharge canal connecting to the Mobile River to the west. An effective hydraulic containment (pump-and-treat) system would likely pull water from the surface waterbodies into pumping wells and, ultimately, into the water treatment system, which would be part of the hydraulic containment corrective action. Treating large volumes of unimpacted surface water or groundwater would be inefficient and time-consuming.

Many pumping wells, extensive piping, and a water treatment system would be required to implement pump-and-treat at the Site. Pump-and-treat systems typically have high operation and maintenance requirements (USEPA 2002). These include keeping the wells, pumps, piping, and water treatment system in working order and replacing components as needed. Fouling of well screens and piping is not uncommon in Southeastern Coastal Plain settings such as the Site location. Pumping wells often require cleaning; rehabilitation; and, under the most adverse conditions, periodic replacement of the wells due to fouling. Pumps and components of the water treatment system will need to be replaced periodically. In addition, water treatment for the two COIs at the Site will require an ongoing supply of water treatment chemicals such as ferric chloride and sodium hydroxide (for pH adjustment) and will produce significant volumes of sludge that will need to be dewatered and disposed of properly. Water treatment systems usually require an operator.

Hydraulic containment (pump-and-treat) will likely not offer any time advantage to achieving GWPSs over geochemical manipulation and MNA due to the slow release of COIs from the aquifer solids. To be effective, many pore volumes of water would need to be passed over the aquifer solids to release the COIs. Natural attenuation is occurring at the Site, and pump-and-treat would operate against (essentially try to reverse) the natural processes already occurring. Pump-and-treat systems for inorganic constituents such as the COIs at the Site typically operate for decades.

Pump-and-treat is also one of the least sustainable groundwater corrective actions, as it requires extensive resources to implement and operate. These resources are expended for decades and include raw materials for the infrastructure, ongoing electricity use, water treatment chemicals, water treatment system operation, pump replacement, well redevelopment and maintenance, equipment maintenance, and laborers for monitoring and maintenance. However, geochemical manipulation and MNA are among the most sustainable groundwater corrective actions due to minimal infrastructure and relatively low operation and maintenance requirements.

2.4.4 Permeable Reactive Barrier Walls

A PRB wall is a feasible corrective action for the Site. However, a PRB wall is not recommended because it would:

- Delay implementation of the groundwater remedy until groundwater flow directions are re-established after closure activities
- Not address the impacted groundwater that has previously moved beyond the consolidated footprint of the CCR
- Be more difficult to implement and have greater maintenance requirements than other viable remedies (e.g., geochemical manipulation via injections and MNA)
- Require extensive and time-consuming replacement and reinstallation as treatment media are expended

A PRB wall relies on groundwater flow through the wall for treatment. Site closure activities, particularly dewatering, will alter groundwater flow magnitude and direction, at least during and possibly beyond the closure period. Therefore, design and implementation of a PRB wall would be delayed until at least 2031. The most viable remedies, geochemical manipulation and MNA, could be implemented prior to 2031.

A PRB wall is more difficult to implement than some other viable remedies and would require periodic maintenance. PRB walls typically require trenching and emplacement of reactive media in the trench through a slurry of some sort. At the Site, trenching would be required to depths of approximately 75 to 100 feet, with the wall keyed into the Unit 4 clay.

Laboratory treatability studies would need to be performed to determine the optimum PRB media composition and life of the media. The media loses effectiveness with time (sorption properties diminish as COIs are captured) and would likely become fouled and less permeable, even before its reactivity was diminished. Therefore, reactive media must be replaced periodically based on laboratory studies and groundwater monitoring near the PRB wall.

2.4.5 Vertical Barrier Walls

As discussed in previous reports (Anchor QEA 2019a, 2021), vertical barrier walls would not be used as a stand-alone corrective action for the Site and would, instead, be part of a hydraulic containment (pump-and-treat) system or PRB wall. Neither hydraulic containment (pump-and-treat) or PRB walls are recommended for corrective action at the Site (Sections 2.4.3 and 2.4.4); therefore, vertical barrier walls are also not recommended for corrective action for the Site.

In addition, vertical barrier walls are not recommended because of the following reasons:

- Barrier walls could produce groundwater mounding with possible rise of groundwater to the surface (causing groundwater to come in contact with CCR) and could produce groundwater flow around the ends of the barrier walls.
- To be effective, a vertical barrier wall would need to be keyed into the Unit 4 clay, to depths of approximately 75 to 100 feet. These depths are approaching the limit of vertical barrier wall installation feasibility.

3 Selected Groundwater Remedy

Since submittal of the ACM in June 2019 (Anchor QEA 2019a), extensive investigations have been performed to select effective corrective measures for COIs in groundwater at the Site. Semiannual status reports regarding investigation and evaluation have been submitted to ADEM and posted to the Site's CCR compliance webpage.

Based on investigation and evaluation, the following combination of corrective measures are proposed to address GWPS exceedances at the Site:

- Source control
  - Dewatering and consolidating the Site footprint by approximately 45%
  - Installing a low-permeability geosynthetic cover system over the consolidated footprint
- Geochemical manipulation
  - Injecting treatment solutions into areas exhibiting highest concentrations of arsenic and cobalt to remove them from groundwater and immobilize them in situ
  - Monitoring treatment performance
- MNA
  - Establish no-exceedance boundary monitoring
  - Monitor concentration reduction and natural attenuation mechanisms
- Adaptive site management (ASM; discussed in Section 5)
  - Routinely evaluate remedy system performance
  - Measure performance against interim performance standards (adaptive triggers)
  - Systematically re-evaluate remedy system performance against adaptive triggers

The selected remedy plan meets the performance standards of 40 CFR § 257.97(b) and ADEM Admin. Code r. 335-13-15-.06(8)(b) and will achieve the following:

- Be protective of human health and the environment.
- Attain the GWPS specified in the rules.
- Control the source of release to reduce or eliminate, to the extent feasible, further releases to the environment.
- Comply with any relevant standards (i.e., all applicable RCRA requirements) for management of wastes generated by the remedial actions.

As required by 40 CFR § 257.97(a) and ADEM Admin. Code r. 335-13-15-.06(8)(a), Sections 3.1 through 3.3 describe the selected remedy.

3.1 Source Control

The Site will be closed in a manner that controls "the source(s) of release so as to reduce or eliminate, to the maximum extent feasible, further releases of constituents in Appendix IV to this part into the environment," as required by 40 CFR § 257.97(b)(3) and ADEM Admin. Code r. 335-13-15-.06(8)(b)(3).

The pond will be closed by dewatering and consolidating the CCR material to an area located in the north-central portion of the impoundment. This will reduce the closure footprint to an area of approximately 330 acres. Closure of the Site will control the source of CCR constituents to groundwater by: 1) removing free liquid from the CCR; 2) consolidating the area of the CCR footprint to minimize the area of potential infiltration; 3) constructing a soil containment berm to contain the CCR and provide separation between the consolidated footprint and areas where CCR will be excavated and relocated to the consolidated footprint; and 4) grading the CCR to promote runoff and installing a low-permeability geosynthetic cover system to prevent precipitation and stormwater infiltration. The following provides further details regarding these source control measures. Excavation will include removing all visible CCR and over excavating a minimum of 6 inches of underlying native materials. A soil containment berm will be constructed in areas where the CCR is being excavated along the existing perimeter berm. The soil containment berm will provide a physical barrier between the excavation areas and consolidated footprint. The consolidated CCR footprint will be capped with a final cover system consisting of an engineered synthetic turf and geomembrane (APC 2020).

3.1.1 Dewatering and Consolidation

Consolidating the horizontal footprint by approximately 45%, from 597 acres to 330 acres, will greatly reduce the CCR surface area potentially exposed to groundwater, thereby reducing the leaching potential of COIs to groundwater. CCR removed from outside of the consolidated footprint will be sufficiently dewatered and compacted within the consolidated footprint. The remaining 267 acres will be converted to stormwater runoff ponds for the cover system and consolidated footprint. Details regarding consolidation are provided in the previously submitted *Amended Closure Plan for Ash Pond* (APC 2020). As discussed, the CCR deposits at the Site (including the consolidated CCR footprint) are separated from the uppermost aquifer (Unit 3) by a low-permeability clay deposit. This serves to isolate the CCR from groundwater at the Site.

3.1.2 Soil Containment Berm

A low-permeability soil containment berm is being constructed around the consolidated CCR to contain the CCR material and prevent the lateral migration of water and will be keyed into the low-permeability clay soils in the uppermost geologic unit. The soil containment berm will provide containment of the consolidated CCR footprint and a physical barrier between CCR excavation and the consolidated footprint. Along the inside toe of the soil containment berm, an internal drainage system will be installed. The drainage system will allow for collection of interstitial water and mechanisms for pumping and collection, thereby reducing the probability of groundwater contact.

Figures 3 through 6 depict the conceptual Site closure model and show the configuration of the soil containment berm relative to the consolidated CCR, surrounding geology, and uppermost aquifer (Unit 3). The containment berm sides, uppermost geologic layers (Units 1 and 2), and cover system will greatly reduce additional releases to groundwater.

3.1.3 Final Cover System (Cap)

The final cover will be constructed to "control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration" of stormwater into the closed CCR unit, which will mitigate potential releases of COIs to groundwater. The cover will consist of the following (described from the final CCR surface upward):

- 6 inches of protective soil
- 50-mil low-density polyethylene MicroDrain geomembrane liner
- Engineered synthetic turf product, and sand infill material with a permeability of 10^{-7} cm/sec or less

Infiltration will also be prevented by providing sufficient grades and slopes to:

- Preclude the probability of future impoundment of water or sediment on the cover system
- Ensure slope and cover system stability
- Minimize the need for further maintenance
- Be completed in the shortest amount of time consistent with recognized and generally accepted good engineering practices

3.2 Geochemical Manipulation via Injections

Geochemical manipulation via subsurface injections is an in situ remediation technology for inorganic constituents in groundwater. In this technology, treatment solutions are injected to create solid precipitates, which remove COIs from groundwater during their formation and continue to sorb COIs on their surfaces over time. Geochemical manipulation for arsenic is well established, and treatment for cobalt was successful in recent laboratory treatability studies. Geochemical manipulation is an emerging technology for cobalt and other CCR constituents and has had significant technological development over the last 3 years (EPRI 2021).

Geochemical manipulation via injections will be implemented at the Site in two phases as follows:

- Phase 1 (Pilot)
  - Identify three areas for treatment based on highest concentrations of COI in groundwater.
  - Collect soil (aquifer media) and groundwater samples for bench-scale treatability studies.
  - Complete bench-scale studies and identify optimum treatment solutions and doses.

  - Plan and install the injection and monitoring points.
  - Perform injections and monitor performance.
  - Evaluate injection results.
- Phase 2
  - Identify additional areas for treatment (if needed).
  - Plan and install the injection and monitoring points based on Phase 1 (Pilot) results.
  - Perform injections and monitor performance.
  - Evaluate injection results.
  - Adjust injectate, injection frequency, or locations as necessary.
  - Expand and adjust the system to meet objectives based on monitoring results.

3.2.1 Injection Treatment Overview

Site-specific laboratory treatability studies using Site aquifer media and impacted groundwater will be performed prior to field implementation of injection treatment. These studies will evaluate multiple viable treatment solutions and a range of doses.

When used to treat localized areas of impact, the extent of exceedances should be defined (delineated) with additional resolution prior to injection. The delineation may include collection of additional groundwater samples through direct-push technology on a grid. Groundwater samples are screened with field test kits, with a subset of samples sent to an analytical laboratory for confirmation analysis.

After selection of the optimum treatment reagents and doses, injections will be performed in two phases: a field pilot phase and follow-up treatments as needed based on the results of the pilot injections and ongoing groundwater monitoring data. Areas with the highest concentrations of arsenic and cobalt will be selected for field pilot studies (Figure 8). A requisite monitoring period (anticipated to be approximately 1 year) will follow the field pilot injections. This approach to injection treatment is consistent with ASM for corrective action.

As described in Section 3.1, source control measures are expected to reduce concentrations of COIs in groundwater. Other areas with SSLs will be treated as needed in a second phase of injection based on groundwater monitoring data from the field pilots and ongoing sitewide monitoring. Depending upon the effectiveness of treatment, injections may need to be repeated periodically, though required time between injection treatments is expected to be years (based on other injection treatment precedents).

3.2.1 Site-Specific Injection Treatment Plan

Phase 1 (Pilot) injections will be performed through permanent injection wells. Phase 2 injections will be performed through permanent injection wells, direct-push technology, or both, depending upon the results of the pilot program.

Prior to installing Phase 1 (Pilot) injection wells, treatability studies and supplemental data collection must be performed to complete the formulation of the injection treatment solutions. Supplementary data collection and evaluation activities planned to be completed as part of Phase 1 (Pilot) include the following:

- Collection of Site soils for batch and column studies from proposed Phase 1 (Pilot) injection areas
- Performance of laboratory treatability studies (batch and column tests) for geochemical manipulation
- Higher-resolution delineation of COIs in Phase 1 (Pilot) injection areas

Laboratory treatability studies will be performed to formulate the injection treatment solution composition, dose, and sequencing (if sequencing is needed). Specifically, the following tasks are anticipated as part of Phase 1 (Pilot):

- Batch tests for reagent selection and sequencing
  - Combinations of iron, manganese, and magnesium salts at different concentrations mixed with impacted groundwater from the Site
    - Formulations are based on previous successful treatability studies.
    - Multiple formulations have been proven successful for arsenic in field applications and for cobalt in laboratory treatability studies.
  - Expected to take approximately 4 to 6 weeks, including post-batch data analysis
- Column tests
  - Apply the selected treatment solution to Site soils (aquifer media) based on batch tests.
  - Simulate injection and subsequent precipitation of reactive solids on the sand aquifer.
  - Pump impacted groundwater through columns and measure arsenic and cobalt in the effluent.
  - After column tests, perform selective sequential extraction (SSE) on soil to determine the treated form of constituents and stability of treatment.
  - Pump ambient groundwater through treated soils in columns to test for stability (remobilization).
  - Column tests are expected to take approximately 12 weeks, including post-column data analysis.

Prior to implementing geochemical manipulation, the COIs in the injection areas will be further delineated with greater resolution and may include the following procedures:

- Collect groundwater samples through direct-push technology.
  - Sampling grid from impacted wells; holes on 10-foot spacings
  - Two or three depths within the Unit 3 aquifer, based on thickness
- Field filter as needed, based on visual observation.
- Screen samples with field test kits for arsenic and cobalt and send samples to an analytical laboratory for confirmation; adjust sampling locations as needed based on field screening.
- Geophysical techniques such as electrical resistivity may be performed over the anticipated treatment area. The geophysical survey would be performed again shortly after treatment. Due to the anticipated conductivity contrast between the treatment solution (higher conductivity) and ambient groundwater, geophysics may be useful in mapping the travel distance of the treatment solution and areal extent of the treatment zone (Halihan et al. 2009).
- Once delineation is refined and wells are installed in each injection area, injections will be performed.

A two-phase injection program will be implemented as follows at the Site targeting areas with the greatest observed arsenic and cobalt concentrations:

- Phase 1 (Pilot) will serve as the pilot testing to determine the optimum spacing for injection locations and evaluate the field performance of the treatment solutions. Based on observed results, adaptations will be made to injection location spacing and treatment solutions (if necessary) to optimize performance and attain desired reduction in constituent concentrations.
- Phase 2 will follow Phase 1 (Pilot) as needed and incorporate site-specific information as determined during Phase 1 (Pilot).

For Phase 1 (Pilot), three areas exhibiting the greatest concentrations of arsenic and cobalt are targeted to evaluate the effectiveness of in situ injection treatment. Figure 8 identifies the three general areas at the Site where Phase 1 (Pilot) injections will be performed. Alternate Phase 1 (Pilot) injection locations may be selected if closure or related activities might interfere with implementation at the time of injection. Phase 2 injection areas will be selected based on current site conditions at the time of Phase 2 implementation. Changes in current site conditions are expected to occur because of closure activities, natural attenuation, and Phase 1 (Pilot) injection effectiveness. In other words, the other correction actions may reduce concentrations of COIs to the point where Phase 2 injection treatment is not necessary.

Injection wells and existing monitoring wells will be used to monitor the effectiveness of the injection treatment. In addition, based on the hydraulics of the aquifer in the injection area, additional remedial effectiveness monitoring wells will be installed at variable distances to demonstrate injection effectiveness. Monitoring parameters will include COIs and other indicator parameters (e.g., iron, manganese, and magnesium) based on the composition of the treatment solutions. Monitoring frequency will be based on the hydraulics of the aquifer in the areas of interest, distance of the monitoring wells from the line of injection, and associated travel time from the points of injection to monitoring wells.

Figures 9 through 14 provide details regarding the planned injection program in each Phase 1 (Pilot) area. The first figure for each injection area provides a plan view of the area identifying the existing monitoring well exhibiting elevated concentrations, locations of planned injection wells spaced approximately 15 feet apart and perpendicular to groundwater flow direction, and performance monitoring points installed approximately 10 feet downgradient of each injection point. The second figure for each injection area provides a cross-sectional depiction of the area and shows well configuration relative to location-specific geology.

The monitoring program for each injection area is expected to include the following components:

- Pre-injection sampling from injection and monitoring wells to establish background
- Post-injection monitoring in select wells at intervals to determine treatment solution behavior, such as 2 days, 1 week, 1 month, 6 months, and annually thereafter (frequency may be adjusted as needed based on data generated)
- Sampling for the following constituents during each monitoring event:
  - Field parameters (temperature, pH, oxidation-reduction potential, and specific conductance)
  - Appendix IV constituents and treatment solution indicators such as iron, magnesium, and manganese (combined radium-226 and -228 will be excluded from monitoring because it is not observed at elevated concentrations at the Site; thus, the burden of additional sample volume, specialized analysis, and additional analysis turnaround time is not warranted)

Data loggers may be installed in select monitoring wells prior to injection to observe changes in groundwater chemistry for indicator parameters (e.g., pH, oxidation-reduction potential, and specific conductance) before, during, and after treatment. Due to the expected conductivity contrast between the treatment solution and groundwater, geophysical methods such as electrical resistivity imaging will be investigated to map the extent of the treatment zone.

3.3 Monitored Natural Attenuation

MNA has been a component of corrective action at RCRA and Comprehensive Environmental Response, Compensation, and Liability Act (Superfund) sites since the 1990s. MNA describes a range of physical, chemical, and biological processes in the environment that reduce the concentration, toxicity, or mobility of constituents in groundwater. For inorganic constituents, the mechanisms of natural attenuation include sorption, dispersion, precipitation and coprecipitation, and ion exchange (USEPA 1999, 2007a, 2007b). MNA as a remedial alternative is dependent on a good understanding of localized hydrogeologic and geochemical conditions and may require considerable information and monitoring over an extended period of time.

USEPA defines MNA as 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" (USEPA 1999, 2015). An MNA evaluation consists of the following steps or tiers (USEPA 2015):

1. Demonstrate that the area of impacts (plume) is stable or shrinking.
2. Determine the mechanisms and rates of attenuation.
3. Determine that the capacity of the aquifer is sufficient to attenuate the mass of constituents in groundwater and that the immobilized constituents are stable and will not remobilize.
4. Design a performance monitoring program based on the mechanisms of attenuation and establish contingency remedies (tailored to site-specific conditions) should MNA not perform as expected.

Where site conditions are conducive to MNA, it has the potential to provide a more sustainable, lower-cost alternative to aggressive remediation technologies such as pump-and-treat. EPRI has prepared a document describing implementation of MNA for 24 inorganic constituents, which include most Appendix III and IV constituents (EPRI 2015).

Attenuation mechanisms can be placed in two broad categories, physical and chemical. Physical mechanisms include dilution, dispersion, flushing, and related processes. All constituents are subject to physical attenuation mechanisms, so physical processes should be considered in MNA evaluations.

When properly implemented, MNA removes constituents from groundwater and immobilizes them onto aquifer solids. Decisions to use MNA as a remedy or remedy component should be thoroughly supported by site-specific data and analysis (USEPA 1999, 2015). In addition, though not an MNA tier per se, source control is presumed to precede MNA implementation. Extensive MNA investigations were performed for the Site in 2020 and 2021 and are documented in the *Monitored Natural Attenuation Demonstration* report provided in Appendix D.

Site closure (dewatering, consolidation, and capping) and the soil containment berm will meet the MNA criteria for source control. As described in Section 3.1, the Site will be closed by consolidating the Site footprint from approximately 597 acres to approximately 330 acres. CCR removed from outside the consolidated footprint will be dewatered, excavated, and compacted within the consolidated footprint. All visible CCR and a portion of the subgrade soils will be excavated outside the consolidated footprint. The final cover of the consolidated footprint will have a permeability of 10^{-7} cm/sec or less and will be constructed to control and minimize or eliminate (to the extent possible) post-closure infiltration of precipitation into the waste and potential releases of CCR from the unit. Site closure will greatly reduce any future discharges to groundwater.

3.3.1 Site-Specific MNA Evaluation Summary

As described in greater detail in Appendix D, the trends observed in concentration versus time and concentration versus distance graphs provide evidence that natural attenuation is currently occurring at the Site, even without source control. Concentration versus time graphs indicate that arsenic concentrations are generally stable in several areas. Also, concentration versus distance graphs along downgradient transects indicate that arsenic and cobalt are generally decreasing with distance from the Site.

Based on the geochemical investigations, several lines of evidence support multiple attenuating mechanisms, depending upon the COIs. The major attenuating mechanisms include the following:

- Sorption on iron oxides (arsenic and cobalt)
- Cation exchange on clays (cobalt)
- Coprecipitation in crystalline iron oxides (arsenic and cobalt)
- Precipitation in barium arsenate (arsenic)

Rates of attenuation were determined by results of reactive transport modeling and by extrapolating decreasing trends on the concentration versus time graphs to the GWPS for areas where decreasing trends were observed. Depending on the COIs and well (area), the estimated time to achieve natural attenuation ranges from 7 to 78 years, not considering source control. Source control via closure is expected to shorten this time frame. Most of this range is reasonable compared to durations of other corrective action technologies. However, attenuation capacity will likely need to be enhanced in some areas (e.g., via injection treatment) to reduce the upper end of the time frame for achieving GWPS for both COIs sitewide. Based on MNA case histories for inorganic constituents, MNA time frames typically range from a few years to decades (EPRI 2015). Because pond closure activities (dewatering, consolidation, and capping) at the Site are projected to take approximately 10 additional years, the time frame for MNA is compatible with the closure period.

Column studies were performed to assess the ability for the aquifer (soil) to chemically attenuate COIs and to help determine the stability of the attenuated COIs. Column studies indicate that arsenic and cobalt are attenuated (sorbed) by aquifer media. The column attenuation capacity was extrapolated to the entire mass of the aquifer downgradient of the consolidated Site but within the property boundary. The extrapolation showed that the aquifer has an attenuating capacity of many more times the mass of arsenic and cobalt requiring attenuation.

SSE was performed on samples of well solids (precipitates) and soils used in the column studies to assess the stability of the attenuated COIs and their host minerals. Most of the mass of arsenic and cobalt is bound in stable fractions: specifically, F3 (reducible), F4 (oxidizable), and F5 (residual) fractions. Attenuated arsenic and cobalt are therefore not expected to remobilize back into groundwater.

3.3.2 Site-Specific MNA Monitoring Plan

Corrective action performance monitoring consists of two major components: 1) monitoring for sitewide corrective action, which would include MNA and the positive benefits of source control and geochemical manipulation (injections) at the Site scale; and 2) remedial effectiveness monitoring for geochemical manipulation in the areas of injections. Sitewide monitoring applies to MNA because MNA will be implemented over the entire Site.

Implementation of MNA at the Site will be relatively easy. Most of the wells for MNA are already in place, though some additional wells will need to be installed to monitor progress in critical areas. The site-specific MNA monitoring plan will be composed of the following:

- A network of sentinel or clean-line monitoring points beyond the extent of GWPS exceedances
  - The sentinel/clean-line network will consist of monitoring wells and surface water sampling locations and will be monitored to verify that GWPS exceedances do not occur at or beyond the locations.
- Monitoring wells located within the areas exhibiting GWPS exceedances
  - These wells will be monitored to verify attenuation mechanisms, document decreasing concentrations, calculate plume mass or mass flux, and provide monitoring data to demonstrate MNA effectiveness.
- A comprehensive data analysis and reporting plan identifying specific wells, performance standards and reporting procedures
- Components of an ASM plan

A key component of MNA is a detailed monitoring and reporting plan. Pursuant to 40 CFR § 257.98(a) and ADEM Admin. Code r. 335-13-15-.06(9)(a), a remedy and monitoring program must be implemented within 90 days of selecting a remedy. As documented in Appendix D, natural attenuation is already occurring at the Site. A comprehensive and specific MNA corrective action groundwater monitoring program will be developed within 90 days of this report. A conceptual summary of the anticipated MNA monitoring network is included in Figure 15.

MNA monitoring will primarily be accomplished by sampling MNA monitoring wells for the following list of constituents on a semiannual basis:

- Appendix IV constituents
- General parameters that influence geochemistry such as pH, temperature, oxidation-reduction potential, dissolved oxygen, and specific conductivity
- Natural attenuation indicator parameters specific to the identified attenuation mechanisms such as ferrous and ferric iron

Because MNA does not require design and construction of infrastructure other than new monitoring wells, the monitoring can be initiated within 6 months to a year. At least 1 year of groundwater monitoring data are recommended to establish baseline conditions and trends.

4 Corrective Action Monitoring Plan

As required by 40 CFR § 257.98(a) and ADEM Admin. Code r. 335-13-15-.06(9)(a), the owner/operator must implement the groundwater remedy within 90 days of selecting a remedy, including establishing a corrective action groundwater monitoring program that: 1) meets the assessment monitoring requirements of 40 CFR § 257.95 and ADEM Admin. Code r. 335-13-15-.06(6); 2) documents the effectiveness of the remedy; and 3) demonstrates compliance with the GWPS. A conceptual groundwater monitoring network is shown in Figure 15.

Assessment monitoring of the certified groundwater monitoring network must continue pursuant to 40 CFR § 257.96(b) and ADEM Admin. Code r. 335-13-15-.06(7)(b). The corrective action groundwater monitoring program will include groundwater monitoring for:

- Assessment monitoring of the certified CCR compliance groundwater monitoring network
- Injection treatment system
    - Injection performance
    - ASM triggers
- MNA
    - Attenuation mechanisms, plume reduction, and mass/concentration reduction
    - ASM triggers
- Sentinel and clean-line boundary monitoring
    - Verify delineation boundaries
    - Potential receptor monitoring using risk-based screening levels
    - ASM triggers

Within 90 days of selecting a remedy, a corrective action groundwater monitoring program will be developed that describes the following in detail:

- Sample locations
- Monitoring schedule
- Monitoring parameters
- Data analysis methods
- Interim adaptive standards and triggers (for ASM)
- Reporting and notification requirements

Following implementation of the ACM, several wells were installed to complete delineation and have been monitored semiannually pursuant to 40 CFR § 257.95(g)(1) and ADEM Admin. Code r. 335-13-15-.06(6)(g)2. Ongoing monitoring of certain delineation monitoring wells may be discontinued when the final corrective action groundwater monitoring program is developed.

Sentinel and clean-line boundary monitoring points will be located between known GWPS exceedances and the property boundary or potential receptors. These wells will be sampled at the same frequency as the CCR compliance monitoring wells. Conceptual sentinel and clean-line monitoring points are shown in Figure 15. Adaptive triggers could include statistically increasing trends for multiple events and verified GWPS exceedances at clean-line boundary monitoring points.

Remedy performance monitoring wells will be used to evaluate the combined effects of source control (Site closure), injection treatment, and MNA. Conceptual remedy performance monitoring wells are shown in Figure 15. Adaptive triggers could include statistically increasing trends above the GWPS for multiple events after closure is complete.

As discussed in Section 5, APC will incorporate ASM into the corrective action at the Site. Adaptive triggers will be developed, and additional actions (monitoring, analysis, and corrective action) will be implemented as needed. These details will be provided in the Site *Corrective Action Groundwater Monitoring Program* to be submitted 90 days after submission of this *Groundwater Remedy Selection Report*.

During closure and dewatering, the pond-groundwater system will be in a state of geochemical disequilibrium, leading to potential temporary increases in COI concentrations at some locations. Additionally, temporary increases could occur as the subsurface is disturbed by injections and possible localized changes in groundwater flow direction.

5 Adaptive Site Management Plan

Changes in Site conditions are inevitable with the long-term performance of groundwater remedies. 40 CFR § 257.98(b) and ADEM Admin. Code r. 335-13-15-.06(9)(b) require an owner or operator to implement other methods or techniques if it is determined that compliance is not being achieved by the existing remedy. Remedy system performance will be proactively and systematically monitored against interim performance standards (sometimes called "adaptive triggers") in accordance with the ASM plan to ensure compliance with 40 CFR § 257.98(b) and ADEM Admin. Code r. 335-13-15-.06(9)(b) requirements and provide a process for proactively responding to changing conditions. Details regarding implementation of the ASM will be included in the comprehensive *Corrective Action Groundwater Monitoring Program*.

The ASM for the Site will include the following items:

- Implementing interim and short-term goals to measure system performance and progress toward long-term goals
- Evaluating remedy system performance against interim goals (adaptive triggers)
- Adapting when performance metrics are satisfied, or interim goals are not met
- Updating Site conceptual model as new data become available
- Re-evaluating and updating interim goals (adaptive triggers)
- Adapting the corrective action system, if necessary

The performance of the groundwater corrective action system at the Site will be subject to routine evaluation and, if necessary, adjustment as part of the ASM. Figure 16 presents the process that will be used to evaluate monitoring data, determine if performance objectives are met, and determine if adaptation of the corrective action system (CAS) is needed. Performance monitoring is an integral component of the ASM. Details regarding the performance monitoring systems, performance criteria, adaptive triggers, and evaluation criteria will be provided in the comprehensive *Corrective Action Groundwater Monitoring Program* developed for the Site within 90 days pursuant to 40 CFR § 257.98(a) and ADEM Admin. Code r. 335-13-15-.06(9)(a).

The purpose of the ASM plan is to identify objective data targets that may be used to evaluate the effectiveness of the CAS. The ASM process is applicable at all stages of corrective action as follows (Figure 16):

- The CAS described herein will be implemented to address current conditions.
- Monitoring will occur and system performance will be evaluated with respect to interim and long-term performance standards (adaptive triggers) that signal a re-evaluation of performance standards or adjustment to the CAS may be warranted.

- If monitoring indicates interim standards (adaptive triggers) have not been met, those performance standards will be re-evaluated and a determination made regarding their continued suitability, if they need to be adjusted, or if the CAS needs to be adapted.
- Adjustments will be made to the adaptive triggers or CAS, as needed, to ensure that long-term (final) performance criteria and remedial goals are met.
- The conceptual site model will be updated as additional data are obtained.
- Implementation of the CAS, monitoring, and ASM plan will continue until the final long-term objectives are met.

5.1 Interim Performance Standards and Monitoring

The long-term performance standards for the CAS are defined in 40 CFR § 257.98(c) and ADEM Admin. Code r. 335-13-15-.06(9)(c): demonstrate compliance with the GWPS at all points that lie beyond the groundwater monitoring system established under 40 CFR § 257.91 and ADEM Admin. Code r. 335-13-15-.06(2) for three consecutive years based on semiannual monitoring.

Interim performance standards and adaptive triggers are developed to evaluate the effectiveness of the CAS in furtherance to meeting the long-term performance standards. As described in Section 3, in addition to closure and source control, the CAS is composed of injection treatment and MNA. Monitoring frequency of CAS components will vary as described in the *Corrective Action Groundwater Monitoring Program*. Performance monitoring reporting will occur at least semiannually.

5.1.1 Injection Treatment

Injection treatment is designed to remove constituents from groundwater by precipitation or sorption via a treatment solution injected into areas with groundwater impacts. The interim performance goal of the injection treatment system is to document a reduction in constituent concentrations in groundwater and distribution of the treatment solution within the Unit 3 aquifer. The long-term performance objective is to demonstrate sustained constituent concentration reductions after injection of treatment solution has ceased. The monitoring plan for injections will be developed after treatability studies because those studies are needed to select treatment solutions and the associated monitoring parameters. The performance monitoring system will account for potential variability created during ongoing closure activities such as dewatering, excavation, and capping.

5.1.2 Monitored Natural Attenuation

The long-term goal of MNA is to document that, in conjunction with source control and injection treatment, natural attenuation of the constituents is occurring. The MNA performance monitoring network and adaptive triggers will be described in detail within the *Corrective Action Groundwater*

Monitoring Program. As described by USEPA (2015), the four tiers of MNA can be summarized as follows:

- Tier 1: plume size and stability
- Tier 2: attenuation mechanisms and rates
- Tier 3: attenuation mechanism capacity and reversibility
- Tier 4: performance monitoring plan

The suitability of MNA has been demonstrated as described in Section 3.3.1 and Appendix D. The performance of the MNA (Tiers 1 through 3) will be monitored by evaluating the following:

- Source control mechanisms
  - Source control at the Site will be complete by way of dewatering, consolidating the former Site footprint, and constructing the final cover system.
- Plume size and stability
  - The size and stability will be monitored by a network of groundwater monitoring wells within and around the perimeter of the area of groundwater exceedances (i.e., the plume). From a practical implementation standpoint, plume stability refers to an area of groundwater impacts that is not substantially expanding or adversely changing (by exhibiting new constituents or increasing mass). The interim performance standard for plume stability may be monitoring wells installed around the areas of groundwater impacts to exhibit trends that are statistically steady or decreasing and for no new SSLs to occur within the plume area. The long-term performance objective is for statistically decreasing trends, continual reduction in the number or SSLs in the MNA performance monitoring network, a reduction in size of the plume, or a reduction in magnitude of COI concentration within the plume.
- Plume mass and mass reduction
  - MNA performance relative to Tier 2 criteria for attenuation mechanisms and rates, and Tier 3 criteria for attenuation capacity and reversibility may be demonstrated by monitoring the mass of each COI within the plume area and documenting changes in mass over time. Steady or decreasing mass indicates that attenuation mechanisms continue to be effective, attenuation capacity remains, and attenuation mechanisms have not reversed. The interim performance standard for mass reduction is for monitoring wells installed in and around the areas of groundwater impacts, in aggregate, to exhibit statistically steady or decreasing mass. Per USEPA guidance, mass flux across transects (cross sections) located in meaningful areas will also be calculated. The long-term performance objective is to demonstrate COI concentration decline to below GWPS and reduction in COI mass.

Adjustments to the MNA performance monitoring network will be made as MNA proceeds.

5.2 Adaptive Triggers

Detailed performance monitoring requirements for each component of the CAS will be included in the *Corrective Action Groundwater Monitoring Program*. Included in the performance monitoring program will be the objective performance standards that serve as adaptive triggers. Should the performance standard not be met, the adaptive trigger will signify that re-evaluation of the performance standards and CAS are warranted.

5.3 Corrective Action System Adaptation

If it is determined that the performance objectives are appropriate and that the CAS is not achieving the interim or long-term goals, then the CAS may be adapted, optimized, or changed. Within a reasonable time, depending on complexity and need, changes to the CAS and associated work plan or implementation schedule will be provided. A semiannual report describing the progress made adapting the CAS will be completed and placed in the operating record as required by 40 CFR § 257.105(h)(12) and ADEM Admin. Code r. 335-13-15-.08(1)(h)12. Amendments to this *Groundwater Remedy Selection Report* and the *Corrective Action Groundwater Monitoring Program* will also be completed and placed in the operating record as described in 40 CFR § 257.105(h)(12) and ADEM Admin. Code r. 335-13-15-.08(1)(h)12.

6 Remedy Performance Requirement Demonstration

As required in 40 CFR § 257.97(b) and ADEM Admin. Code r. 335-13-15-.06(8)(b), the groundwater remedy for the Site must meet the following performance standards:

1. Be protective of human health and the environment.
2. Attain applicable GWPSs as specified in the rules.
3. Control the source of release to reduce or eliminate, to the extent feasible, further releases to the environment.
4. Comply with any relevant standards (i.e., all applicable RCRA requirements) for management of wastes generated by the remedial actions).

The following describes how the selected remedy plan meets the performance requirements of 40 CFR § 257.97(b) and ADEM Admin. Code r. 335-13-15-.06(8)(b).

6.1 Protection of Human Health and the Environment

A remedy is protective of human health and the environment when a quantitative risk assessment, conducted according to well-supported scientific principles, demonstrates that chemicals in relevant environmental media are at or below regulatory or health-based benchmarks for human health and the environment. Quantitative risk assessment approaches and the derivation of health-based benchmarks may vary by the competent authority or regulatory application. The State of Alabama has several reports that provide specific guidance on risk assessment approaches and the selection and derivation of appropriate health-based benchmarks for chemicals in groundwater and in surface water that will be protective of human health and the environment.

Current conditions are protective of human health and the environment. The proposed remedy plan will improve groundwater quality and result in a reduction in concentrations; therefore, the proposed remedy will be protective of human health and the environment as required by 40 CFR § 257.97(b)(1) and ADEM Admin. Code r. 335-13-15-.06(8)(b)1.

6.2 Attain Groundwater Protection Standard Requirements

As stated in 40 CFR § 257.97(b)(2) and ADEM Admin. Code r. 335-13-15-.06(8)(b)2., a groundwater remedy plan must be able to attain the GWPS specified in the rules. As described in this report, a three-pronged approach will be used to achieve the GWPS. A significant component of the groundwater remedy plan is the closure and source control measures being implemented at the Site. The combination of CCR consolidation, dewatering, and installation of a low-permeability geosynthetic cover system will greatly reduce release to the environment.

Injection treatment of areas with significantly elevated concentrations of constituents will reduce concentrations by creating precipitates (solids) that remove COI from the groundwater. Injection treatment was based on successful field treatments for arsenic and successful laboratory treatability studies from other sites for cobalt (Anchor QEA 2017, 2018, 2019b, 2019c; EPRI 2021). Effectiveness of injection treatments will be evaluated in the context of decreasing trends from source control and natural attenuation. If warranted, injection treatments will be repeated on a frequency determined to be necessary based on remedial effectiveness monitoring data.

Finally, COIs are currently being attenuated, and concentrations are declining in some areas as a result of natural attenuation processes. In concert with closure, source control, and treatment injections, MNA will continue until constituent concentrations are below the GWPS. Closure activities and injection treatments will serve to enhance the natural attenuation already occurring.

Remedy evaluation has demonstrated that actions proposed for the Site result in decreasing concentrations in groundwater (Appendix D). Decreasing concentrations will ultimately result in constituents occurring at concentrations below the GWPS. Therefore, as required by 40 CFR § 257.97(b)(2) and ADEM Admin. Code r. 335-13-15-.06(8)(b)2., the groundwater remedy plan will be able to attain the GWPS specified in the rules.

Depending on constituent and well (location), the estimated time to achieve GWPSs from natural attenuation ranges from 7 to 78 years, not considering source control. Source control via closure is expected to shorten this time frame. Most of this range is reasonable compared to durations of other corrective action technologies. However, attenuation capacity will likely need to be enhanced in some areas (e.g., via injection treatment) to reduce the upper end of the time frame for achieving GWPS for both COIs sitewide. Pump-and-treat for inorganic constituents, for example, typically takes decades because that process must reverse the natural attenuation processes already operating by desorbing constituents from aquifer solids by passing many pore volumes (sometimes hundreds) through the aquifer. Supporting information for time to attain GWPSs, including concentration versus time and concentration versus distance graphs, is included in Appendix D. Source control and geochemical manipulation (injections) are expected to accelerate this time frame, particularly in areas where little attenuation is currently observed.

6.3 Control Sources of Releases

Site closure will greatly reduce potential discharges to groundwater as required by 40 CFR § 257.97(b) (3) and ADEM Admin. Code r. 335-13-15-.06(8)(b)3. Review of Site hydrogeologic data demonstrates that the Site is separated from the uppermost aquifer by a low-permeability clay soil. Source control will be accomplished by the following:

1. Dewatering and consolidating the CCR material to the northern portion of the existing Site and reducing the footprint from approximately 597 acres to approximately 330 acres and contained within a soil berm. Slopes will be graded to provide stability, promote drainage, and prevent

ponding in the disposal area. As shown in Figure 2, dewatering and consolidation are anticipated to proceed into 2031.

2. Placing final cover, consisting of an engineered synthetic turf and geomembrane over the disposal area. The low-permeability cover system will promote and control runoff from the disposal area and prevent infiltration. Eliminating infiltration will prevent the mobilization of constituents within the disposal unit and further reduce the potential for future releases from the Site. The final cover will be installed after consolidation is complete and the soil containment berm is installed. The planned installation of the final cover system is scheduled for 2031.

The closure activities are, in themselves, anticipated to improve groundwater quality by isolating the source area, preventing infiltration of water, minimizing the mobilization of constituents, and impeding release to the environment. The closure and source control measures meet the requirements of 40 CFR § 257.97(b)(3) and ADEM Admin. Code r. 335-13-15-.06(8)(b)3. and will control the source of release to reduce or eliminate, to the extent feasible, further releases to the environment.

6.4 Standards for Waste Management

As specified in requirements of 40 CFR § 257.97(b)(5) and ADEM Admin Code r. 335-13-15-.06(8)(b)5., any waste must be handled and disposed according to all applicable requirements under RCRA. Specifically, any liquid or solid waste generated must be handled and disposed according to applicable regulations in 40 CFR parts 239 through 282 and ADEM Admin. Code chapters 335-13-1 through 335-13-16.

Based on the technologies selected, very little waste will be generated. Waste may be generated by additional well installations, completing injections, and monitoring. All waste generated during completion of the remedy will be handled and disposed according to RCRA requirements for the type of waste. Therefore, the remedy plan meets the requirements of 40 CFR § 257.97(b)(5) and ADEM Admin. Code r. 335-13-15-.06(8)(b)5. for managing waste generated by the remedy.

As demonstrated here, the groundwater remedy plan meets the performance criteria of 40 CFR § 257.97(b) and ADEM Admin. Code r. 335-13-15-.06(8)(b).

7 Schedule

The following factors were considered when determining the schedule for remedial activities as required by 40 CFR § 257.97(d)(1 through 5) and ADEM Admin. Code r. 335-13-15-.06(8)(d)(1 through 5):

- Extent and nature of exceedances
- Reasonable probabilities of remedial technologies in achieving compliance with CCR rule GWPSs and other objectives of the remedy
- Availability of treatment or disposal capacity for CCR managed during implementation of the remedy (not applicate for the Site)
- Potential risks to human health and the environment from exposure to contamination prior to completion of the remedy
- Resource value of the aquifer

In accordance with 40 CFR § 257.97(d) and ADEM Admin. Code r. 335-13-15-.06(8)(d), the following schedules are provided for implementing and completing remedial activities at the Site.

7.1 Site Closure and Source Control

Site closure and source control activities are currently being implemented and are expected to be completed as shown in the timeline in Figure 2. Anticipated project milestones are as follows:

- Late 2023: final cover (liner) installation begins
- Late 2030: CCR consolidation complete
- 2031: final cover installation complete and Site closure certification complete

7.2 Injection Treatment

The anticipated injection treatment implementation schedule is included in this section and summarized in Figure 17. Prior to beginning injections, APC will secure an Underground Injection Control (UIC) Class V permit after submitting a well permit application to ADEM. The application package will be prepared in accordance with ADEM's "UIC Class V Well Permit Application Requirements Guidance" (ADEM 2021) and include the following information:

- Contact information for the permit applicant and responsible official
- Site name and address
- A map(s) which shows the location of proposed injection well(s), public and private water supply wells, source water assessment areas, well head protection areas, surface waters and other pertinent surface features such as roads, natural or manufactured drainage courses, residences, and other structures within the area of review
- A description of the fluids to be injected and the proposed operational procedures

- Design, plans, specifications, and other pertinent information (including injection wells and a groundwater monitoring plan)
- Hydrogeologic data

For treatability studies and the UIC permit, the following schedule is anticipated:

- Collect soil and groundwater samples for treatability studies: 2 months
- Conduct batch studies for reagents and doses: 4 to 6 weeks
- Conduct column studies for effectiveness: 3 months
- Prepare Class V UIC permit: 3 months

After securing the proper ADEM UIC permit, the following schedule is anticipated:

- Design field implementation of injection treatment: 3 months
- Refine delineation in the field: 1 month
- Phase 1 (Pilot): field implementation (well installation and injections): 4 months
- Phase 1 (Pilot): collect and analyze remedial effectiveness monitoring data: 15 months
- Phase 2 injections: field implementation: 4 months
- Phase 2 injections: collect and analyze remedial effectiveness monitoring data: 15 months

7.3 Monitored Natural Attenuation

Strictly speaking, the MNA process is currently being implemented at the Site, although a formalized process to evaluate and document the process has not yet been established. MNA will be implemented by establishing the detailed MNA sampling, analysis, and evaluation plan in 90 days as part of the corrective action groundwater monitoring program. Implementation of the MNA program is anticipated to include the following:

- Install additional no-exceedance and remedial effectiveness monitoring wells (at an estimated 7 locations, to take 2 to 3 weeks)
- Coordinate MNA sampling with the first semiannual compliance sampling event after new well installation
- Collect and analyze baseline data: 1 year
- Remedy complete: depending on area, 7 to 78 years (maximum), not considering source control. Source control via closure and injections are expected to significantly shorten the upper end of this range.

8 References

ADEM (Alabama Department of Environmental Management), 2021. "ADEM UIC Class V Well Permit Application Requirements Guidance." *Alabama Department of Environmental Management*. Accessed October 22, 2021. Available at: http://adem.alabama.gov/programs/water/waterforms/UIC_Class_V_Guidance.pdf.

APC (Alabama Power Company), 2020. *Amended Closure Plan for Ash Pond*. Plant Barry. April 1, 2020.

Anchor QEA (Anchor QEA, LLC), 2017. *Remedial Action Plan Final Report – Lynn Haven Pilot Test*. Lynn Haven Retired Substation. Prepared for Gulf Power Company. May 2017.

Anchor QEA, 2018. *Lynn Haven Full Site Remedy – Post-Construction Report*. Lynn Haven Retired Substation. Prepared for Gulf Power Company. October 2018.

Anchor QEA, 2019a. *Assessment of Corrective Measures*. Plant Barry Ash Pond. Prepared for Alabama Power Company. June 2019.

Anchor QEA, 2019b. *Bench-Scale Study Results and Field-Scale Pilot Test Work Plan*. Former St. Andrews Substation Site. Prepared for Gulf Power Company. August 2019.

Anchor QEA, 2019c. *Lynn Haven Third Quarterly Remediation Monitoring Report*. Lynn Haven Retired Substation. Prepared for Gulf Power Company. October 2019.

Anchor QEA, 2019d. *Semi-Annual Remedy Selection and Design Progress Report*. Plant Barry Ash Pond. Prepared for Alabama Power Company. December 2019.

Anchor QEA, 2020a. *Semi-Annual Remedy Selection and Design Progress Report*. Plant Barry Ash Pond. Prepared for Alabama Power Company. June 2020.

Anchor QEA, 2020b. *Semi-Annual Remedy Selection and Design Progress Report*. Plant Barry. Prepared for Alabama Power Company. December 2020.

Anchor QEA, 2021. *Semi-Annual Remedy Selection and Design Progress Report*. Plant Barry. Prepared for Alabama Power Company. June 2021.

EPRI (Electric Power Research Institute), 2015. *Corrective Action for Closed and Closing Ash Ponds*. Final Report. 3002006292. December 2015.

EPRI, 2021. Corrective Action Technology Profile: Permeable Reactive Zones for Groundwater Remediation at Coal Combustion Product Landfills and Impoundments. 3002021966. 2021.

Halihan, T., S. Comfort, and V. Zlotnik, 2009. *Using Electrical Resistivity Imaging to Evaluate Permanganate Performance During an In Situ Treatment of a RDX-Contaminated Aquifer*. Environmental Security Technology Certification Program. August 2009.

SCS (Southern Company Services, Inc), 2018a. *2017 Annual Groundwater Monitoring and Corrective Action Report*. Plant Barry Ash Pond. Prepared for Alabama Power Company. January 31, 2018.

SCS, 2018b. *Facility Plan for Groundwater Investigation.* Plant Barry Ash Pond. Prepared for Alabama Power Company. October 2018.

SCS, 2019. *2018 Annual Groundwater Monitoring and Corrective Action Report.* Plant Barry Ash Pond. Prepared for Alabama Power Company. January 31, 2019.

SCS, 2020. *2019 Annual Groundwater Monitoring and Corrective Action Report.* Plant Barry Ash Pond. Prepared for Alabama Power Company. January 31, 2020.

SCS, 2021. *2020 Annual Groundwater Monitoring and Corrective Action Report.* Plant Barry Ash Pond. Prepared for Alabama Power Company. January 31, 2021.

USEPA (U.S. Environmental Protection Agency), 1999. *Use of Monitored Natural Attenuation of Superfund, RCRA Corrective Action, and Underground Storage Tank Sites*. Office of Solid Waste and Emergency Response. EPA/OSWER No. 9200.4-17P. April 1999.

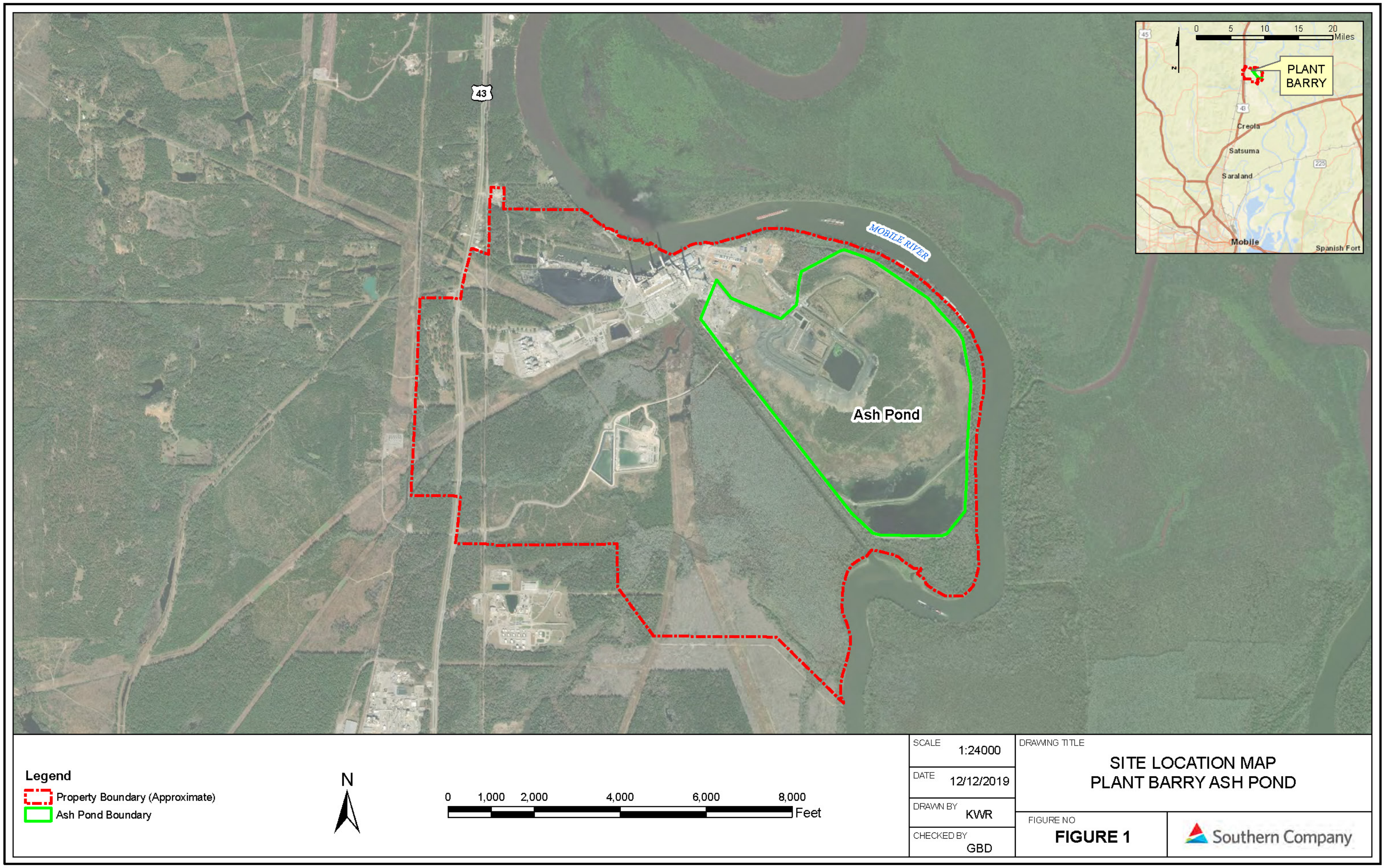
USEPA, 2002. *Elements for Effective Management of Operating Pump and Treat Systems.* 542-R-02-009, USEPA Office of Solid Waste and Emergency Response Directive 9355, 4-27FS-A, 22. December 2002.

USEPA, 2007a. *Monitored Natural Attenuation of Inorganic Contaminants in Ground Water. Volume 1 – Technical Basis for Assessment.* EPA/600/R-07/139. October 2007.

USEPA, 2007b. *Monitored Natural Attenuation of Inorganic Contaminants in Ground Water. Volume 2. Assessment for Non-Radionuclides Including Arsenic, Cadmium, Chromium, Copper, Lead, Nickel, Nitrate, Perchlorate, and Selenium*. EPA/600/R-07/140. October 2007.

USEPA, 2015. *Use of Monitored Natural Attenuation for Inorganic Contaminants in Groundwater at Superfund Sites.* USEPA Office of Solid Waste and Emergency Response Directive 9283.1-36. August 2015.

Figures



Source: Southern Company Services, 2020. *Semi-Annual Progress and Groundwater Delineation Report*. Plant Barry. Prepared for Alabama Power Company. September 30, 2020.

Filepath: \\Athena\Mobile\Projects\Southern Company\Alabama Power ACMs - PRIVILEGED & CONFIDENTIAL\Remedy Selection Reports\Barry\Figures\Figure 1 - Site Location.docx

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Figure 1
Site Location Map

Groundwater Remedy Selection Report
Plant Barry

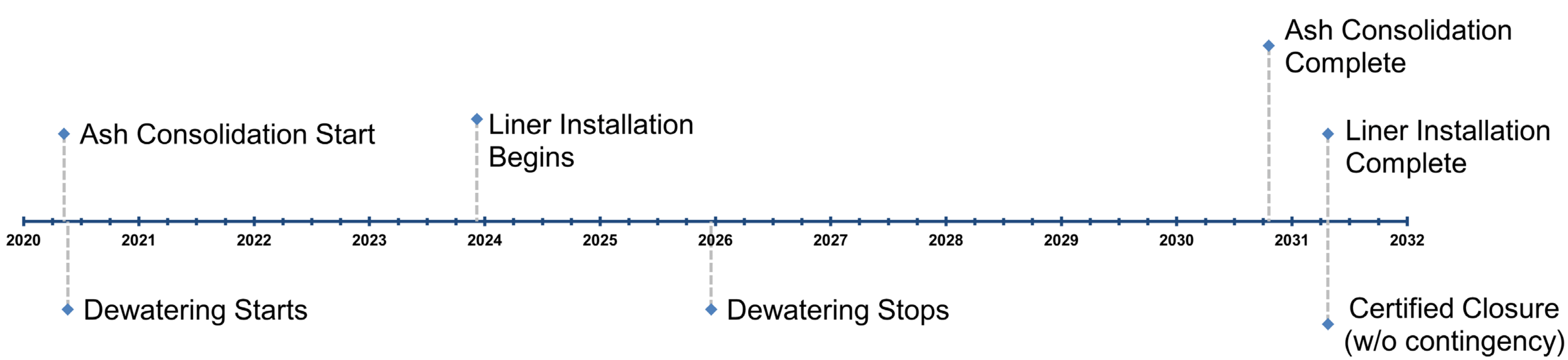

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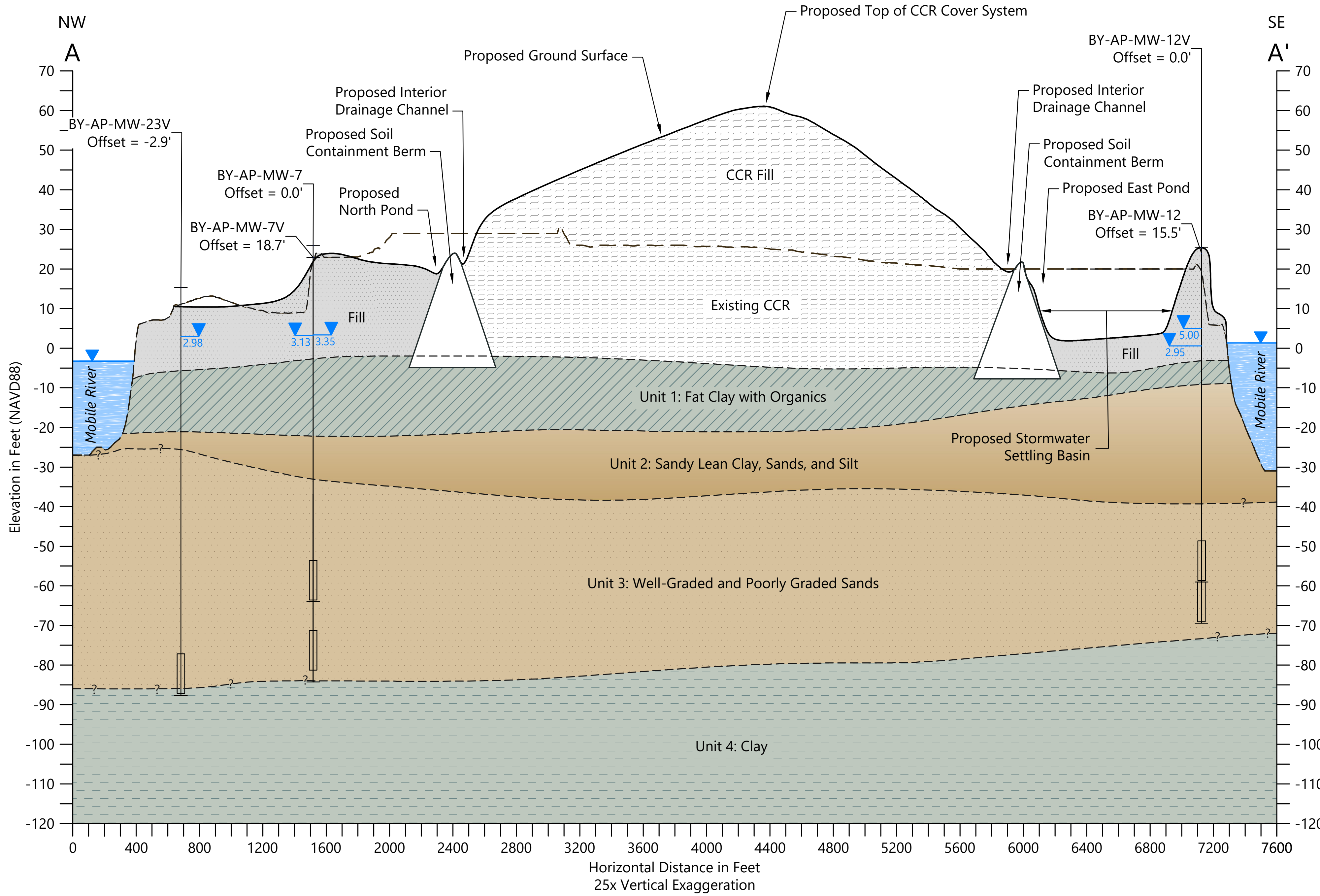
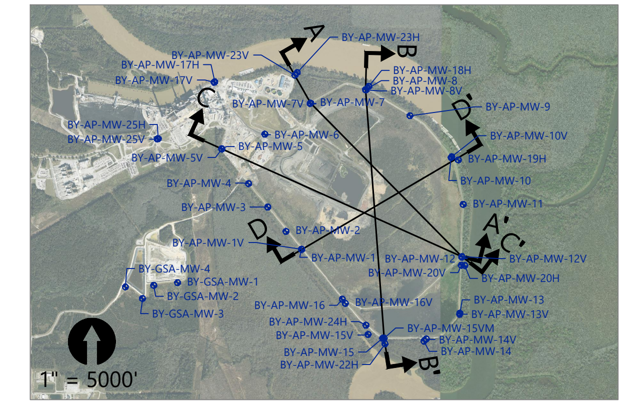
Figure 2
Closure Timeline
Groundwater Remedy Selection Report
Plant Barry





LEGEND:

- Existing Ground Surface
- Proposed Ground Surface
- Geologic Contact
- Existing Monitoring Well
- Water Elevation (Collected August 31, 2020)
- Screened Interval

0 800
Feet

NOTES:

1. Water elevations measured on August 31, 2020.
2. Proposed features are based on Plant Barry CCR Pond Closure, Mobile County, Alabama, Geosyntec, December 2018.
3. CCR: Coal Combustion Residuals

HORIZONTAL DATUM: Alabama State Plane West Zone, NAD83, U.S. Survey Feet
VERTICAL DATUM: North American Vertical Datum of 1988 (NAVD88)

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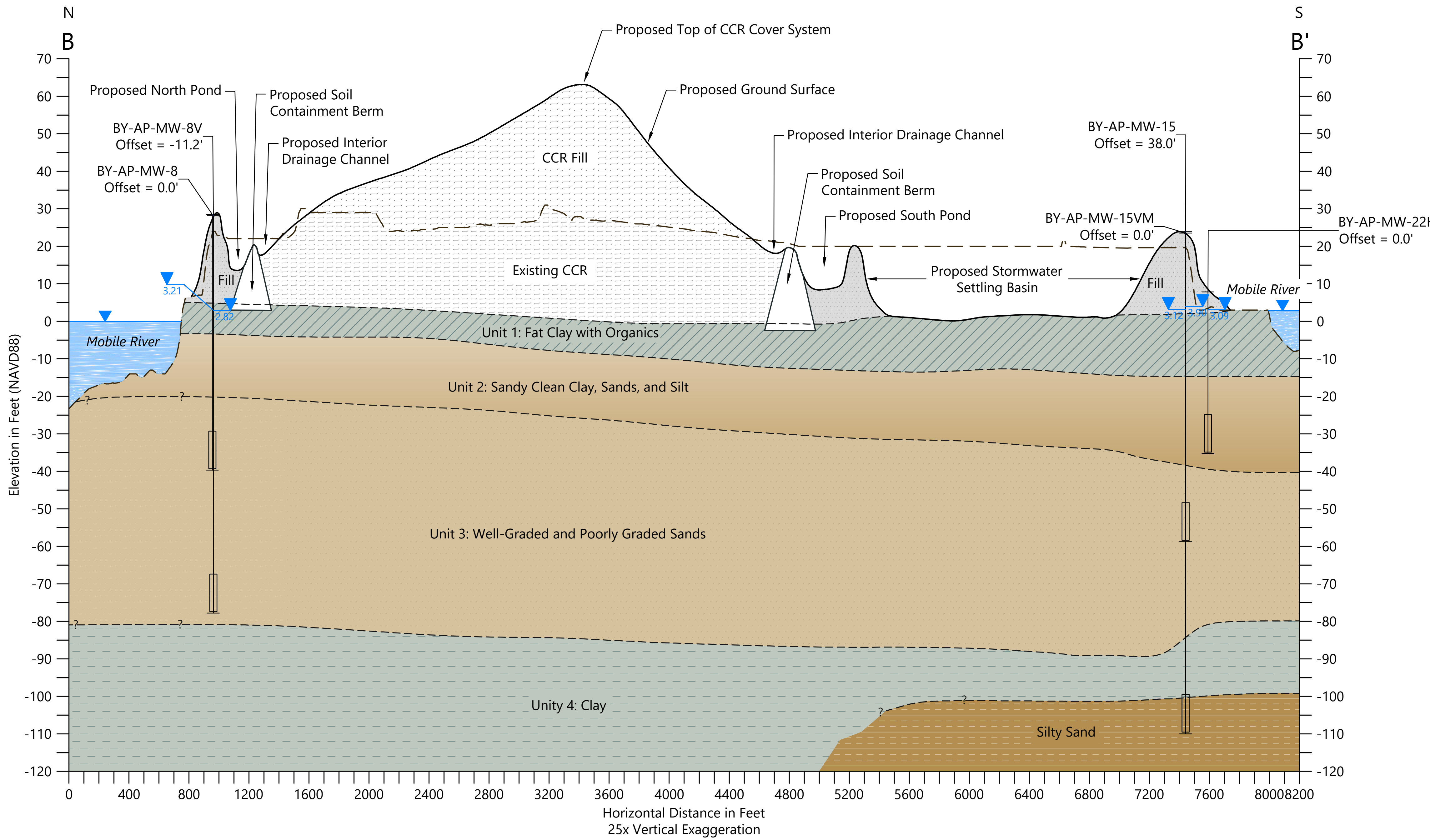
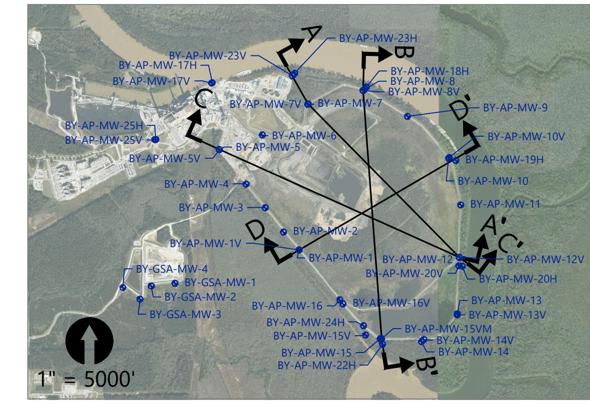
Figure 3
Conceptual Cross Section A-A'

Groundwater Remedy Selection Report
Plant Barry





LEGEND:

Existing Ground Surface

Proposed Ground Surface

Geologic Contact

Existing Monitoring Well

Water Elevation (Collected August 31, 2020)

Screened Interval

0 800
Feet

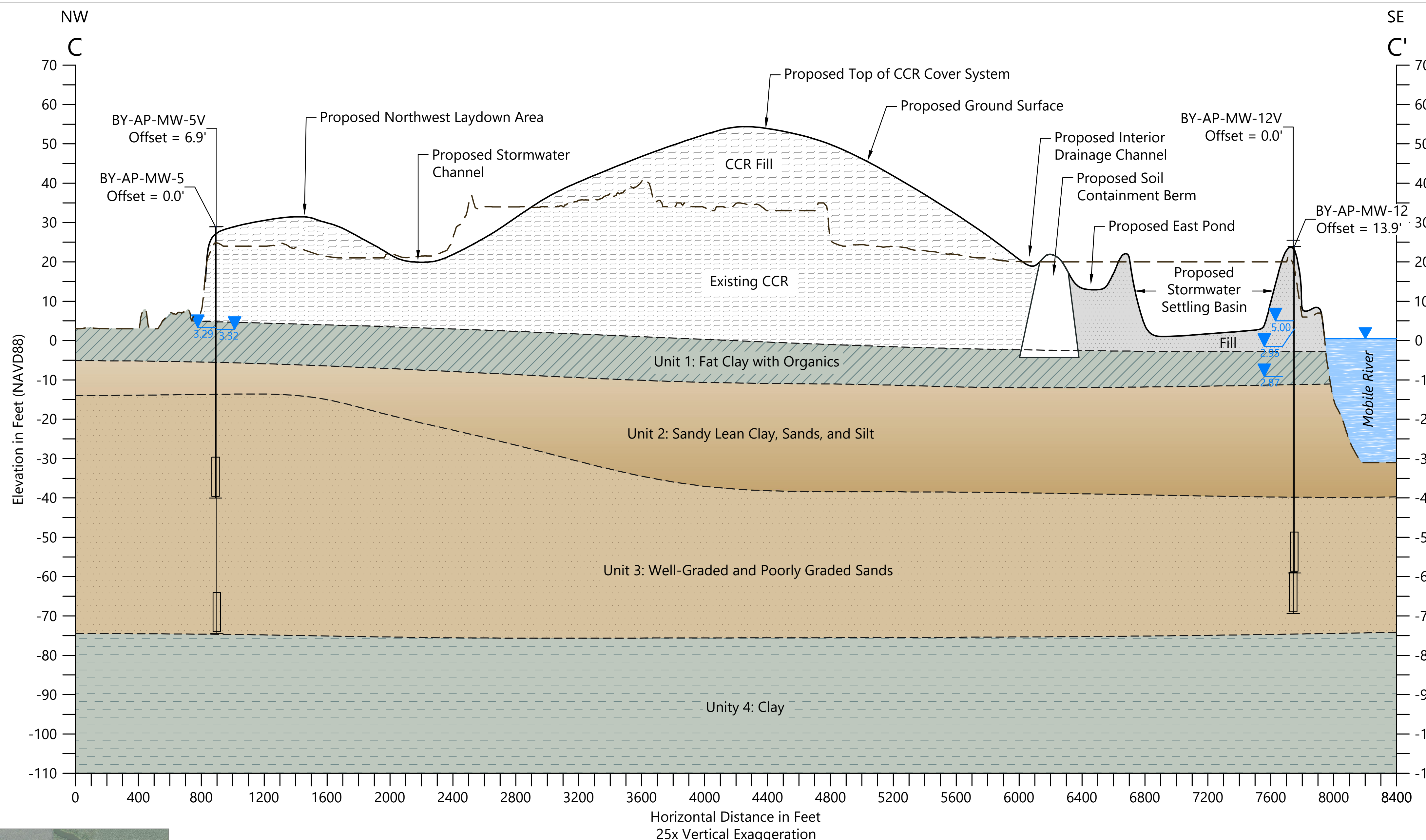
NOTES:

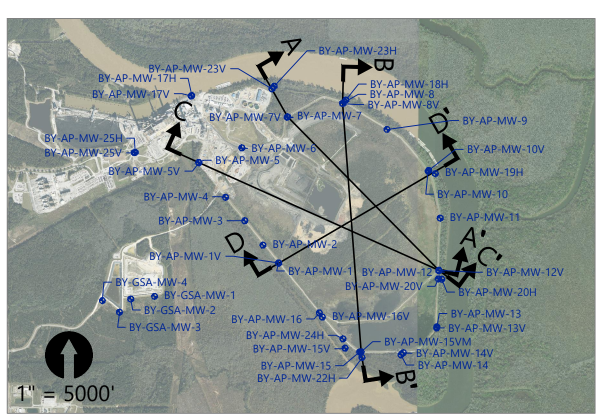
1. Water elevations measured on August 31, 2020.
2. Proposed features are based on Plant Barry CCR Pond Closure, Mobile County, Alabama, Geosyntec, December 2018.
3. CCR: Coal Combustion Residuals

HORIZONTAL DATUM: Alabama State Plane West Zone, NAD83, U.S. Survey Feet
VERTICAL DATUM: North American Vertical Datum of 1988 (NAVD88)

Figure 4
Conceptual Cross Section B-B'

Groundwater Remedy Selection Report
Plant Barry





LEGEND:

Existing Ground Surface

Proposed Ground Surface

Geologic Contact

Existing Monitoring Well

Water Elevation
(Collected August 31, 2020)

Screened Interval

0 800
Feet

NOTES:

1. Water elevations measured on August 31, 2020.
2. Proposed features are based on Plant Barry CCR Pond Closure, Mobile County, Alabama, Geosyntec, December 2018.
3. CCR: Coal Combustion Residuals

HORIZONTAL DATUM: Alabama State Plane West Zone, NAD83, U.S. Survey Feet
VERTICAL DATUM: North American Vertical Datum of 1988 (NAVD88)

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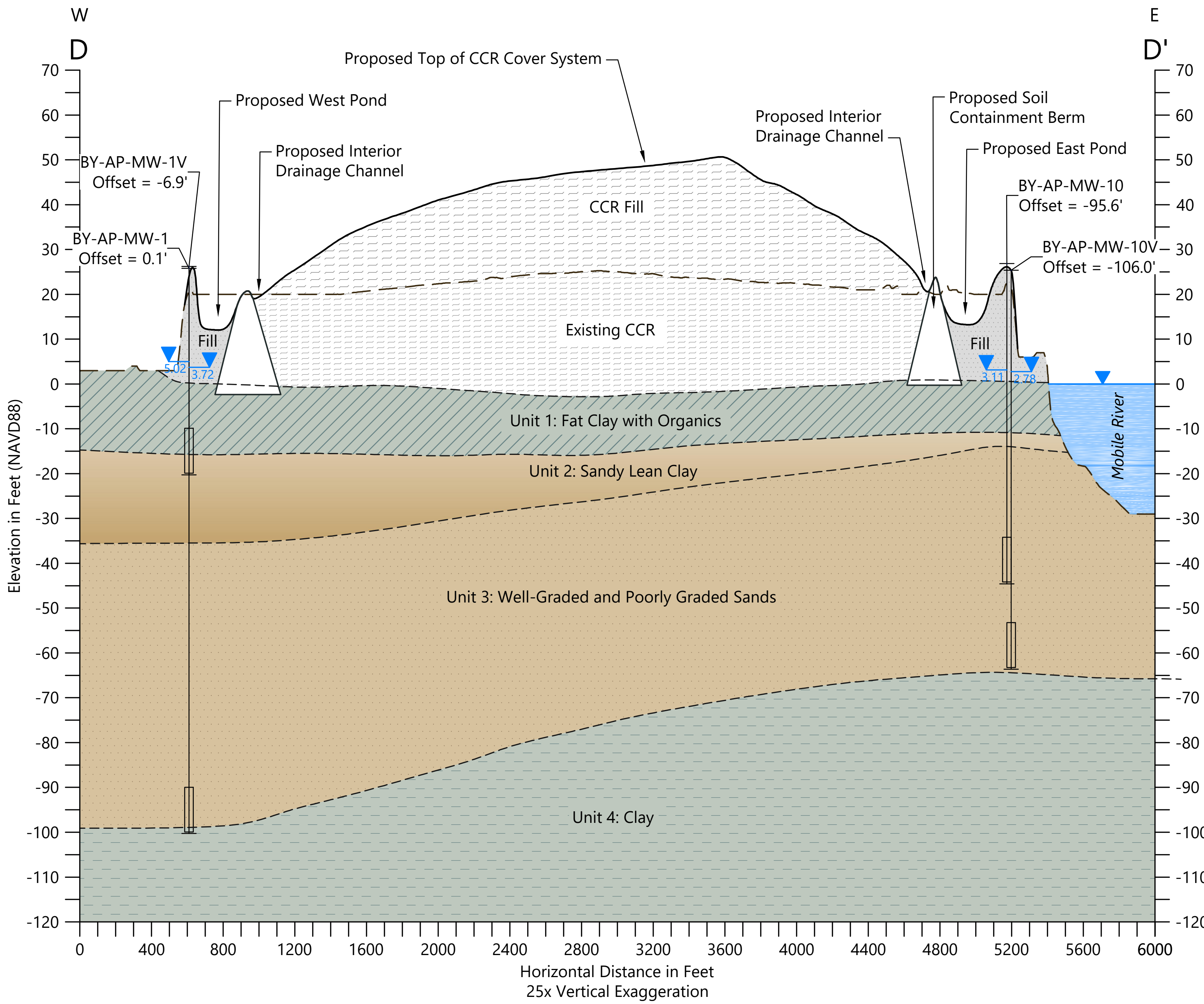
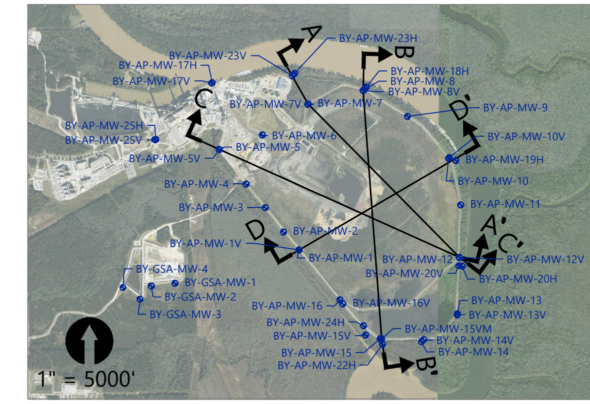
Figure 5
Conceptual Cross Section C-C'

Groundwater Remedy Selection Report
Plant Barry





LEGEND:

Existing Ground Surface

Proposed Ground Surface

Geologic Contact

Existing Monitoring Well

Water Elevation (Collected August 31, 2020)

Screened Interval

0 800
Feet

NOTES:

1. Water elevations measured on August 31, 2020.
2. Proposed features are based on Plant Barry CCR Pond Closure, Mobile County, Alabama, Geosyntec, December 2018.
3. CCR: Coal Combustion Residuals

HORIZONTAL DATUM: Alabama State Plane West Zone, NAD83, U.S. Survey Feet
VERTICAL DATUM: North American Vertical Datum of 1988 (NAVD88)

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Filepath: K:\Projects\1114-Southern Company\Barry\Groundwater Remedy Selection Report\1114-RP-001 (Barry Sections).dwg Figure 6

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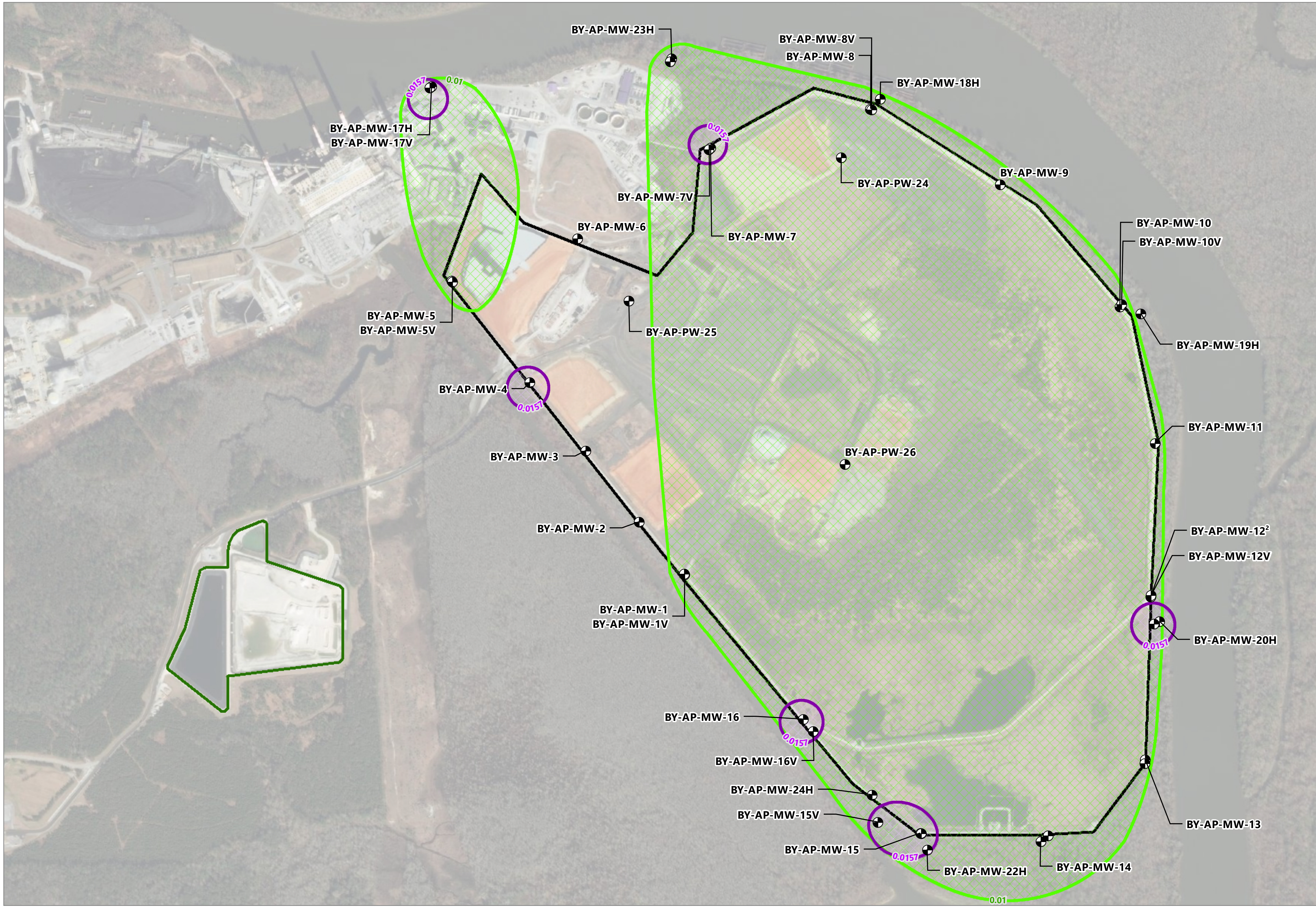
Figure 6
Conceptual Cross Section D-D'
Groundwater Remedy Selection Report
Plant Barry



LEGEND:

- Property Boundary
- Ash Pond
- Gypsum Pond
- Consolidated CCR Footprint
- CCR Compliance Monitoring Well Location
- Arsenic GWPS Isoconcentration (0.01 mg/L)
- Cobalt GWPS Isoconcentration (0.0157 mg/L)

NOTES:

The arsenic and cobalt GWPS isoconcentrations shown on this map are based on spring and early summer 2020 sampling events.

CCR: Coal Combustion Residuals
GWPS: Groundwater Protection Standard
mg/L: Milligrams per Liter

0 1,000
Feet

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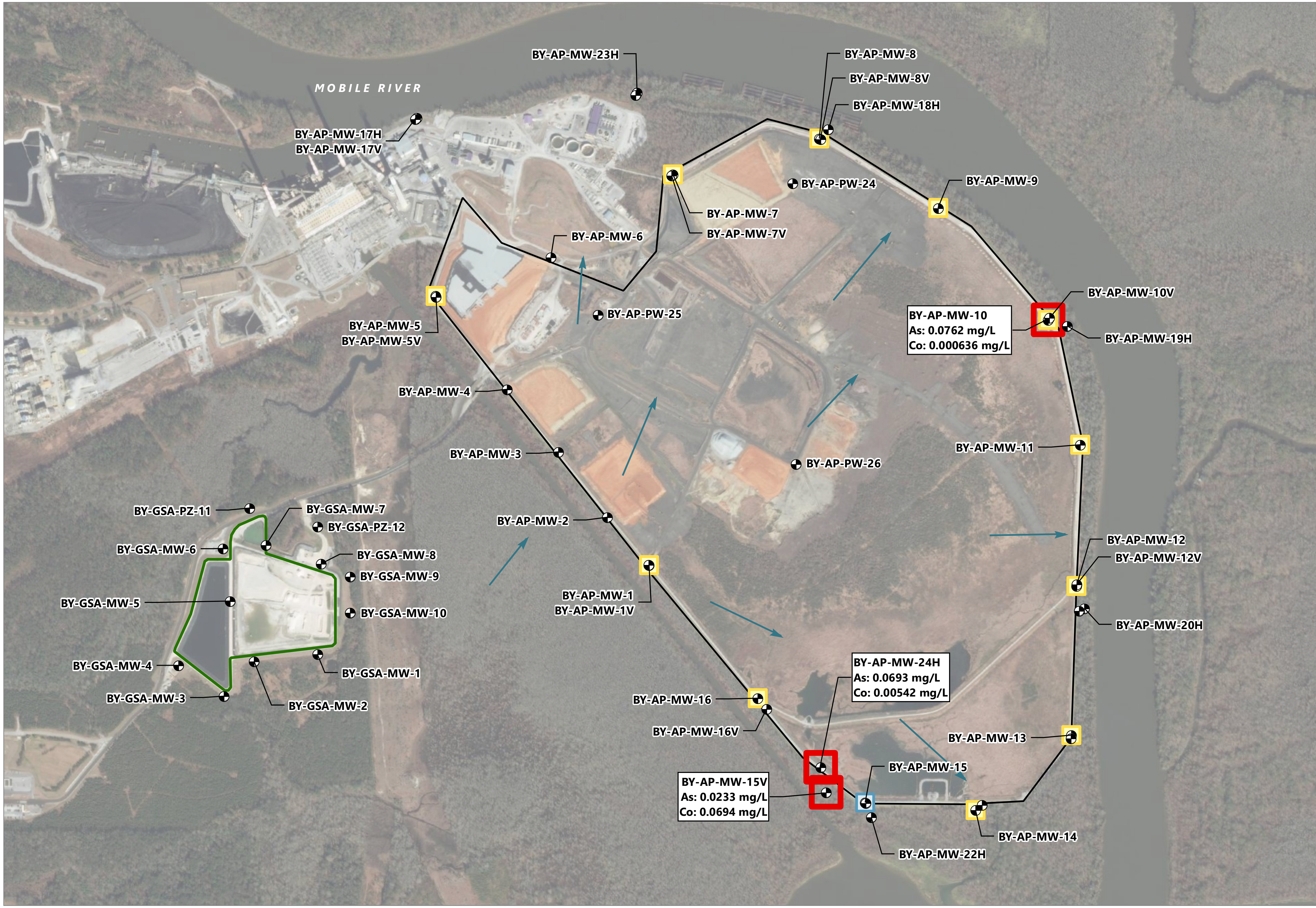
Figure 7
Groundwater Protection Standard Exceedance Map
Groundwater Remedy Selection Report
Plant Barry



LEGEND:

- Ash Pond
- Gypsum Pond
- Well Location
- Arsenic SSL
- Arsenic and Cobalt SSLs
- Typical Groundwater Flow Direction
- Pilot Test Injection Area

NOTES:
Groundwater concentrations are from May 2021 sampling event.
Arsenic GWPS: 0.01 mg/L
Cobalt GWPS: 0.0157 mg/L

As: arsenic
Co: cobalt
GWPS: groundwater protection standard
mg/L: milligrams per liter
SSL: statistically significant level

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Figure 8
Pilot Test Injection Treatment Areas
Groundwater Remedy Selection Report
Plant Barry

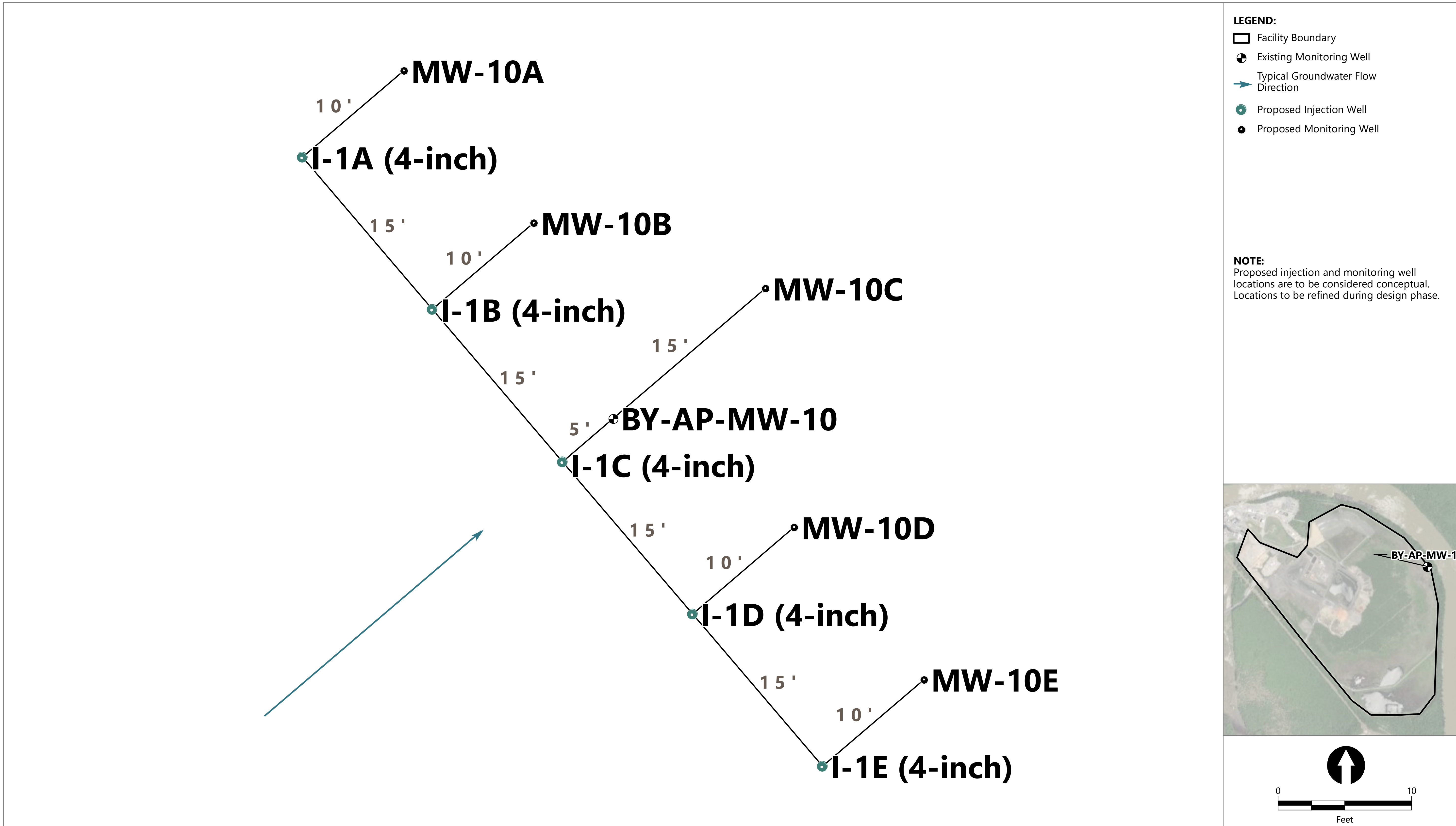

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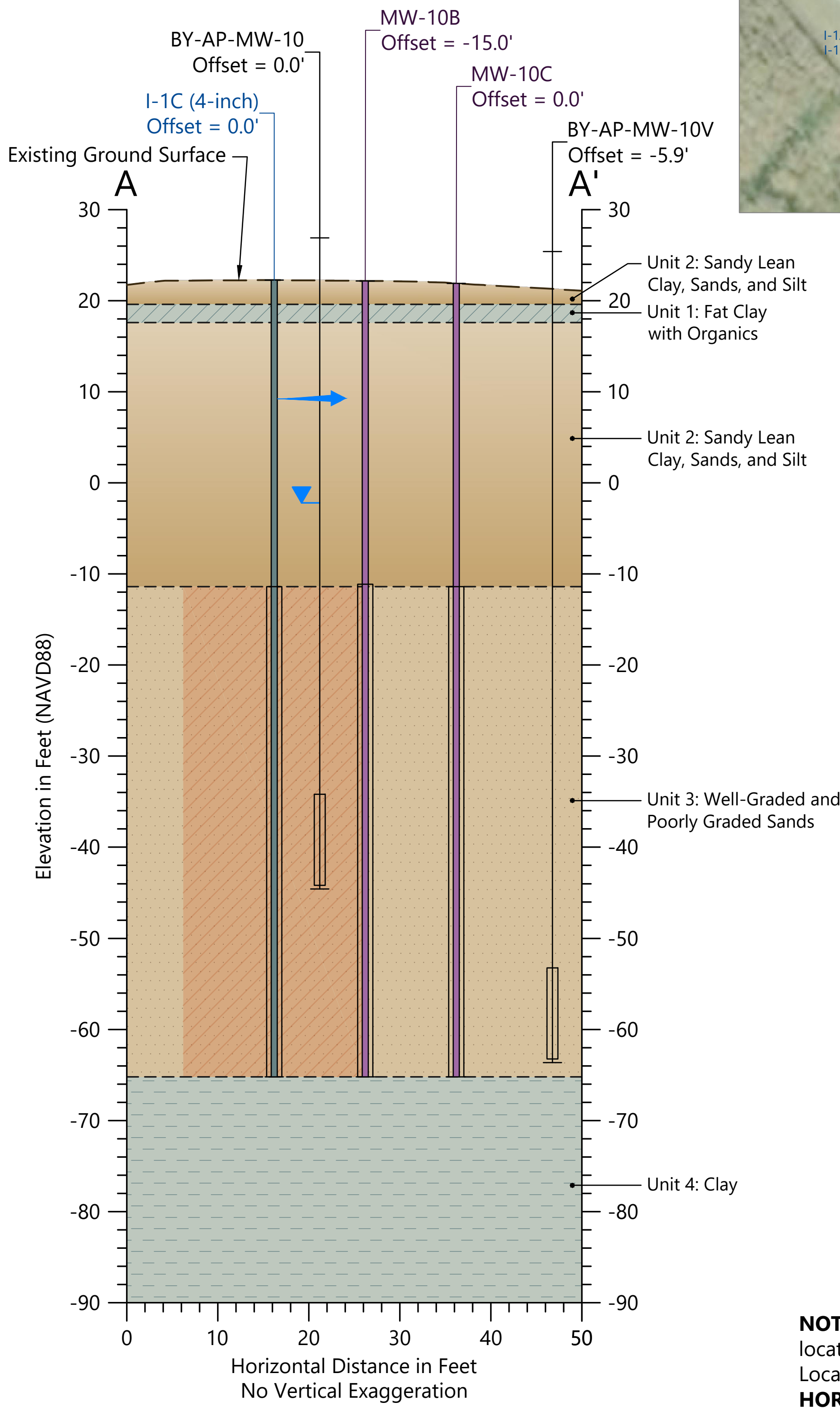
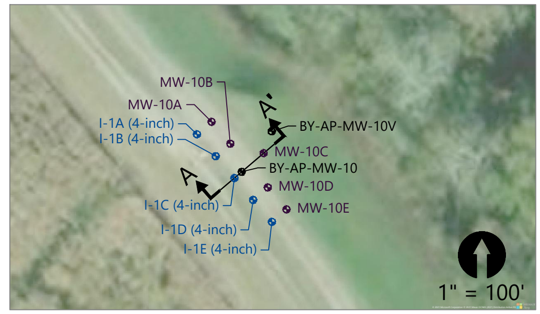
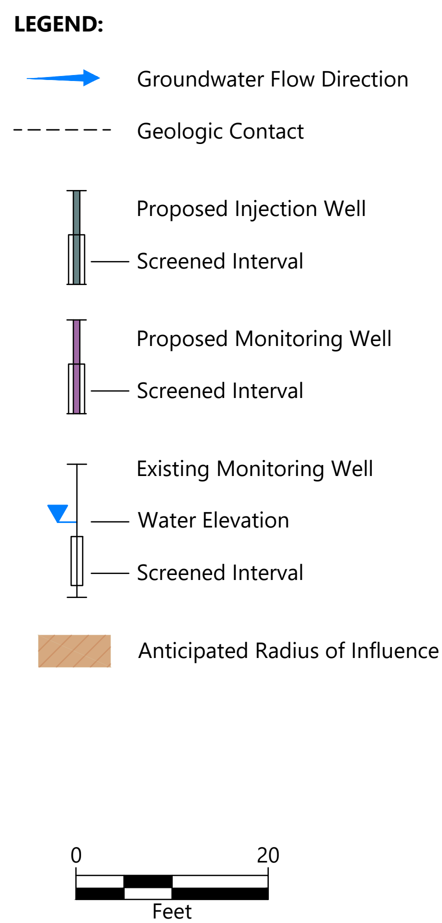
Figure 9
Pilot Test Injection and Monitoring (Plan View): BY-AP-MW-10
Groundwater Remedy Selection Report
Plant Barry







NOTE: Proposed injection and monitoring well locations are to be considered conceptual. Locations to be refined during design phase.
HORIZONTAL DATUM: Alabama State Plane West Zone, NAD83, U.S. Survey Feet
VERTICAL DATUM: NAVD88

Publish Date: 2021/10/14 8:04 AM | User: hmerrick
Filepath: K:\Projects\1114-Southern Company\Barry\Groundwater Remedy Selection Report\1114-RP-002 (Barry Inj Well Sections).dwg Figure 10

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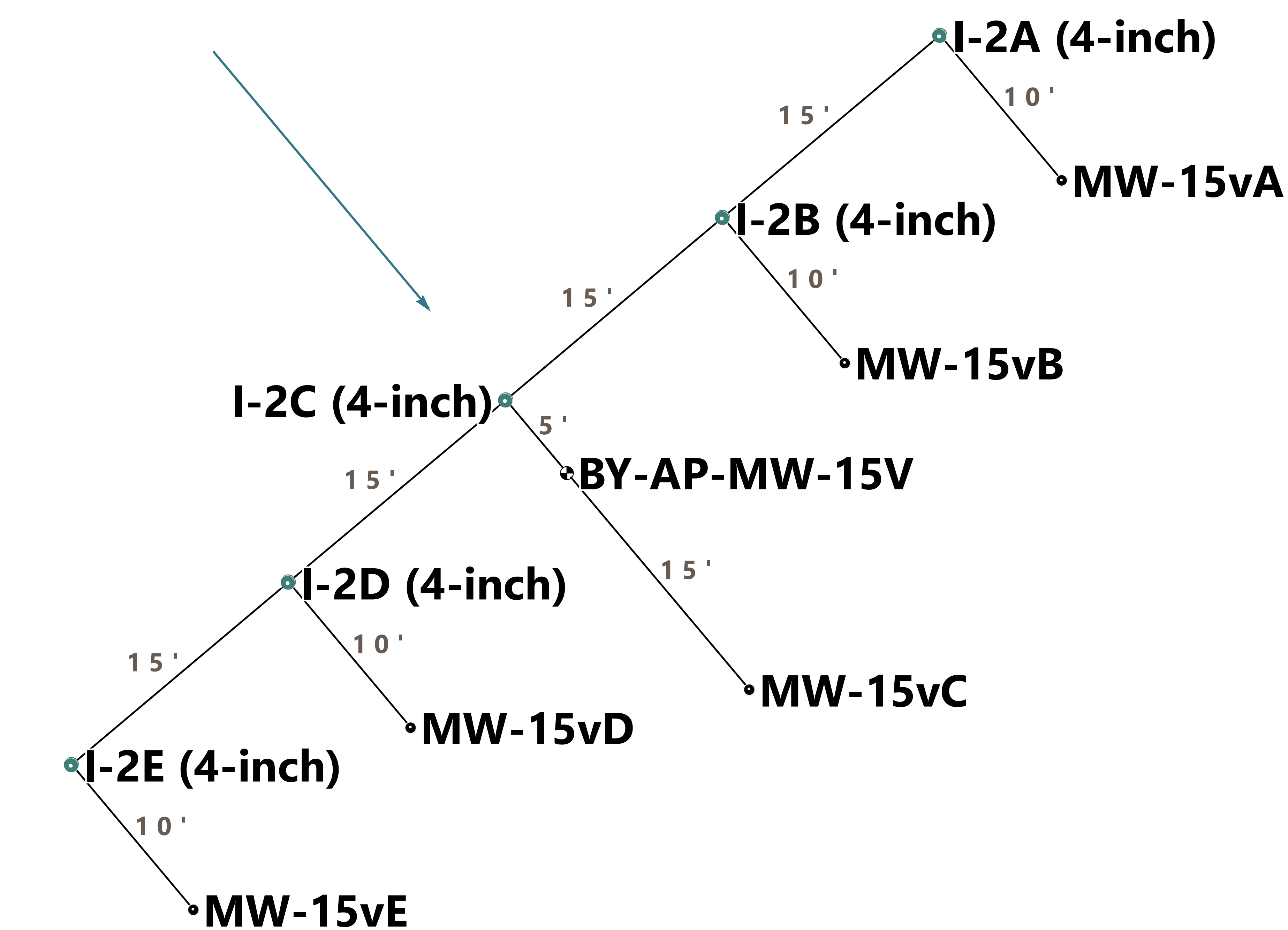
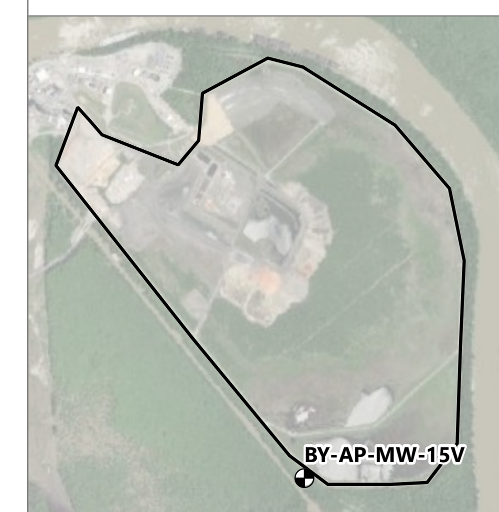
Figure 10
Pilot Test Injection and Monitoring (Cross Section): BY-AP-MW-10



LEGEND:
- Facility Boundary
- Existing Monitoring Well
- Typical Groundwater Flow Direction
- Proposed Injection Well
- Proposed Monitoring Well

NOTE:
Proposed injection and monitoring well locations are to be considered conceptual. Locations to be refined during design phase.



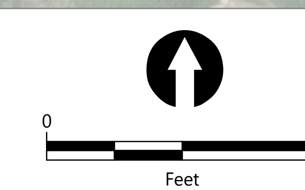


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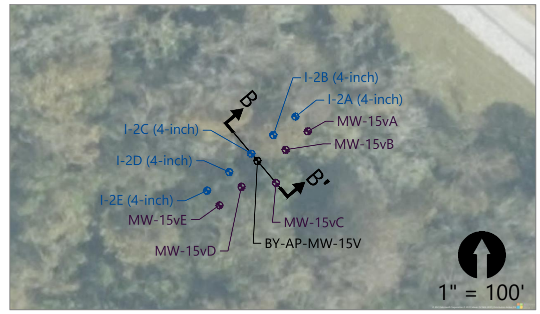
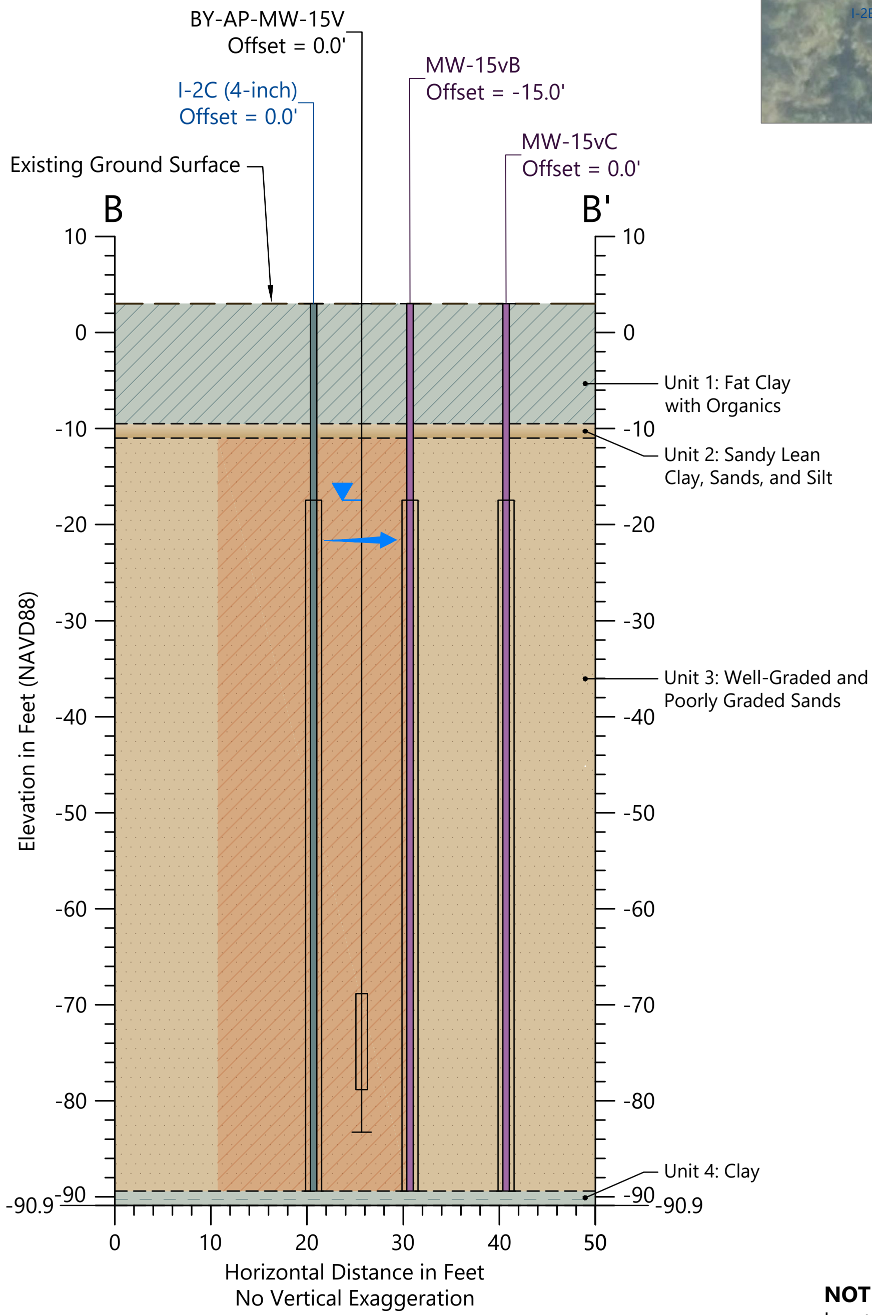
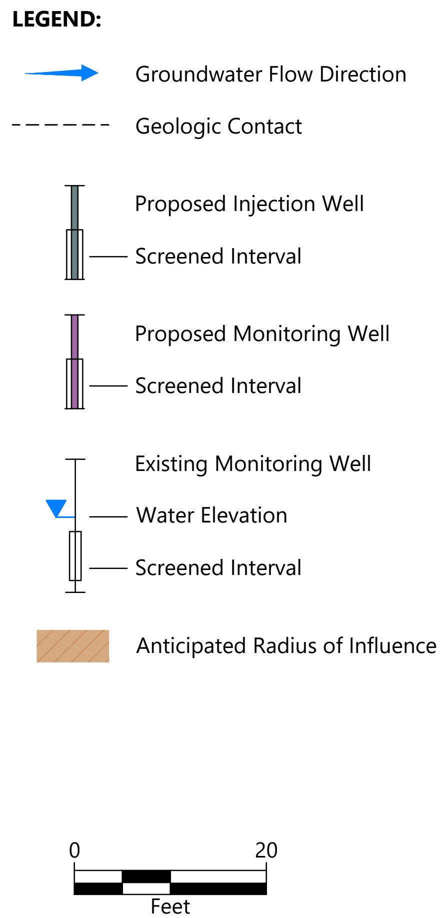
Figure 11
Pilot Test Injection and Monitoring (Plan View): BY-AP-MW-15V
Groundwater Remedy Selection Report
Plant Barry







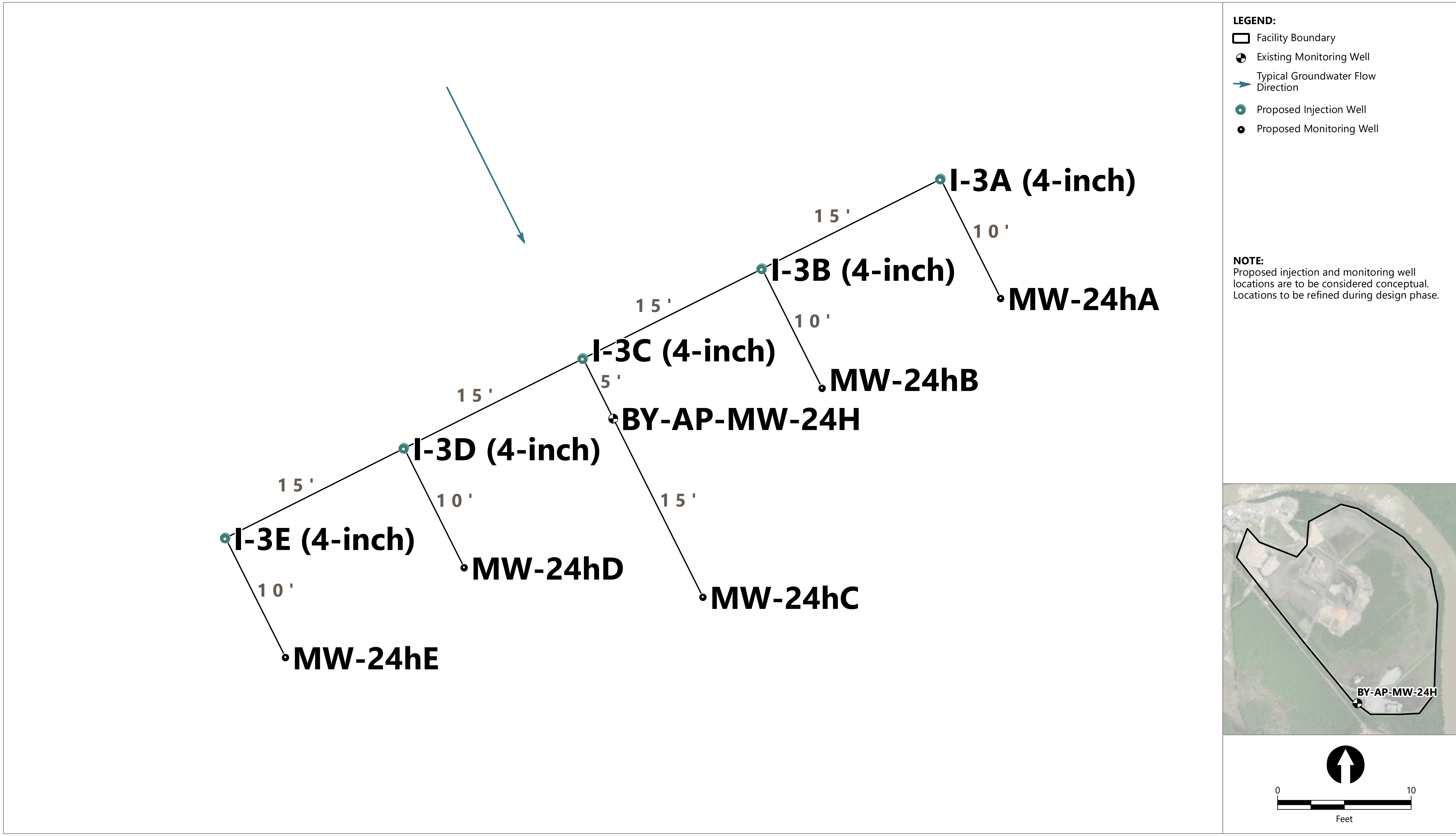
NOTE: Proposed injection and monitoring well locations are to be considered conceptual. Locations to be refined during design phase.
HORIZONTAL DATUM: Alabama State Plane West Zone, NAD83, U.S. Survey Feet
VERTICAL DATUM: NAVD88

Publish Date: 2021/10/14 8:04 AM | User: hmerrick
Filepath: K:\Projects\1114-Southern Company\Barry\Groundwater Remedy Selection Report\1114-RP-002 (Barry Inj Well Sections).dwg Figure 12

ANCHOR QEA

Figure 12
Pilot Test Injection and Monitoring (Cross Section): BY-AP-MW-15V

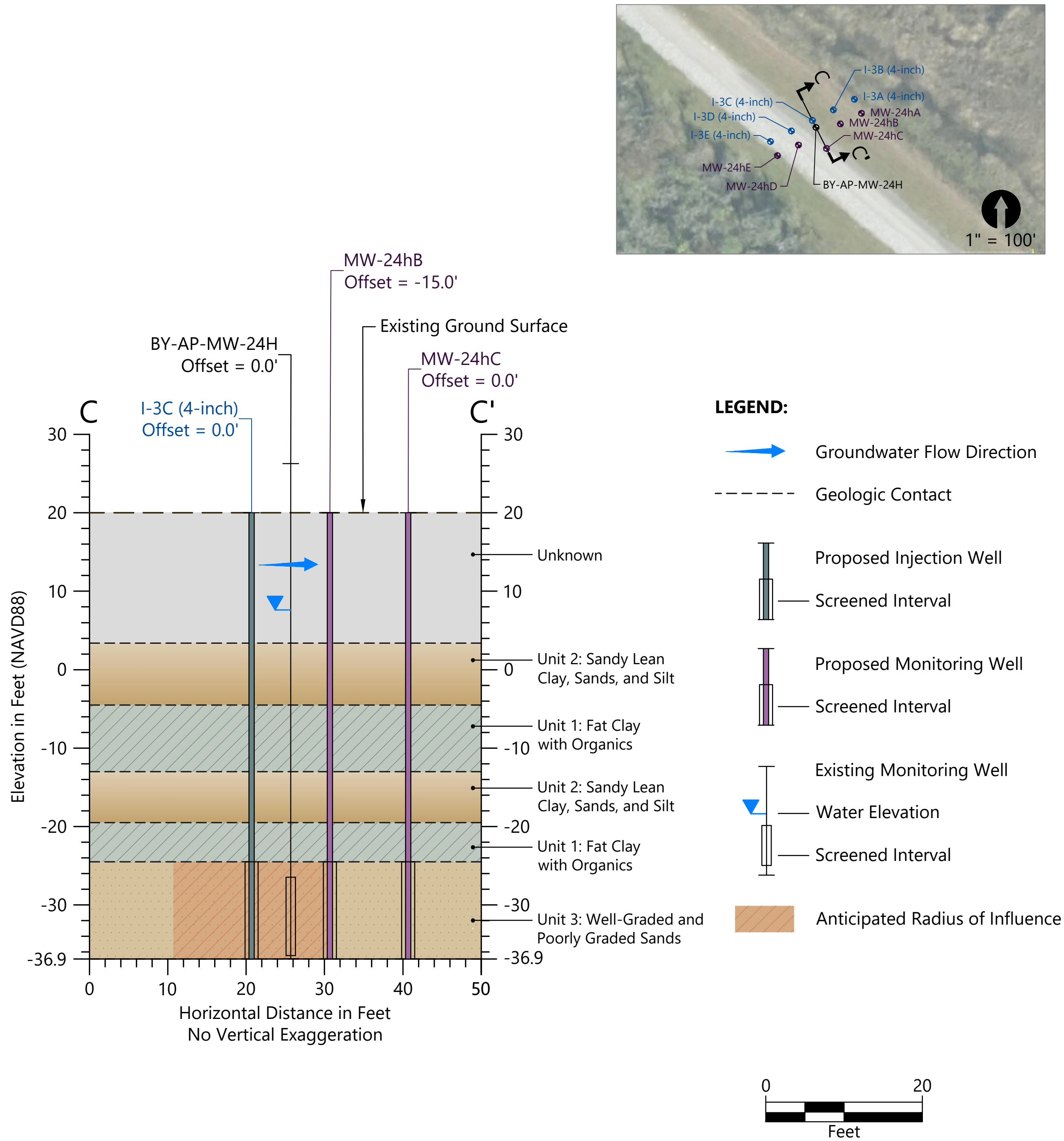
Groundwater Remedy Selection Report
Plant Barry



Publish Date: 2021/10/27, 3:41 PM | User: jquinley
Filepath: \\orcas\GIS\Jobs\SouthernCompany_1114\PlantBarry\Maps\2021_GW_Remedy_Selection\AQ_PlantBarry_Figure09_11_13_Injection_Treatment_Layouts.mxd

ANCHOR QEA

Figure 13
Pilot Test Injection and Monitoring (Plan View): BY-AP-MW-24H
Groundwater Remedy Selection Report
Plant Barry



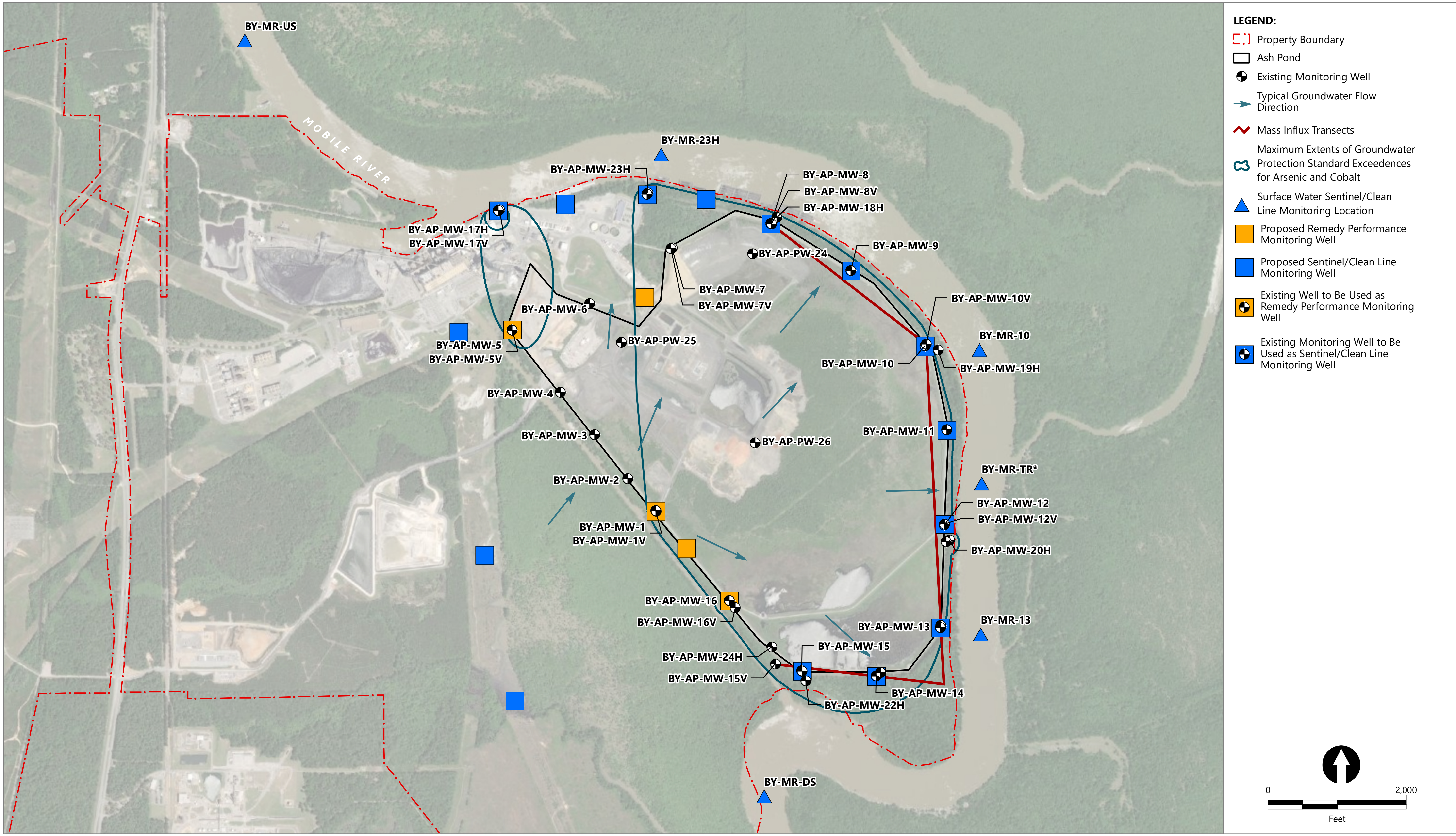
NOTE: Proposed injection and monitoring well locations are to be considered conceptual. Locations to be refined during design phase.
HORIZONTAL DATUM: Alabama State Plane West Zone, NAD83, U.S. Survey Feet
VERTICAL DATUM: NAVD88

Publish Date: 2021/10/14 8:05 AM | User: hmerrick
Filepath: K:\Projects\1114-Southern Company\Barry\Groundwater Remedy Selection Report\1114-RP-002 (Barry Inj Well Sections).dwg Figure 14

ANCHOR QEA

Figure 14
Pilot Test Injection and Monitoring (Cross Section): BY-AP-MW-24H

Groundwater Remedy Selection Report
Plant Barry



Publish Date: 2021/10/28, 1:05 PM | User: jquinley
Filepath: \\orcas\GIS\Jobs\SouthernCompany_1114\PlantBarry\Maps\2021_GW_Remedy_Selection\AQ_PlantBarry_Figure15_Conceptual_Corrective_Action_Plan.mxd

ANCHOR QEA

Figure 15
Conceptual Corrective Action Monitoring Plan
Groundwater Remedy Selection Report
Plant Barry

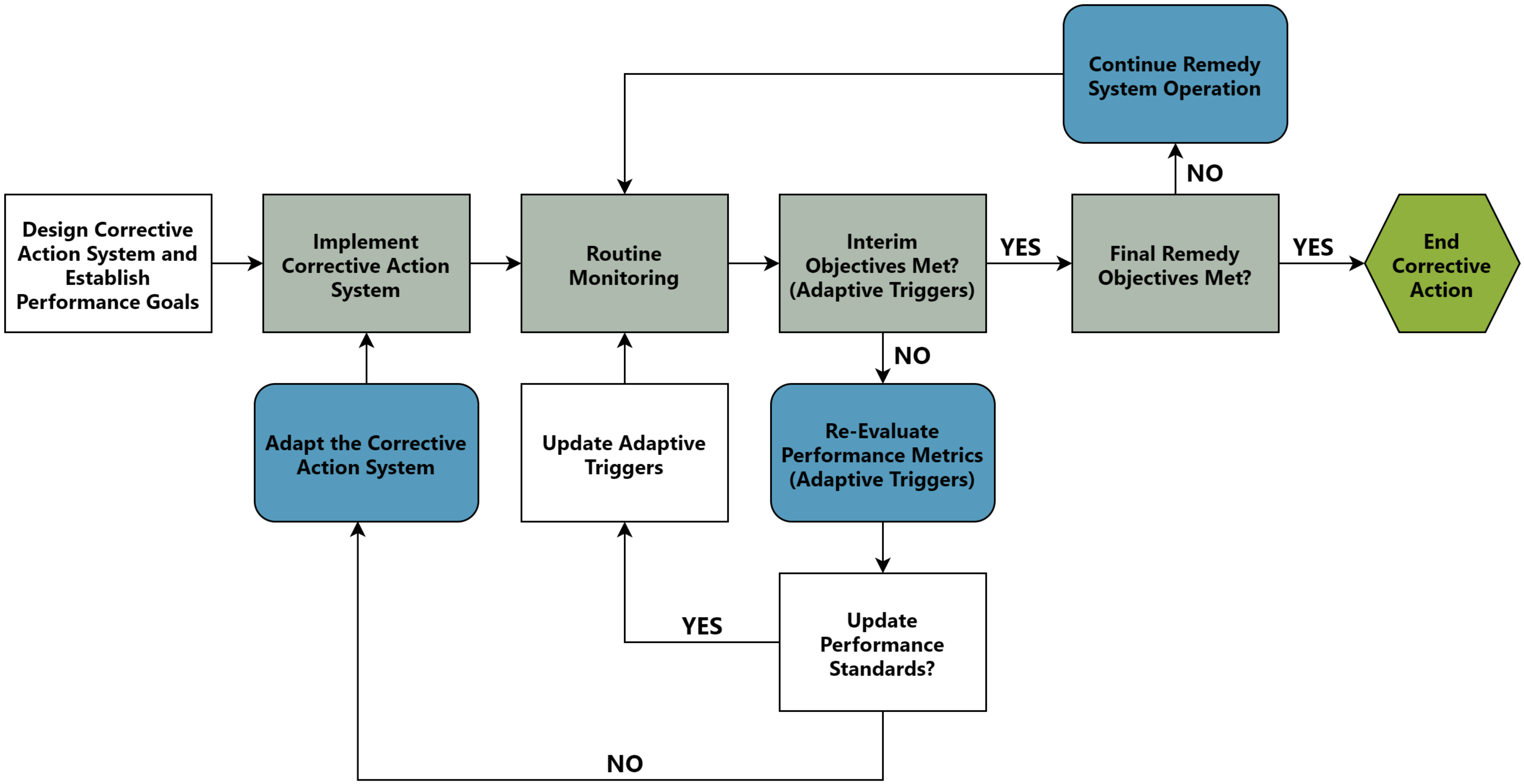


Figure 16
Adaptive Site Management Framework

Before UIC Permit Submittal	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
Collect soil and groundwater samples for treatability studies	■	■								
Conduct batch studies for reagents and doses			■	■						
Conduct column studies for effectiveness					■	■	■			
Prepare Class V UIC Permit								■	■	■

After Class V UIC Permit Approval	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	Y2	Y3	Y4
Design field implementation of injection treatment	■	■	■												
Refine delineation in the field		■													
Phase 1 (Pilot): field implementation (well installation and injections)				■	■	■	■								
Phase 1 (Pilot): collect and analyze remedial effectiveness monitoring data								■	■	■	■	■	■		
Phase 2 injections: field implementation														■	
Phase 2 injections: collect and analyze remedial effectiveness monitoring data														■	■

Notes:
M: month
UIC: Underground Injection Control
Y: year

Appendix A
Certificate of Authorization

State of Alabama

Board of Licensure for Professional Engineers and Land Surveyors

This is to certify that

ANCHOR QEA LLC

Having given satisfactory evidence of the necessary qualifications required by law has been duly certificated and is hereby issued Certificate of Authorization

CA- 5073 -E

authorizing the firm to provide or offer to provide

Engineering

services in the State of Alabama through individual licensed professional licensees as agents, employees, officers or partners.

This certificate requires the firm to operate in the State of Alabama as

ANCHOR QEA LLC

This certificate will lapse January 31, 2022 unless renewed.

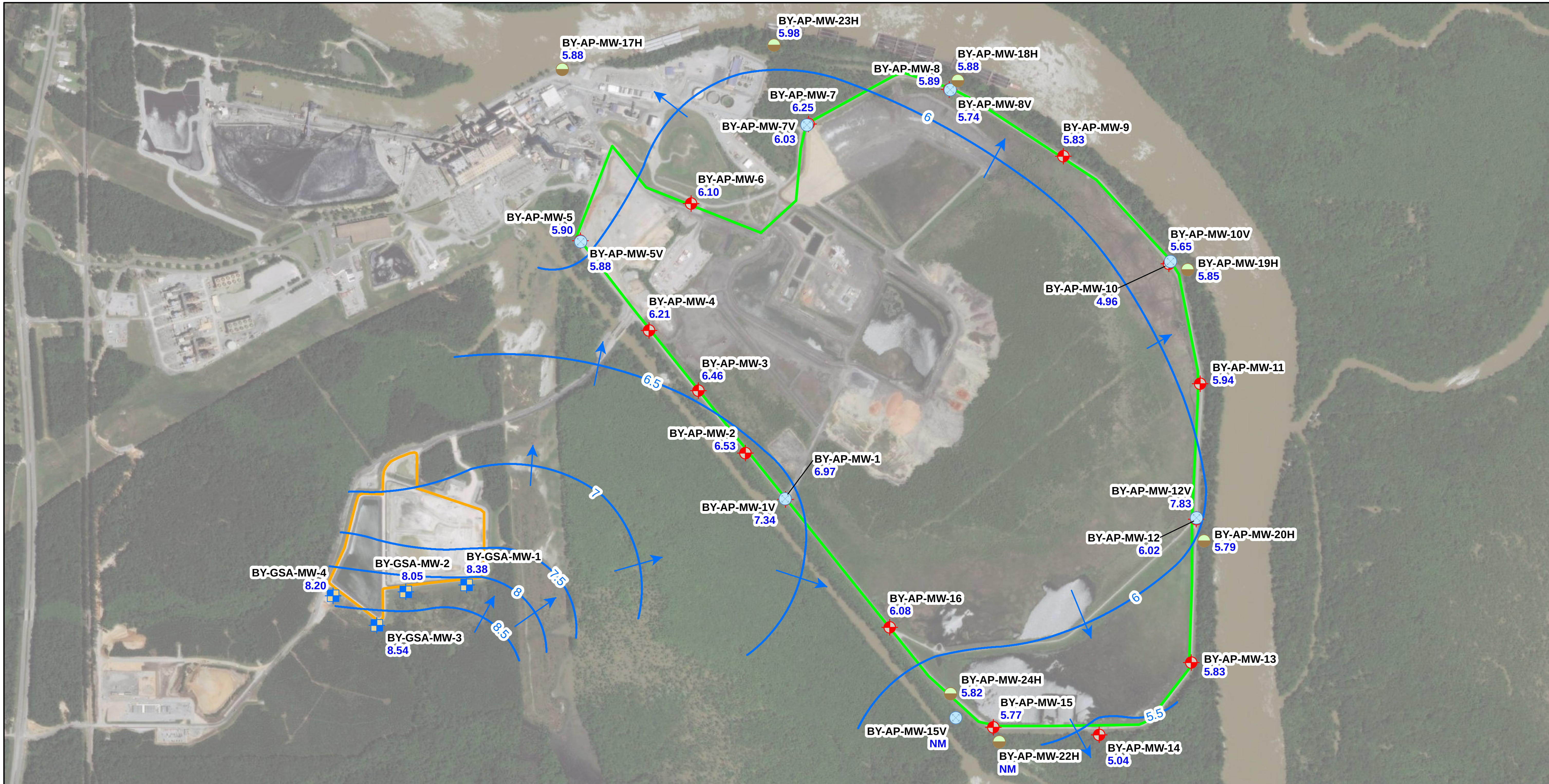
In Testimony whereof, witness the signature of the Executive Director under seal of the Board on November 02, 2020

William R. Huett

Executive Director

RECEIPT NO.
20201102000023800

Appendix B
Potentiometric Surface Maps



Legend

- Downgradient Monitoring Well
- Upgradient Monitoring Well
- Phase I Horizontal Delineation Monitoring Well
- Phase II Vertical Delineation Monitoring Well
- Approximate Groundwater Flow Direction
- Potentiometric Surface Contour (ft NAVD88)
- Ash Pond Boundary
- Gypsum Pond Boundary

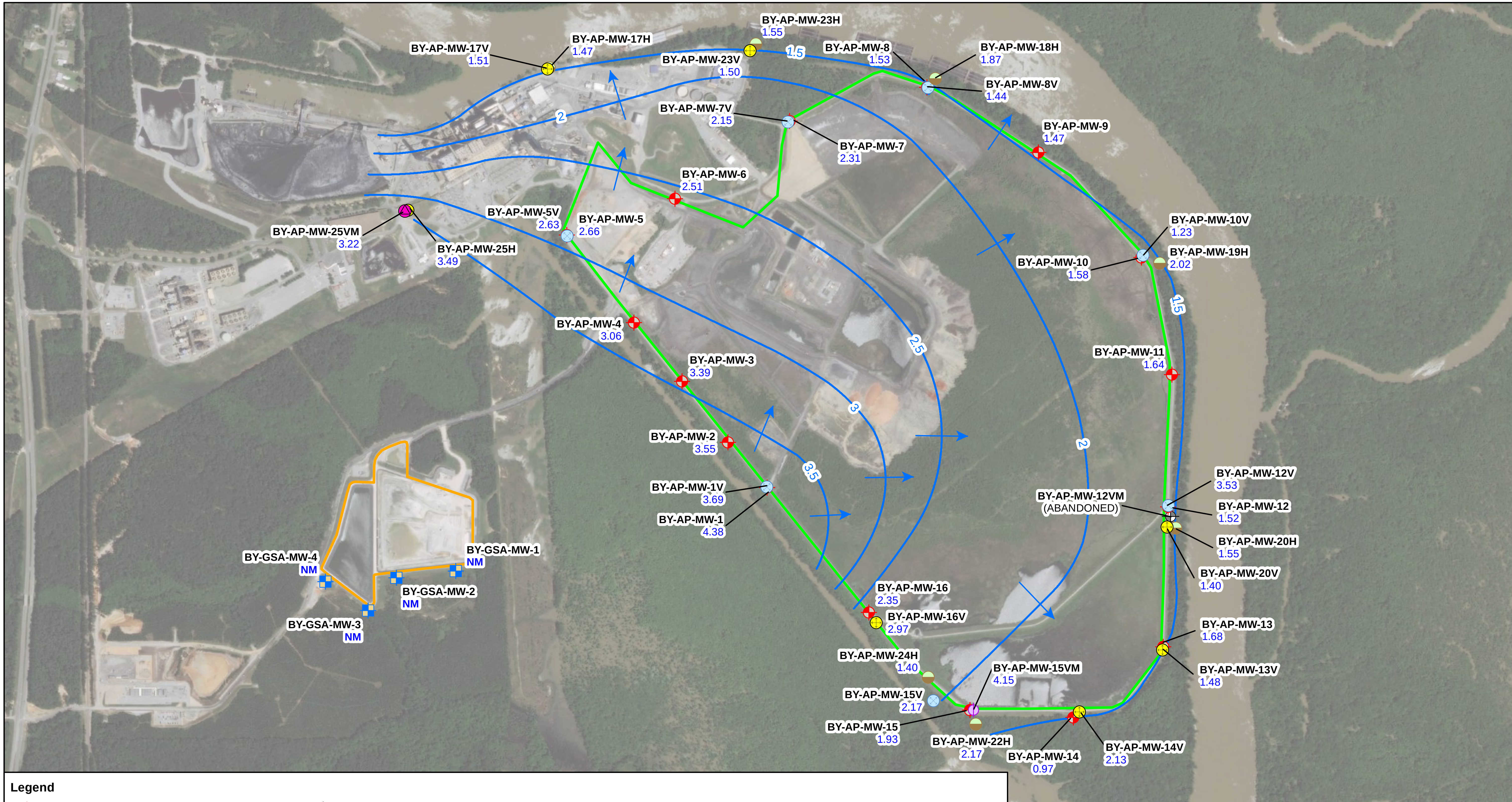
BY-AP-MW-1 Well ID
6.97 Groundwater Elevation

N

0 1,000 2,000 4,000 Feet

NOTES:
1. NAVD88 indicates North American Vertical Datum of 1988.
2. MW-15V and MW-22H were unable to be accessed due to surface flooding conditions.
3. MW-1 was not factored into groundwater elevation contours, because groundwater elevations observed in MW-1 indicate that screened interval is semi-confined from others in the network.
4. MW-10 was not factored into groundwater elevation contours, because groundwater elevations observed in MW-10 indicate that screened interval is semi-confined from others in the network.
5. MW-12V was not factored into groundwater elevation contours, because of its anomalously high groundwater elevation. Because of this anomalously high groundwater elevation value, the accuracy of the surveyed top of casing elevation of MW-12V is being evaluated.

SCALE 1:12000	DRAWING TITLE POTENTIOMETRIC SURFACE CONTOUR MAP MARCH 30, 2020 PLANT BARRY ASH POND
DATE 10/16/2020	
DRAWN BY KAR	FIGURE NO **FIGURE 6A**
CHECKED BY GBD	Southern Company



Legend

- Downgradient Monitoring Well
- Upgradient Monitoring Well
- Phase I Horizontal Delineation Well
- Phase I Vertical Delineation Well
- Phase II Vertical Delineation Well (Miocene Series)
- Phase II Vertical Delineation Well
- Phase II Piezometer (Miocene Series)
- Abandoned Soil Boring
- Approximate Groundwater Flow Direction
- Potentiometric Surface Contour (ft NAVD88)
- Ash Pond Boundary
- Gypsum Pond Boundary

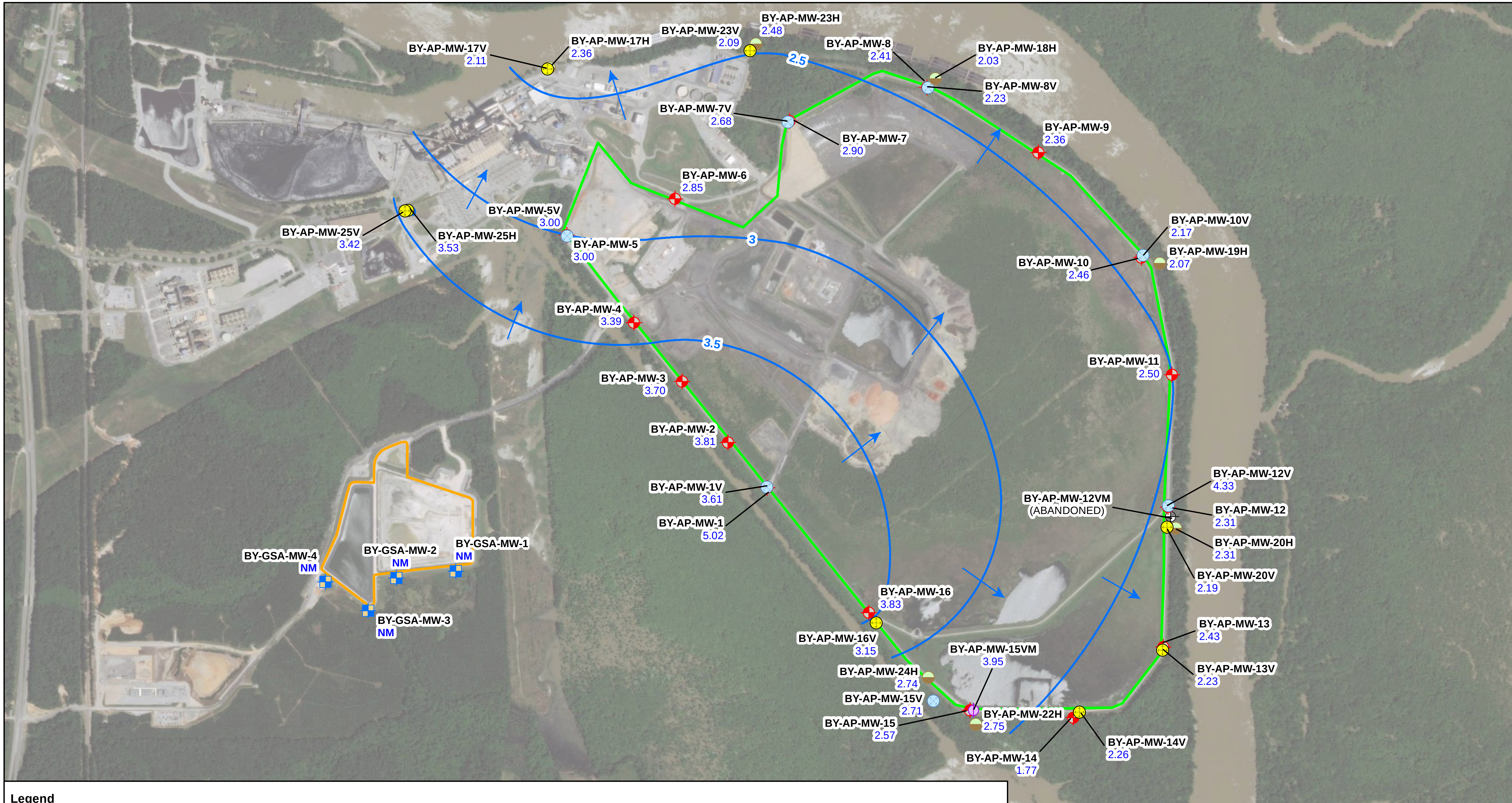
BY-AP-MW-1 Well ID
4.38 Groundwater Elevation

N

0 500 1,000 2,000 3,000 Feet

NOTES:
1. NAVD88 indicates North American Vertical Datum of 1988.
2. NM indicates not measured.
3. Groundwater elevations monitored in compliance and horizontal delineation wells can vary slightly based on the screened interval within Unit 3 sands and presence of lower permeability material. Vertical delineation wells were not factored into contouring.

SCALE 1:12000	DRAWING TITLE POTENTIOMETRIC SURFACE CONTOUR MAP MAY 12, 2020 PLANT BARRY ASH POND
DATE 10/16/2020	
DRAWN BY KWR	FIGURE NO **FIGURE 6B**
CHECKED BY GBD	Southern Company



Legend

- Downgradient Monitoring Well
- Upgradient Monitoring Well
- Phase I Horizontal Delineation Well
- Phase I Vertical Delineation Well
- Phase II Vertical Delineation Well
- Phase II Piezometer (Miocene Series)
- Abandoned Soil Boring
- Potentiometric Surface Contour (ft NAVD88)
- Approximate Groundwater Flow Direction
- Ash Pond Boundary
- Gypsum Pond Boundary

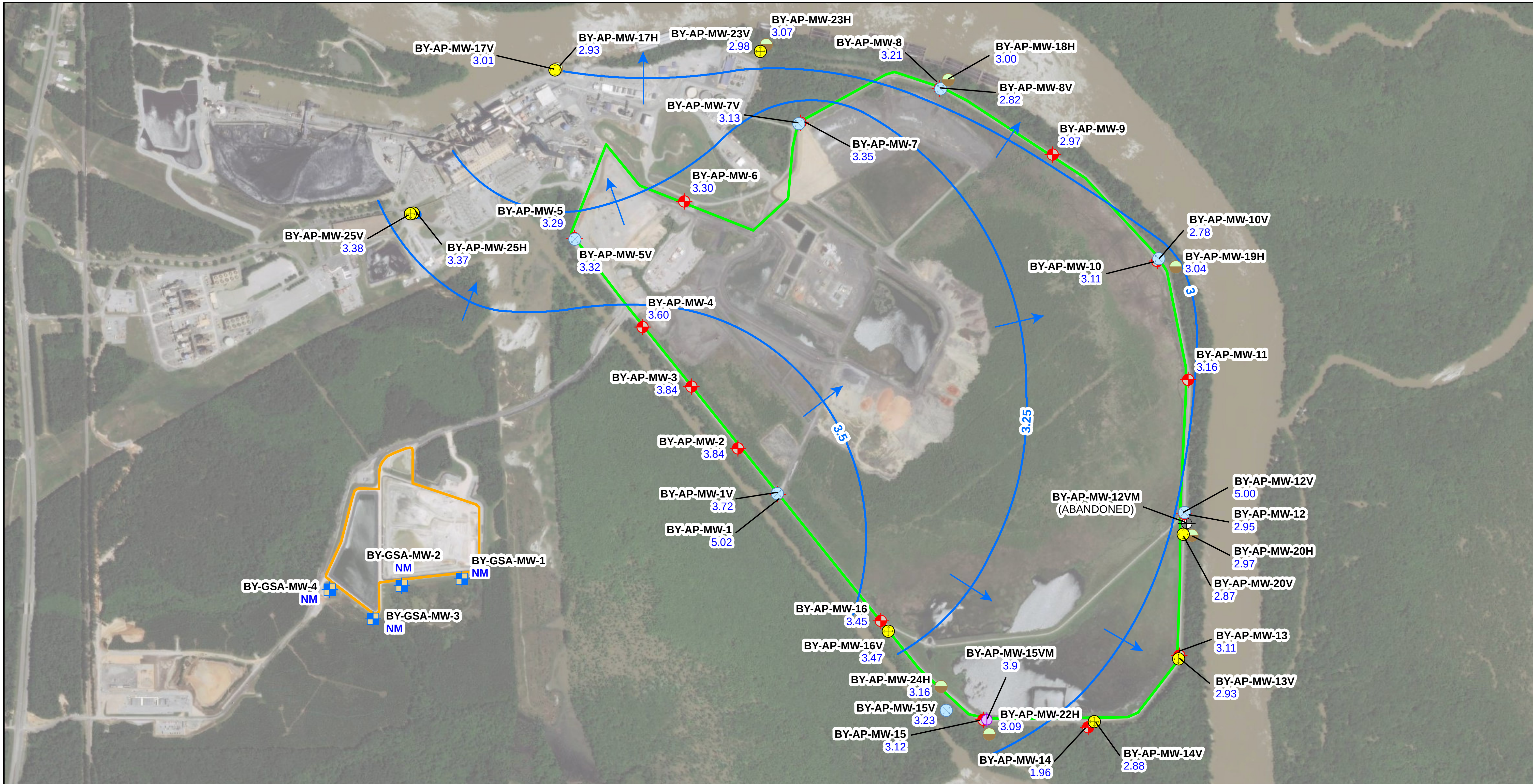
BY-AP-MW-1 Well ID
5.02 Groundwater Elevation

N

0 500 1,000 2,000 3,000 Feet

NOTES:
1. NAVD88 indicates North American Vertical Datum of 1988.
2. NM indicates not measured.
3. Groundwater elevations monitored in compliance and horizontal delineation wells can vary slightly based on the screened interval within Unit 3 sands and presence of lower permeability material. Vertical delineation wells were not factored into contouring.

SCALE 1:12000	DRAWING TITLE POTENTIOMETRIC SURFACE CONTOUR MAP JUNE 15, 2020 PLANT BARRY ASH POND
DATE 10/16/2020	
DRAWN BY KWR	FIGURE NO **FIGURE 6C**
CHECKED BY GBD	Southern Company



Legend

- Downgradient Monitoring Well
- Upgradient Monitoring Well
- Phase I Horizontal Delineation Well
- Phase I Vertical Delineation Well
- Phase II Vertical Delineation Well
- Phase II Piezometer (Miocene Series)
- Abandoned Soil Boring
- Potentiometric Surface Contour (ft NAVD88)
- Approximate Groundwater Flow Direction
- Ash Pond Boundary
- Gypsum Pond Boundary
- BY-AP-MW-1 Well ID
- 5.02 Groundwater Elevation

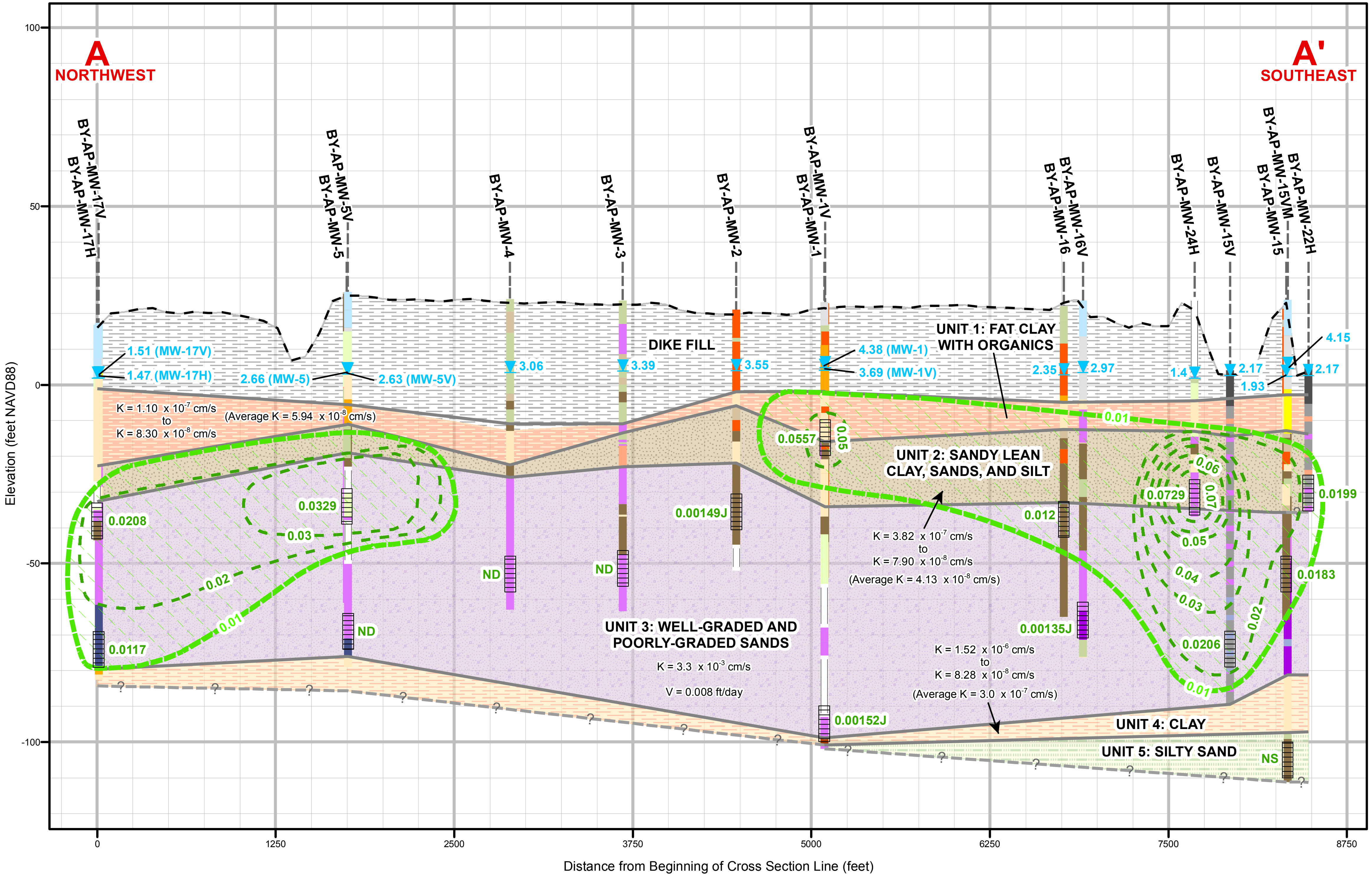
N

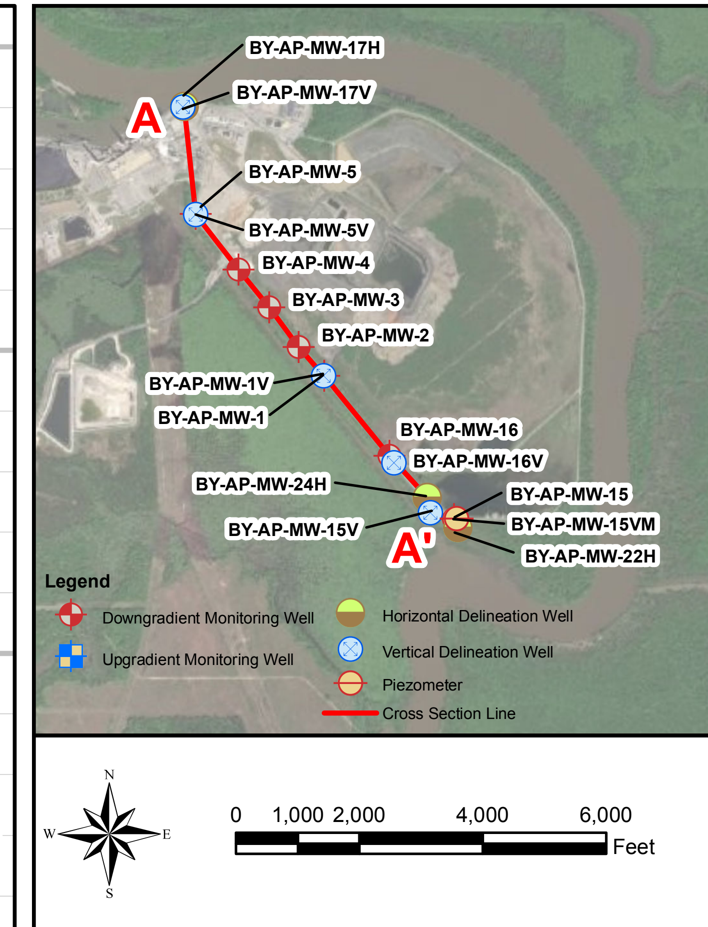
0 500 1,000 2,000 3,000 Feet

NOTES:
1. NAVD88 indicates North American Vertical Datum of 1988.
2. NM indicates not measured.
3. Groundwater elevations monitored in compliance and horizontal delineation wells can vary slightly based on the screened interval within Unit 3 sands and presence of lower permeability material. Vertical delineation wells were not factored into contouring.

SCALE 1:12000	DRAWING TITLE: POTENTIOMETRIC SURFACE CONTOUR MAP AUGUST 31, 2020 PLANT BARRY ASH POND
DATE 10/26/2020	
DRAWN BY KWR	FIGURE NO **FIGURE 6D**
CHECKED BY GBD	Southern Company

Appendix C
Concentrations Along Geologic Cross Sections





Notes:
1. Source of ground surface elevation data: Lidar
2. NAVD88 indicates North American Vertical Datum of 1988.
3. Groundwater elevations were measured on May 12, 2020.
4. Water samples were collected between March 30 and April 1, 2020 (MW-1, MW-1V, MW-2, MW-3, MW-4, MW-5, MW-5V, MW-17H), on May 12, 2020 (MW-15V and MW-22H), and on June 16, 2020 (MW-16V and MW-17V).
5. mg/L indicates milligrams per liter.
6. J indicates a laboratory estimated concentration between the analytical method detection limit and the laboratory reporting limit.
7. ND indicates not detected above the laboratory method detection limit.
8. NS indicates not sampled.
9. GWPS indicates groundwater protection standard.
10. K indicates hydraulic conductivity.
11. Units 1, 2, and 4 hydraulic conductivity calculated from Shelby tube permeameter testing on undistrubed soil samples.
12. Unit 3 hydraulic conductivity calculated from long duration pumping test data.
13. V indicates groundwater flow velocity.
14. Vertical exaggeration: 25x.

Legend

- Groundwater Elevation
- Well Location
- Ground Surface Elevation
- Screen Interval
- Unit Boundary (inferred)
- Unit Boundary
- Arsenic Concentration (mg/L)
- Arsenic GWPS (mg/L)
- Area Exceeding GWPS for Arsenic
- 0.0208 Arsenic Concentration (mg/L)
- 0.01 Arsenic GWPS (mg/L)

Borehole Description

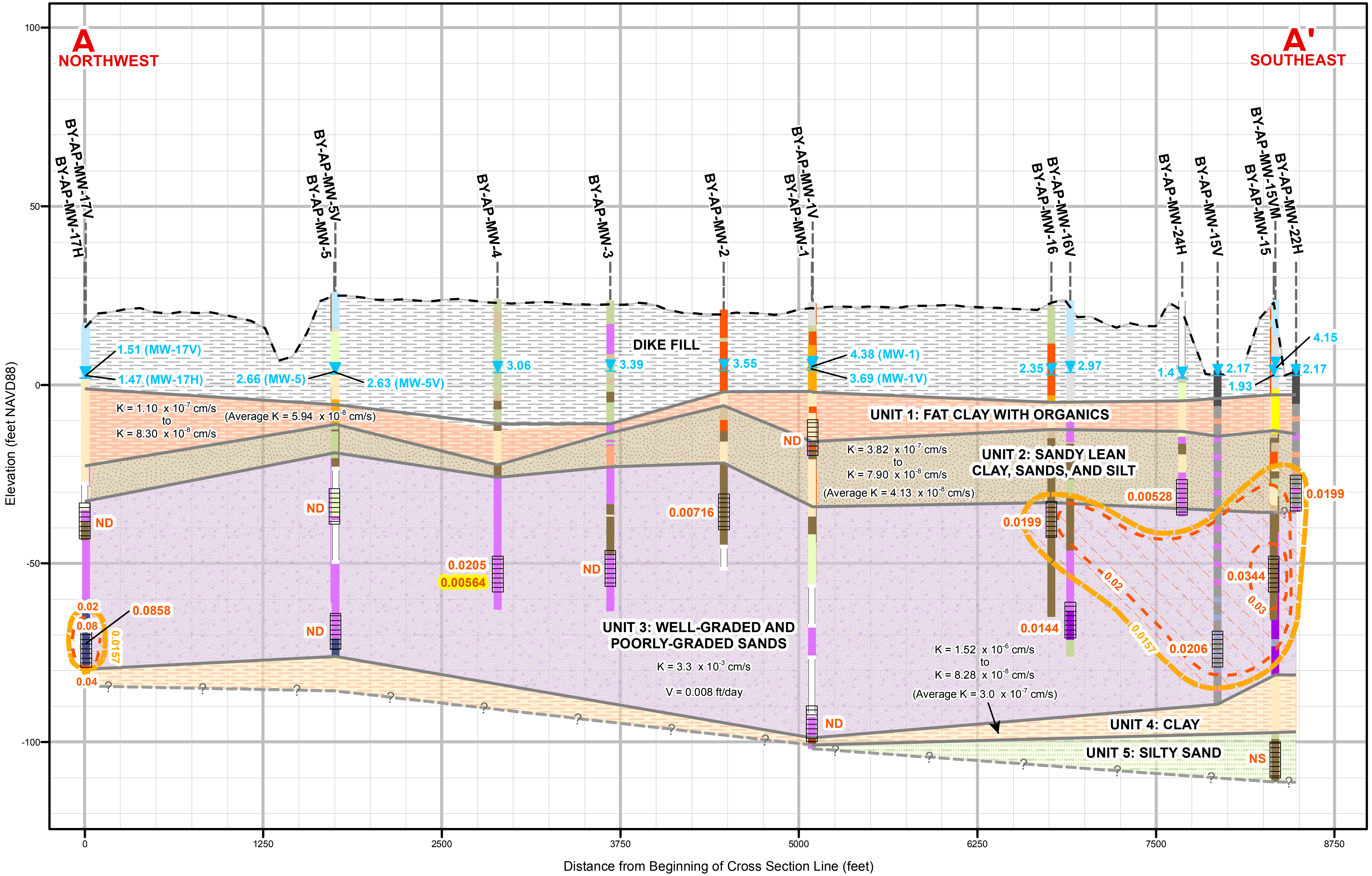
- Hydroexcavation
- Hand Auger
- No Data
- No Recovery
- Fill
- Organic Soil
- Fat Clay
- Lean Clay
- Sandy Fat Clay
- Sandy Lean Clay
- Gravelly Fat Clay
- Silt
- Sandy Silt
- Clayey Sand
- Silty Sand
- Well-graded and Poorly-graded Sands
- Well-graded Gravelly Sand
- Well-graded and Poorly-graded Gravels
- Well-graded Gravel with Sand and/or Silt

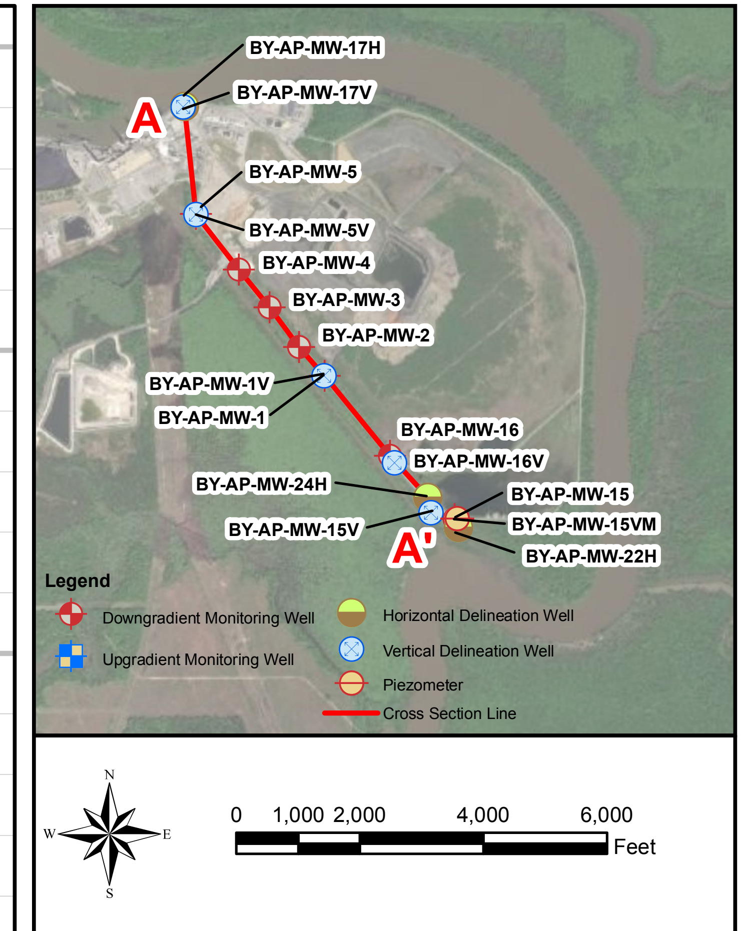
Geologic Unit

- Fill
- Unit 1: Fat Clay with Organics
- Unit 2: Sandy Lean Clay, Sands, and Silt
- Unit 3: Well-graded and Poorly-graded Sands
- Unit 4: Clay
- Unit 5: Silty Sand

SCALE	As Shown
DATE	9/19/2020
DRAWN BY	KWR
CHECKED BY	GBD
DRAWING TITLE	ARSENIC CONCENTRATIONS ALONG GEOLOGIC CROSS SECTION A - A' PLANT BARRY ASH POND
FIGURE NO	FIGURE 9A

Southern Company





Notes:
1. Source of ground surface elevation data: Lidar
2. NAVD88 indicates North American Vertical Datum of 1988.
3. Groundwater elevations were measured on May 12, 2020.
4. Water samples were collected between March 30 and April 1, 2020 (MW-1, MW-1V, MW-2, MW-3, MW-4, MW-5, MW-5V, MW-17H), on May 12, 2020 (MW-15V and MW-22H), and on June 16, 2020 (MW-16V and MW-17V).
5. mg/L indicates milligrams per liter.
6. J indicates a laboratory estimated concentration between the analytical method detection limit and the laboratory reporting limit.
7. ND indicates not detected above the laboratory method detection limit.
8. NS indicates not sampled.
9. GWPS indicates groundwater protection standard.
10. The average cobalt concentration for MW-4 was derived using concentration data from water samples collected between March 1, 2016 and March 31, 2020.
11. K indicates hydraulic conductivity.
12. Units 1, 2, and 4 hydraulic conductivity calculated from Shelby tube permeameter testing on undistrubed soil samples.
13. Unit 3 hydraulic conductivity calculated from long duration pumping test data.
14. V indicates groundwater flow velocity.
15. Vertical exaggeration: 25x.

Legend

- Groundwater Elevation
- Well Location
- Ground Surface Elevation
- Screen Interval
- Unit Boundary (inferred)
- Unit Boundary
- Cobalt Concentration (mg/L)
- Cobalt GWPS (mg/L)
- Area Exceeding GWPS for Cobalt
- 0.0205 Cobalt concentration (mg/L)
- 0.00546 Average Cobalt Concentration (mg/L)
- 0.0157 Cobalt GWPS (mg/L)

Borehole Description

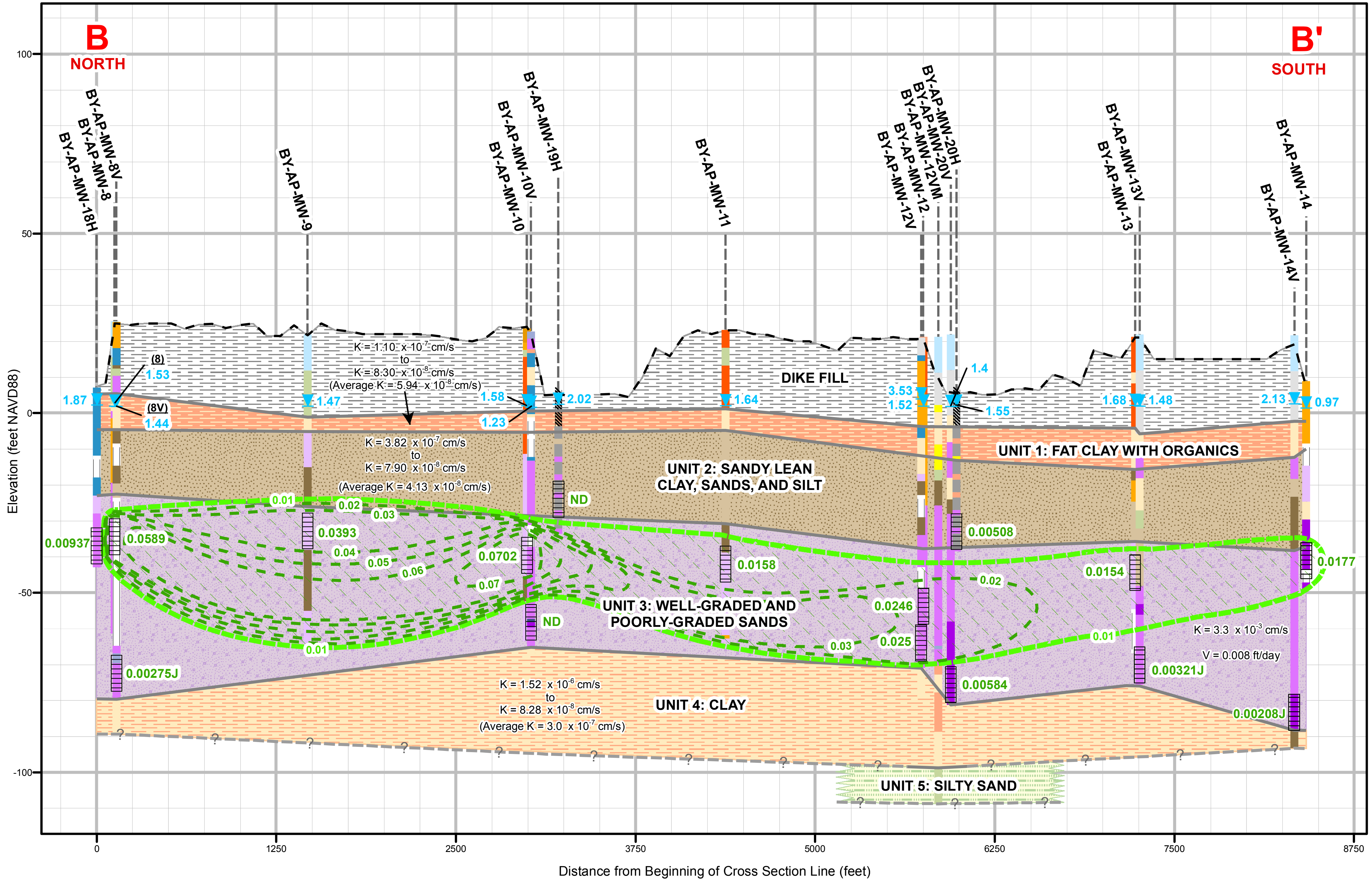
- Hydroexcavation
- Hand Auger
- No Data
- No Recovery
- Fill
- Organic Soil
- Fat Clay
- Lean Clay
- Sandy Fat Clay
- Sandy Lean Clay
- Gravelly Fat Clay
- Silt
- Sandy Silt
- Clayey Sand
- Silty Sand
- Well-graded and Poorly-graded Sands
- Well-graded Gravelly Sand
- Well-graded and Poorly-graded Gravels
- Well-graded Gravel with Sand and/or Silt

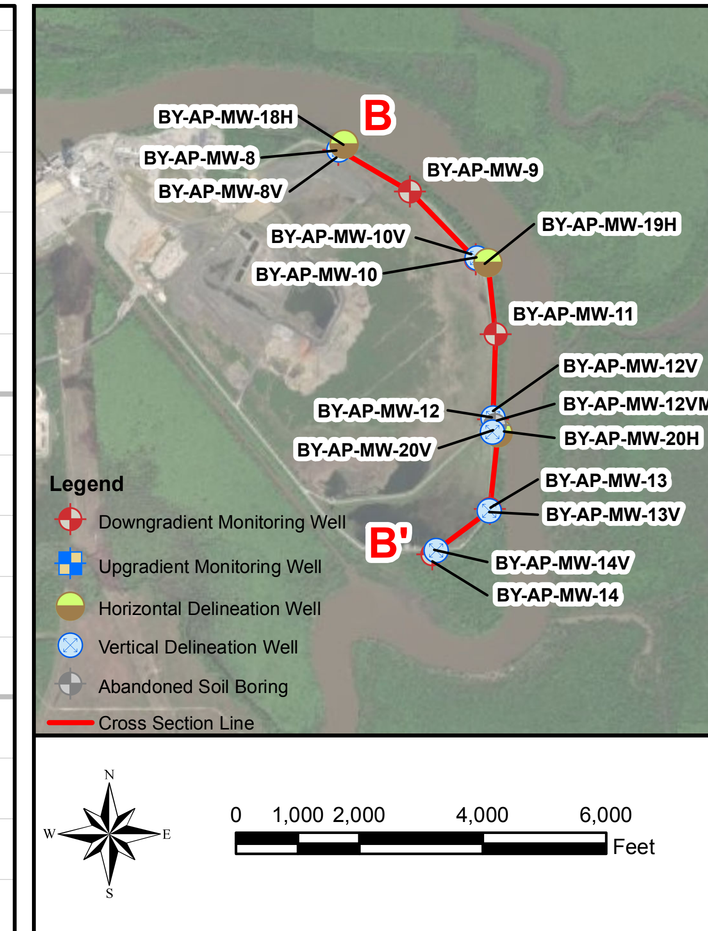
Geologic Unit

- Fill
- Unit 1: Fat Clay with Organics
- Unit 2: Sandy Lean Clay, Sands, and Silt
- Unit 3: Well-graded and Poorly-graded Sands
- Unit 4: Clay
- Unit 5: Silty Sand

SCALE	As Shown
DATE	9/20/2020
DRAWN BY	KWR
CHECKED BY	GBD
DRAWING TITLE	COBALT CONCENTATIONS ALONG GEOLOGIC CROSS SECTION A - A' PLANT BARRY ASH POND
FIGURE NO	FIGURE 9B

Southern Company





Notes:
1. Source of ground surface elevation data: Lidar
2. NAVD88 indicates North American Vertical Datum of 1988.
3. Groundwater elevations were measured on May 12, 2020.
4. Water samples were collected between March 30 and April 1, 2020 (MW-8, MW-8V, MW-9, MW-10, MW-10V, MW-11, MW-12, MW-12V, MW-14, MW-18H, MW-20H), on May 12, 2020 (MW-19H), and on June 17, 2020 (MW-13V, MW-14V and MW-20V).
5. mg/L indicates milligrams per liter.
6. J indicates a laboratory estimated concentration between the analytical method detection limit and the laboratory reporting limit.
7. ND indicates not detected above the laboratory method detection limit.
8. GWPS indicates groundwater protection standard.
9. K indicates hydraulic conductivity.
10. Units 1, 2, and 4 hydraulic conductivity calculated from Shelby tube permeameter testing on undistrubed soil samples.
11. Unit 3 hydraulic conductivity calculated from long duration pumping test data.
12. V indicates groundwater flow velocity.
13. Vertical exaggeration: 25x.

Legend

- Groundwater Elevation
- Well Location
- Ground Surface Elevation
- Screen Interval
- Unit Boundary (inferred)
- Unit Boundary
- Arsenic Concentration (mg/L)
- Arsenic GWPS (mg/L)
- Area Exceeding GWPS for Arsenic
- 0.0589 Arsenic Concentration (mg/L)
- 0.01 Arsenic GWPS (mg/L)

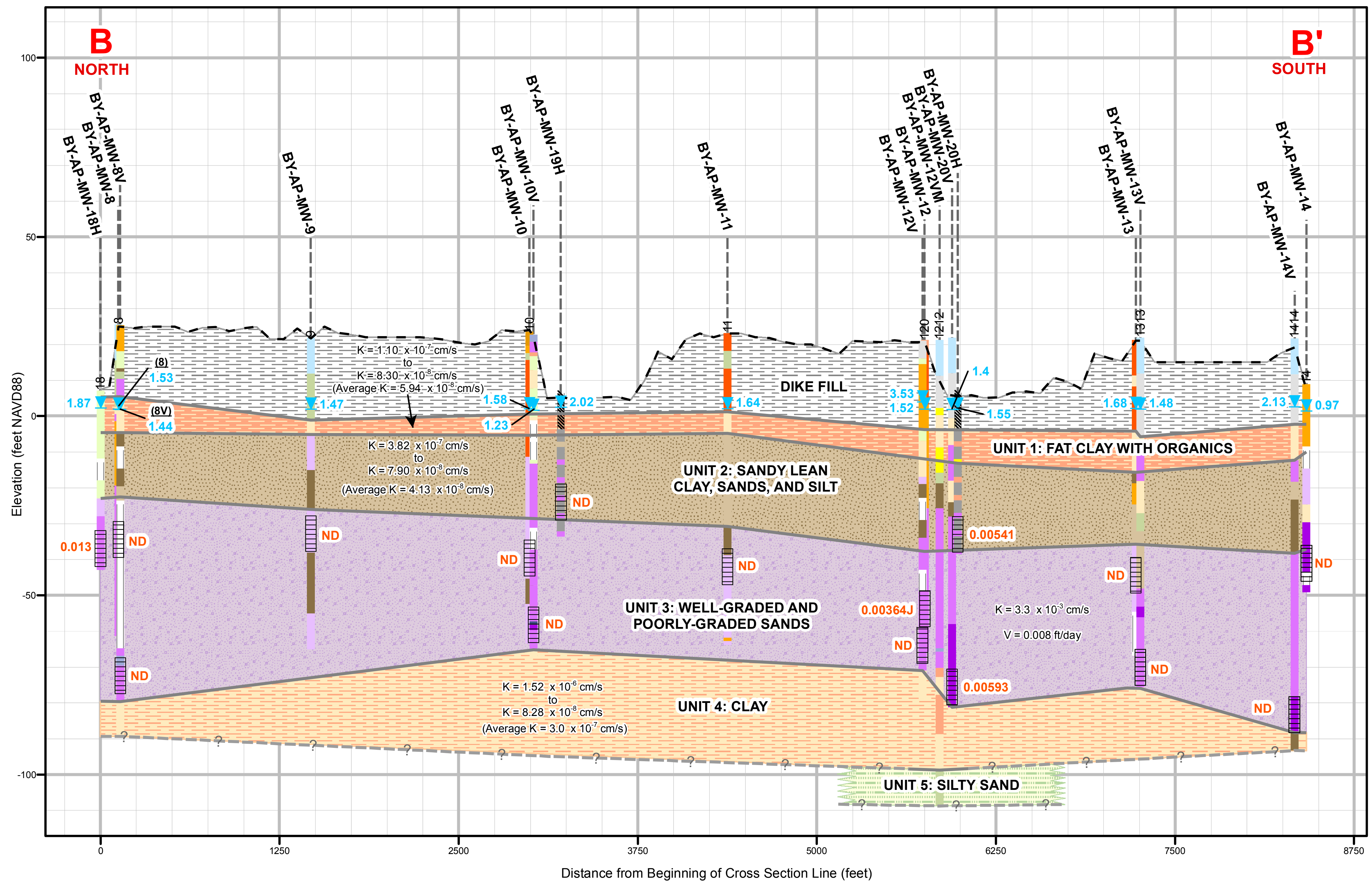
Borehole Description

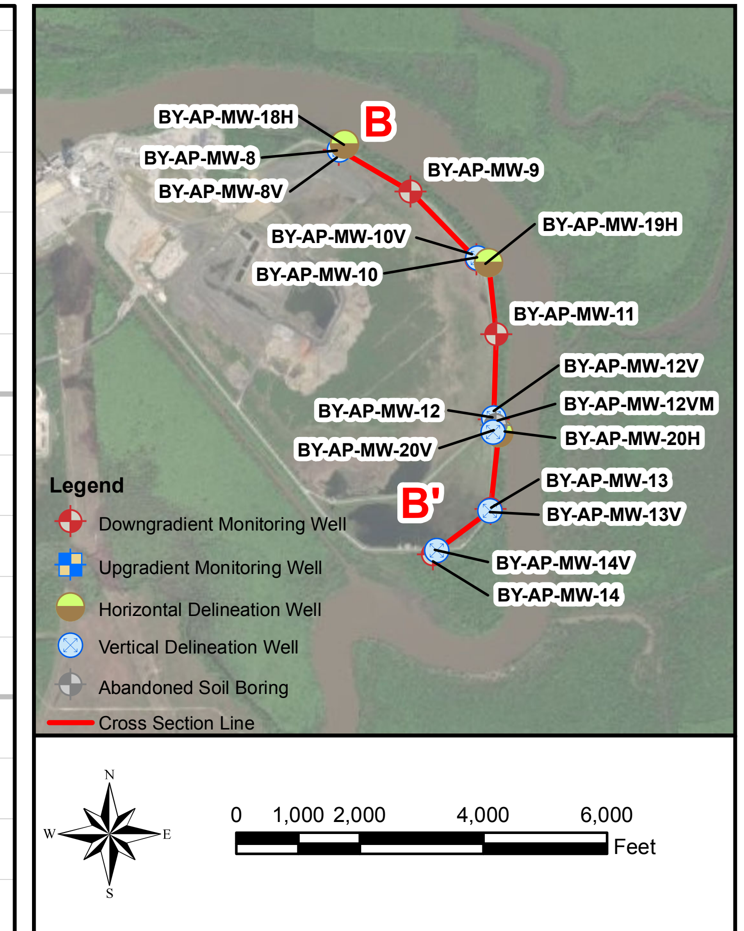
- Hydroexcavation
- Hand Auger
- No Data
- No Recovery
- Fill
- Fat Clay
- Lean Clay
- Silty Clay
- Sandy Fat Clay
- Sandy Lean Clay
- Silt
- Sandy Silt
- Clayey Sandy
- Silty Sand
- Well-graded and Poorly-graded Sand with Silt
- Well-graded and Poorly-graded Sand with Silt
- Well-graded Gravelly Sand
- Well-graded and Poorly-graded Gravels
- Well-graded Gravel with Sand and/or Silt

Geologic Unit

- Fill
- Unit 1: Fat Clay with Organics
- Unit 2: Sandy Lean Clay, Sands, and Silt
- Unit 3: Well-graded and Poorly-graded Sands
- Unit 4: Clay
- Unit 5: Silty Sand

SCALE	DRAWING TITLE
As Shown	ARSENIC CONCENTRATIONS ALONG GEOLOGIC CROSS SECTION B - B' PLANT BARRY ASH POND
DATE 9/18/2020	
DRAWN BY KWR	FIGURE NO **FIGURE 10A**
CHECKED BY GBD	Southern Company





Notes:
1. Source of ground surface elevation data: Lidar
2. NAVD88 indicates North American Vertical Datum of 1988.
3. Groundwater elevations were measured on May 12, 2020.
4. Water samples were collected between March 30 and April 1, 2020 (MW-8, MW-8V, MW-9, MW-10, MW-10V, MW-11, MW-12, MW-12V, MW-14, MW-18H, MW-20H), on May 12, 2020 (MW-19H), and on June 17, 2020 (MW-13V, MW-14V and MW-20V).
5. mg/L indicates milligrams per liter.
6. J indicates a laboratory estimated concentration between the analytical method detection limit and the laboratory reporting limit.
7. ND indicates not detected above the laboratory method detection limit.
8. GWPS indicates groundwater protection standard.
9. K indicates hydraulic conductivity.
10. Units 1, 2, and 4 hydraulic conductivity calculated from Shelby tube permeameter testing on undistrubed soil samples.
11. Unit 3 hydraulic conductivity calculated from long duration pumping test data.
12. V indicates groundwater flow velocity.
13. Vertical exaggeration: 25x.

Legend

- Groundwater Elevation
- Well Location
- Ground Surface Elevation
- Screen Interval
- Unit Boundary (inferred)
- Unit Boundary
- 0.013 Cobalt concentration (mg/L)

Borehole Description

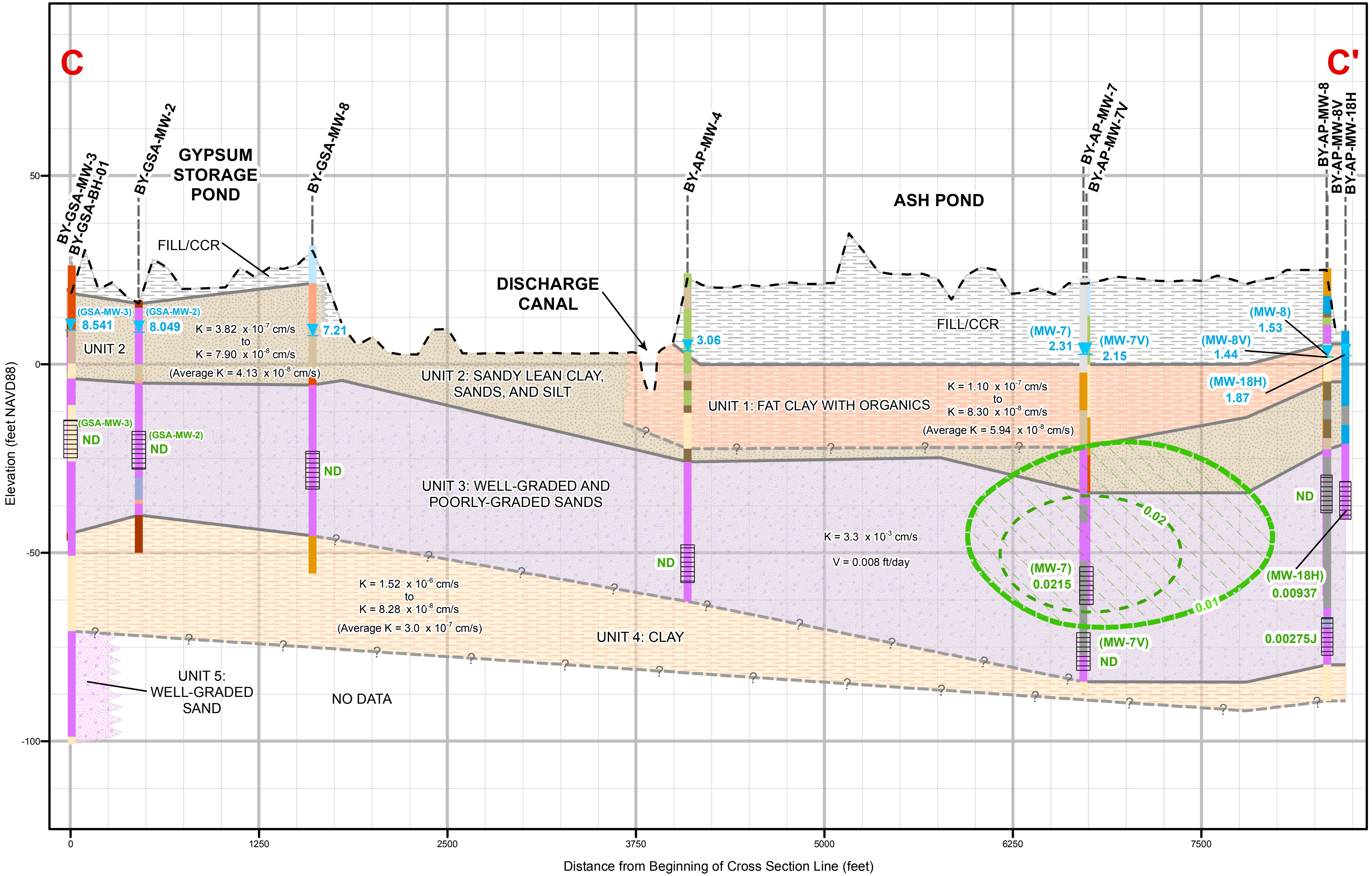
- Hydroexcavation
- Hand Auger
- No Data
- No Recovery
- Fill
- Fat Clay
- Lean Clay
- Silty Clay
- Sandy Fat Clay
- Sandy Lean Clay
- Silt
- Sandy Silt
- Clayey Sandy
- Silty Sand
- Well-graded and Poorly-graded Sand with Silt
- Well-graded and Poorly-graded Sand with Silt
- Well-graded Gravelly Sand
- Well-graded and Poorly-graded Gravels
- Well-graded Gravel with Sand and/or Silt

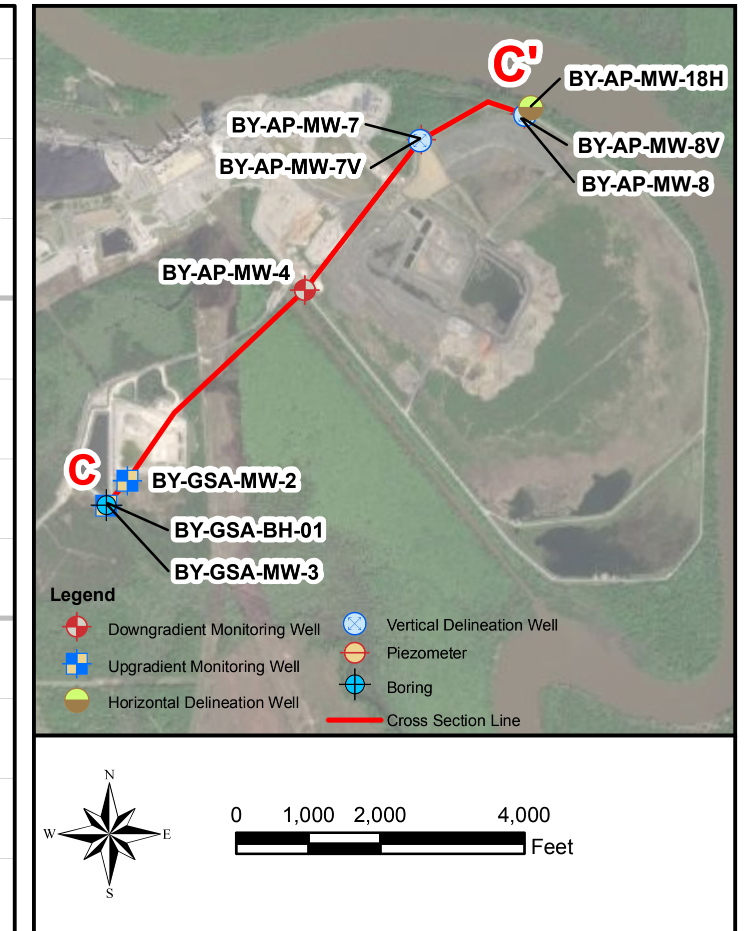
Geologic Unit

- Fill
- Unit 1: Fat Clay with Organics
- Unit 2: Sandy Lean Clay, Sands, and Silt
- Unit 3: Well-graded and Poorly-graded Sands
- Unit 4: Clay
- Unit 5: Silty Sand

SCALE	As Shown
DATE	9/20/2020
DRAWN BY	KWR
CHECKED BY	GBD
DRAWING TITLE	COBALT CONCENTRATIONS ALONG GEOLOGIC CROSS SECTION B - B' PLANT BARRY ASH POND
FIGURE NO	FIGURE 10B

Southern Company





Notes:
1. Source of ground surface elevation data: Lidar
2. Source of Discharge Canal depth: Bathymetry
3. NAVD88 indicates North American Vertical Datum of 1988.
4. ND indicates concentration not detected above laboratory method detection limit.
5. GWPS indicates groundwater protection standard.
6. Groundwater elevations were measured on March 30, 2020 for ash pond wells and on May 12, 2020 for gypsum pond wells.
7. Groundwater samples were collected on March 30, 2020.
8. K indicates hydraulic conductivity.
9. Units 1, 2, and 4 hydraulic conductivity calculated from Shelby tube permeameter testing on undistrubed soil samples.
10. Unit 3 hydraulic conductivity calculated from long duration pumping test data.
11. V indicates groundwater flow velocity.
12. Vertical exaggeration: 25x.

Legend

- 7.21 Groundwater Elevation
- Ground Surface Elevation
- Screen Interval
- Unit Boundary (inferred)
- Unit Boundary
- Well Location
- Arsenic Concentration (mg/L)
- Arsenic GWPS (mg/L)
- Area Exceeding GWPS for Arsenic
- 0.0215 Arsenic Concentration (mg/L)
- 0.01 Arsenic GWPS (mg/L)

Borehole Description

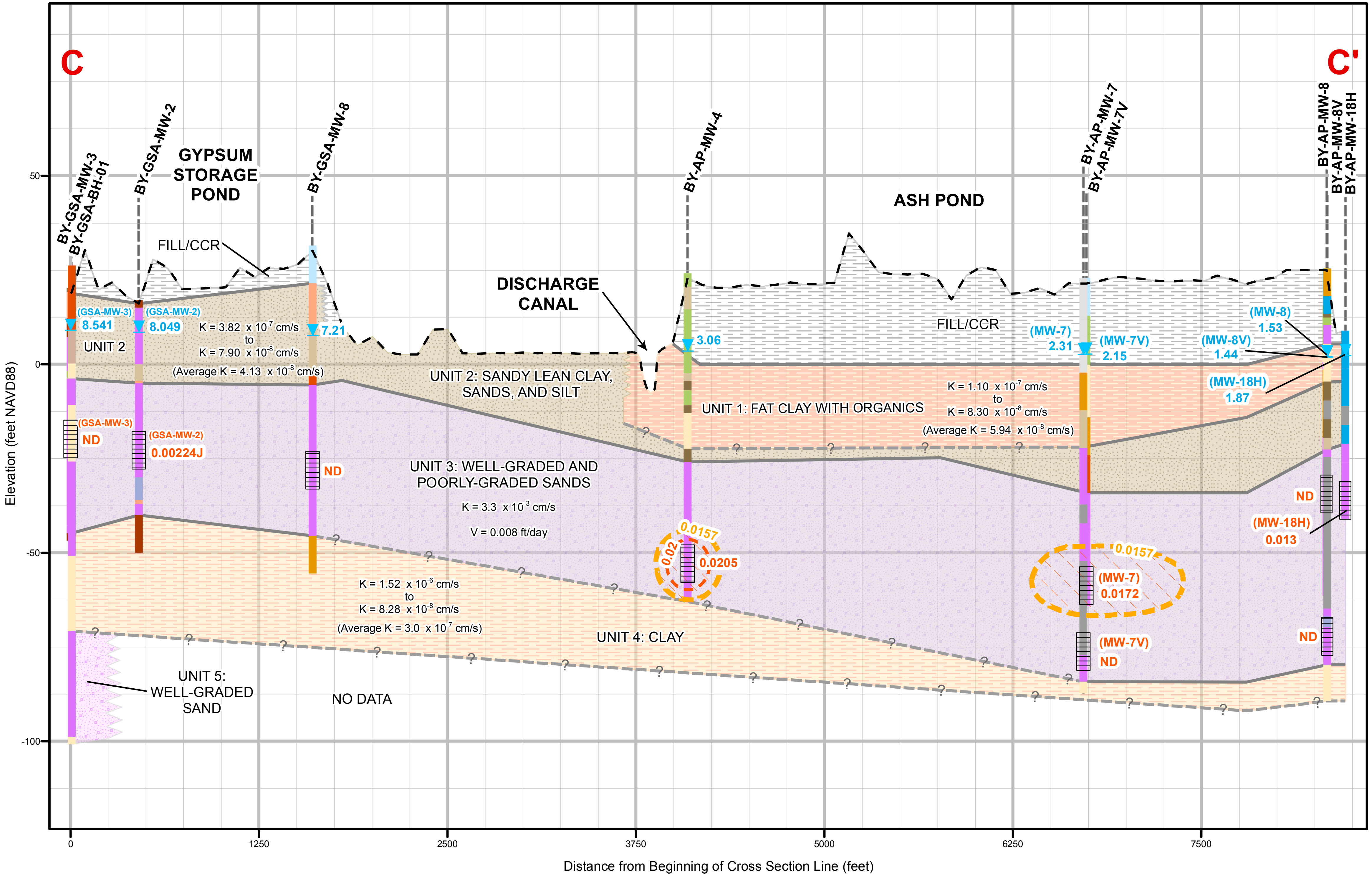
- Hydroexcavation
- Fill
- No Recovery
- Fat Clay
- Lean Clay
- Sandy Fat Clay
- Sandy Lean Clay
- Organic Silt or Clay
- Silt
- Sandy Silt
- Clayey Sand
- Silty Sand
- Clayey Silty Sand
- Silty Sand
- Well-graded and Poorly-graded Sands
- Well-graded and Poorly-graded Gravels

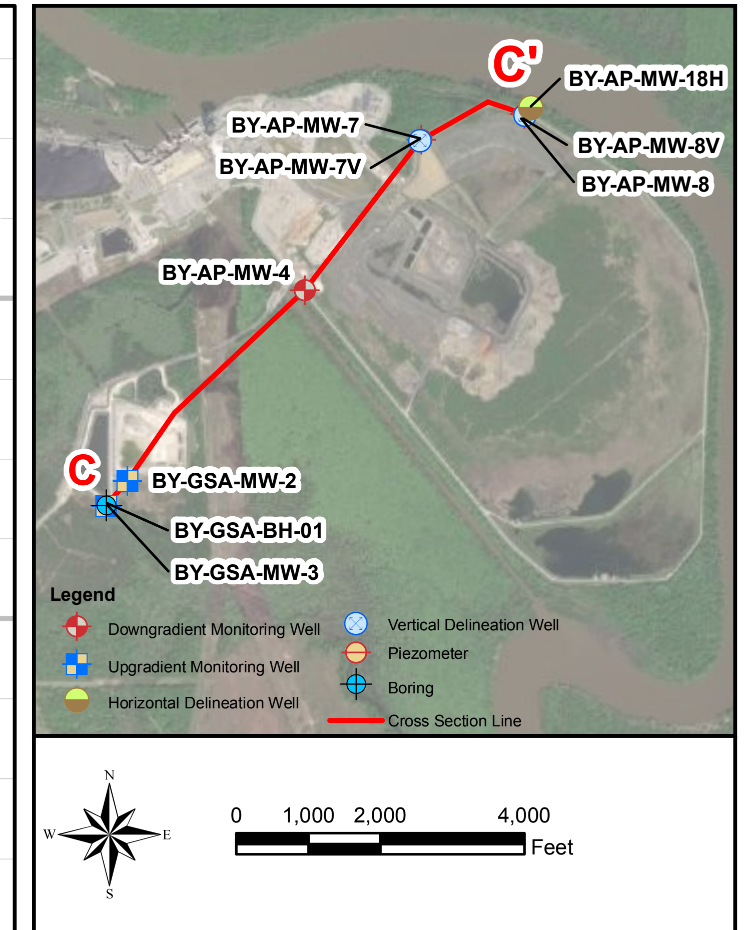
Geologic Unit

- Fill
- Unit 1: Fat Clay with Organics
- Unit 2: Sandy Lean Clay, Sands, and Silts
- Unit 3: Well-graded and Poorly-graded Sands
- Unit 4: Clay
- Unit 5: Well-Graded Sand

SCALE: As Shown	DRAWING TITLE: ARSENIC CONCENTRATIONS ALONG GEOLOGIC CROSS SECTION C - C' PLANT BARRY ASH POND
DATE: 9/20/2020	
DRAWN BY: KWR	
CHECKED BY: GBD	FIGURE NO: FIGURE 11A

Southern Company





Notes:
1. Source of ground surface elevation data: Lidar
2. Source of Discharge Canal depth: Bathymetry
3. NAVD88 indicates North American Vertical Datum of 1988.
4. ND indicates concentration not detected above laboratory method detection limit.
5. GWPS indicates groundwater protection standard.
6. Groundwater elevations were measured on March 30, 2020 for ash pond wells and on May 12, 2020 for gypsum pond wells.
7. Groundwater samples were collected on March 30, 2020.
8. K indicates hydraulic conductivity.
9. Units 1, 2, and 4 hydraulic conductivity calculated from Shelby tube permeameter testing on undistrubed soil samples.
10. Unit 3 hydraulic conductivity calculated from long duration pumping test data.
11. V indicates groundwater flow velocity.
12. Vertical exaggeration: 25x.

Legend

- 7.21 Groundwater Elevation
- Ground Surface Elevation
- Screen Interval
- Unit Boundary (inferred)
- Unit Boundary
- Well Location
- Cobalt Concentration (mg/L)
- Cobalt GWPS (mg/L)
- Area Exceeding GWPS for Cobalt
- 0.0215 Cobalt Concentration (mg/L)
- 0.0157 Cobalt GWPS (mg/L)

Borehole Description

- Hydroexcavation
- Fill
- No Recovery
- Fat Clay
- Lean Clay
- Sandy Fat Clay
- Sandy Lean Clay
- Organic Silt or Clay
- Silt
- Sandy Silt
- Clayey Sand
- Silty Sand
- Clayey Silty Sand
- Silty Sand
- Well-graded and Poorly-graded Sands
- Well-graded and Poorly-graded Gravels

Geologic Unit

- Fill
- Unit 1: Fat Clay with Organics
- Unit 2: Sandy Lean Clay, Sands, and Silts
- Unit 3: Well-graded and Poorly-graded Sands
- Unit 4: Clay
- Unit 5: Well-Graded Sand

SCALE	As Shown
DATE	9/20/2020
DRAWN BY	KWR
CHECKED BY	GBD

DRAWING TITLE

COBALT CONCENTRATIONS ALONG GEOLOGIC CROSS SECTION C - C' PLANT BARRY ASH POND

FIGURE NO

FIGURE 11B

Southern Company

Appendix D
Monitored Natural Attenuation Demonstration

October 2021
Plant Barry

Monitored Natural Attenuation Demonstration

Prepared for Alabama Power Company

October 2021
Plant Barry

Monitored Natural Attenuation Demonstration

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Project Number: 201114-01.05
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APPENDICES

Appendix A	Concentration Versus Time Graphs
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ABBREVIATIONS

µg/L	microgram per liter
ADEM	Alabama Department of Environmental Management
Admin. Code	Administrative Code
APC	Alabama Power Company
CCR	coal combustion residuals
CEC	cation exchange capacity
cm	centimeter
C/Co	effluent to influent
COI	constituent of interest
EGL	Anchor QEA Environmental Geochemistry Laboratory
GWPS	groundwater protection standard
meq/kg	milliequivalent per kilogram
mg/kg	milligram per kilogram
MNA	monitored natural attenuation
N_2	nitrogen
PV	pore volume
SEM	scanning electron microscopy
Site	Plant Barry Ash Pond
SSE	selective sequential extraction
SSL	statistically significant level
USEPA	U.S. Environmental Protection Agency
XRD	X-ray diffraction
XRF	X-ray fluorescence

Executive Summary

Extensive geochemical and related studies demonstrate that monitored natural attenuation (MNA) is a viable corrective action for groundwater impacts associated with the Plant Barry Ash Pond (Site). The preponderance of evidence indicates that conditions at the Site meet the U.S. Environmental Protection Agency's evaluation criteria for the use of MNA, specifically: area of impacts stable or shrinking, identified mechanisms for attenuation, stability of the attenuating mechanisms, sufficient aquifer capacity for attenuation, and time to achieve groundwater protection standards (GWPSs) are reasonable compared to other corrective action alternatives. However, MNA is one component of the Site's corrective action remedy. As noted in the *Groundwater Remedy Selection Report*, the following corrective measures were selected for the Site: source control to include dewatering, consolidation, and capping of the Site; geochemical manipulation via injections in areas of relatively high concentrations of constituents of interest (COIs) to remove them from groundwater and immobilize them in situ; and MNA over the entire Site.

Investigations performed to support the use of MNA at the Site included preparation of concentration versus time and concentration versus distance graphs for COIs in groundwater; groundwater, well solids (precipitates), and soil sampling; laboratory analyses of well solids and soil samples for bulk chemistry (X-ray fluorescence), mineralogy (X-ray diffraction and scanning electron microscopy), and cation exchange capacity; geochemical modeling; selective sequential extraction (SSE) to determine associations of COIs with attenuating solids; and column studies to assess the aquifer (soil) capacity for attenuation.

The trends observed in concentration versus time and concentration versus distance graphs provide evidence that natural attenuation is occurring at the Site. Concentration versus time graphs indicate that arsenic concentrations are generally stable in several areas, even without source control. Also, concentration versus distance graphs along downgradient transects indicate that arsenic and cobalt are generally decreasing with distance from the Site.

Based on the geochemical investigations, multiple lines of evidence support multiple attenuating mechanisms, depending upon the COI. The major attenuating mechanisms include sorption on iron oxides (for arsenic and cobalt), cation exchange on clays (for cobalt), coprecipitation in crystalline iron oxides (for cobalt), and precipitation in barium arsenate (for arsenic). All COIs are subject to physical attenuation mechanisms such as dispersion and flushing, which will contribute to decreased concentrations with time and distance from the Site.

Column studies indicate that arsenic and cobalt are attenuated by aquifer media. The column attenuation capacity was extrapolated to the entire mass of the aquifer downgradient of the Site but within the property boundary. The extrapolation showed that attenuating capacity of the aquifer greatly exceeds the mass of arsenic and cobalt requiring attenuation.

SSE was performed on samples of well solids (precipitates) and soils used in the column studies to assess the stability of the attenuated COIs and their host minerals. Most of the mass of arsenic and cobalt is bound in stable fractions: specifically, F3 (reducible), F4 (oxidizable), and F5 (residual). Attenuated arsenic and cobalt, therefore, are not expected to remobilize back into groundwater.

The slope of trend lines through recent data on concentration versus time graphs and results from reactive transport modeling were used to estimate time to achieve the applicable GWPS. Depending on the COI and well (area), the estimated time to achieve natural attenuation ranges from 7 to 78 years, not considering source control. Most of this range is reasonable compared to durations of other corrective action technologies. However, attenuation capacity will likely need to be enhanced in some areas (e.g., via injection treatment) to reduce the upper end of the time frame for achieving the GWPS for both COIs sitewide.

1 Introduction

The Plant Barry Ash Pond (Site), located in Mobile County, Alabama, is owned and operated by Alabama Power Company (APC). As of April 15, 2019, the Site ceased receipt of all coal combustion residuals (CCR) and non-CCR waste streams.

APC has been monitoring groundwater at the Site in accordance with the U.S. Environmental Protection Agency (USEPA) CCR Rule 40 Code of Federal Regulations (CFR) § 257.97 and the Alabama Department of Environmental Management (ADEM) Administrative Code (Admin. Code) r. 335-13-15-.06 since 2016. Constituents of interest (COIs) for the Site include arsenic and cobalt.

Though substantial evidence for natural attenuation exists for the Site, natural attenuation is expected to increase as source control measures are implemented (i.e., dewatering, consolidation, and capping).

USEPA defines monitored natural attenuation (MNA) as 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" (USEPA 1999, 2015). An MNA evaluation consists of the following steps or tiers (USEPA 2015):

1. Demonstrate that the area of impacts (plume) is stable or shrinking.
2. Determine the mechanisms and rates of attenuation.
3. Determine that the capacity of the aquifer is sufficient to attenuate the mass of constituents in groundwater and that the immobilized constituents are stable and will not remobilize.
4. Design a performance monitoring program based on the mechanisms of attenuation and establish contingency remedies (tailored to site-specific conditions) should MNA not perform as expected.

As shown in Table 1, the field and laboratory investigations completed for this evaluation support Tiers 1 through 3. Tier 4 is addressed in the accompanying *Groundwater Remedy Selection Report*. A detailed sitewide corrective action monitoring plan will be submitted within 90 days of the *Groundwater Remedy Selection Report*.

2 Stability of Areas of Impacts

Existing groundwater data were used to generate concentration versus time and concentration versus distance graphs to determine if attenuation is occurring over time and/or space and to assess natural attenuation occurrence and rates. COIs were plotted on the y-axis. For the concentration versus time plots, the time between sampling events (in days from 2016 through 2021) was plotted on the x-axis. For the concentration versus distance graphs, the distance between the pond boundary and monitoring well was plotted on the x-axis. Concentration versus distance graphs were made for COIs along the upgradient-downgradient flowpaths. Specifically, concentration versus distance graphs were made for the following wells:

- BY-AP-MW-5 to BY-AP-MW-17H (arsenic)
- BY-AP-MW-7 to BY-AP-MW-23H (arsenic)
- BY-AP-MW-8 to BY-AP-MW-18H (arsenic)
- BY-AP-MW-10 to BY-AP-MW-19H (arsenic)
- BY-AP-MW-12 to BY-AP-MW-20H (arsenic)
- BY-AP-MW-15 to BY-AP-MW-22H (arsenic and cobalt)

The trends observed in recent data provide evidence that natural attenuation is occurring at the Site. Except for arsenic concentrations along transect BY-AP-MW-15 to BY-AP-MW-22H, all transects showed COI concentrations decreasing with distance from the Site, indicating spatial attenuation (Figure 2). Arsenic concentrations are stable with time in approximately 50% of wells with arsenic statistically significant levels (SSLs), and decreasing trends are expected in other wells after closure, as closure activities cut off the source of COIs to groundwater. Although cobalt concentrations are increasing with time in well BY-AP-MW-15, and arsenic concentrations are increasing with distance from BY-AP-MW-15 to BY-AP-MW-22H, evidence of attenuation is still present in this area. Cobalt concentrations are decreasing with distance from BY-AP-MW-15, and arsenic concentrations are decreasing with time at BY-AP-MW-15. A selection of concentration versus time graphs is included in Figure 1. All concentration versus time graphs are included in Appendix A.

3 Groundwater Sampling and Analysis

Groundwater samples were collected by RDH Environmental, Inc., on February 3 through February 6, 2020. The samples were submitted to the Alabama Power General Test Laboratory for analysis and groundwater geochemical modeling. This groundwater data could also be used to support geochemically based corrective action such as in situ geochemical manipulation (injections). Groundwater samples were collected from monitoring wells as listed in Table 2. The samples were analyzed for major cations, anions, and geochemical parameters influencing the chemical behavior of the COI. The analyzed constituents and associated laboratory analytical methods are summarized in Table 3.

Groundwater samples were collected from monitoring wells included in Table 2 using the dedicated pump installed in each well. Wells were purged at a low flow rate to minimize drawdown and sampled using low-flow sampling techniques in accordance with 40 CFR § 257.93(a) and ADEM Admin. Code r. 335-13-15-.06(4)(a). Prior to sampling, each monitoring well was purged until field parameters (pH, temperature, specific conductance, dissolved oxygen, and oxidation-reduction potential) stabilized. Turbidity was measured during sampling but was not used as a stabilization criterion.

4 Geochemical Stability and Speciation Calculations

Geochemical equilibrium modeling was performed to determine mineral phases that may be controlling the dissolved concentrations, mobility, and attenuation of arsenic and cobalt, as well as the behavior of other species (such as iron) that influence the behavior of the COIs.

The Geochemist's Workbench software (Bethke and Yeakel 2013) was used to construct Pourbaix (Eh-pH) diagrams for the COIs and iron based on Site groundwater chemistry to assess the geochemical stability of phases potentially controlling COI concentrations under Site conditions (Figures 3 through 5). Blue fields indicate dissolved/mobile species, and yellow fields indicate solid/attenuated species. Eh-pH data from the February 2020 groundwater sampling event are also plotted to determine the most stable species under Site conditions. The Pourbaix stability diagrams indicate the following associations and attenuating mechanisms:

- Site Eh-pH data fall along or near the thermodynamic stability boundaries between amorphous iron hydroxide [$Fe(OH)_3(a)$] and dissolved ferrous iron [Fe^{2+}] at pH less than 6, or between amorphous iron hydroxide and siderite [$FeCO_3$] at higher pH. Aquifer Eh-pH conditions are, therefore, controlled by equilibria between iron species (Figure 3). Amorphous iron oxides are strong sorbents for many metals and metalloids, including arsenic and cobalt.
- Site Eh-pH data also plot within the stability field of a barium arsenate mineral phase [$Ba_3(AsO_4)_2$], which may control dissolved arsenic concentrations in areas where barium concentrations exceed those of arsenic (Figure 4).
- A cobalt-iron oxide phase [$CoFe_2O_4$] is also predicted to be stable under Site conditions (Figure 5). This phase has a similar structure to the iron oxide mineral magnetite [Fe_3O_4], suggesting incorporation/coprecipitation of cobalt in iron oxides as an attenuation mechanism under conditions in which such phases could form.

Geochemical speciation-solubility calculations were also performed using the U.S. Geological Survey computer program PHREEQC (Parkhurst and Appelo 2013) with the WATEQ4F thermodynamic database (augmented with cobalt species from the MINTEQv4 database) to calculate aqueous speciation and determine the saturation state of groundwater samples with respect to possible mineral phases. Saturation index calculations can be used to infer solid phases potentially present in the aquifer for which solubility may be controlling dissolved concentrations. If a groundwater solution is saturated or supersaturated with respect to a mineral phase, then that phase could be precipitating and attenuating COIs as it precipitates. Saturation indices for groundwater samples collected in February 2020 are presented in Table 4, and geochemical speciation modeling results indicate the following:

- Groundwater is slightly supersaturated and/or close to equilibrium with respect to amorphous iron hydroxide [$Fe(OH)_3(a)$] and iron carbonate (siderite) and supersaturated with respect to the more crystalline iron oxides (goethite, hematite, and magnetite).
- Groundwater with detectable arsenic is supersaturated with respect to a barium arsenate mineral phase.
- Groundwater with detectable cobalt is supersaturated with respect to a cobalt-iron oxide phase.

5 Solids Sampling and Analysis

Precipitation and coprecipitation reactions can be important mechanisms for natural attenuation of COIs. Soil and aquifer media can also sorb COIs, and their geochemistry can indicate if natural attenuation is occurring or has the potential to occur. If well solids (precipitates collected from a well) are forming and incorporating COIs, then natural attenuation is occurring. Moreover, if the well solids (precipitates) are forming and incorporating COIs, then these attenuation mechanisms could be enhanced by geochemical manipulation (injections) under existing Site conditions.

5.1 Sample Collection

To evaluate these mechanisms (precipitation and coprecipitation), solid particles were collected from the bottom of select monitoring wells and analyzed (summarized in Table 2). The well solids may include precipitates forming in situ in the aquifer, as well as finer-grained particles of the aquifer matrix that have been transported through the well screen and deposited in the bottom of the well. Regardless, the recovered well solids provide unique insights into aquifer geochemistry and mineralogy, and may have the ability to attenuate COIs.

Well solids (precipitates) samples were collected as follows:

- Well solids (precipitates) were pumped from the bottom of the well via polyethylene tubing.
- Groundwater and well solids (precipitates) were pumped through an inline filter holder and stand (for example, those manufactured by Geotech Environmental Equipment, Inc.) with a 0.45-micron filter membrane until the filter clogged or the water ran clear. Up to five filters containing well solids (precipitates) were collected at each well (with the objective to collect as much solid material as possible from the bottom of each well).
- All filters from each well were placed in a single plastic petri dish, and the petri dish lid was secured with duct tape.
- Each sealed petri dish was placed in a Mylar bag with oxygen-absorbent packets to minimize oxidation of the well solids samples during transport.
- The Mylar bags were sealed with no headspace and placed in a secured iced cooler.
- Samples were stored on ice and shipped to the Anchor QEA Environmental Geochemistry Laboratory (EGL) in Portland, Oregon, for analysis.

Aquifer solids (soil) samples were also collected from borings and analyzed to conduct column laboratory experiments to determine capacity, rates, and stability of MNA. Soil samples were collected on March 16 to March 22, 2021, from the soil boring locations shown in Figure 6. Soil samples were collected using sonic drilling technology at 6 areas (14 borings) at the Site: one location upgradient (area 6) and five locations along potential groundwater flow paths (downgradient areas 1 through 5) from the CCR unit. Two composite soil samples were collected per boring: one from Unit 2 (sandy lean clay, sands, and silt) and one from Unit 3 (well-graded to poorly graded sands).

Photographs of representative soil samples are shown in Figure 7. Samples were selected in the field, packaged to preserve field redox conditions (airtight containers packed in Mylar bags with oxygen-absorbent packets), and shipped on ice to the EGL for analysis and column studies.

Each soil sample collected for laboratory analyses was assigned a unique alphanumeric identifier. Analytical sample identification was based on the following designations:

- 1 through 6 (transect number "1")
- A through C (location identifier in which "A" is closest to the Site, and "C" is farthest downgradient)

5.2 Sample Analysis

Upon arrival at the EGL, well solids (precipitates) and soil samples were inspected and checked against the chain of custody. Samples were then stored under refrigeration until processing. Well solids (precipitates) were recovered from the filters in a glove box under a nitrogen (N_2) atmosphere to prevent oxidation prior to analysis for geochemical characterization. Solids accumulated on the filters were scraped and collected in centrifuge tubes. The wet material was then centrifuged, and the solids were transferred into a pre-weighed glass jar. The solids were then dried under an N_2 atmosphere at 38°C for 24 to 72 hours until dry.

The well solids (precipitates) and soil samples were analyzed by the following methods:

- X-ray fluorescence (XRF) to determine the chemical composition of the matrix (e.g., iron compounds) and presence of detectable COIs
- X-ray diffraction (XRD) to determine crystalline mineral phases
- Selective sequential extraction (SSE) to determine association of COIs with attenuating phases, determine relative strength of attenuation, and provide a sense of permanence
- Cation exchange capacity (CEC) to assess cation exchange as a mechanism for attenuation
- Scanning electron microscopy (SEM) to directly observe and determine the composition of attenuating phases (well solids [precipitates] only [not soil])

Additional detail (including the relevance of each analysis to the MNA evaluation) is included in Table 5.

All well solids (precipitates) samples with sufficient mass and all aquifer solids were analyzed by XRF to determine bulk chemical composition. After drying, processed samples were loaded and sealed in plastic sample containers for elemental analysis by XRF. XRF testing was performed by EGL staff using a Niton XL3t GOLDD+ XRF Analyzer. Individual samples were analyzed by XRF using the "Test All Geo" method under the "Mining" profile, which includes most elements heavier than sodium.

Powder XRD analysis was performed on selected well solids (precipitates) and aquifer soil samples to determine mineralogy. Samples were selected based on several factors, including well location; groundwater chemistry; bulk chemical composition data (XRF); and, for well solids (precipitates) samples, available sample mass.

Following XRF analysis, samples for SSE analysis were selected using the criteria above and results of the XRF analysis. SSE measures the distribution of COIs bound to the solid phase in different forms with decreasing solubility and mobility. Samples are extracted stepwise with chemical solutions of increasing aggressiveness into fractions, which are operationally defined as follows:

- F1: Water soluble
- F2: Exchangeable (e.g., bound to clay minerals)
- F3: Reducible (e.g., associated with amorphous or poorly crystalline oxides such as ferrihydrite, a hydrous iron oxide)
- F4: Strong acid/oxidizable (e.g., associated with crystalline oxides and/or sulfide minerals)
- F5: Residual (e.g., bound in insoluble silicate phases)

Each successive step represents stronger attenuation and greater permanence. The F3, F4, and F5 fractions represent COIs associated with relatively stable (permanent) attenuating mechanisms, provided Site geochemical conditions do not change drastically in the future.

Cation exchange on clays is an important attenuation mechanism for some COIs, such as cobalt. After XRF analysis, samples for CEC analysis were selected using the criteria above and the results of the XRF analysis. CEC was determined by leaching samples with ammonium acetate and analyzing the leachate for exchangeable cations, including cobalt.

Select well solids (precipitate) samples were also submitted for examination by SEM, including point microanalysis and elemental mapping, to confirm the identity and chemical compositions of attenuating mineral phases and document the presence of amorphous iron and aluminum oxide coatings on mineral grains that can attenuate COIs.

5.3 Well Solids Results

The XRF chemical analysis of the well solids (precipitates; Table 6) showed relatively high concentrations (i.e., greater than 5,000 milligrams per kilogram [mg/kg]) of iron in samples from seven wells. Figure 8 shows the relationship between arsenic and iron concentrations in well solids samples, which suggests that iron compounds are attenuating arsenic, especially because most of the arsenic values in samples from downgradient wells are above those in samples from BY-AP-MW-3, which does not have any COI SSLs.

XRD identified quartz as a major component of the well solids (precipitates) in all wells and minor feldspar. Goethite (an attenuating iron oxide) was identified in solids from one well from the Site and montmorillonite and zeolite in solids from five wells from the Site. Muscovite-illite was identified in one well. Montmorillonite and muscovite-illite are attenuating clay minerals, and zeolite is an attenuating clay-like mineral (Table 7).

SEM and associated elemental mapping were conducted on select samples to confirm mineral phases and attenuating mechanisms. SEM results indicate that the solids collected from BY-AP-MW-1 (Figure 9) are predominantly quartz interspersed with feldspar and iron-rich grains. Some alteration was observed, with dissolution pitting in some grains and thin coatings of aluminum, calcium, and iron material in others. Elemental mapping (Figure 9) indicates these secondary minerals contain iron and are likely coatings of amorphous iron oxides. The colors in Figure 9 are not natural but are added to show the relative abundance and distribution of the various elements analyzed. SEM results indicate that the solids collected from BY-AP-MW-2 (Figure 10) are predominantly freshly fractured quartz interspersed with small calcite, feldspar, and iron-rich grains. Alteration is minimal, with some very thin coatings of aluminum or iron material. Figure 10 shows secondary mineral growth on sand grains. These secondary minerals likely contain iron.

Based on the results from the XRF and XRD analyses and available sample volume, samples were selected for SSE using the technique described in Section 5.2.

Figure 11 shows the results of SSE for six samples from the Site. Interpretation of SSE results by COI includes the following:

- Arsenic: Bound primarily in the F3 (reducible), F4 (oxidizable), and F5 (residual) fractions. Some arsenic is bound in the F2 (exchangeable) fraction, and negligible arsenic is associated with the F1 (water soluble) fraction.
- Cobalt: Bound primarily in the F2 (exchangeable), F3 (reducible), F4 (oxidizable), and F5 (residual) fractions. Some cobalt is also associated with the F1 (water soluble) fraction.
- Results from the F2 (exchangeable) fraction is consistent with the XRD identification of the clay minerals montmorillonite, muscovite-illite, and kaolinite as possible attenuating phases for cobalt.
- Results from the F3 (reducible) and F4 (oxidizable) fractions are consistent with the geochemical modeling results indicating iron oxides as attenuating phases for both arsenic and cobalt.

Select samples with suspected clay content were submitted for CEC testing. CEC was variable in the samples, ranging from 45 to 350 milliequivalents per kilogram (meq/kg; Table 8). CEC reflects the clay mineralogy (calcium-rich montmorillonite) of the well solids and supports cation exchange on clays as a mechanism for cobalt attenuation.

5.4 Aquifer Solids (Soil) Results

XRF analysis of soil samples show total iron content in the range of 400 to 17,000 mg/kg, which likely reflects variable iron oxide content, which provides substantial attenuating capacity (Table 9). The mineralogy of the soil samples (as determined by XRD) consists mostly of quartz, with lesser amounts of feldspar, mica, and clay minerals (Table 10). Clay minerals identified include montmorillonite and kaolinite, which are also characterized by CEC, although CEC of montmorillonite is much greater than kaolinite. Although muscovite was identified by XRD, it is likely a mixture of muscovite and illite, which is a clay mineral weathering product of muscovite with a similar XRD pattern that possesses some CEC that would contribute to attenuation of cobalt.

CEC for the soil samples ranges from 1.4 to 55 meq/kg (Table 11) and reflects the range of clay mineral content of aquifer soil samples. Aquifer solids (soil) analytical results are included in Appendix B.

6 Mechanisms for Natural Attenuation

To support MNA, the following laboratory analyses of groundwater and well solids (precipitates) and aquifer solids (soils) were conducted:

- Performed groundwater geochemical modeling using PHREEQC
- Analyzed samples by XRF, XRD, SEM, and CEC to identify attenuating mechanisms for COIs
- Determined association of COIs with attenuating phases, determined relative strength of attenuation mechanisms, and provided a sense of permanence by SSE

As discussed in Section 5, results from groundwater data analysis, geochemical modeling, well solids (precipitates) and aquifer solids (soil) analyses provide multiple lines of evidence for specific attenuation mechanisms for COIs (summarized in Table 12). The major attenuating mechanisms include sorption on amorphous iron oxides (arsenic and cobalt), cation exchange on clay minerals (cobalt), coprecipitation in crystalline iron oxides (cobalt), and precipitation in barium arsenate (arsenic).

XRF detected at least one COI and elements associated with natural attenuation (iron, aluminum, barium, calcium, and/or potassium). The XRF bulk chemical analysis showed sufficient concentrations of iron for attenuation, ranging between 2,220 and 25,600 mg/kg. The positive correlation between iron and arsenic (Figure 8) indicates that iron compounds are attenuating these two COIs. Aluminum concentrations from the XRF analysis suggest clay minerals are present.

XRD identified at least one of three potentially attenuating clay minerals: montmorillonite, muscovite-illite, and kaolinite in 10 soil samples. CEC, SSE and SEM were performed on select samples to verify the results of the XRD work. The aquifer solids (soils) samples exhibit moderate but variable CEC, which ranges from 1.4 to 55 meq/kg. Exchangeable cobalt concentrations also show a positive, though not strong, relationship with CEC (Figure 12), which supports uptake by clay minerals as a contributing attenuation mechanism for cobalt.

SEM elemental mapping identified widespread occurrence of iron oxide coatings on sand grains, which supports the other lines of evidence that indicate amorphous iron oxides are important attenuating phases for arsenic and cobalt.

As discussed in greater detail in Section 5.3, SSE indicated an association of COIs with multiple attenuation mechanisms as follows:

- Arsenic: Bound primarily in the F3 (reducible), F4 (oxidizable), and F5 (residual) fractions. Some arsenic is bound in the F2 (exchangeable) fraction, and negligible arsenic is associated with the F1 (water soluble) fraction.
- Cobalt: Bound primarily in the F2 (exchangeable), F3 (reducible), F4 (oxidizable), and F5 (residual) fractions. Some cobalt is also associated with the F1 (water soluble) fraction.

- Results from the F2 (exchangeable) fraction are consistent with the XRD identification of the clay minerals as attenuating phases for cobalt.
- Results from the F3 (reducible) and F4 (strong acid/oxidizable) fractions are consistent with the geochemical modeling results indicating iron oxides as attenuating phases for both arsenic and cobalt.

In summary, most of the arsenic and cobalt in solids samples are in the F3 (reducible), F4 (oxidizable), and F5 (residual) fractions, which represent stable to very stable attenuation mechanisms. Subordinate amounts of the arsenic and cobalt are less strongly bound in the F1 (soluble) and F2 (exchangeable) fractions. The F5 (residual) fraction, however, likely represents crystalline mineral phases (grains) that are part of the aquifer matrix, rather than attenuating phases formed in situ.

7 Reactive Transport Modeling

Reactive transport modeling was performed to assess the post-closure fate and transport of COIs (arsenic and cobalt) along representative groundwater flow paths at the Site. The objective of the modeling was to quantitatively assess the effectiveness of natural attenuation processes to achieve and maintain COI concentrations below the applicable groundwater protection standard (GWPS) outside the Site boundaries following ash pond closure (source control) and, for cases where these are predicted to not be achieved, to conservatively estimate the rate of migration of COI concentrations exceeding GWPS to support remedy selection and implementation time frames.

Five 1D transects, extending along groundwater flow paths from the boundary of the Site to downgradient surface water features, were modeled using PHREEQC (Figure 6). Following ash pond closure, groundwater currently present along these transects will be progressively replaced by upgradient groundwater with COI concentrations less than the GWPS. In addition, COI concentrations will be attenuated along the flow path due to reactions with the aquifer matrix. Specific attenuating mechanisms for the two COIs included in the models are as follows:

- Arsenic: Sorption to iron and aluminum oxide binding sites in aquifer soil, as well as precipitation of a barium arsenate mineral phase
- Cobalt: Sorption to binding sites on iron oxides and clay minerals in aquifer soil

Inclusion of these attenuation mechanisms in the models was based on analysis of trends in groundwater monitoring data, geochemical modeling, and laboratory studies described previously, including data on extractable iron and aluminum oxides and CEC of aquifer soil samples collected in the vicinity of the model transects (Tables 13 and 11, respectively).

Sorption reactions of COI and other species on iron oxides was modeled using the surface complexation model of Dzombak and Morel (1990). For sorption on clays, the aluminum oxide binding site model presented in Karamalidis and Dzombak (2010) was used. Transect-specific data, including groundwater chemistry, as well as CEC and extractable iron and aluminum oxide concentration data for aquifer solids, were used to define initial groundwater and aquifer matrix geochemistry.

Initial groundwater chemistry along each transect was based on data for samples collected in September 2020 for which complete chemical analyses (major and minor constituents, including COIs) were available. Initial chemistries along the transects were defined by background[1] groundwater chemistry data from a downgradient well with no SSLs. The chemistry of groundwater entering the upgradient boundary of each model transect was defined by upgradient well data with

[1] "Background" here refers to groundwater chemical composition, but not necessarily hydraulically upgradient, i.e., groundwater that is not impacted by the ash pond.

COI concentrations at SSLs. During closure, groundwater extraction from within the ash pond is expected to induce flushing of the aquifer by groundwater with chemistry similar to background composition, which will result in lower COI mass loading to the transects than assumed in the models; model predictions are, therefore, considered to be conservative. The groundwater chemistry data used in the transect models are presented in Table 14. Average CEC and extractable iron and aluminum oxide data (Table 15) for aquifer soil samples collected along each transect were used to assign soil sorption parameters in the models (concentrations of cation exchange, iron, and aluminum oxide binding sites).

Model simulations for each transect were run for total simulation time of 50 years post-closure. Groundwater velocities were calculated from hydraulic conductivity, hydraulic gradients, and effective porosity data. The average horizontal hydraulic conductivity (9.35 feet per day) for Unit 3 (well-graded and poorly graded sands) and a value of 0.25 for effective porosity were taken from the *2020 Annual Groundwater Monitoring and Corrective Action Report* (SCS 2021). Hydraulic gradients were calculated from August 2020 groundwater elevation data for wells along each transect.

Reactive transport models for the five transects, including model results, are described in more detail as follows:

- Transect 1, Arsenic at SSLs
  - Transect length = 890 feet; hydraulic gradient = 0.00042; linear groundwater velocity = 5.8 feet per year.
  - Transect wells for chemistry: upgradient = MW-7; downgradient = MW-23V.
  - Post-closure arsenic concentrations are predicted to remain below the GWPS due to natural attenuation processes occurring along this transect (Figure 13).
- Transect 2, Arsenic at SSLs
  - Transect length = 190 feet; hydraulic gradient = 0.0011; linear groundwater velocity = 15.0 feet per year.
  - Transect wells for chemistry: upgradient = MW-8; downgradient = MW-18H.
  - Arsenic concentrations are predicted to remain below the GWPS for at least 30 years post-closure due to natural attenuation processes occurring along this transect (Figure 14).
- Transect 3, Arsenic at SSLs
  - Transect length = 220 feet; hydraulic gradient = 0.00059; linear groundwater velocity = 8.0 feet per year.
  - Transect wells for chemistry: upgradient = MW-10; downgradient = MW-19H.
  - Arsenic concentrations will continue to be attenuated along this flow path post closure; however, groundwater with arsenic concentrations exceeding the GWPS is predicted to migrate downgradient at a very slow rate (less than 0.5 feet per year; Figure 15).

- Transect 4, Arsenic at SSLs
  - Transect length = 200 feet; hydraulic gradient = 0.0004; linear groundwater velocity = 5.5 feet per year.
  - Transect wells for chemistry: upgradient = MW-12; downgradient = MW-20V.
  - Post-closure arsenic concentrations are predicted to remain below the GWPS due to natural attenuation processes occurring along this transect (Figure 16).
- Transect 5, Arsenic and Cobalt at SSLs
  - Transect length = 530 feet; hydraulic gradient = 0.0003; linear groundwater velocity = 4.1 feet per year.
  - Transect wells for chemistry: upgradient = average of MW-24H, MW-15, and MW-16; downgradient = MW-22H.
  - Post-closure arsenic concentrations are predicted to remain below the GWPS due to natural attenuation processes occurring along this transect (Figure 17a).
  - Cobalt concentrations will continue to be attenuated along this flow path post closure; however, groundwater with cobalt concentrations exceeding the GWPS is predicted to migrate downgradient at a slow rate (approximately 3 feet per year; Figure 17b).

The reactive transport model results presented here indicate that, following completion of source control measures that will also reduce COI concentrations in groundwater, natural attenuation processes will play an important role in achieving the GWPS. For arsenic, model predictions indicate that GWPS could be achieved at the Site within a few years after source control measures are implemented. For cobalt SSLs along the southwestern boundary of the Site, attenuation is occurring but may not be effective as a standalone remedy. The modeling results indicate that, while natural attenuation of COIs is occurring and can be a component of the final remedy for a large portion of the Site, attenuation capacity may need to be enhanced in some areas (e.g., via injection treatment) to achieve GWPS for both COIs sitewide.

8 Column Studies

8.1 Methodology (Setup)

Column tests were performed using Site aquifer media (soil) and impacted groundwater to document COI removal and uptake capacity of the soils under flow conditions and provide a basis for estimating the natural attenuation capacity of the aquifer matrix (part of USEPA's Tier 3).

Groundwater for column testing was collected from May 12 to 19, 2021, from monitoring wells BY-AP-MW-8, BY-AP-MW-10, and BY-AP-MW-15, located at the upgradient ends of transects 2, 3, and 5 (Section 7). These wells were selected for column testing, based on COI concentrations, to provide high COI mass loading to the soils. Upon receipt, groundwater samples were submitted to ALS Environmental in Kelso, Washington, for chemical analysis prior to beginning the column testing. Arsenic is a COI at SSLs in all three groundwater wells, and cobalt is also a COI at SSLs in BY-AP-MW-15. Analytical results are summarized in Table 16 and included in Appendix B. Ten column tests were prepared with combinations of the three groundwaters and 10 Site soils collected from Units 2 and 3 along the 5 transects used for modeling (Table 17). The laboratory column test setup is shown in Figure 18, and a detailed schematic is provided in Figure 19.

Column tests were carried out in 12.8-centimeter (cm)-long, 2.6-cm-diameter polypropylene columns. Site soils were packed into the columns to achieve a total depth of 12.8 cm. Site groundwater was pumped in an upflow direction through the columns at a flow rate of approximately 0.4 milliliters per minute for 9 days (approximately 200 pore volumes) using a peristatic pump with a multichannel pump head. Flow rates were regularly checked and adjusted as needed to maintain a constant flow rate. Table 18 provides a summary of the column test operating conditions.

The initial arsenic concentrations in the three groundwater samples were lower than expected based on historical data (3.5 micrograms per liter [µg/L] in BY-AP-MW-8, 1.5 µg/L in BY-AP-MW-10, and 0.8 µg/L in BY-AP-MW-15 versus historical concentration of approximately 46 µg/L in BY-AP-MW-8, 42 µg/L in BY-AP-MW-10, and 17 µg/L in BY-AP-MW-15). For the column tests, the three groundwaters were, therefore, spiked with arsenic. An arsenic stock solution was prepared from sodium arsenate heptahydrate and added to the influent reservoirs of BY-AP-MW-8, BY-AP-MW-10, and BY-AP-MW-15 to produce an influent concentration of approximately 400 µg/L. Cobalt was also a COI in BY-AP-MW-15 groundwater, and the initial cobalt concentration in BY-AP-MW-15 was 32.5 µg/L. BY-AP-MW-15 groundwater was spiked with cobalt to produce an influent concentration of approximately 80 µg/L. A cobalt stock solution was prepared from cobalt chloride hexahydrate.

Column influents and effluents were sampled periodically over the duration of the tests, and pH was measured at the time of sampling. The samples were filtered using 0.45-micron nylon syringe filters and preserved with nitric acid for metals analysis. Flow rates and cumulative flow volumes were also recorded for each column at the time of sampling to calculate the total number of pore volumes (PVs) treated. The column influent and effluent samples were analyzed for dissolved COIs by USEPA method 200.8 (inductively coupled plasma mass spectrometry) at ALS Environmental.

The laboratory column tests were operated at a higher linear velocity (102 cm per day) than the groundwater flow conditions in the vicinity of the Site, which ranges from 0.49 to 0.70 cm per day (SCS 2021). As a result, the hydraulic residence time in the columns was also much shorter than the hydraulic residence time at the Site. The attenuation measured in the columns, therefore, provides a conservative estimate of the attenuation in the field.

8.2 Column Test Results

Column test results for arsenic are shown in Figures 20 through 22 and for cobalt in Figure 23. Results are plotted as the concentration ratio of effluent to influent (C/Co) as a function of PVs of groundwater passed through each column. Analytical summary reports are included in Appendix B. Arsenic concentrations in the influent reservoirs were not stable and decreased over time. Although the influent reservoirs were purged with N_2 and kept in sealed Mylar bags with oxygen-absorbing packets during the column tests, orange-brown precipitates, inferred to be iron oxides, were observed to form inside the influent reservoirs. This was likely due to the high dissolved iron concentrations of the groundwaters (40.1 mg/L in BY-AP-MW-8, 43.4 mg/L in BY-AP-MW-10, and 74.4 mg/L in BY-AP-MW-15).

Site soils from all transects showed arsenic uptake through the end of the column tests with removal efficiencies ranging between 25% and 100% (Figures 20 to 22, C/Co ranging from 0.75 to 0, respectively). In six of the column tests, C/Co values initially increased during the first day to values greater than 1 (i.e., influent concentration lower than effluent concentration) due to the precipitation of iron oxides in the influent reservoir. During this period, influent and effluent concentrations were both very low and similar in magnitude; the elevated C/Co values do not indicate release of arsenic from the soil but, rather, are an artifact of the influent arsenic concentrations. Arsenic concentrations in the influent reservoirs subsequently rebounded as the dissolved arsenic equilibrated with the iron oxide precipitates; therefore, C/Co values calculated from the second day of column operation onward are considered representative of removal efficiency.

Cobalt concentrations in the BY-AP-MW-15 reservoir also decreased initially due to iron oxide precipitation in the reservoir but to a lesser degree than arsenic. The soil column with Unit 2 soil began with C/Co of 0.3 (70% removal), which increased to 1 by the end of the test, indicating the soil uptake capacity had been exhausted after approximately 200 PV (Figure 23). The column with Unit 3 soil, in contrast, did not remove cobalt from groundwater (Figure 23), consistent with the lower extractable iron oxide content of Unit 3 soils (Table 13).

9 Aquifer Capacity for Attenuation

Geospatial methods were used to calculate the estimated saturated volume of the aquifer and estimated mass of COIs in the aquifer. ArcGIS software (Esri 2021a) was used to perform all geospatial operations. Saturated aquifer thickness data (interpreted from boring and well construction logs), groundwater chemistry data (collected from Site monitoring wells), and previously reported Site porosity values (SCS 2021) were used to create interpolated Thiessen polygons showing saturated aquifer thickness and COI concentration polygons for the entire Site (Esri 2021b).

Vector and raster geospatial data, in combination with results from the column tests, were used as inputs for calculations to estimate the aquifer capacity for attenuating COIs. Vector data consist of points, lines, and polygons and are used to spatially represent precise locations or discrete boundaries in real-world space. Raster data are matrices of cells organized into rows and columns (i.e., a grid) for which each cell carries a data value. Thiessen polygons delineate area around each input point such that any location within the polygon is closer to that point than any of the other input points, effectively allocating area to each point based on the way the points are distributed across a site. A value encoded in the point, such as aquifer thickness, is applied across the entire area of the Thiessen polygon surrounding the point.

The primary geospatial data sources used in this analysis are as follows:

- Aquifer extent (estimated maximum lateral extent of the aquifer available for attenuating COIs based on parcel boundaries in the downgradient flow direction)
- Isoconcentration boundaries (estimated extent of COIs at concentrations greater than the GWPS)
- Sitewide estimates for saturated aquifer thickness and COI concentrations

A workflow was developed using the ArcGIS Model Builder application to calculate estimated saturated aquifer volumes and the mass of COIs in the aquifer. The workflow was divided into modular steps, with separate models created to execute one or more steps. A summary of each step in the workflow is as follows:

1. Interpolate Saturated Aquifer Thickness Using Thiessen Polygons: The saturated aquifer thickness across the Site was determined by interpolating saturated aquifer thickness values from boring and well construction logs. Thiessen polygons were generated from the aquifer thickness points. Because data within the Site footprint is limited, Thiessen polygons were used because they are an interpolation method that estimates data values across large distances between data points without reducing the magnitude of the values, allowing for the estimate of aquifer thickness in the interior portion of the Site where no data points were available.
2. Convert Saturated Aquifer Thickness Thiessen Polygons into Saturated Aquifer Thickness Raster: Saturated aquifer thickness Thiessen polygons were then converted into a saturated aquifer

thickness raster surface with a grid cell resolution of 50 feet by 50 feet, where each cell is encoded with the interpolated saturated aquifer thickness at that location. A 50-foot by 50-foot grid captures adequate detail, given that the Site is hundreds of acres in size.

3. Create Saturated Aquifer Volume Raster: The saturated aquifer thickness raster was used to create a saturated aquifer volume raster by multiplying all thickness cells by their respective area (i.e., 50 feet by 50 feet equals 2,500 square feet). The saturated aquifer volume could then be estimated by taking the summation of all the grid cell values in the saturated aquifer volume raster.
4. Create Plume Volume Raster: For a given COI, a plume volume raster was created by taking the summation of all the grid cell values from the saturated aquifer volume raster within the isoconcentration boundary.
5. Interpolate COI Concentrations Using Thiessen Polygons: Thiessen polygons were created from the groundwater chemistry data for each COI following the same methods used to create the saturated aquifer thickness polygons by applying groundwater chemistry data, instead of aquifer thickness values, to the areas surrounding each point.
6. Convert COI Concentrations Thiessen Polygons into COI Concentrations Raster Surfaces: COI concentration Thiessen polygons were then converted into COI concentration raster surfaces using the same 50-foot by 50-foot cell size.
7. Estimate COI Mass Within Plumes: For each COI, mass within the plume was estimated using Equation 1.
8. Extrapolate Column Test Results to Entire Aquifer: Aquifer capacity for attenuation was determined by multiplying the mass of COIs attenuated in the column studies by the total volume of saturated aquifer calculated in Step 3.

Equation 1

$$M_C = \sum_{i=1}^{n} (V_i \times C_i) \times A \times B \times p$$

where:

M_c	=	estimated mass of COIs within the plume
n	=	number of grid cells in raster
V	=	volume of grid cell
C	=	COI concentration at grid cell
A	=	conversion factor for cubic feet to liters
B	=	conversion factor for either microgram or milligram to kilogram
p	=	porosity

To calculate to mass of COI attenuated during the column study, the influent minus effluent concentrations were plotted on the y-axis (in µg/L), and the volume of water used in the column study was plotted on the x-axis (in liters). The area under the curve was calculated to determine the mass of COI (in micrograms) that was attenuated by column soil. An example graph is included as Figure 24. The average mass of COI attenuated by the columns was used to estimate the attenuating capacity of the entire aquifer.

The aquifer has far more potential for attenuation than the mass of arsenic and cobalt requiring attenuation. Specifically, the aquifer has an attenuating capacity of many times the mass of arsenic and cobalt in groundwater. Aquifer capacity for attenuation results is summarized in Table 19.

10 Time to Achieve Groundwater Protection Standards (Rates) and Stability of Attenuated COIs

The slope of trend lines through recent monitoring data on concentration versus time graphs and results from reactive transport modeling were used to estimate time to achieve the applicable GWPS. Constituents already less than their applicable GWPSs were not included in this analysis. Depending on the COI and well (area), the estimated time to achieve natural attenuation ranges from 7 to 78 years, not considering source control. Most of this range is reasonable compared to durations of other corrective action technologies. However, attenuation capacity will likely need to be enhanced in some areas (e.g., via injection treatment) to reduce the upper end of the time frame for achieving GWPS for both COIs sitewide. Figure 1 shows typical concentration versus time graphs that served as the basis for the rate analysis, and Appendix A contains all time versus concentration graphs.

SSE performed on soils used in the column studies provides a measure of relative stability of the attenuated COIs and their hosts, such as iron oxides. The SSE fractions, from least stable to most stable, are as follows:

- F1: Water soluble
- F2: Exchangeable (e.g., clay minerals)
- F3: Reducible (e.g., poorly crystalline metal oxides such as iron oxides)
- F4: Oxidizable (e.g., crystalline oxide and crystalline sulfide minerals)
- F5: Residual (e.g., silicate phases)

As described in Section 6, most of the arsenic and cobalt in the well solids (precipitates) is in the F3 (reducible); F4 (strong acid/oxidizable); and F5 (residual) phases, which are very stable. Some of the arsenic and cobalt are in the relatively weakly bound F1 (water soluble) and F2 (exchangeable) phases.

SSE was also performed on Site soils used in the column uptake experiments (Table 20) to help determine the attenuating mechanisms and stability of the COIs and their hosts. Much of the post-column SSE data were below detection limits due to the lab having to dilute those samples prior to analysis due to matrix interference. However, for detected data (bold in Table 20), most of the arsenic and cobalt was in the F4 (oxidizable) fraction, with a little in the F3 (reducible) and F5 (residual) fractions. Iron compounds, which are likely the hosts (attenuating species) for arsenic and cobalt, also occur in the F3, F4, and F5 fractions (Table 20). These fractions are very stable, so remobilization of arsenic and cobalt back into groundwater is not anticipated.

11 Conclusions and Interpretation

Extensive geochemical and related studies demonstrate that MNA is a viable corrective action for groundwater impacts associated with the Site. The preponderance of evidence indicates that Site conditions meet USEPA's evaluation criteria for the use of MNA, specifically: area of impacts stable or shrinking, identified mechanisms for attenuation, stability of the attenuating mechanisms, sufficient aquifer capacity for attenuation, and time to achieve GWPSs reasonable as compared to other corrective action alternatives. However, MNA is one component of the Site's corrective action remedy. As noted in the *Groundwater Remedy Selection Report*, the following corrective measures were selected for the Site: source control to include dewatering, consolidation, and capping of the Site; geochemical manipulation via injections in areas of relatively high concentrations of COIs to remove them from groundwater and immobilize them in situ; and MNA over the entire Site.

Investigations performed to support the use of MNA at the Site included the following:

- Preparation of concentration versus time and concentration versus distance graphs for COIs in groundwater
- Groundwater, well solids (precipitates), and soil sampling and analysis
- Laboratory analysis of well solids (precipitates) samples for bulk chemistry (XRF), mineralogy (XRD and SEM), and CEC
- Geochemical modeling
- SSE to determine associations of COIs with attenuating solids
- Column studies to assess the attenuation capacity of the aquifer and to determine the stability of the attenuating phases
- Calculation of the time to achieve natural attenuation

Graphs of concentration versus time for COIs at the Site indicate a reduction of arsenic in groundwater through time in several areas, even without source control. Specifically, arsenic is generally stable over time at wells BY-AP-MW-1, BY-AP-MW-7, BY-AP-MW-12, BY-AP-MW-13, BY-AP-MW-15, and BY-AP-MW-16.

Concentration versus distance graphs along multiple downgradient transects indicate that arsenic and cobalt are decreasing or stable with distance from the Site. Transects with decreasing concentrations include the following:

- Arsenic: BY-AP-MW-5 to BY-AP-MW-17H, BY-AP-MW-7 to BY-AP-MW-23H, BY-AP-MW-8 to BY-AP-MW-18H, BY-AP-MW-10 to BY-AP-MW-19H, and BY-AP-MW-12 to BY-AP-MW-20H
- Cobalt: BY-AP-MW-15 to BY-AP-MW-22H

Results from existing groundwater data analysis, geochemical modeling, and well solids (precipitates) analyses provide multiple lines of evidence for attenuation mechanisms for COIs operating at the Site. The major attenuation mechanisms operating at the Site include the following:

- Sorption on amorphous iron oxides (arsenic and cobalt)
- Cation exchange on clays (cobalt)
- Coprecipitation in crystalline iron oxides (arsenic and cobalt)
- Precipitation in barium arsenate (arsenic)

All COIs are also subject to physical attenuation mechanisms such as dispersion and flushing, which will contribute to decreased concentrations with time and distance from the Site.

Column studies were performed to assess the ability and capacity of the aquifer media (soil) to take up COIs. Laboratory results were then extrapolated to the entire saturated mass of aquifer (downgradient of the consolidated pond footprint) using quantitative GIS-based techniques. Based on the column studies and saturated volume of the downgradient aquifer, the aquifer has much higher capacity to attenuate (sorb) arsenic and cobalt than the mass of the COIs currently in groundwater. Specifically, the aquifer has an attenuating capacity of many times the mass of arsenic and cobalt in groundwater.

SSE was performed on samples of well solids (precipitates) and soils used in the column studies to assess the stability of the attenuated COIs and their host minerals. Most of the arsenic and cobalt is bound in stable fractions, specifically: F3 (reducible), F4 (strong acid/oxidizable), and F5 (residual). Arsenic and cobalt, therefore, are not anticipated to remobilize into groundwater in the future, unless geochemical conditions change drastically, which is not expected.

Trend lines through recent groundwater data and results from reactive transport modeling were used to estimate time to achieve the applicable GWPS. Depending on the COI and well (area), the estimated time to achieve natural attenuation ranges from 7 to 78 years, not considering source control. Most of this range is reasonable compared to durations of other corrective action technologies. However, attenuation capacity will likely need to be enhanced in some areas (e.g., via injection treatment) to reduce the upper end of the time frame for achieving GWPS for both COIs sitewide.

12 References

Bethke, C.M., and S. Yeakel, 2013. *The Geochemist's Workbench – Release 9.0. GWB Essentials Guide*. Champaign, Illinois: Aqueous Solutions, LLC. 2013.

Dzombak, D.A., and F.M.M. Morel, 1990. *Surface Complexation Modeling: Hydrous Ferric Oxide*. New York: John Wiley and Sons, Inc.

Esri, 2021a. ArcGIS Desktop: Release 10.8. Redlands, CA: Environmental Systems Research Institute.

Esri, 2021b. *ArcGIS Help, Create Thiessens Polygons Tool*.

Karamalidis, A.K., and D.A. Dzombak, 2010. *Surface Complexation Modeling: Gibbsite*. New Jersey: John Wiley and Sons, Inc.

Parc, S., D. Nahon, Y. Tardy, and P. Vieillard, 1989. "Estimated Solubility Products and Fields of Stability for Cryptomelane, Nsutite, Birnessite, and Lithiophorite Based on Natural Lateritic Weathering Sequences." *American Mineralogist*. 74:466-475.

Parkhurst, D.L., and C.A.J. Appelo, 2013. "Description of Input and Examples for PHREEQC Version 3—A Computer Program for Speciation, Batch-Reaction, One-Dimensional Transport, and Inverse Geochemical Calculations." *U.S. Geological Survey Techniques and Methods, Book 6*. Washington, DC: U.S. Department of the Interior; p. 497.

SCS (Southern Company Services, Inc.), 2021. *2020 Annual Groundwater Monitoring and Corrective Action Report*. Plant Barry Ash Pond. Prepared for Alabama Power Company. January 31, 2021.

USEPA (U.S. Environmental Protection Agency), 1999. *Use of Monitored Natural Attenuation of Superfund, RCRA Corrective Action, and Underground Storage Tank Sites*. Office of Solid Waste and Emergency Response. EPA/OSWER No. 9200.4-17P. April 1999.

USEPA, 2015. *Use of Monitored Natural Attenuation for Inorganic Contaminants in Groundwater at Superfund Sites*. USEPA Office of Solid Waste and Emergency Response Directive 9283.1-36. August 2015.

Tables

Table 1
Monitored Natural Attenuation Demonstration Status

Tier	Approach	Status of MNA Demonstration
Tier 1: Area of Impacts Stable or Shrinking	Concentration versus time and/or distance graphs, statistics; isoconcentrations in plan and/or section view; Ricker Method (part of ongoing monitoring)	Satisfied
Tier 2a: Determine Mechanisms of Attenuation	Analysis of well solids: XRF, XRD, SEM, CEC, and SSE; complete analysis of groundwater (major cations and anions); geochemical modeling	Satisfied
Tier 2b: Determine Rates of Attenuation	Derived from concentration versus time graphs; batch and/or column tests; geochemical modeling	Satisfied
Tier 3a: Determine System (Aquifer) Capacity for Attenuation	Batch and/or column tests; geochemical modeling	Satisfied
Tier 3b: Determine Stability of the Attenuating Mechanisms (Solids) and COIs	SSE on tested materials from batch and column tests; geochemical modeling; inference from mechanisms	Satisfied
Tier 4a: Design a Performance Monitoring Program	Additional wells; repeat well solids and/or complete groundwater analysis; triggers	Satisfied
Tier 4b: Identify Alternative Remedies Should MNA Not Perform as Expected	Completed as part of the ACM; some technologies may need further testing and/or development (bench and pilot)	Satisfied

Notes:

ACM: *Assessment of Corrective Measures*

CEC: cation exchange capacity

COI: constituent of interest

MNA: monitored natural attenuation

SEM: scanning electron microscopy

SSE: selective sequential extraction

XRD: X-ray diffraction

XRF: X-ray fluorescence

Table 2
Sampling Locations

Groundwater Sampling Locations				
BY-AP-MW-1	BY-AP-MW-4	BY-AP-MW-8	BY-AP-MW-11	BY-AP-MW-14
BY-AP-MW-2	BY-AP-MW-5	BY-AP-MW-9	BY-AP-MW-12	BY-AP-MW-15
BY-AP-MW-3	BY-AP-MW-7	BY-AP-MW-10	BY-AP-MW-13	BY-AP-MW-16
Well Solids Sampling Locations				
BY-AP-MW-1	BY-AP-MW-5	BY-AP-MW-9	BY-AP-MW-12	BY-AP-MW-15
BY-AP-MW-2	BY-AP-MW-7	BY-AP-MW-10	BY-AP-MW-13	BY-AP-MW-16
BY-AP-MW-3	BY-AP-MW-8	BY-AP-MW-11	BY-AP-MW-14	

Table 3
Analyzed Constituents and Laboratory Analytical Methods

Constituent	Analytical Method	Constituent	Analytical Method
Alkalinity (total as $CaCO_3$)	SM 2320 B	Lead (dissolved)	EPA 200.8
Aluminum (dissolved)	EPA 200.8	Iron (total)	EPA 200.7
Aluminum (total)	EPA 200.8	Lead (total)	EPA 200.8
Antimony (dissolved)	EPA 200.8	Lithium (total)	EPA 200.7
Antimony (total)	EPA 200.8	Magnesium (total)	EPA 200.7
Arsenic (dissolved)	EPA 200.8	Manganese (dissolved)	EPA 200.8
Arsenic (total)	EPA 200.8	Manganese (total)	EPA 200.8
Barium (total)	EPA 200.8	Molybdenum (dissolved)	EPA 200.8
Beryllium (dissolved)	EPA 200.8	Molybdenum (total)	EPA 200.8
Beryllium (total)	EPA 200.8	Nitrogen nitrate (calculated)	EPA 353.2
Bicarbonate Alkalinity (calculated)	SM 4500CO2 D	Nitrogen nitrate/nitrite	EPA 353.2
Boron (total)	EPA 200.7	Nitrogen nitrite	EPA 353.2
Cadmium (dissolved)	EPA 200.8	Ortho phosphate	SM 4500PF-OP
Cadmium (total)	EPA 200.8	Potassium (total)	EPA 200.8
Calcium (total)	EPA 200.7	Selenium (dissolved)	EPA 200.8
Carbonate Alkalinity (calculated)	SM 4500CO2 D	Selenium (total)	EPA 200.8
Chloride	SM4500Cl E	Silica (total; calculated)	EPA 200.7
Chromium (dissolved)	EPA 200.8	Silicon (total)	EPA 200.7
Chromium (total)	EPA 200.8	Sodium (total)	EPA 200.7
Cobalt (dissolved)	EPA 200.8	Sulfate	SM 4500SO4 E 2011
Cobalt (total)	EPA 200.8	Thallium (dissolved)	EPA 200.8
Fluoride	SM 4500F G 2017	Thallium (total)	EPA 200.8
Iron (dissolved)	EPA 200.7	Total organic carbon	SM 5310 B

Notes:

$CaCO_3$: calcium carbonate

EPA: U.S. Environmental Protection Agency (method)

SM: Standard Method

Table 4
Saturation Indices for Groundwater Samples

Sample ID	Well Designation	$Fe(OH)_3(a)$	Goethite	Hematite	Magnetite	Siderite	$CoFe_2O_4$	$Ba_3(AsO_4)_2$
BY-AP-MW-1	Downgradient	-0.38	**5.40**	**12.8**	**13.6**	**1.20**	--	**5.59**
BY-AP-MW-2	Upgradient	-1.06	**4.70**	**11.4**	**10.9**	-1.97	**16.4**	**1.64**
BY-AP-MW-3	Upgradient	--	--	--	--	--	--	--
BY-AP-MW-4	Upgradient	-2.60	**3.16**	**8.31**	**4.34**	-4.36	**9.88**	--
BY-AP-MW-5	Downgradient	**0.67**	**6.42**	**14.8**	**15.5**	**0.71**	--	**4.58**
BY-AP-MW-7	Downgradient	-0.02	**5.75**	**13.5**	**14.2**	**0.16**	**18.7**	**4.77**
BY-AP-MW-8	Downgradient	-0.79	**4.97**	**11.9**	**13.2**	**1.01**	--	**5.82**
BY-AP-MW-9	Downgradient	**0.15**	**5.93**	**13.9**	**15.3**	**1.16**	--	**5.93**
BY-AP-MW-10	Downgradient	-0.58	**5.18**	**12.3**	**13.6**	**1.23**	--	**5.21**
BY-AP-MW-11	Downgradient	**0.17**	**5.91**	**13.8**	**15.2**	**1.17**	--	**4.51**
BY-AP-MW-12	Downgradient	-0.27	**5.49**	**13.0**	**14.1**	**1.03**	**17.2**	**4.52**
BY-AP-MW-13	Downgradient	-0.30	**5.44**	**12.9**	**13.5**	**0.50**	--	**3.75**
BY-AP-MW-14	Downgradient	-0.37	**5.37**	**12.7**	**13.3**	**0.52**	--	**3.54**
BY-AP-MW-15	Downgradient	**0.61**	**6.34**	**14.7**	**16.7**	**1.29**	**20.6**	**5.42**
BY-AP-MW-16	Downgradient	-0.11	**5.66**	**13.3**	**14.0**	**0.84**	**17.8**	**3.08**

Notes:

SI for Plant Barry groundwater samples were collected on February 3 through February 6, 2020.

Bold indicates positive SI values (i.e., groundwater supersaturated with respect to mineral phase).

--: No SI calculated because one or more constituent(s) in phase was not detected in groundwater sample.

$Ba_3(AsO_4)_2$: barium arsenate

$CoFe_2O_4$: cobalt-iron oxide phase

$Fe(OH)_3(a)$: amorphous iron hydroxide

SI: saturation indices

Table 5

Geochemical Analysis of Monitoring Well and Aquifer Solids

Analysis	Description	Relevance to MNA Demonstration
CEC	Determines if cation exchange on clays is an attenuating mechanism.	Supports Tier 2 (mechanisms) and Tier 3 (stability) of cation exchange.
SEM	Allows direct visual observation of attenuating phases, such as framboidal pyrite and iron oxide coatings on sand grains.	Supports Tier 2 (mechanisms) and Tier 3 (stability) of attenuating phases.
SSE	Determines which attenuating solid phases are associated with arsenic and cobalt.	Supports Tier 2 (mechanisms) and Tier 3 (stability) of attenuating phases.
XRD	Identifies and provides mineralogy of crystalline attenuating phases.	Supports Tier 2 (mechanisms) and Tier 3 (stability) of attenuation involving crystalline mineral phases.
XRF	Provides bulk chemistry and presence of arsenic and cobalt.	Relationships are determined among elements in attenuating phases (e.g., iron and manganese) and arsenic. Supports Tier 2 (mechanisms) and Tier 3 (stability).

Notes:

CEC: cation exchange capacity

MNA: monitored natural attenuation

SEM: scanning electron microscopy

SSE: selective sequential extraction

XRD: X-ray diffraction

XRF: X-ray fluorescence

Table 6
Bulk Chemistry of Well Solids Samples by XRF

Well ID	Arsenic	Cobalt	Iron	Manganese	Aluminum	Calcium	Magnesium	Potassium	Silicon
BY-AP-MW-1	21	ND	25,600	ND	11,700	2,170	ND	6,530	302,000
BY-AP-MW-2	ND	ND	7,810	ND	7,020	2,010	ND	7,060	362,000
BY-AP-MW-3	ND	ND	11,200	ND	5,980	1,470	ND	4,610	283,000
BY-AP-MW-5	24	ND	6,540	ND	2,490	946	ND	1,160	263,000
BY-AP-MW-7	44	ND	49,800	ND	4,290	3,710	ND	3,760	223,000
BY-AP-MW-9	44	ND	33,000	ND	2,360	6,260	ND	2,450	46,500
BY-AP-MW-11	11	ND	10,200	ND	4,060	2,280	ND	4,840	237,000
BY-AP-MW-12	ND	ND	2,220	ND	1,810	1,340	ND	2,170	279,000
BY-AP-MW-13	ND	ND	2,650	ND	1,370	816	ND	2,890	253,000
BY-AP-MW-16	ND	ND	4,020	ND	4,340	1,920	ND	5,920	311,000

Notes:

Units are in milligrams per kilogram.

ND: below limit of detection

XRF: X-ray fluorescence

Table 7
Minerals Identified in Well Solids Samples by XRD[1]

	Oxides	Carbonates	Clay Minerals	Mica	Feldspar			
Sample ID	Goethite	Dolomite	Montmorillonite	Muscovite/Illite	K-feldspar	Plagioclase	Zeolite	Quartz
BY-AP-MW-1				X				X
BY-AP-MW-2			0.1			1.9	0.2	97.8
BY-AP-MW-5			0.2				0.4	99.4
BY-AP-MW-7	X							X
BY-AP-MW-11			0.1			9.3	0.6	89.9
BY-AP-MW-13			0.1				0.3	99.6
BY-AP-MW-16		1.8	0.2		1.1		0.3	96.6

Notes:

1: Estimated concentration (weight percent) reported where available

X: Positive identification, not quantified

XRD: X-ray diffraction

Table 8
Cation Exchange Capacity of Well Solids Samples

Well ID	Aluminum	Calcium	Cobalt	Magnesium	Potassium	Sodium	Sum
BY-AP-MW-1	0.037 J	100	0.006	7.4	0.73	5.4	114
BY-AP-MW-2	0.14 J	29	0.014	4.8	4.0	7.0	44.8
BY-AP-MW-11	0.010 J	84	0.006	4.0	1.6	1.9	91.6
BY-AP-MW-16	<0.013	340	0.010	4.4	1.7	2.8	350

Notes:

Concentrations are in milliequivalents per kilogram.

<: Indicates the compound was analyzed for but not detected

J: Detected but result is below the method reporting limit

Table 9
Bulk Chemistry of Aquifer Solids Samples by XRF

Boring Location	Depth Interval (ft bgs)	Units	Arsenic	Cobalt	Iron	Manganese	Barium	Calcium	Potassium	Sulfur
1A - Unit 2	55-57	ppm	<LOD	<LOD	5,711	89	277	1,807	7,188	<LOD
1A - Unit 3	62-65	ppm	<LOD	21	755	70	236	1,065	2,570	<LOD
1A - Unit 3	65-70	ppm	<LOD	28	382	101	257	294	1,215	<LOD
2A - Unit 2	33-35	ppm	<LOD	<LOD	6,323	130	210	1,432	6,868	515
2A - Unit 3	43-45	ppm	3	154	2,164	287	275	1,836	3,048	<LOD
2A - Unit 3	48-55	ppm	<LOD	22	702	92	239	58	1,594	<LOD
2A - Unit 2	44-45	ppm	<LOD	<LOD	16,559	184	257	4,178	9,610	897
2B - Unit 3	45-50	ppm	<LOD	<LOD	1,397	110	259	110	2,352	1,017
2B - Unit 3	53-55	ppm	<LOD	<LOD	2,523	116	282	619	1,706	561
3A - Unit 3	34-38	ppm	<LOD	<LOD	6,244	130	273	728	4,325	1,616
3A -Unit 3	38-45	ppm	<LOD	<LOD	1,313	91	243	410	1,912	1,630
3B - Unit 2	29-33	ppm	<LOD	<LOD	16,584	209	317	7,513	11,786	1,109
3B - Unit 3	33-45	ppm	<LOD	<LOD	2,925	113	272	853	4,926	864
4A - Unit 2	38-40	ppm	<LOD	<LOD	3,299	132	290	2,610	7,598	1,668
4A - Unit 3	58-65	ppm	<LOD	<LOD	657	91	289	256	3,134	<LOD
4A - Unit 3	62-65	ppm	<LOD	<LOD	953	93	236	237	3,939	<LOD
4B - Unit 2	40-42	ppm	<LOD	<LOD	1,860	89	237	793	3,743	<LOD
4B - Unit 3	46-48	ppm	<LOD	<LOD	2,878	107	255	1,431	6,332	955
4B - Unit 3	60-65	ppm	<LOD	<LOD	1,021	90	247	113	5,422	<LOD
4C - Unit 3	55-65	ppm	<LOD	<LOD	703	90	239	65	2,319	679
5A - Unit 2	47-49	ppm	<LOD	<LOD	3,247	89	244	901	3,611	<LOD
5A - Unit 3	65-67	ppm	<LOD	<LOD	2,911	110	320	736	5,704	<LOD
5B - Unit 2	43-44	ppm	<LOD	<LOD	1,361	80	211	143	2,040	469
5B - Unit 3	75-78	ppm	<LOD	20	427	93	271	48	1,667	<LOD
5C - Unit 3	65-70	ppm	<LOD	<LOD	728	100	265	<LOD	1,770	<LOD
5C - Unit 3	75-80	ppm	<LOD	<LOD	448	81	248	90	1,604	<LOD
6 - Unit 2	30-31	ppm	<LOD	<LOD	6,902	68	237	4,179	3,815	682
6 - Unit 3	60-62	ppm	<LOD	<LOD	1,584	74	254	900	4,047	621
6 - Unit 3	70-73	ppm	<LOD	<LOD	1,071	95	223	71	3,489	<LOD

Notes:

Samples were analyzed on April 40, 2021 and May 3, 2021

<LOD: less than limit of detection

ft bgs: feet below ground surface

ppm: parts per million

XRF: X-ray fluorescence

Table 10

Minerals Identified in Aquifer Solids Samples by XRD[1]

Sample ID	Location ID	Depth Interval (ft bgs)	Carbonates	Clay Minerals		Mica	Feldspar		Quartz
			Dolomite	Montmorillonite	Kaolinite	Muscovite/Illite	K-feldspar	Plagioclase	
BA1-1A-Unit2_55-57	SB-1A	55-57		0.2	0.7	3.2	1.8		94.1
BA2-1A-Unit3_62-65	SB-1A	62-65		tr	0.6		1		98.4
BA5-2A-Unit3_43-45	SB-2A	43-45		0.1		1.1	1.5		97.3
BA7-2B-Unit2_44-45	SB-2B	44-45		0.1	2.2	16.3		2.7	78.7
BA10-3A-Unit3_34-38	SB-3A	34-38	0.1	0.1	0.4	1.6			97.8
BA12-3B-Unit2_29-33	SB-3B	29-33		0.3		15.3	1.8		82.6
BA14-4A-Unit2_38-40	SB-4A	38-40		0.1		3.1	3.4		93.4
BA18-4B-Unit3_46-48	SB-4B	46-48		0.1		2.8	1.3		95.8
BA26-5A-Unit2_47-49	SB-5A	47-49		0.1	1.5	1.2			97.2
BA21-5C-Unit3_65-70	SB-5C	65-70		0.1		0.3		2.4	97.2

Notes:

1: Estimated concentration (weight percent) reported where available.

ft bgs: feet below ground surface

tr: Mineral present at trace level (less than 0.1 %)

XRD: X-ray diffraction

Table 11
Cation Exchange Capacity and Exchangeable Cations in Aquifer Soils

Sample ID	Boring Location	Depth Interval (ft bgs)	Exchangeable Cations (meq/kg soil)						CEC (meq/kg soil)
			Aluminum	Calcium	Cobalt	Magnesium	Potassium	Sodium	
1A-UNIT2-55-57	1A	55-57	0.0695 U	**22.5**	**0.00365**	**9.33**	**1.55**	**1.32**	**34.7**
1A-UNIT3-62-65	1A	62-65	0.0695 U	**4.89**	**0.0351**	**1.27**	**0.281**	**0.57**	**7.05**
2A-UNIT3-43-45	2A	43-45	0.0692 U	**23.6**	**0.00291**	**3.04**	**0.726**	**0.494**	**27.9**
2B-UNIT2-44-45	2B	44-45	0.0692 U	**46.0**	**0.0147**	**6.77**	**1.29**	**0.837**	**54.9**
3A-UNIT3-34-38	3A	34-38	0.0695 U	**8.06**	**0.00877**	**3.42**	**0.735**	**0.652**	**12.9**
3B-UNIT2-29-33	3B	29-33	0.0694 U	**34.6**	**0.0327**	**13.6**	**1.43**	**1.19**	**50.9**
4A-UNIT2-38-40	4A	38-40	0.0695 U	**10.2**	**0.00546**	**8.39**	**1.26**	**0.961**	**20.8**
4B-UNIT3-46-48	4B	46-48	0.139 U	**9.57**	**0.00317**	**5.96**	**0.959**	**1.03**	**17.5**
5A-UNIT2-47-49	5A	47-49	0.0694 U	**6.50**	0.000847 U	**4.85**	**0.711**	**0.801**	**12.9**
5C-UNIT3-65-70	5C	65-70	0.0695 U	**0.624 J**	**0.00373**	**0.551**	**0.128**	**0.668**	**1.97**
5C-UNIT3-65-70[1]	5C[1]	65-70	0.139 U	0.749 U	**0.00373**	**0.625**	**0.148**	**0.615**	**1.39**

Notes:
Bold indicates detected values.
1. Duplicate
CEC: cation exchange capacity
J: Estimated value
ft bgs: feet below ground surface
meq/kg: milliequivalents per kilogram
U: Compound analyzed for but not detected above detection limit

Table 12
Geochemical Evidence for Attenuation Mechanisms for Arsenic and Cobalt

Mechanism	Geochemical Modeling	XRF	XRD	SSE	CEC
Sorption on iron oxides (arsenic and cobalt)	X	X	X	X	
Cation exchange on clays (cobalt)			X	X	X
Coprecipitation in iron oxides and/or carbonates (arsenic and cobalt)	X	X	X	X	
Precipitation in barium arsenate (arsenic)	X			X	

Notes:
X: Indicates attenuation for arsenic and cobalt.

Table 13
Extractable Aluminum, Manganese, and Iron Oxides in Aquifer Soils

Sample ID	Boring Location	Depth Interval (ft bgs)	Extractable Oxides (mg/kg soil)			Simultaneously Extractable Metals (mg/kg)	
			Aluminum	Iron	Manganese	Arsenic	Cobalt
1A-UNIT2-55-57	1A	55-57	**218**	**818**	**3.00**	**0.444**	**0.30**
1A-UNIT3-62-65	1A	62-65	**18.5**	**154**	**2.01**	**0.413**	**1.16**
2A-UNIT3-43-45	2A	43-45	**195**	**1080**	**23.6**	**0.319**	**0.496**
2B-UNIT2-44-45	2B	44-45	**350**	**2590**	**29.1**	**0.425**	**1.77**
3A-UNIT3-34-38	3A	34-38	**196**	**1110**	**17.8**	**0.243 J**	**0.671**
3B-UNIT2-29-33	3B	29-33	**392**	**3180**	**80.0**	**0.687**	**2.91**
4A-UNIT2-38-40	4A	38-40	**293**	**228**	**3.43**	**0.741**	**0.741**
4B-UNIT3-46-48	4B	46-48	**184**	**735**	**8.18**	**0.253 J**	**0.394**
5A-UNIT2-47-49	5A	47-49	**226**	**1100**	**6.39**	**0.336 J**	0.179 U
5C-UNIT3-65-70	5C	65-70	**14.2 J**	**69.9**	**1.17**	0.179 U	0.179 U
5C-UNIT3-65-70[1]	5C[1]	65-70	**13.9 J**	**74.7**	**1.13**	0.176 U	0.176 U

Notes:
Bold indicates detected values.
1. Duplicate
Extractable oxides determined by acid ammonium oxalate method.
J: Estimated value
ft bgs: feet below ground surface
mg/kg: milligrams per kilogram
U: Compound analyzed for but not detected above detection limit

Table 14
Groundwater Chemistry Data Used in the 1D Reactive Transport Models

		Transect 1		Transect 2		Transect 3		Transect 4		Transect 5			
	Sample Location ID:	MW-7	MW-23V	MW-8	MW-18H	MW-10	MW-19H	MW-12	MW-20V	MW-24H	MW-15	MW-16	MW-22H
Analyte	Units	Upgradient	Downgradient	Upgradient	Downgradient	Upgradient	Downgradient	Upgradient	Downgradient	Upgradient	Upgradient	Upgradient	Downgradient
eH	V	0.218	0.020	0.153	0.147	0.125	0.120	0.151	0.154	0.144	0.097	0.227	0.115
pe	SU	3.72	0.34	2.63	2.53	2.14	2.06	2.59	2.63	2.45	1.66	3.87	1.97
pH	SU	6.25	7.98	5.89	6.15	6.33	6.31	6.19	6.03	6.01	6.57	5.47	6.48
DO	mg/L	0.29	0.19	0.13	0.13	0.23	0.12	0.15	0.27	0.17	0.13	0.18	0.16
Alkalinity	mg/L	118	169	214	200	302	228	251	254	339	123	224	248
Arsenic	mg/L	0.023	0.005 U	0.063	0.015	0.076	0.001	0.025	0.008	0.078	0.021	0.014	0.022
Barium	mg/L	0.075	0.009	0.151	0.123	0.078	0.159	0.083	0.115	0.260	0.074	0.095	0.234
Calcium	mg/L	10.4	1.27	31.5	25.6	57.2	31.6	22.2	14.7	17.6	7.04	13.1	14.8
Chloride	mg/L	12.9	117	22.2	19.8	25.0	17.6	23.4	27.1	43.7	47.0	20.8	59.9
Cobalt	mg/L	0.020	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.003	0.012	0.006	0.039	0.019	0.003
Iron (dissolved)	mg/L	13.1	0.516	74.1	82.4	67.6	96.9	63.8	80.5	108	101	84.3	70.0
Lithium	mg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Magnesium	mg/L	7.91	0.592	9.90	10.2	17.3	7.63	17.1	9.38	16.4	5.12	6.98	13.6
Manganese (dissolved)	mg/L	0.430	0.036	1.47	1.20	1.43	1.20	0.656	1.47	0.202	0.683	0.810	0.526
Potassium	mg/L	1.84	1.71	0.756	1.32	1.53	1.83	2.97	2.48	2.67	2.95	2.14	2.15
Sodium	mg/L	20.8	134	18.1	16.4	23.8	19.5	39.4	46.7	75.0	25.0	25.2	70.9
Sulfate	mg/L	3.59	9.25	15.8	30.6	15.6	16.9	32.1	38.3	59.7	7.61	13.3	93.2

Notes:

Groundwater chemistry data is from September 2020.

Thick border indicates transect constituent of interest at a statistically significant level.

DO: dissolved oxygen

mg/L: milligrams per liter

pe: A measure of oxidation-reduction potential

SU: standard units

U: Compound analyzed for but not detected above detection limit

V: volts

Table 15
Cation Exchange and Sorption Capacity for the 1D Model Transects

Constituent	Units	Transect 1	Transect 2	Transect 3	Transect 4	Transect 5
Cation exchange capacity for Unit 3 soil	meq/kg	7.01	27.8	12.9	17.5	1.97
X	meq/L	0.056	0.221	0.103	0.139	0.016
Extractable iron oxides for Unit 3 soil	mg/kg	154	1076	1112	735	69.9
≡FeOH (weak)	mol/L	0.0044	0.031	0.032	0.021	0.0020
≡FeOH (strong)	mol/L	0.00011	0.00077	0.00079	0.00052	0.00005
Extractable aluminum oxides for Unit 3 soil	mg/kg	18.5	195	196	184	14.2
≡AlOH	mol/L	0.00018	0.0019	0.0019	0.0018	0.00014

Notes:

≡FeOH (weak): weak surface binding site on $Fe(OH)_3$

≡FeOH (strong): strong surface binding site on $Fe(OH)_3$

≡AlOH: surface binding site on $Al(OH)_3$

meq/kg: milliequivalents per kilogram

meq/L: milliequivalents per liter

mg/kg: milligrams per kilogram

mol/L: moles per liter

X: ion exchange site

Table 16
Initial Groundwater Characterization Results

Parameter	Result			Unit
	MW-8	MW-10	MW-15	
Alkalinity	143	236	30	mg/L as $CaCO_3$
Ammonia as N	0.503	1.45	0.250	mg/L
Total organic carbon	9.70	11.7	3.80	mg/L
Chloride	19.4	23.7	76.0	mg/L
Fluoride	0.01 U	0.01 U	0.01 U	mg/L
Nitrate as N[1]	0.02 U	0.02 U	0.02 U	mg/L
Nitrite as N	0.006 U	0.006 U	0.006 U	mg/L
Orthophosphate	0.020 U	0.020 U	0.020 U	mg/L
Sulfate	0.26 J	0.26 J	0.11 J	mg/L
Aluminum, dissolved	4 J	4 J	3 J	µg/L
Aluminum, total	3 J	5 J	3 J	µg/L
Antimony, dissolved	0.10 U	0.10 U	0.10 U	µg/L
Arsenic, dissolved	3.5	1.5 J	0.8 J	µg/L
Barium, dissolved	62.7	45.6	68.00	µg/L
Beryllium	0.03 U	0.03 U	0.03 U	µg/L
Boron, dissolved	1,040	2,020	18	µg/L
Cadmium, dissolved	0.04 U	0.04 U	0.04 U	µg/L
Calcium, dissolved	6.76	58.0	31.5	mg/L
Chromium, dissolved	0.5 J	0.3 J	0.2 U	µg/L
Cobalt, dissolved	0.55	0.59	32.5	µg/L
Iron, dissolved	40,100	43,400	74,400	µg/L
Iron, total	41,000	53,000	82,700	µg/L
Lead, dissolved	0.03 U	0.03 U	1.01	µg/L
Lithium, dissolved	1.86	2.35	3.69	µg/L
Magnesium, dissolved	5.01	17.5	10.4	mg/L
Manganese, dissolved	1,620	1,520	721	µg/L
Manganese, total	1,600	1,510	717	µg/L
Molybdenum, dissolved	0.16 J	0.15 U	0.18 J	µg/L
Nickel, dissolved	0.3 J	0.2 J	3.3	µg/L
Potassium, dissolved	2.30	1.63	910	mg/L
Selenium, dissolved	1.0 U	1.0 U	1.0 U	µg/L
Silicon, dissolved	5.47	12.1	14.7	mg/L
Silver, dissolved	0.05 U	0.05 U	0.05 U	µg/L
Sodium, dissolved	35.2	25.0	19.4	mg/L
Thallium, dissolved	0.05 U	0.05 U	0.05 U	µg/L
Zinc, dissolved	3 U	3 U	3 U	µg/L
pH	6.60	6.94	5.53	--

Notes:

Samples were field filtered with a 0.45-micron filter at the time of collection and filtered again prior to analysis for dissolved constituents.

1. Calculated as: (nitrogen, nitrate + nitrite) – (nitrogen, nitrite)

--: not applicable

µg/L: micrograms per liter

$CaCO_3$: calcium carbonate

J: Indicates that the result is an estimated value.

mg/L: milligrams per liter

N: nitrogen

U: Indicates that the compound was analyzed for but not detected.

Table 17
Site Soils and Groundwater Used in Column Tests

Column Number	Soil ID	Groundwater ID	COI(s) in Groundwater
1	1a-unit2 55-57, ba1	MW-8	Arsenic
2	1a-unit3 62-65, ba2	MW-8	Arsenic
3	2a-unit3 43-45, ba5	MW-8	Arsenic
4	2b-unit2 44-45, ba7	MW-8	Arsenic
5	3a-unit3 34-38, ba10	MW-10	Arsenic
6	3b-unit2 29-33, ba12	MW-10	Arsenic
7	4a-unit2 38-40, ba14	MW-10	Arsenic
8	4b-unit3 46-48, ba18	MW-10	Arsenic
9	5a-unit2 47-49, ba26	MW-15	Arsenic, Cobalt
10	5c-unit3 65-70, ba21	MW-15	Arsenic, Cobalt

Note:
COI: constituent of interest

Table 18
Column Test Operating Conditions

Parameter	Value	Unit
Soil/sand mixture depth	12.8	cm
Column inside diameter	2.68	cm
Flow rate	0.4	mL per minute
Empty bed contact time	3.01	hours
Porosity	31–40	%
Dry mass of soil in column	109–121	gram
Hydraulic residence time	0.93–1.20	hours
Darcy flux	31.6–40.8	cm per day
Linear velocity	102	cm per day
Column test duration	8	days

Notes:

cm: centimeters

mL: milliliters

Table 19
Estimated Aquifer Capacity

COI	Estimated Maximum Mass of COI in Aquifer (kg)	Estimated Maximum Attenuating Capacity of Aquifer (kg)	Estimated Excess Attenuating Capacity of Aquifer
Arsenic	341	8,500 to 112,000	25x to 330x
Cobalt	10	112 to 114,000	11x to 11,000x

Notes:

COI: constituent of interest

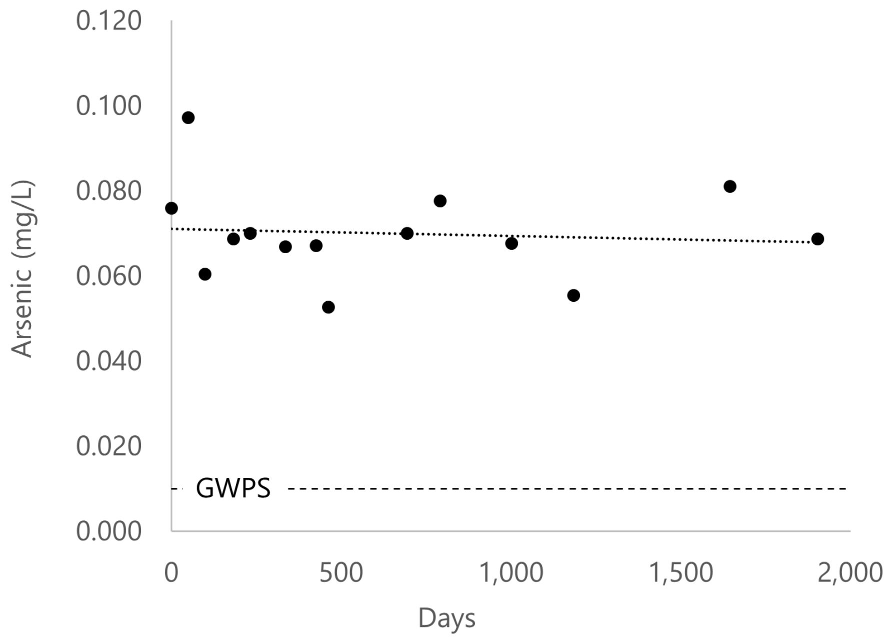
kg: kilograms

Table 20
Post-Column Test Soil SSE Results

Sample ID	Boring Location	Depth Interval (ft bgs)	Groundwater	Arsenic (mg/kg)					Cobalt (mg/kg)					Iron (mg/kg)					Manganese (mg/kg)				
				F1	F2	F3	F4	F5	F1	F2	F3	F4	F5	F1	F2	F3	F4	F5	F1	F2	F3	F4	F5
1A-UNIT2-55-57	1A	55-57	MW-8	2.18 U	2.18 U	0.218 U	**0.332 J**	0.533 U	2.18 U	2.18 U	0.218 U	**0.199 J**	**0.889 J**	--	109 U	**403**	**412**	**2970**	--	**4.82**	**1.32**	**1.19**	**6.46**
1A-UNIT3-62-65	1A	62-65	MW-8	2.01 U	2.01 U	0.201 U	**0.407**	0.536 U	2.01 U	2.01 U	0.201 U	**0.696**	0.536 U	--	100 U	**67.3**	**88**	**144**	--	**4.31**	**0.45**	**1.35**	**0.742 J**
2A-UNIT3-43-45	2A	43-45	MW-8	2.04 U	2.04 U	0.204 U	**0.319 J**	0.518 U	2.04 U	2.04 U	0.204 U	**0.344 J**	**0.53 J**	--	102 U	**589**	**358**	**1010**	--	**8**	**9.49**	**10.5**	**4.62**
2B-UNIT2-44-45	2B	44-45	MW-8	1.86 U	1.86 U	0.186 U	**0.392**	0.529 U	1.86 U	1.86 U	0.186 U	**0.465**	0.529 U	--	93.2 U	**525**	**447**	**1230**	--	**6.67**	**5.75**	**6.97**	**3.73**
3A-UNIT3-34-38	3A	34-38	MW-10	1.94 U	1.94 U	0.194 U	**0.562**	**0.796 J**	1.94 U	1.94 U	**0.715**	**0.932**	**1.75**	--	97.2 U	**1420**	**1780**	**4400**	--	**12.8**	**12.0**	**22.6**	**19.2**
3B-UNIT2-29-33	3B	29-33	MW-10	1.92 U	1.92 U	0.192 U	**0.593**	**1.01 J**	1.92 U	1.92 U	**0.952**	**1.29**	**1.87**	--	96 U	**1290**	**1640**	**5340**	--	**10.2**	**16.6**	**37.6**	**21.8**
4A-UNIT2-38-40	4A	38-40	MW-10	1.91 U	1.91 U	**0.212 J**	**0.708**	0.513 U	1.91 U	1.91 U	0.191 U	**0.656**	0.513 U	--	95.5 U	**125**	**363**	**427**	--	**12.4**	**1.63**	**0.837**	**2.82**
4A-UNIT2-38-40[1]	5C	65-70	MW-15	1.91 U	1.91 U	0.191 U	**0.583**	0.548 U	1.91 U	1.91 U	0.191 U	**0.798**	0.548 U	--	95.5 U	**121**	**394**	**438**	--	**7.42**	**0.977**	**1.16**	**2.74**
4B-UNIT3-46-48	4A[1]	38-40	MW-10	1.81 U	1.81 U	0.181 U	**0.206 J**	0.52 U	1.81 U	1.81 U	0.181 U	**0.332**	0.52 U	--	90.6 U	**296**	**1250**	**527**	--	**2.76 J**	**2.41**	**14.2**	**3.01**
5A-UNIT2-47-49	4B	46-48	MW-10	1.77 U	1.77 U	0.177 U	**0.34**	0.536 U	1.77 U	1.77 U	0.177 U	0.151 U	0.536 U	--	88.6 U	**344**	**825**	**649**	--	1.77 U	**0.32 J**	**3.66**	**2.18**
5C-UNIT3-65-70	5A	47-49	MW-15	1.89 U	1.89 U	0.189 U	0.161 U	0.551 U	1.89 U	1.89 U	0.189 U	0.161 U	0.551 U	--	94.5 U	**105**	**264**	**78.4**	--	1.89 U	0.189 U	**0.732**	0.551 U

Notes:
Bold indicates detected values.
1. Duplicate
F: Fraction
F1: Soluble
F2: Exchangeable
F3: Reducible (iron/magnesium oxide bound)
F4: Oxidizable (Sulfide/organic/crystalline oxide bound)
F5: Residual
ft bgs: feet below ground surface
J: Estimated value
mg/kg: milligrams per kilogram
--: not measured
SSE: selective sequential extraction
U: Compound analyzed for but not detected above detection limit

Figures



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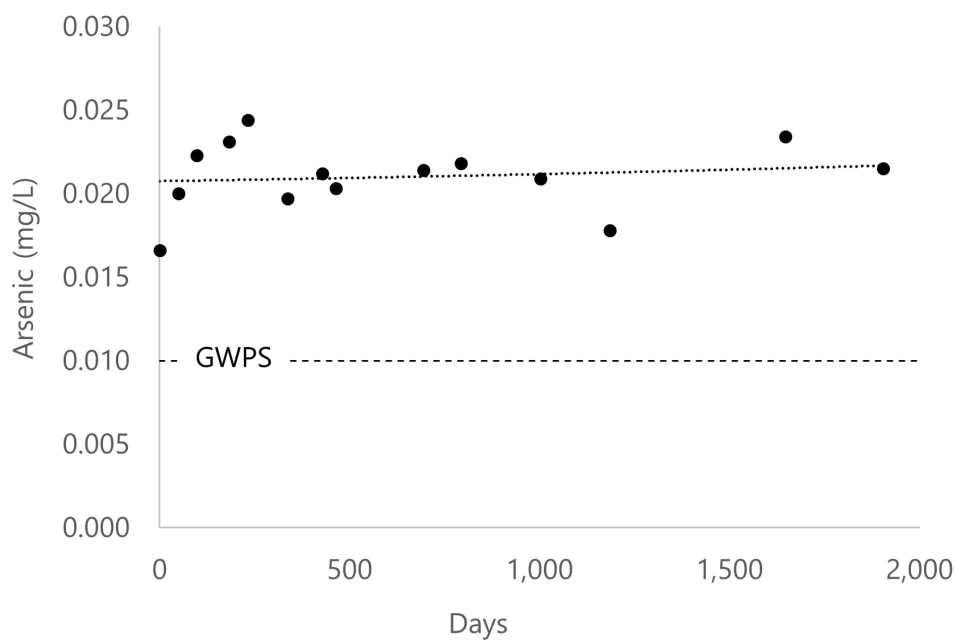
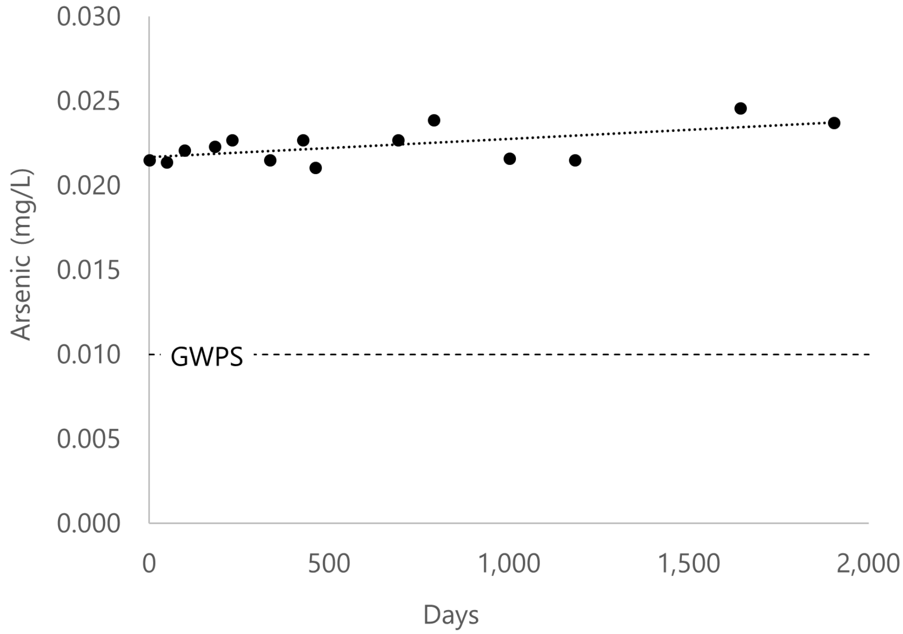


BY-AP-MW-7

Notes:
GWPS: groundwater protection standard
mg/L: milligrams per liter



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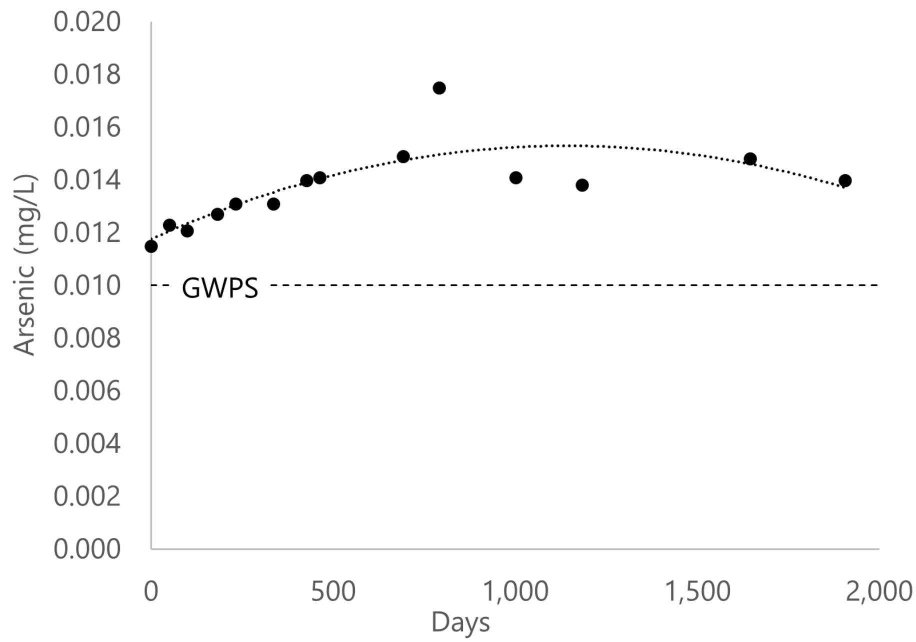
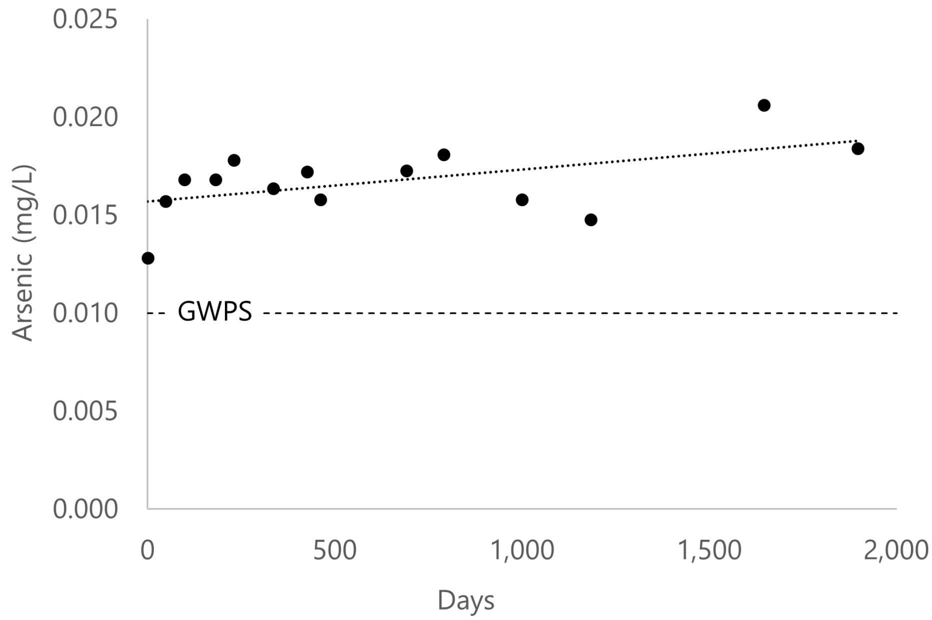


BY-AP-MW-13

Notes:
GWPS: groundwater protection standard
mg/L: milligrams per liter

Figure 1b
Concentration Versus Time Graphs
Monitored Natural Attenuation Demonstration
Plant Barry



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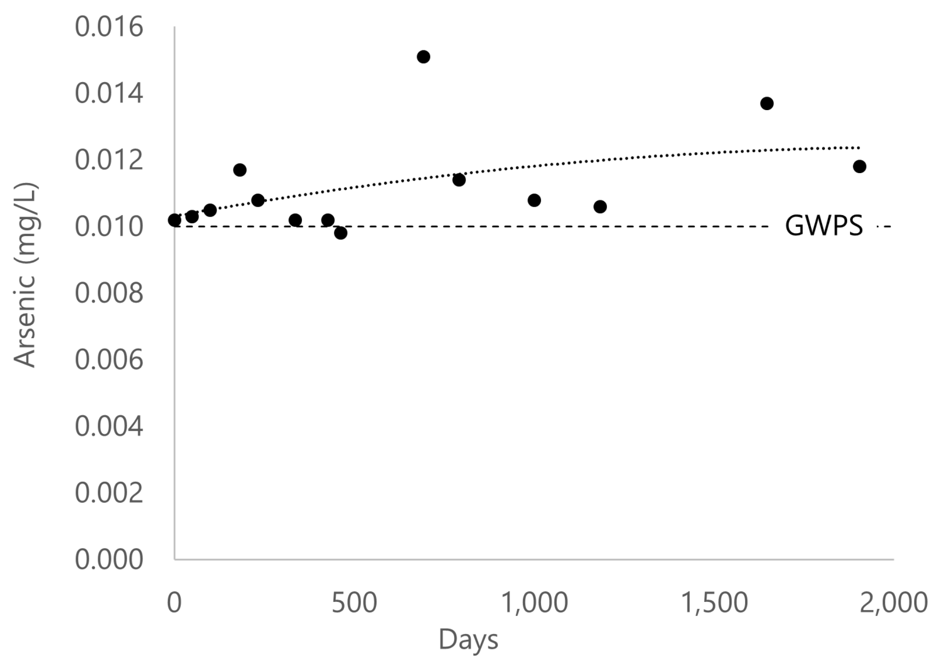
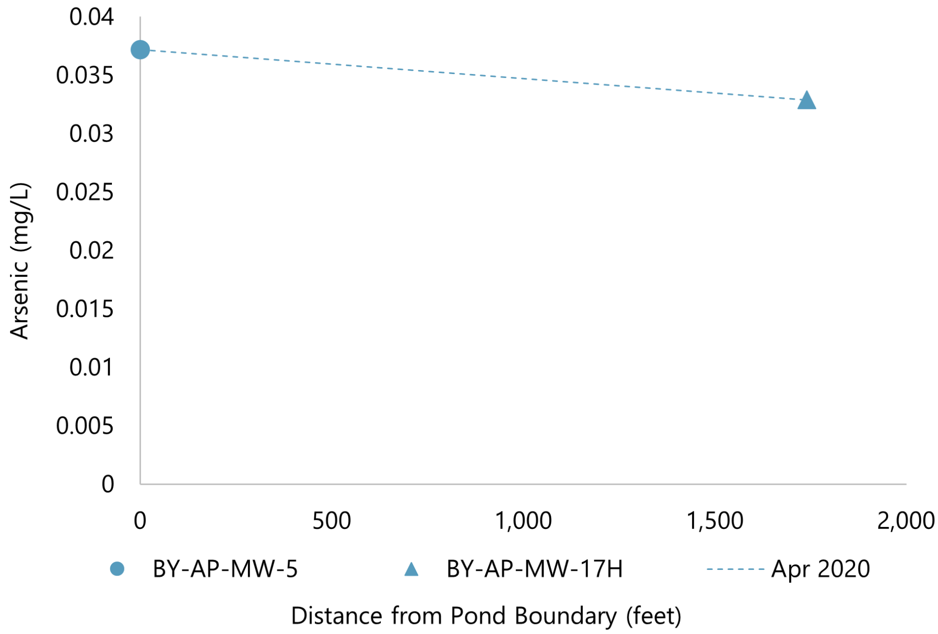


BY-AP-MW-16

Notes:
GWPS: groundwater protection standard
mg/L: milligrams per liter



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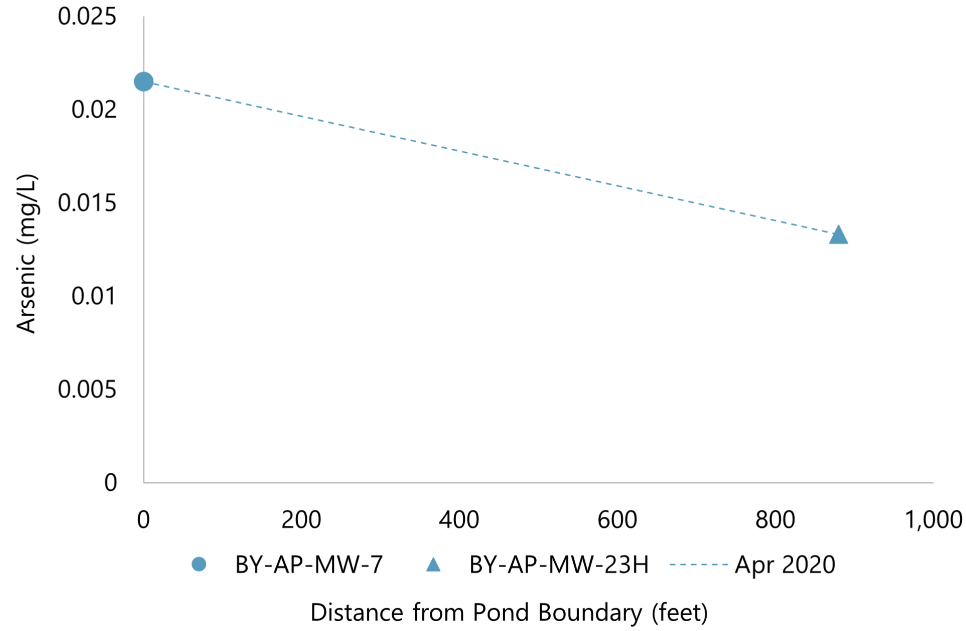
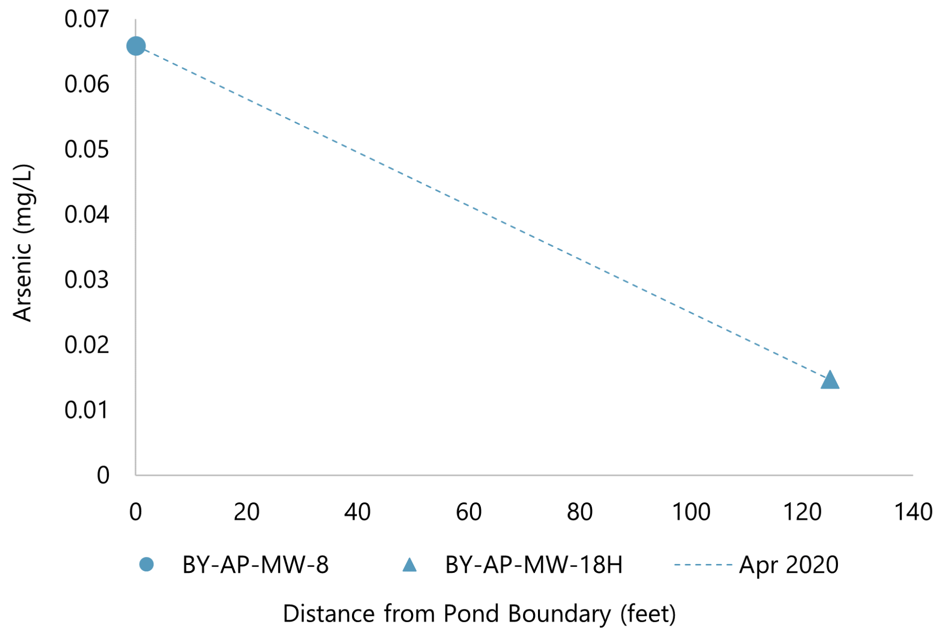


BY-AP-MW-7

Note:
mg/L: milligrams per liter



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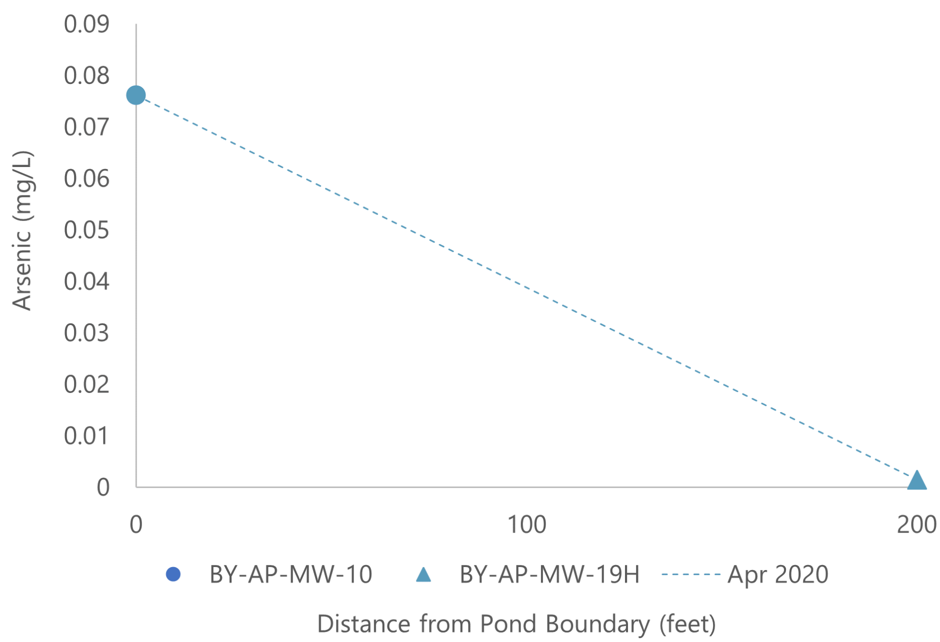
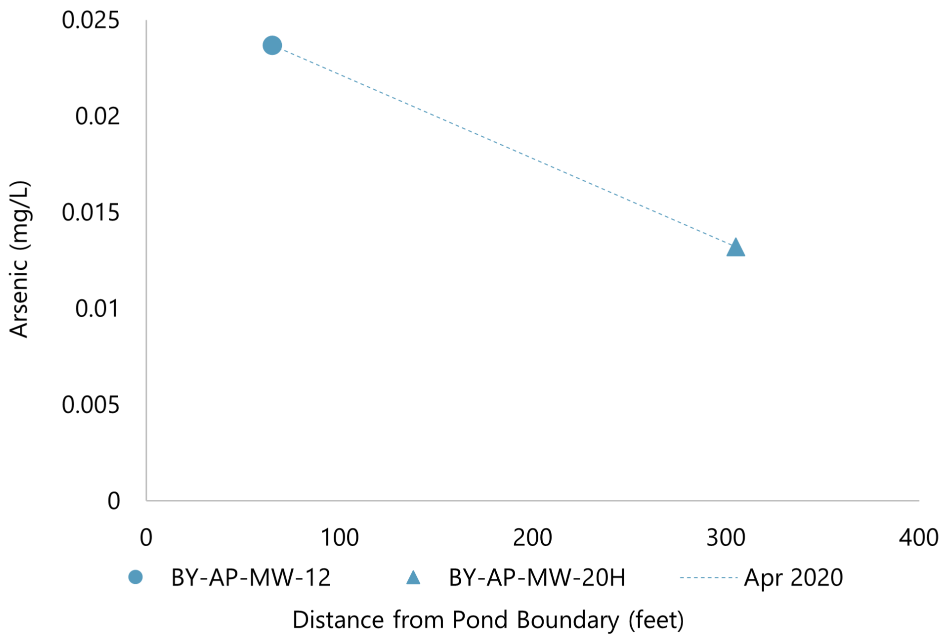


BY-AP-MW-10

Note:
mg/L: milligrams per liter



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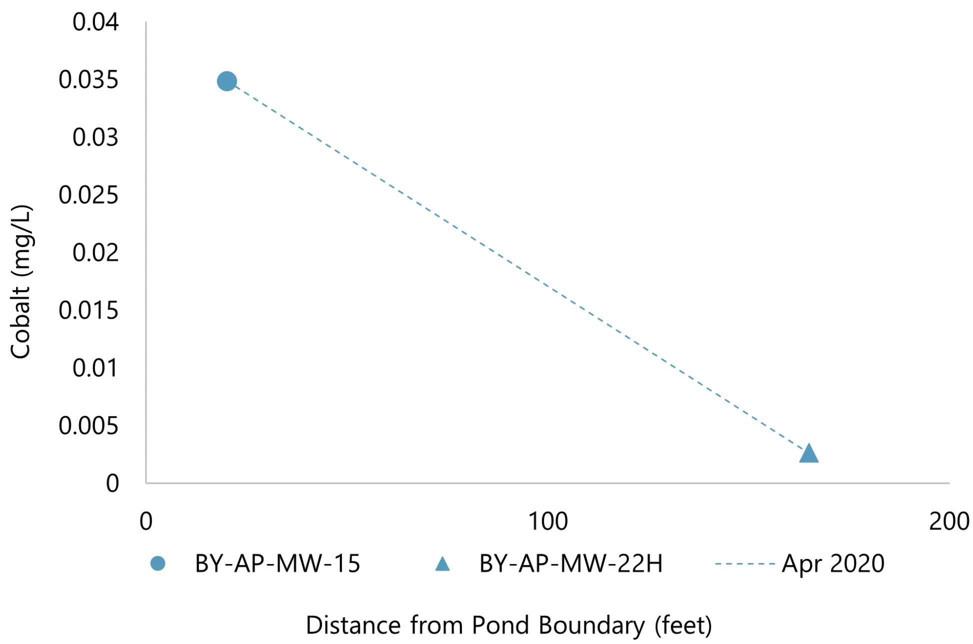
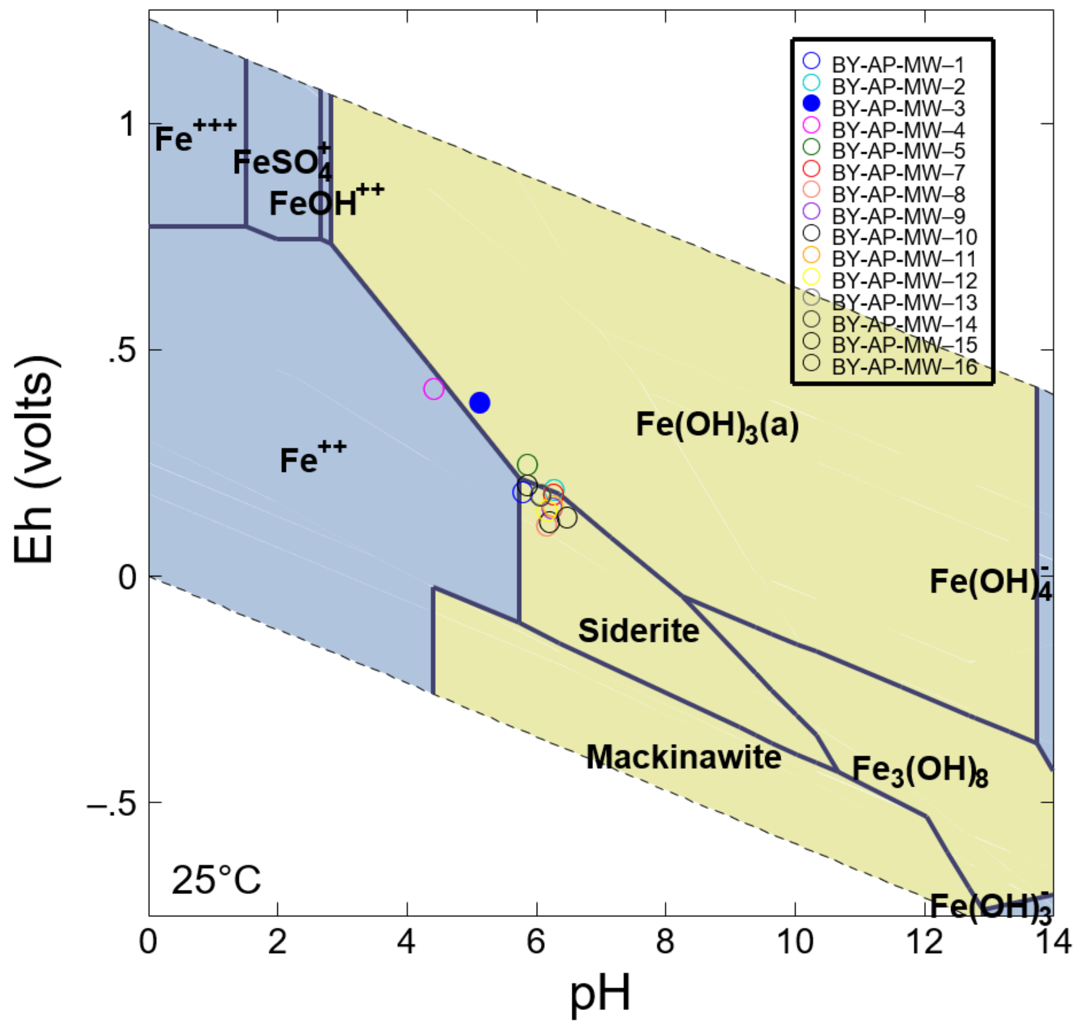


BY-AP-MW-15

Note:
mg/L: milligrams per liter



Notes:
Blue fields indicate dissolved/mobile species.
Yellow fields indicate solid/attenuated species.

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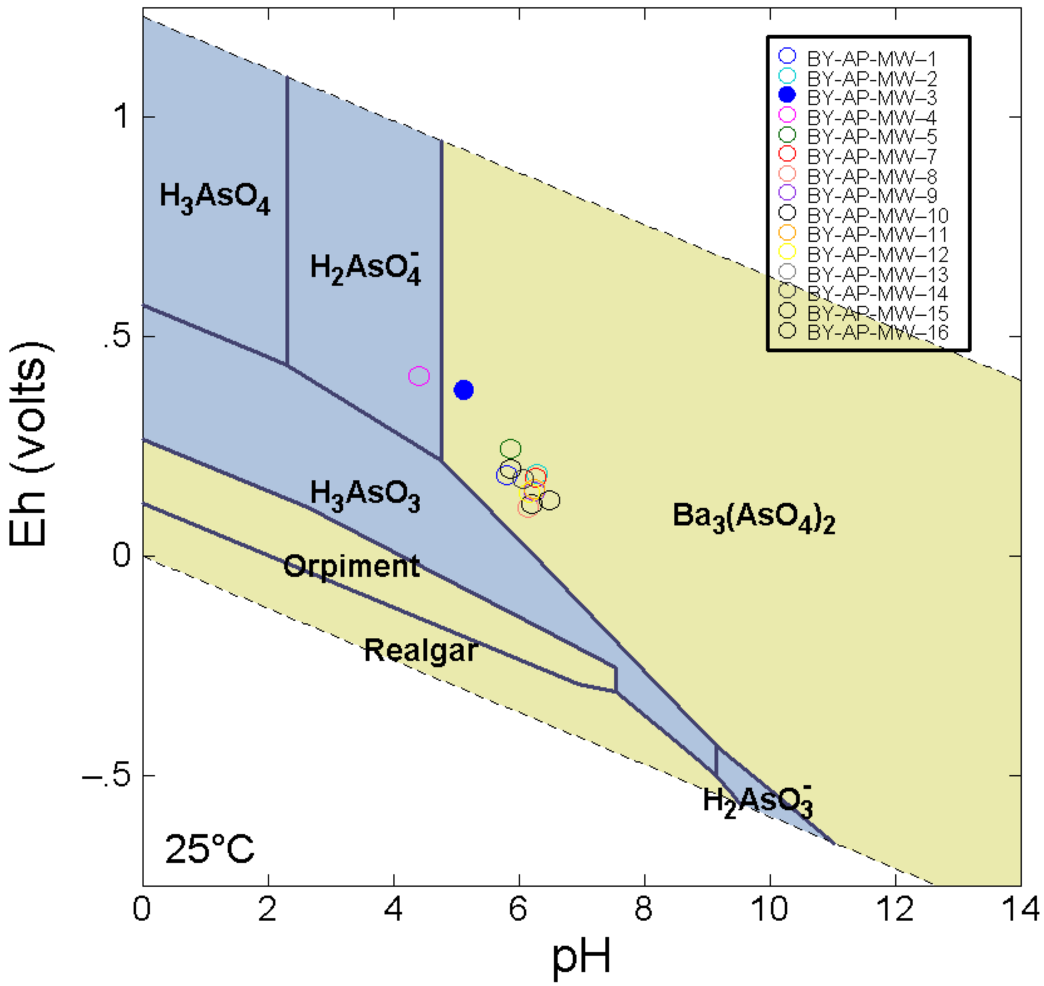
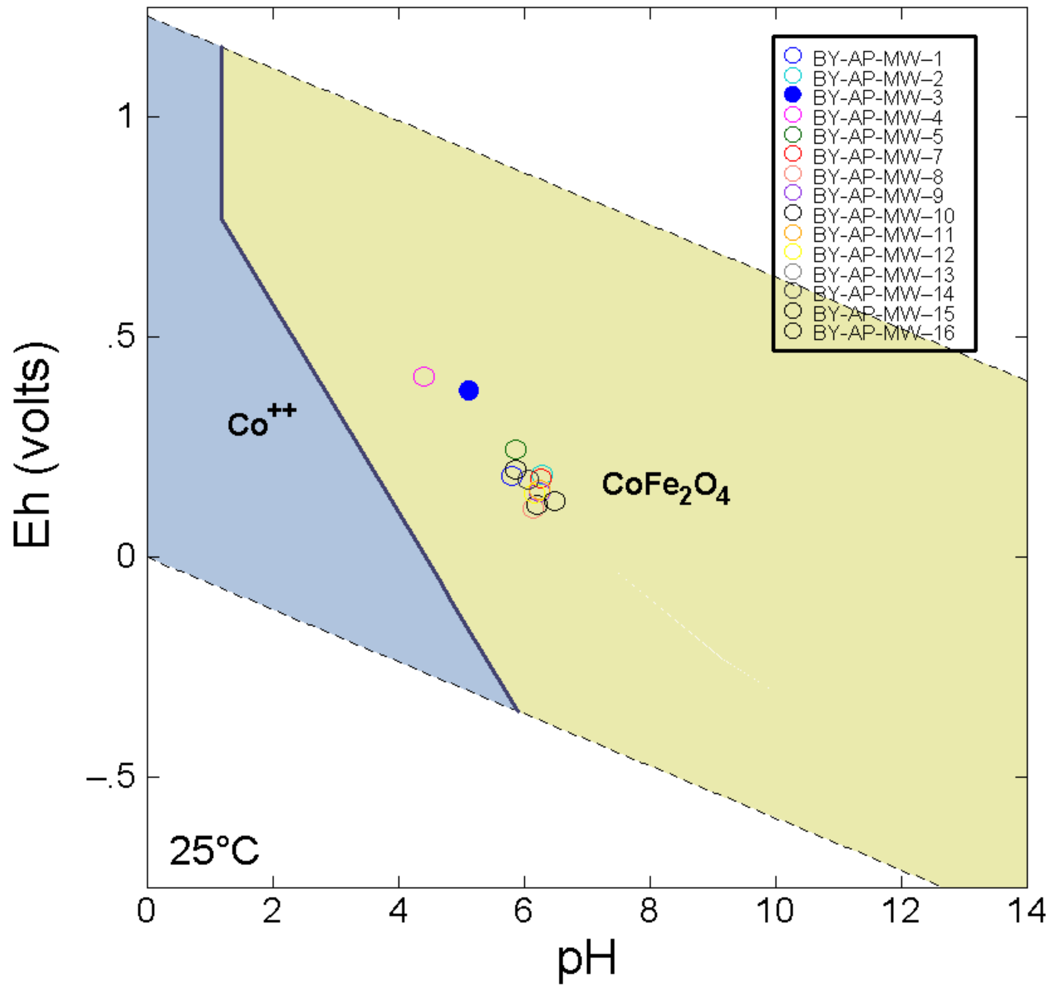
Figure 3
Eh-pH Stability Diagram for Dissolved and Solid Iron Phases
Monitored Natural Attenuation Demonstration
Plant Barry



Notes:
Blue fields indicate dissolved/mobile species.
Yellow fields indicate solid/attenuated species.

Figure 4
Eh-pH Stability Diagram for Dissolved and Solid Arsenic Phases
Monitored Natural Attenuation Demonstration
Plant Barry



Notes:
Blue fields indicate dissolved/mobile species.
Yellow fields indicate solid/attenuated species.

Figure 5
Eh-pH Stability Diagram for Dissolved and Solid Cobalt Phases
Monitored Natural Attenuation Demonstration
Plant Barry

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Figure 6
1D Model Transects
Monitored Natural Attenuation Demonstration
Plant Barry

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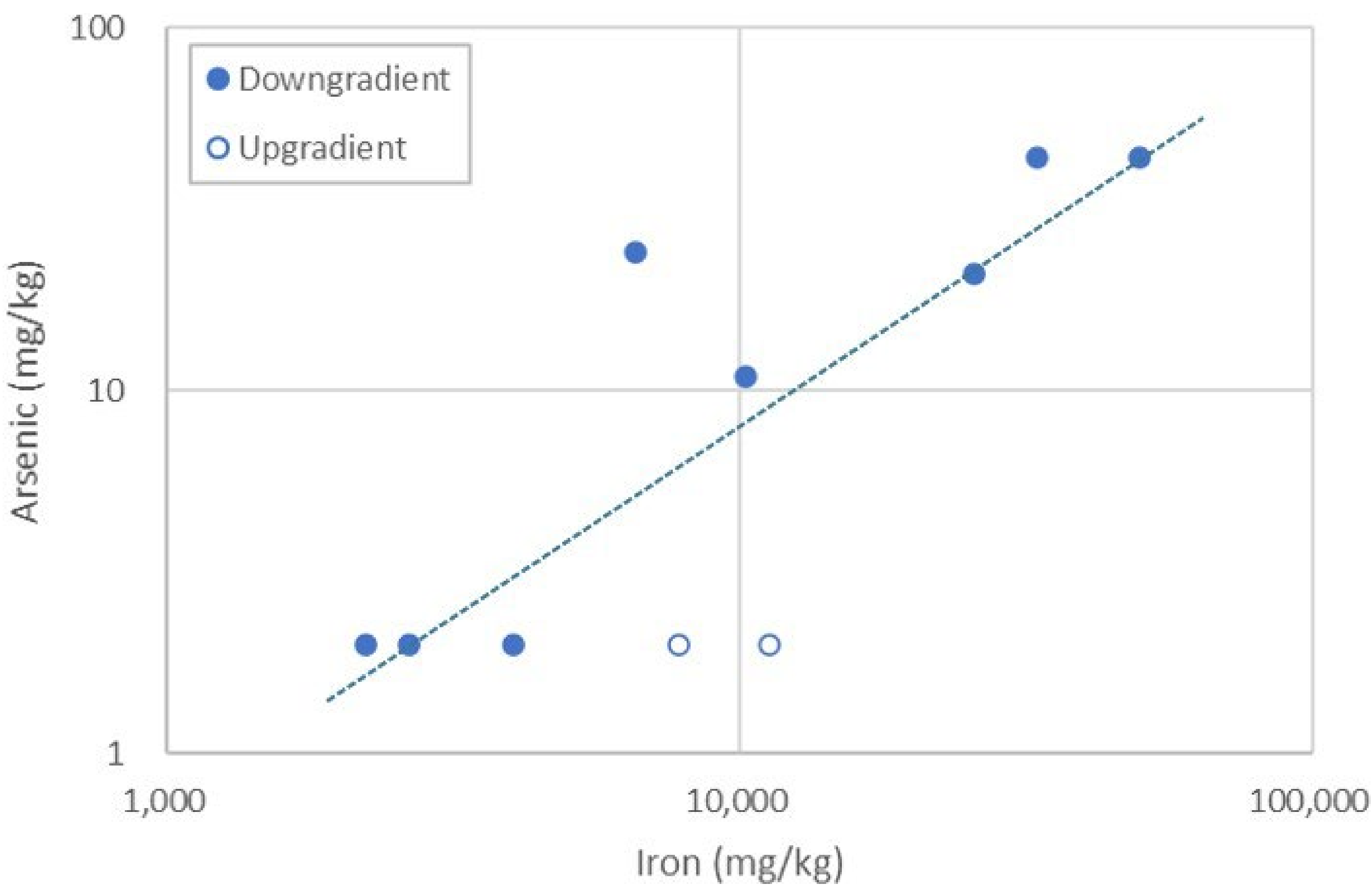
Figure 7
Representative Soil Samples
Monitored Natural Attenuation Demonstration
Plant Barry



Note:
mg/kg: milligrams per kilogram

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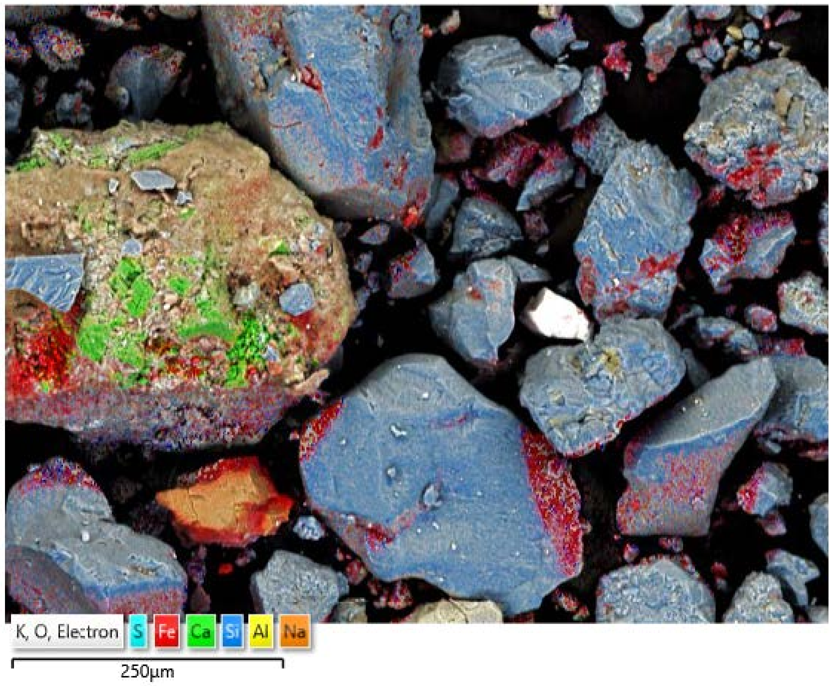
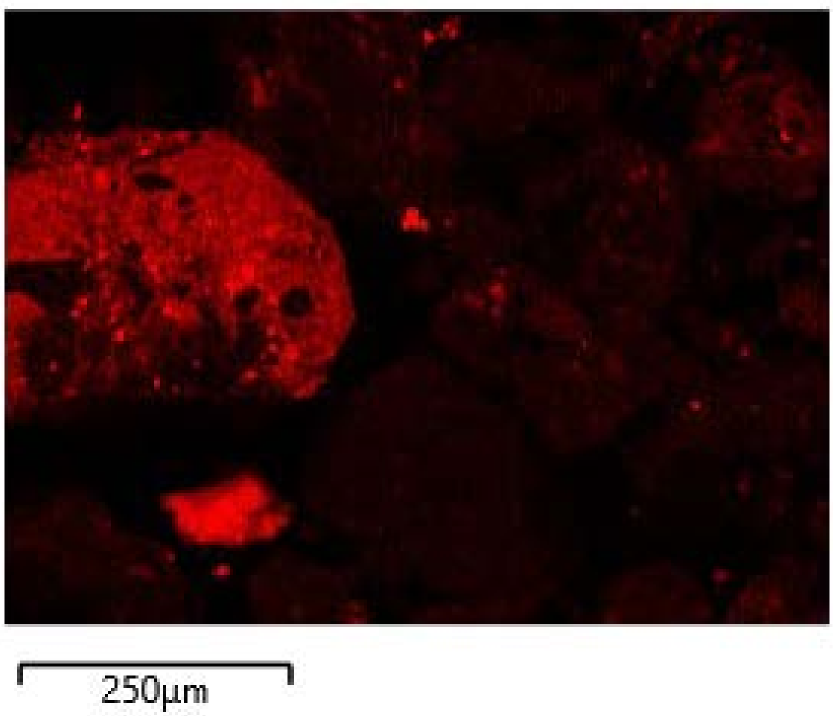
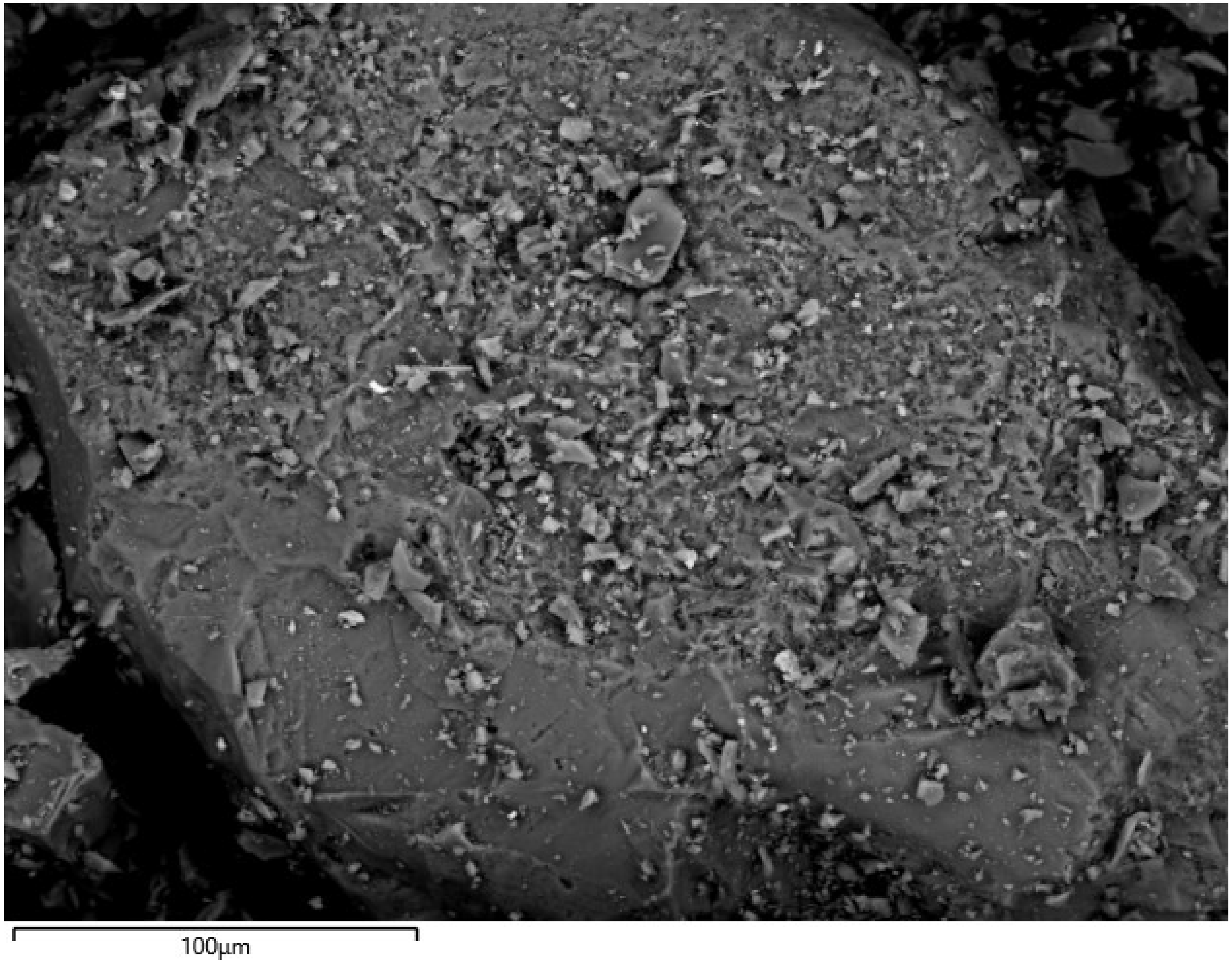
Figure 8
Bulk Chemistry Relationship Between Arsenic and Iron
Monitored Natural Attenuation Demonstration
Plant Barry





Notes:
µm: microns
SEM: scanning electron microscopy

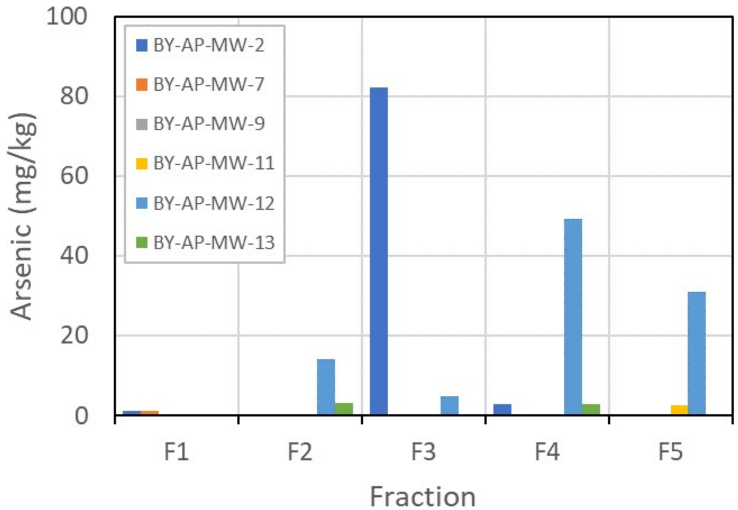
Figure 9
SEM Results for BY-AP-MW-1
Monitored Natural Attenuation Demonstration
Plant Barry

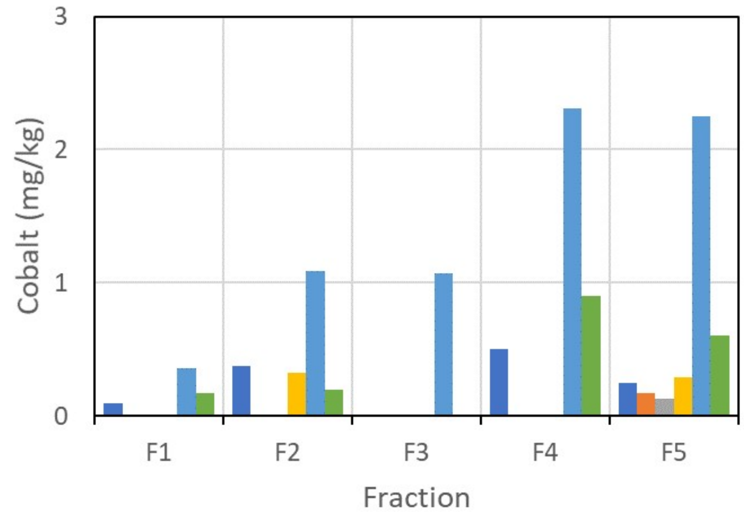


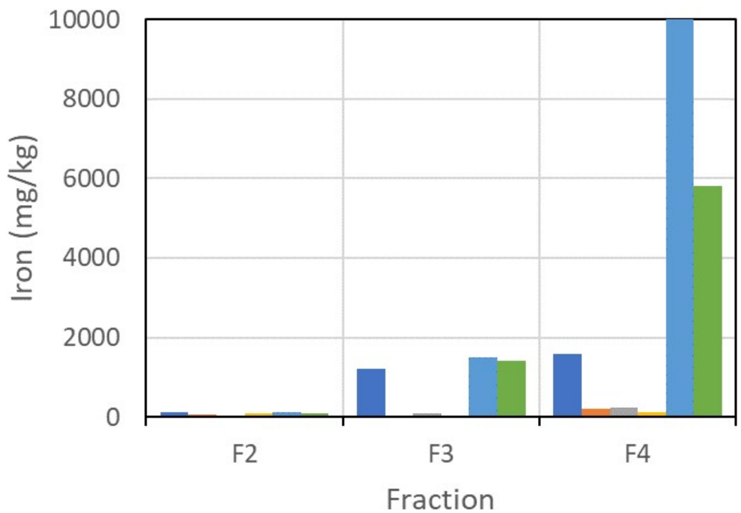
Notes:
µm: microns
SEM: scanning electron microscopy

Figure 10
SEM Results for BY-AP-MW-2

Monitored Natural Attenuation Demonstration
Plant Barry

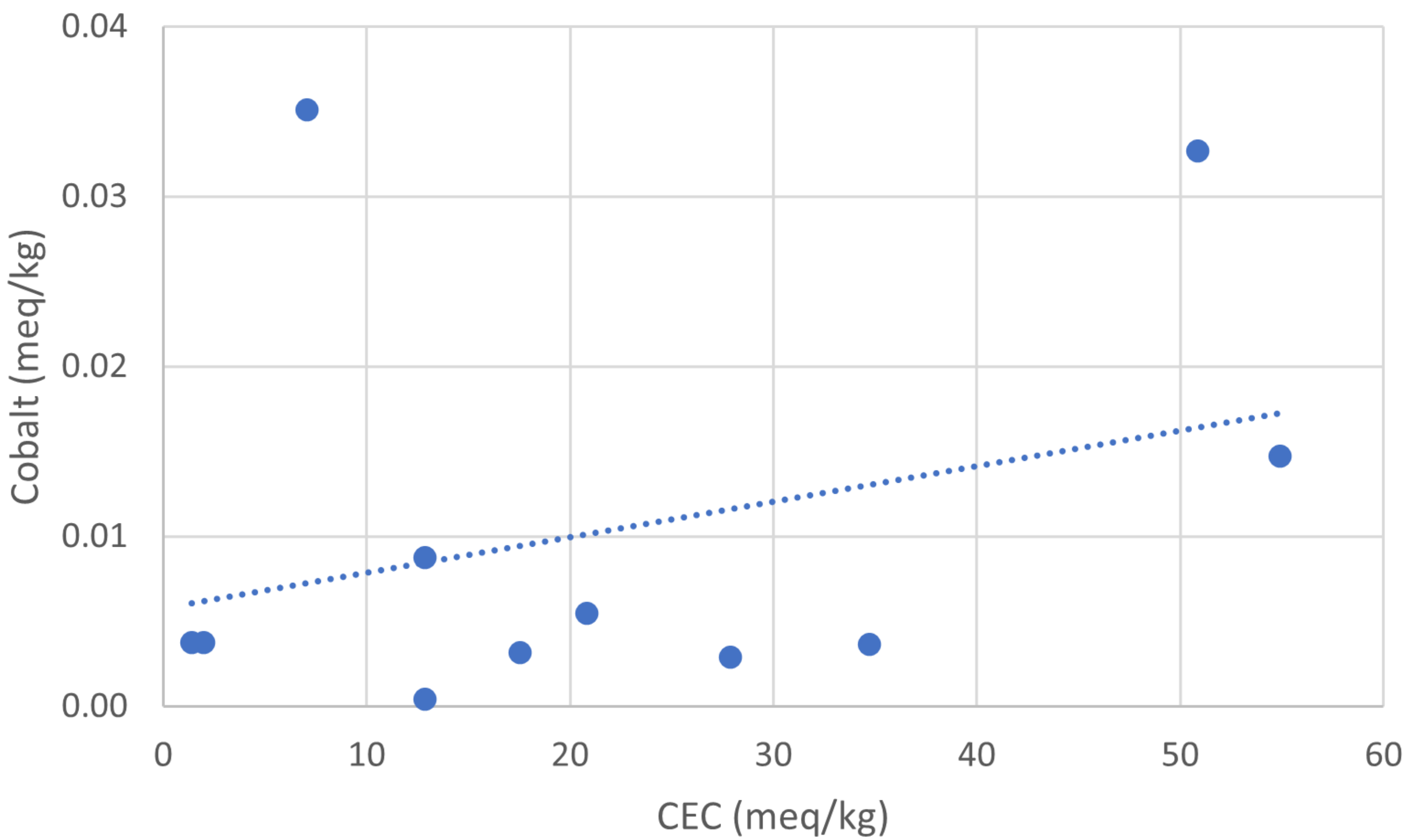






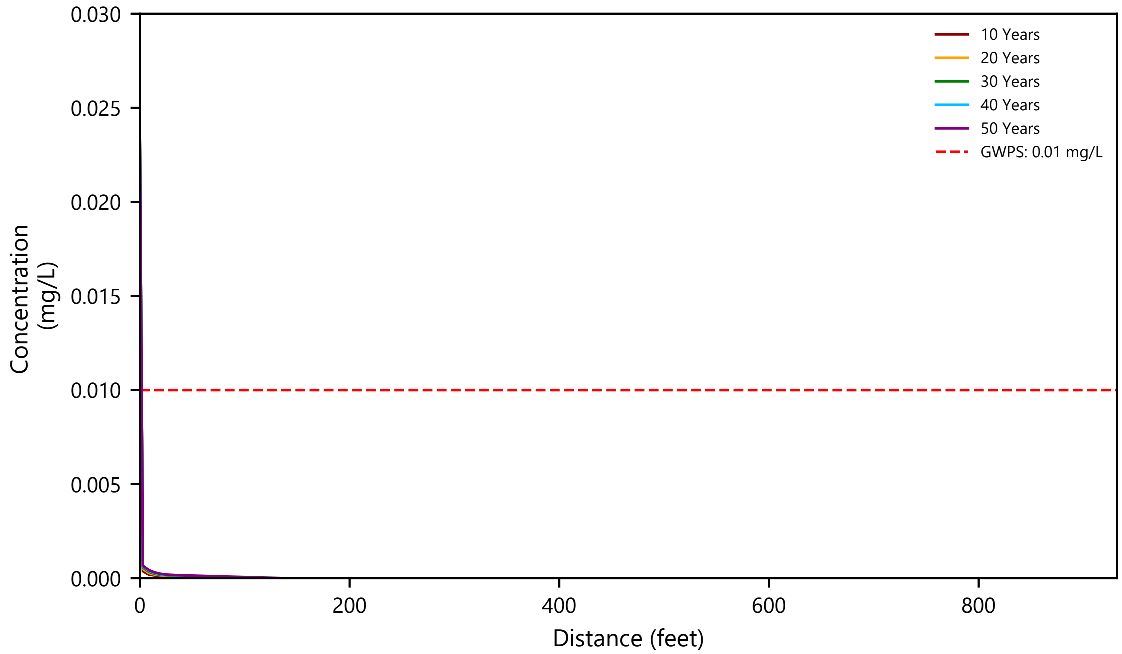
Notes:
mg/kg: milligrams per kilogram
SSE: selective sequential extraction
F1: water soluble
F2: exchangeable (e.g., clay minerals)
F3: reducible (e.g., poorly crystalline metal oxides such as iron oxides)
F4: oxidizable (e.g., crystalline oxide and crystalline sulfide minerals)
F5: residual (e.g., silicate phases)

Figure 11
SSE Results for Well Solids
Monitored Natural Attenuation Demonstration
Plant Barry



Notes:
CEC: cation exchange capacity
meq/kg: milliequivalents per kilogram

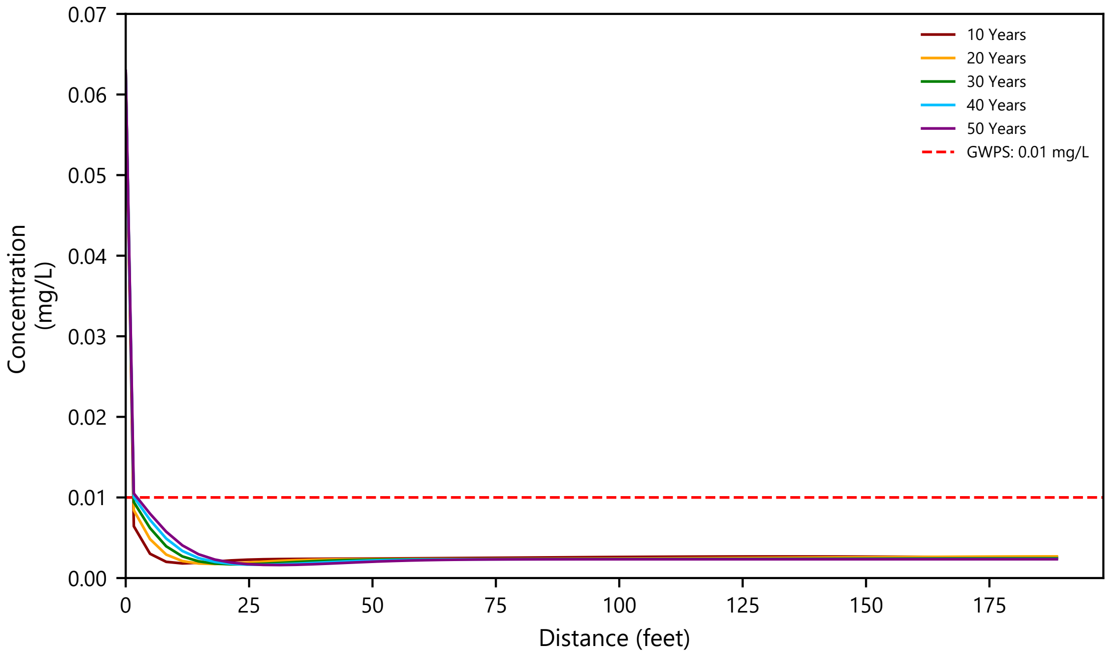
Figure 12
Cobalt Versus Cation Exchange Capacity
Monitored Natural Attenuation Demonstration
Plant Barry



Notes:
Model reactions include surface complexation, cation exchange, and mineral precipitation.

GWPS: Groundwater Protection Standard
COI: Constituent of Interest
mg/L: Milligrams per Liter

Figure 13
Simulated Arsenic Concentrations Along Model Transect 1
Monitored Natural Attenuation Demonstration
Plant Barry



Notes:
Model reactions include surface complexation, cation exchange, and mineral precipitation.

GWPS: Groundwater Protection Standard
COI: Constituent of Interest
mg/L: Milligrams per Liter

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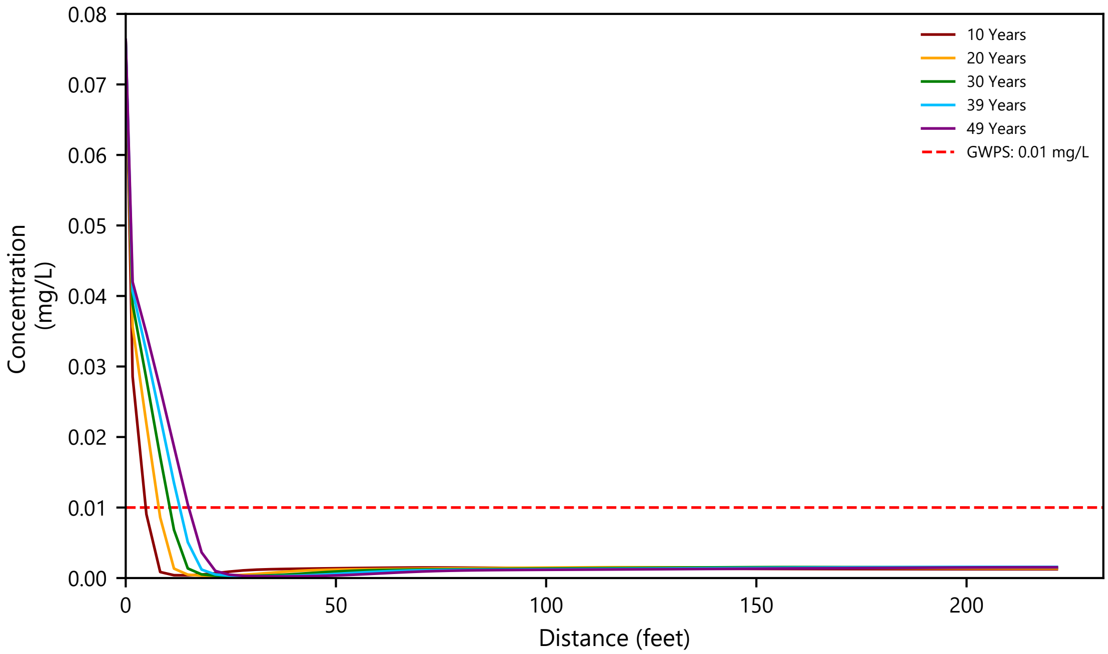
Figure 14
Simulated Arsenic Concentrations Along Model Transect 2
Monitored Natural Attenuation Demonstration
Plant Barry



Notes:
Model reactions include surface complexation, cation exchange, and mineral precipitation.

GWPS: Groundwater Protection Standard
COI: Constituent of Interest
mg/L: Milligrams per Liter

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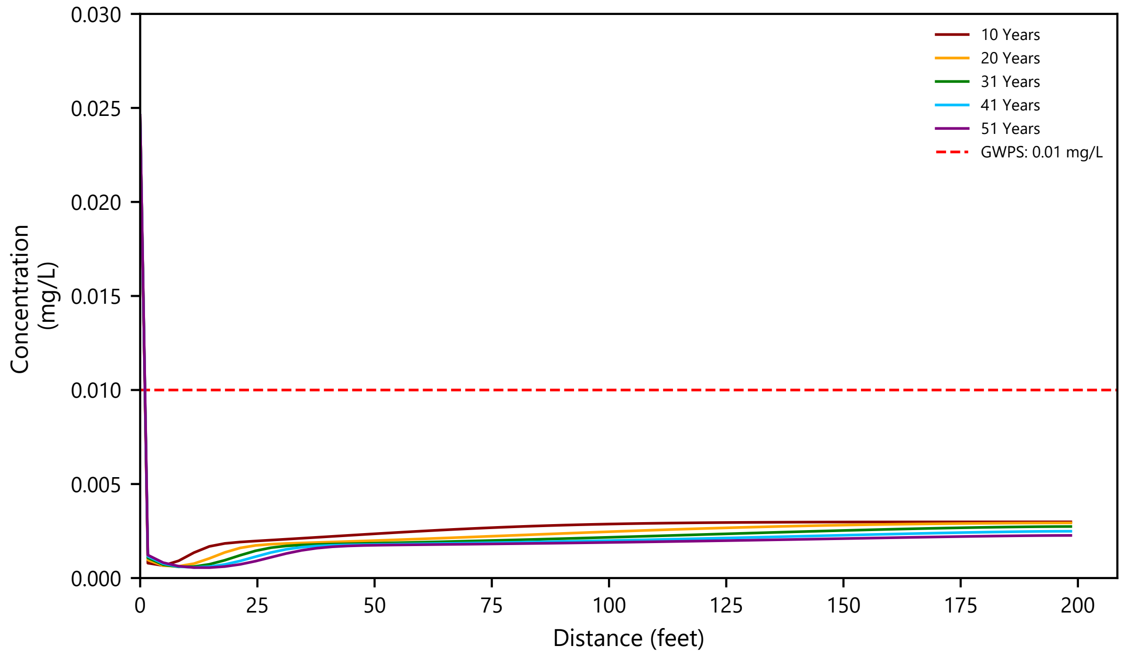
Figure 15
Simulated Arsenic Concentrations Along Model Transect 3
Monitored Natural Attenuation Demonstration
Plant Barry



Notes:
Model reactions include surface complexation, cation exchange, and mineral precipitation.

GWPS: Groundwater Protection Standard
COI: Constituent of Interest
mg/L: Milligrams per Liter

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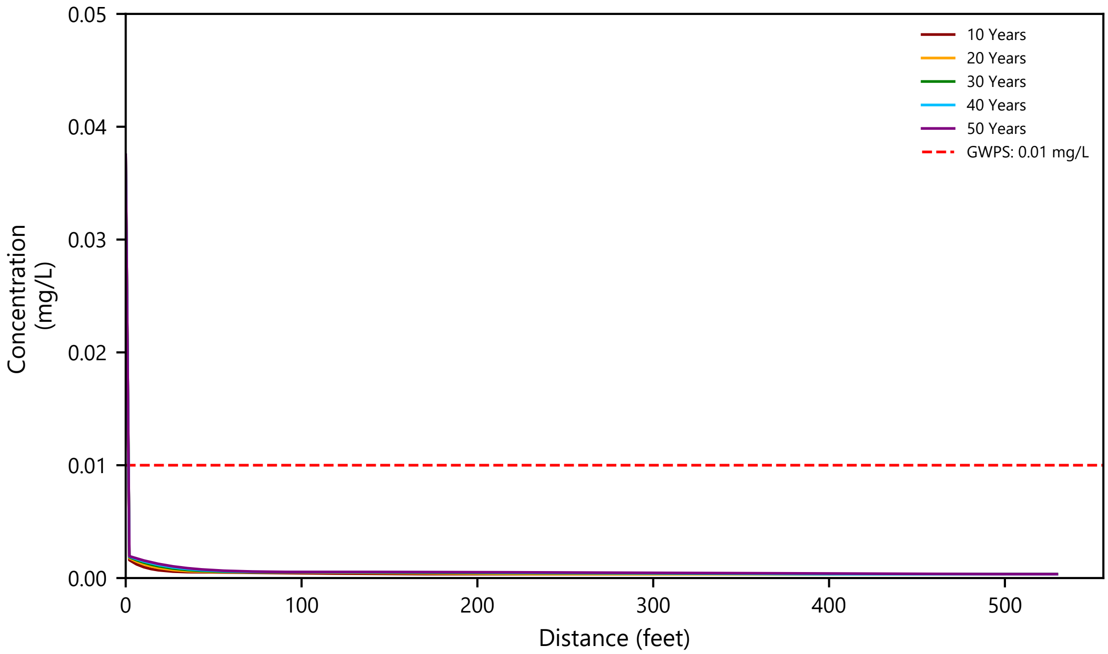
Figure 16
Simulated Arsenic Concentrations Along Model Transect 4
Monitored Natural Attenuation Demonstration
Plant Barry



Notes:
Model reactions include surface complexation, cation exchange, and mineral precipitation.

GWPS: Groundwater Protection Standard
COI: Constituent of Interest
mg/L: Milligrams per Liter

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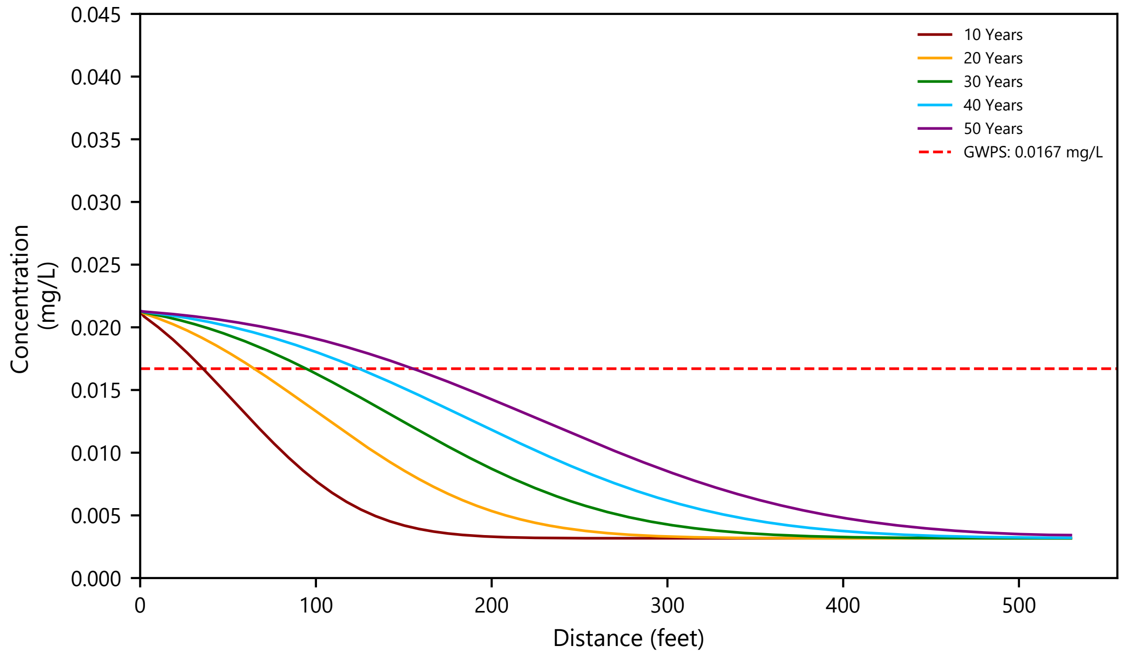
Figure 17a
Simulated Arsenic Concentrations Along Model Transect 5
Monitored Natural Attenuation Demonstration
Plant Barry



Notes:
Model reactions include surface complexation, cation exchange, and mineral precipitation.

GWPS: Groundwater Protection Standard
COI: Constituent of Interest
mg/L: Milligrams per Liter

Figure 17b
Simulated Cobalt Concentrations Along Model Transect 5
Monitored Natural Attenuation Demonstration
Plant Barry

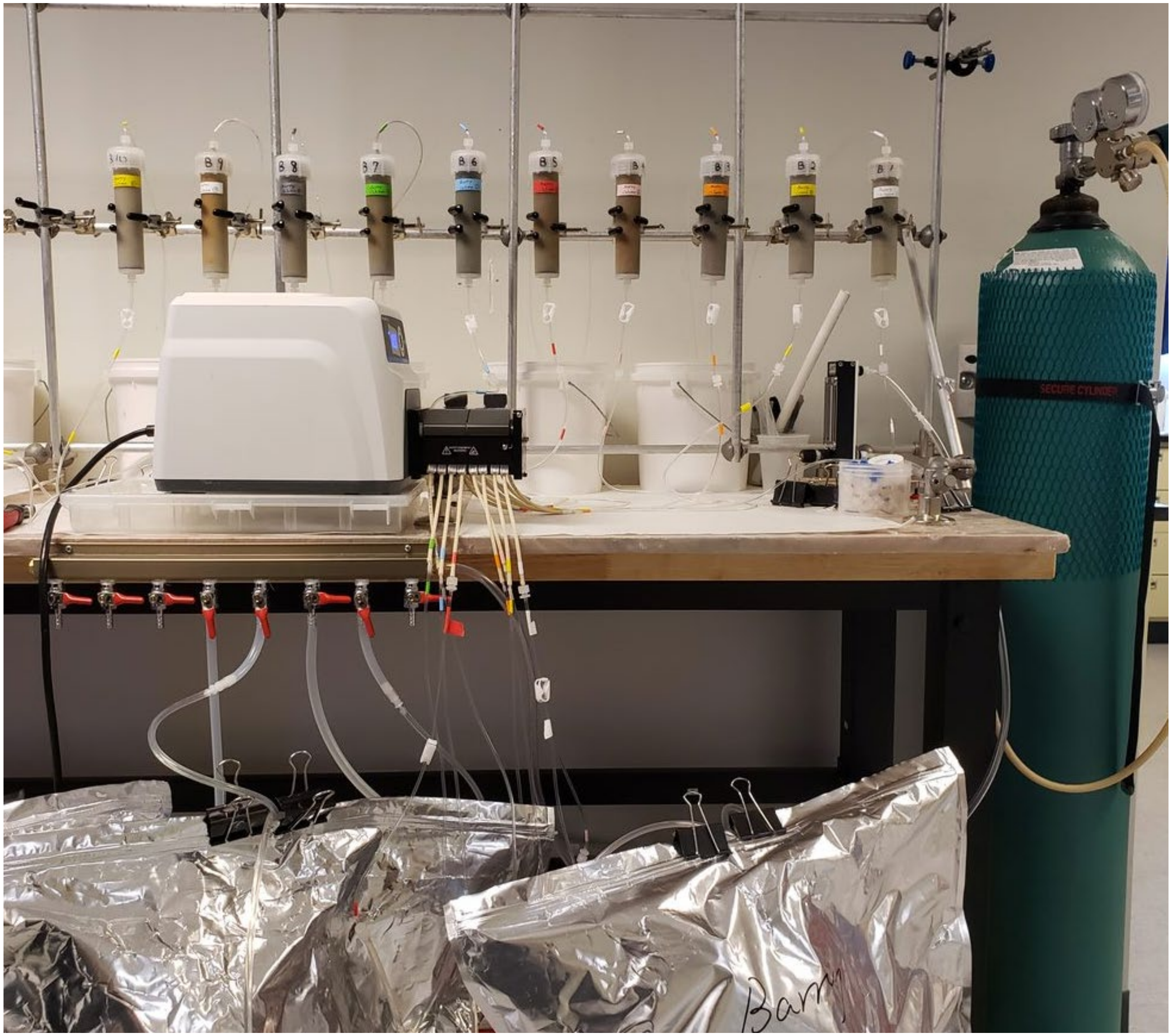


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Figure 18
Column Test Equipment Setup
Monitored Natural Attenuation Demonstration
Plant Barry

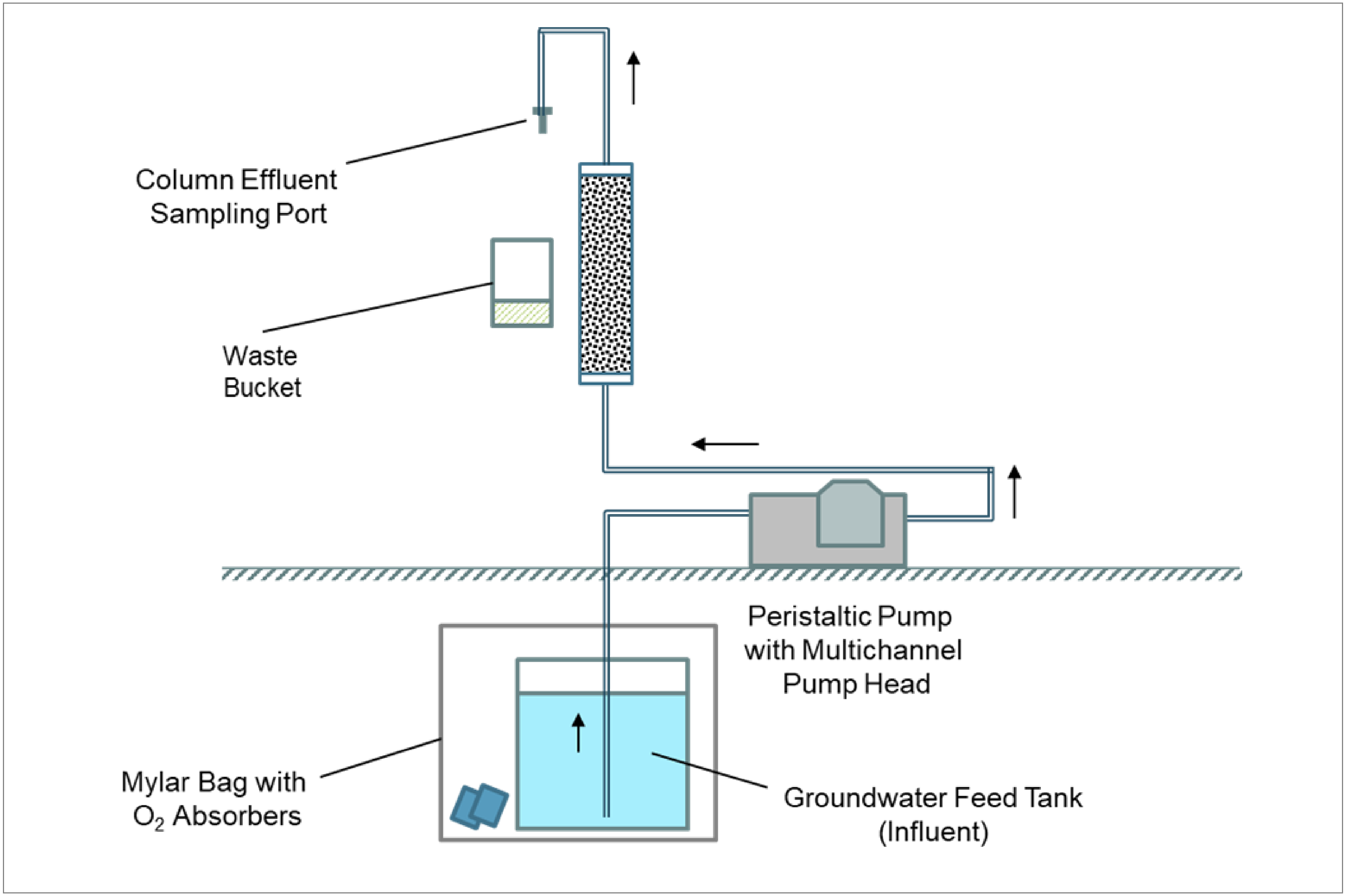

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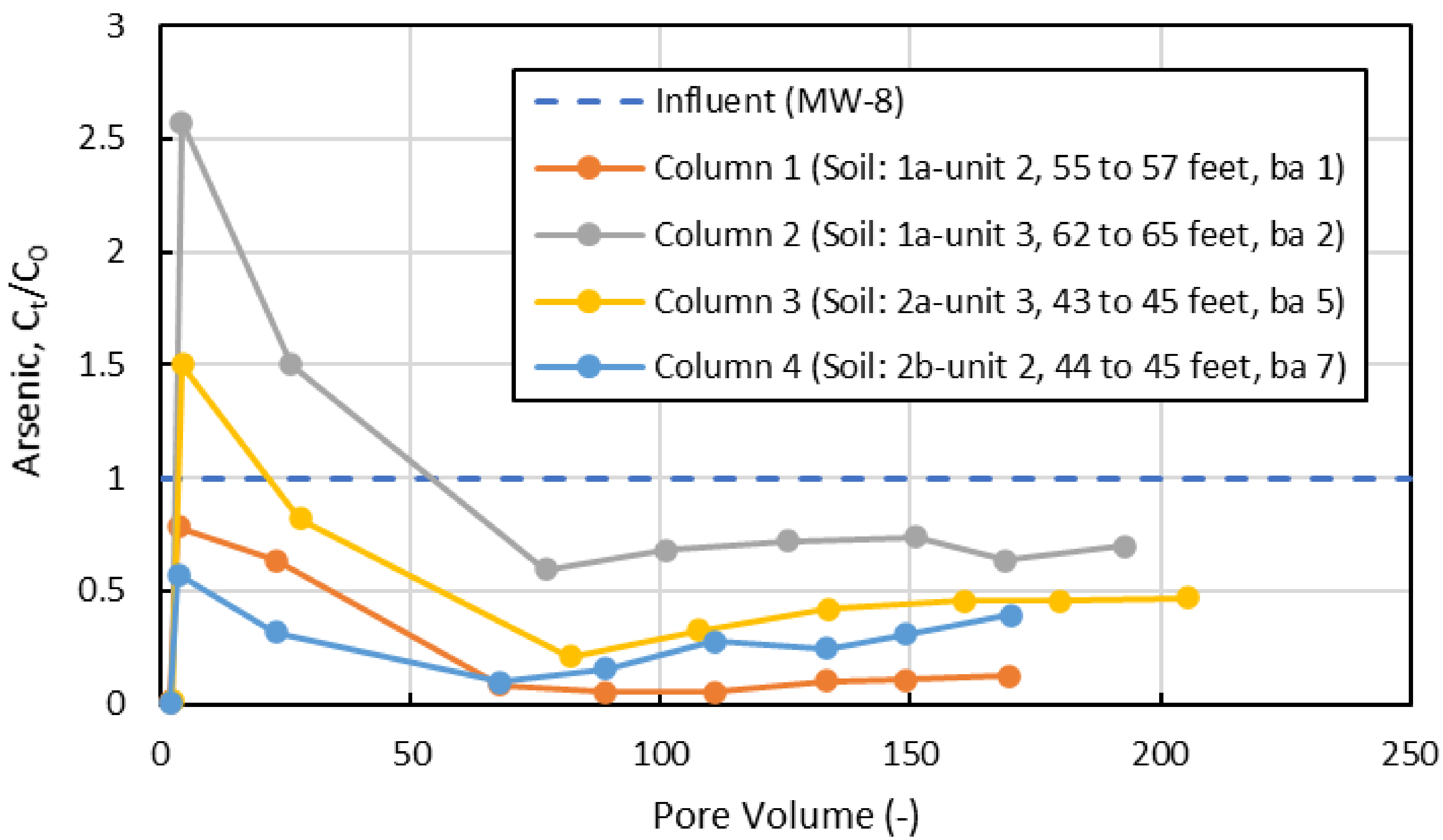
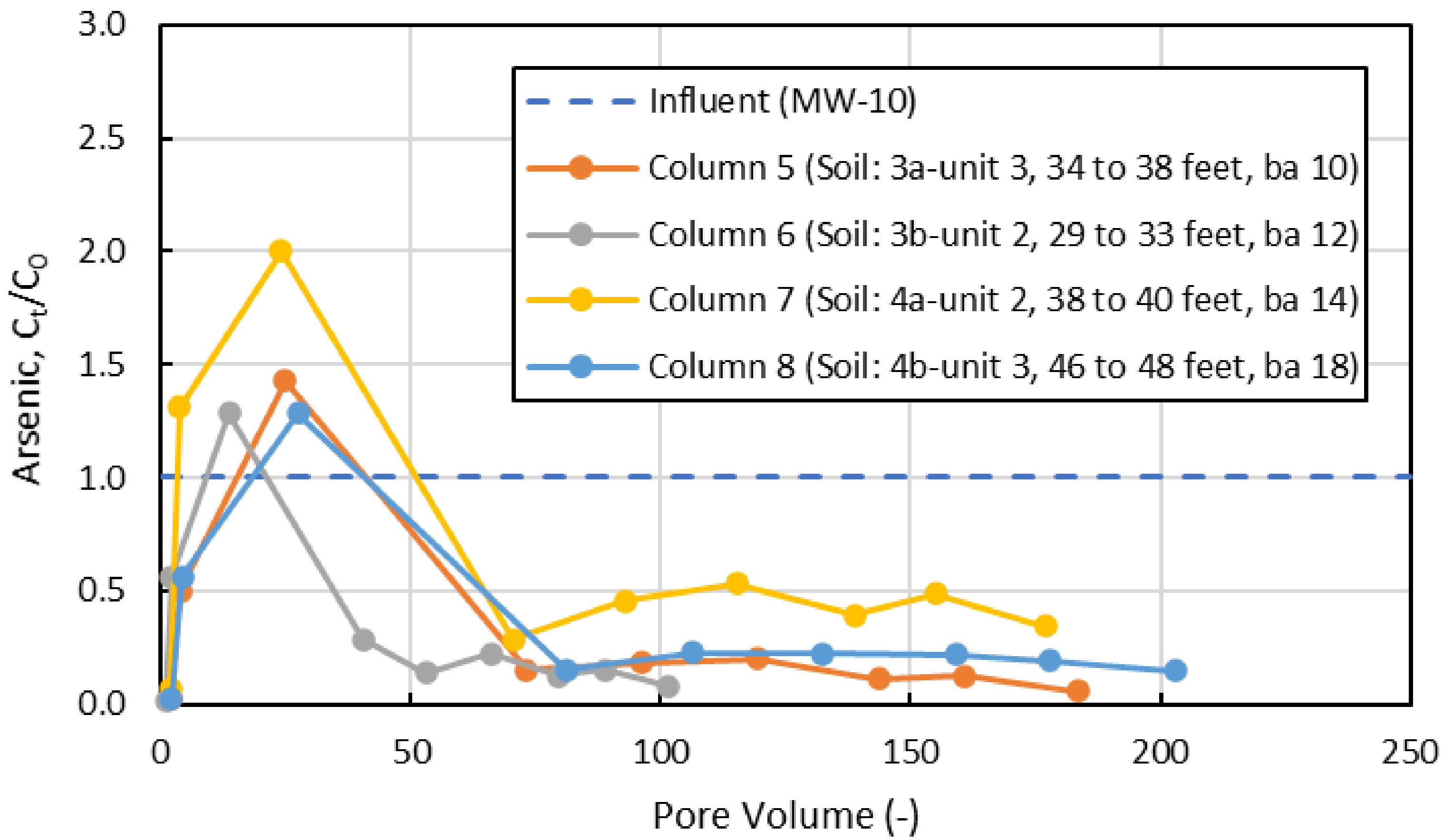
Figure 19
Schematic of Column Test Setup
Monitored Natural Attenuation Demonstration
Plant Barry



Note:
Blue dashed line indicates that effluent concentrations equal influent concentrations (i.e., capacity for attenuation has been consumed).

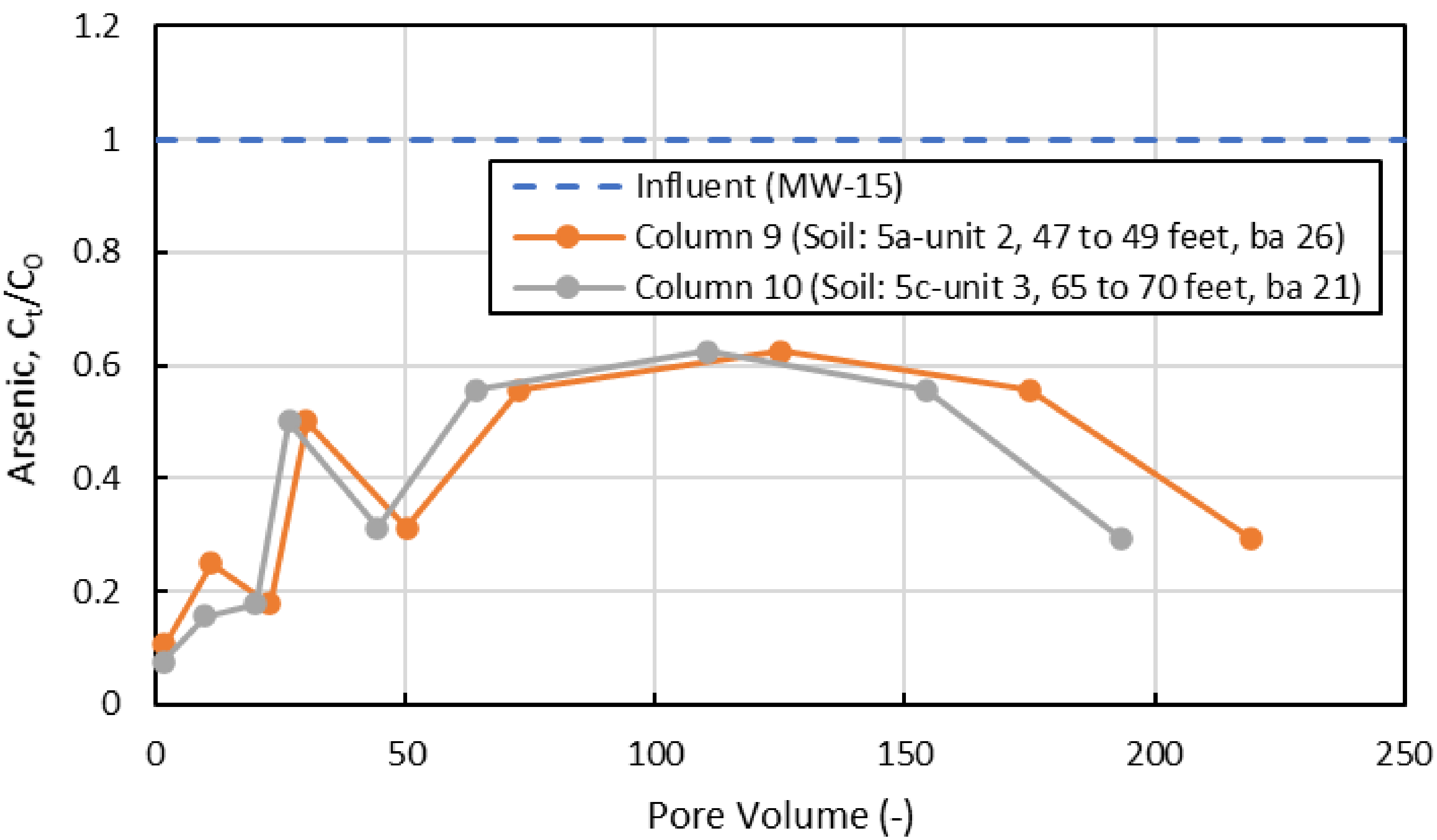
Figure 20
Dissolved Arsenic Breakthrough Curves: Columns 1 Through 4

Monitored Natural Attenuation Demonstration
Plant Barry



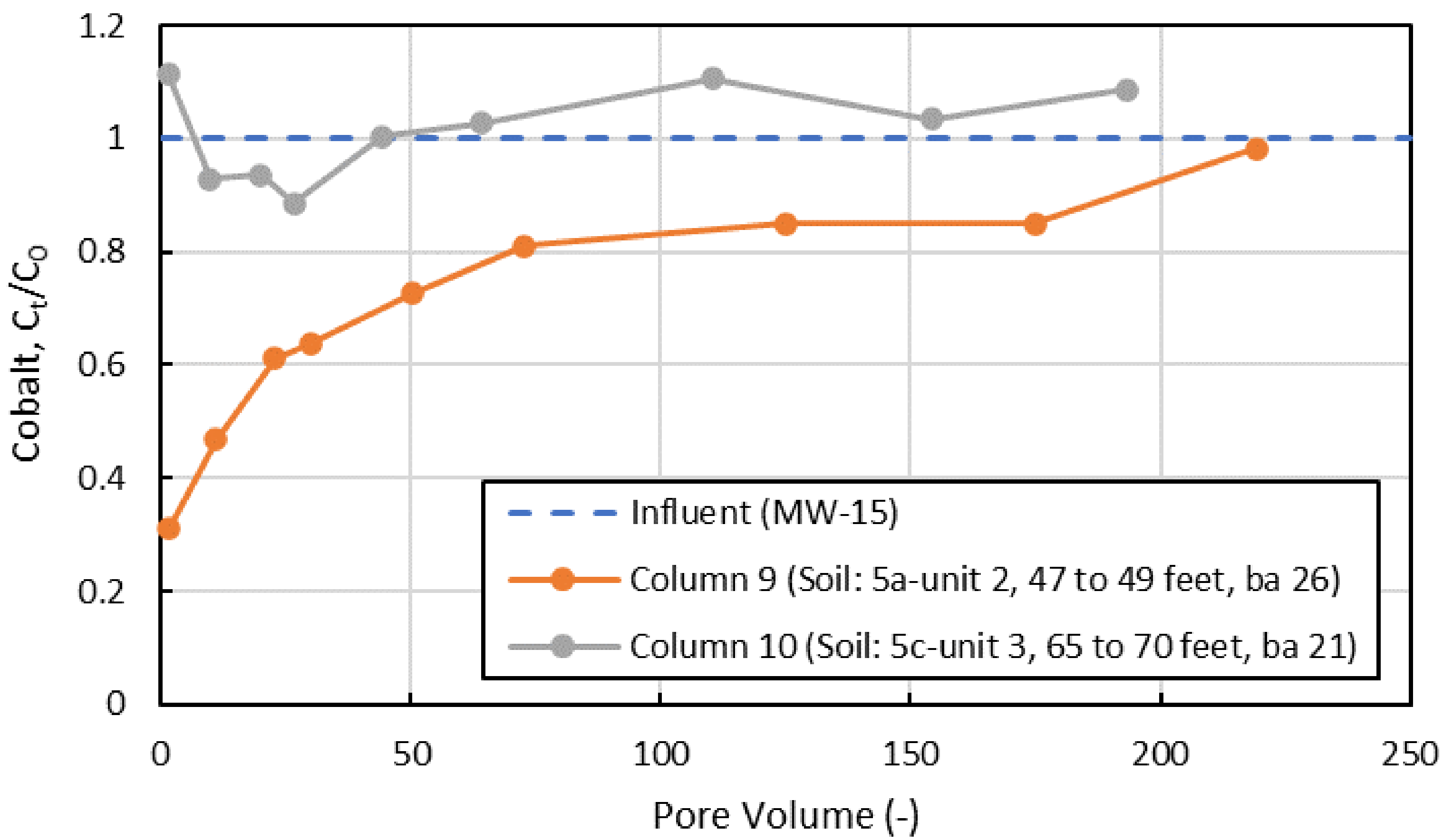
Note:
Blue dashed line indicates that effluent concentrations equal influent concentrations (i.e., capacity for attenuation has been consumed).

Figure 21
Dissolved Arsenic Breakthrough Curves: Columns 5 Through 8
Monitored Natural Attenuation Demonstration
Plant Barry



Note:
Blue dashed line indicates that effluent concentrations equal influent concentrations (i.e., capacity for attenuation has been consumed).

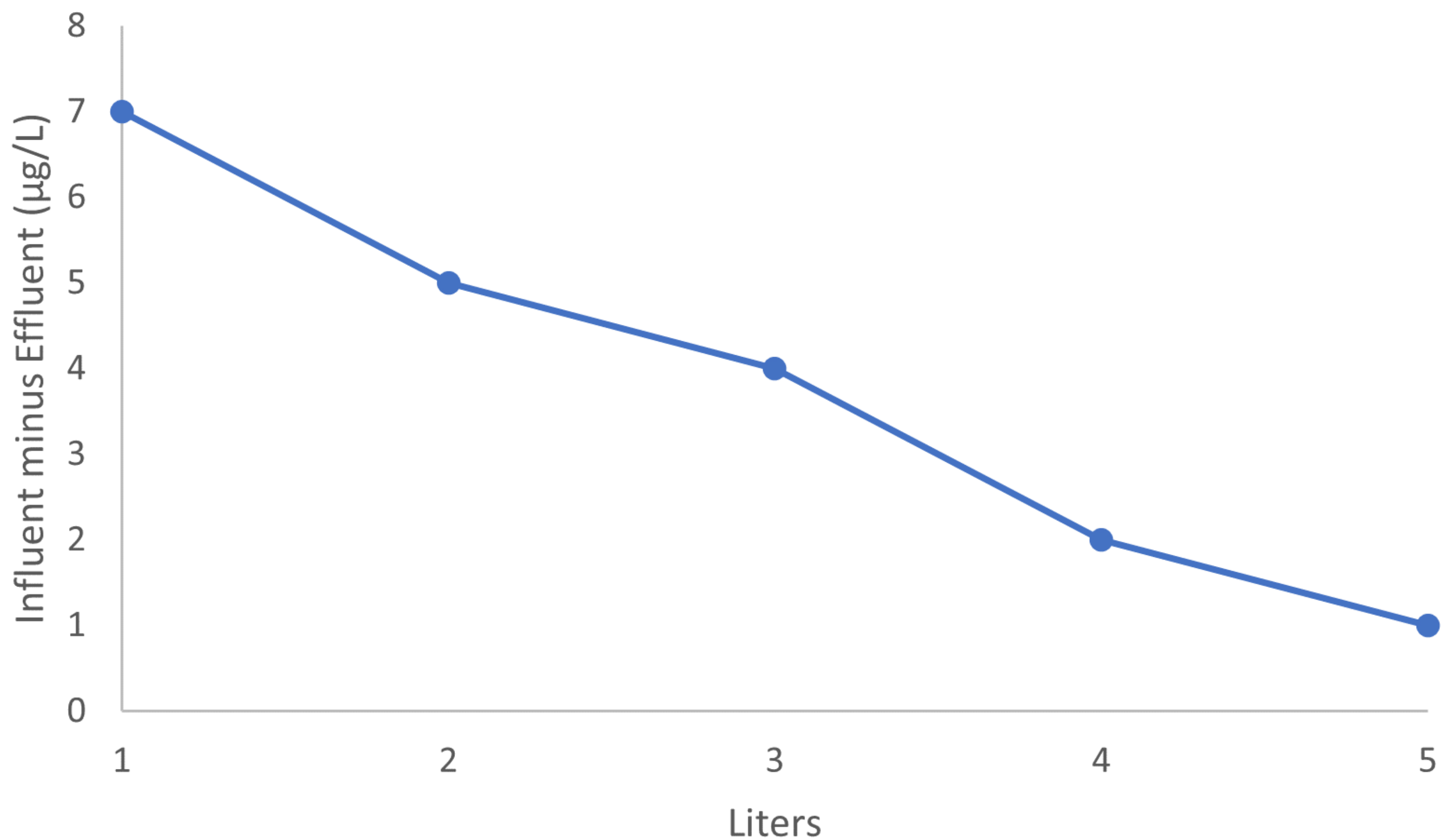
Figure 22
Dissolved Arsenic Breakthrough Curves: Columns 9 and 10



Note:
Blue dashed line indicates that effluent concentrations equal influent concentrations (i.e., capacity for attenuation has been consumed).

Figure 23
Dissolved Cobalt Breakthrough Curves: Columns 9 and 10

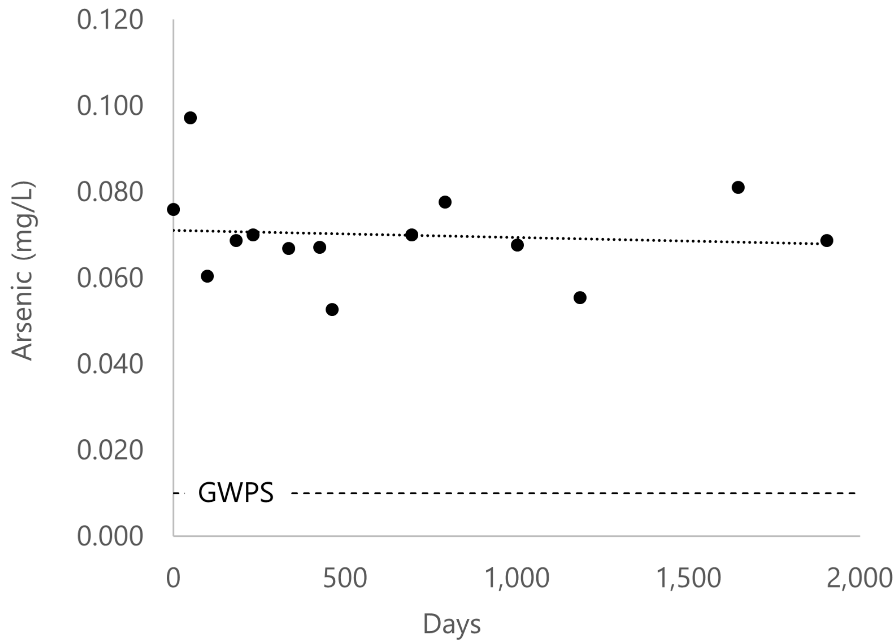
Monitored Natural Attenuation Demonstration
Plant Barry



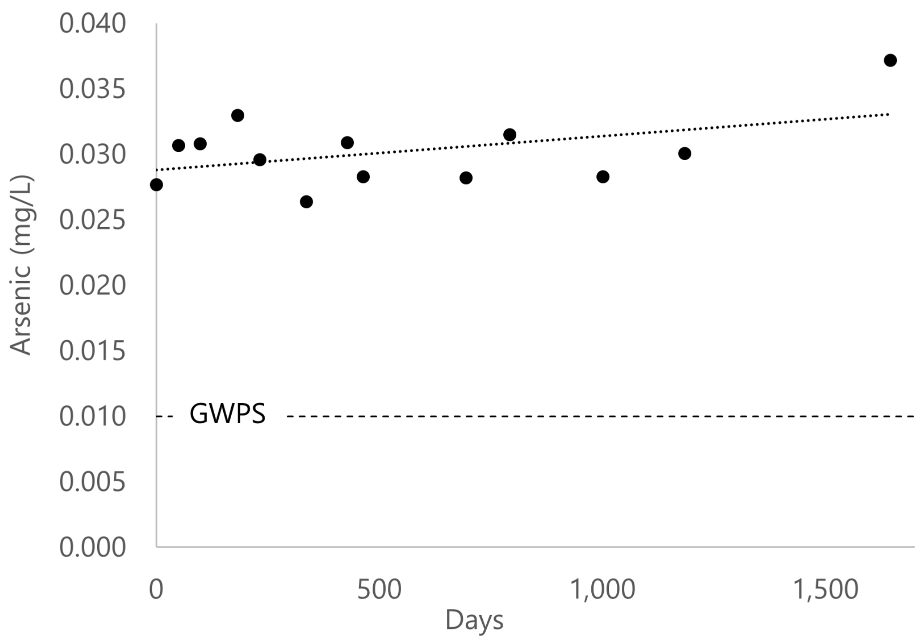
Note:
µg/L: micrograms per liter

Figure 24
Example Graph to Calculate Mass Attenuated by Columns
Monitored Natural Attenuation Demonstration
Plant Barry

Appendix A
Concentration Versus Time Graphs

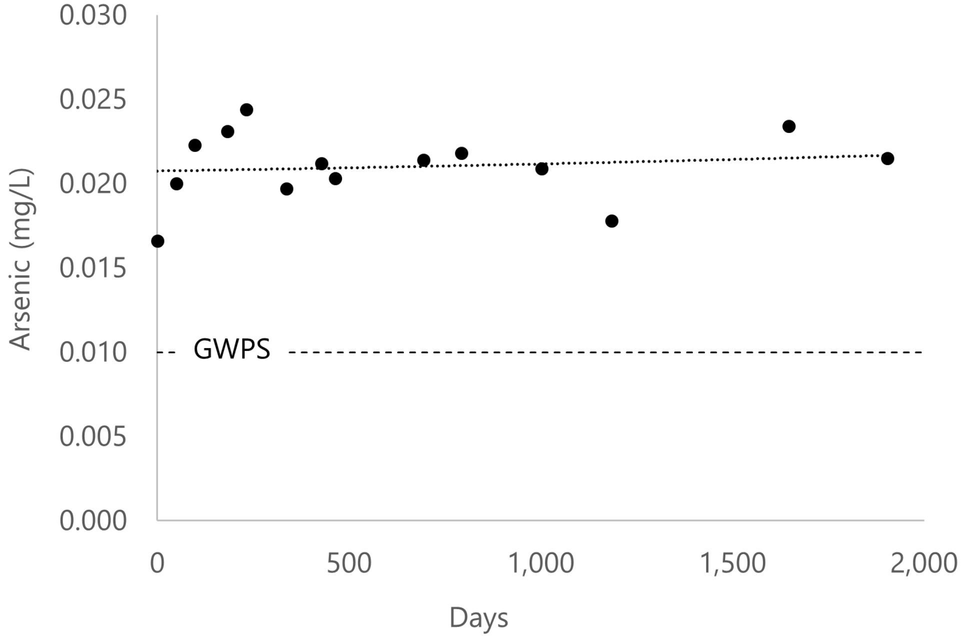


BY-AP-MW-1

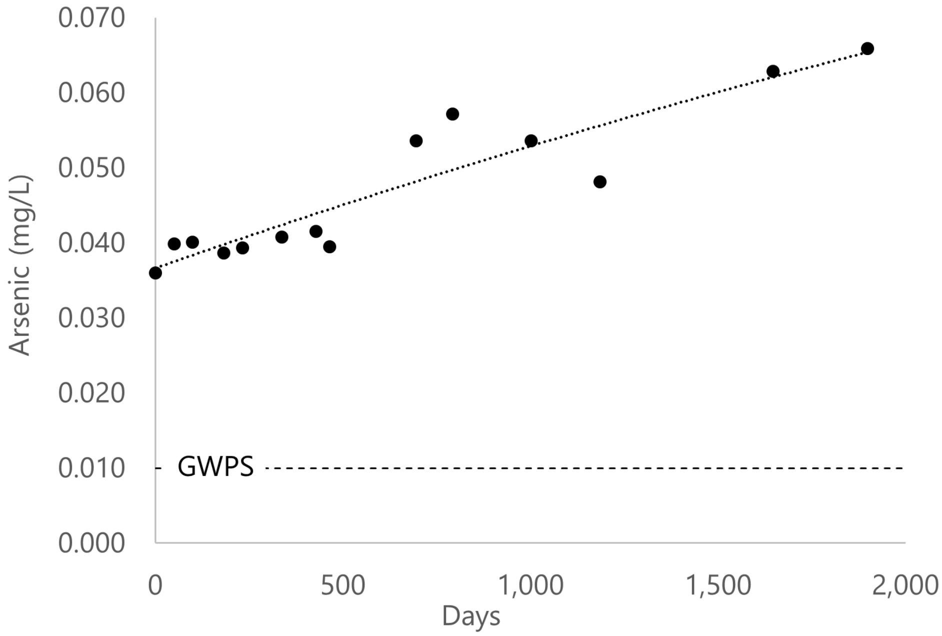


BY-AP-MW-5

Notes:
GWPS: groundwater protection standard
mg/L: milligram per liter

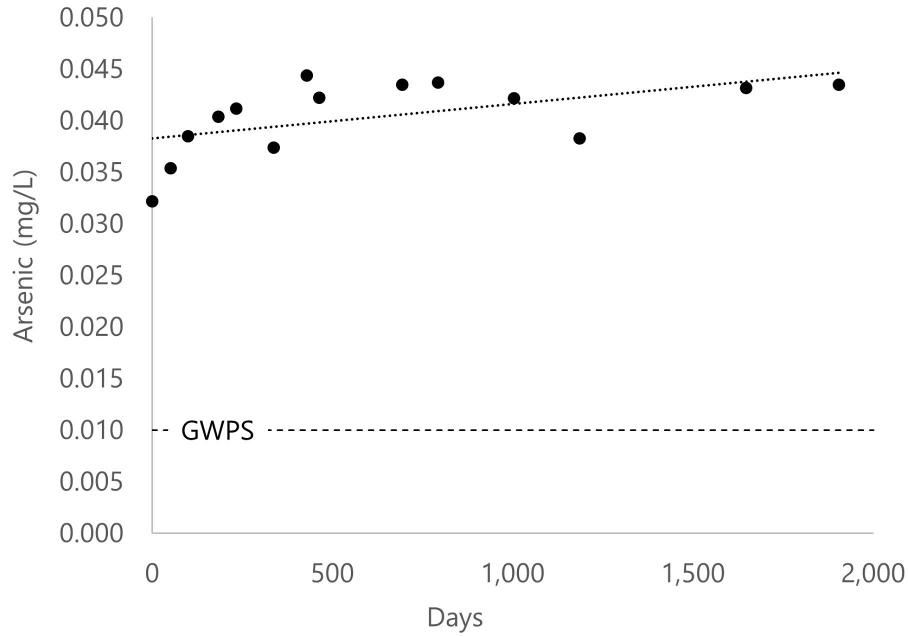


BY-AP-MW-7

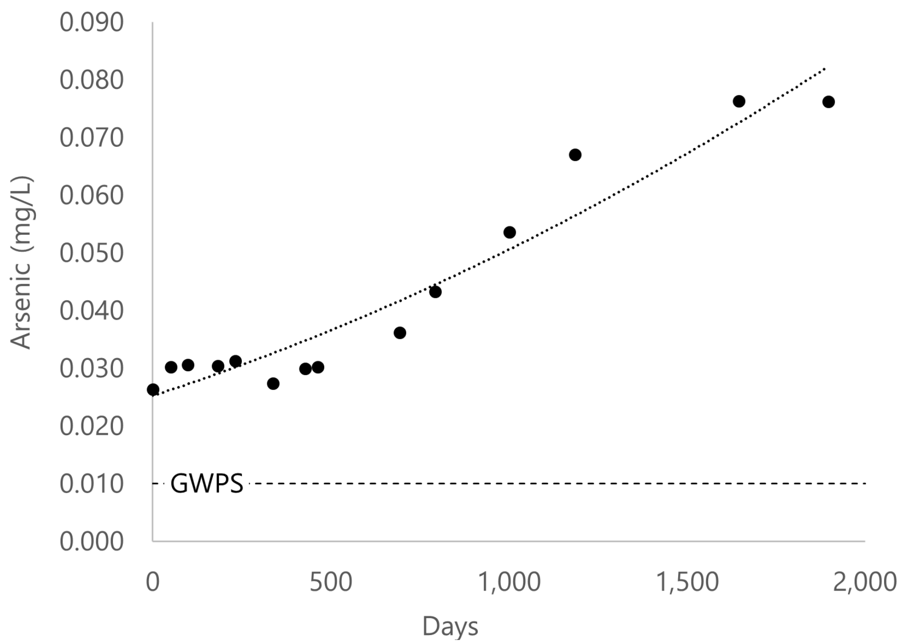


BY-AP-MW-8

Notes:
GWPS: groundwater protection standard
mg/L: milligram per liter

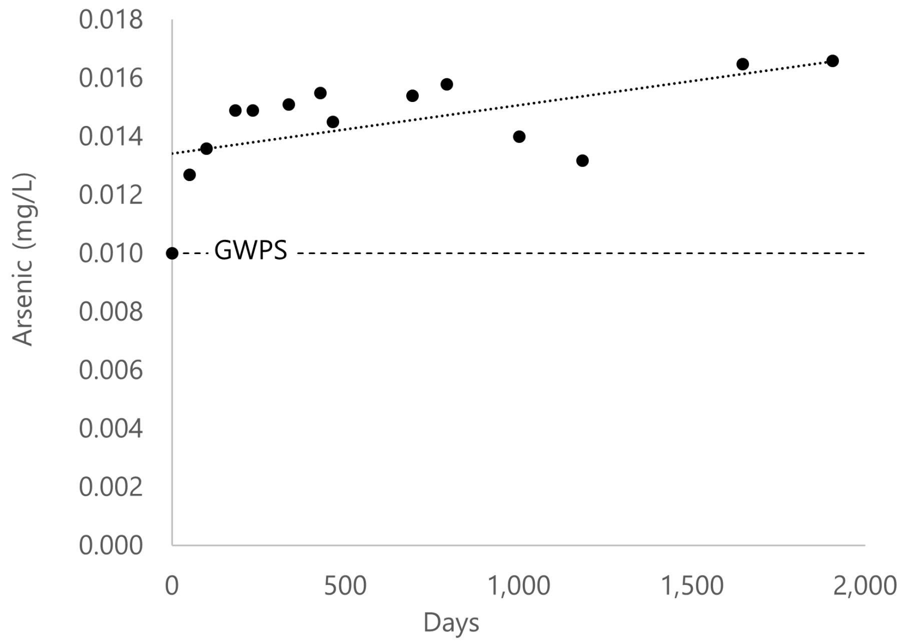


BY-AP-MW-9

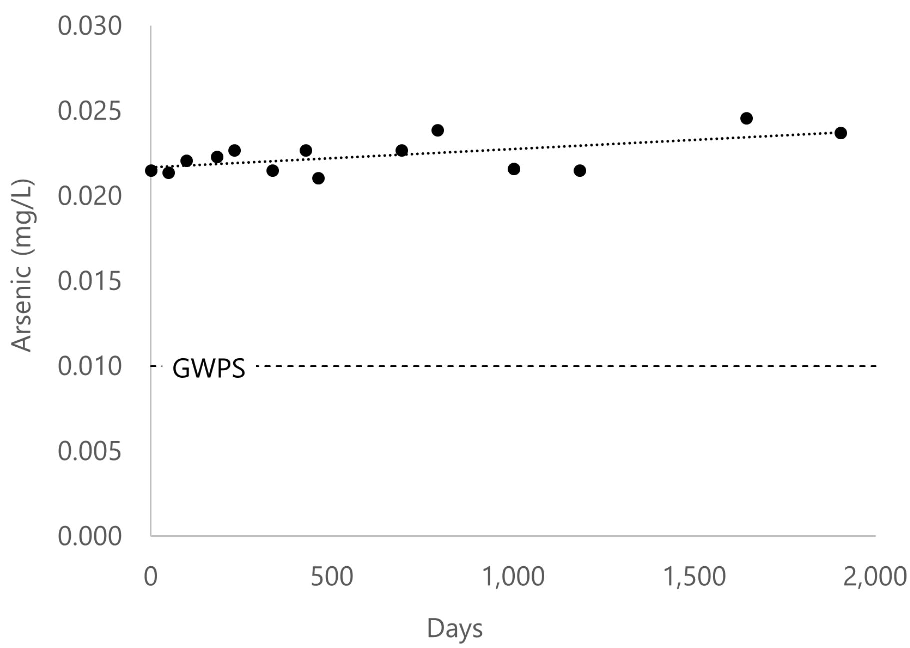


BY-AP-MW-10

Notes:
GWPS: groundwater protection standard
mg/L: milligram per liter

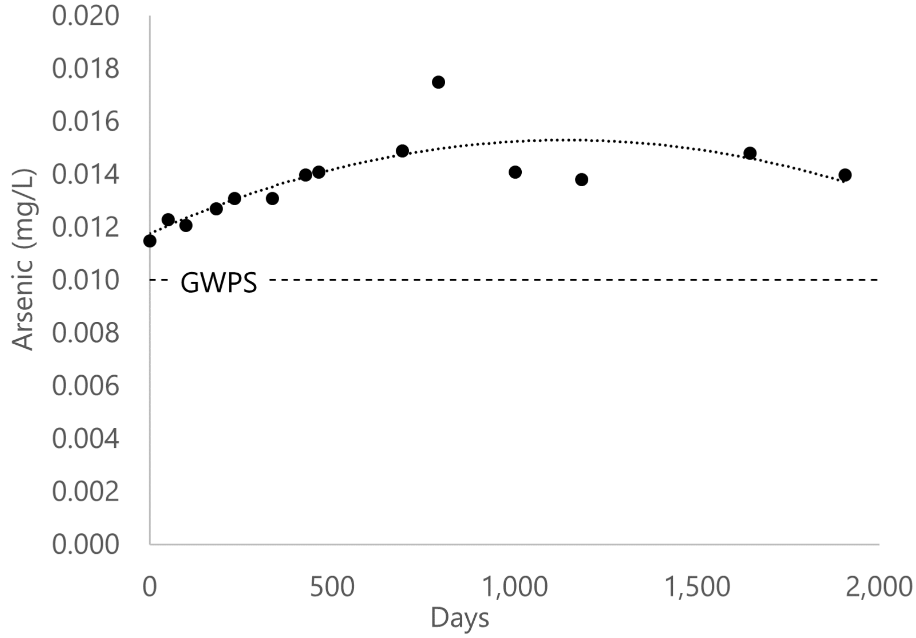


BY-AP-MW-11

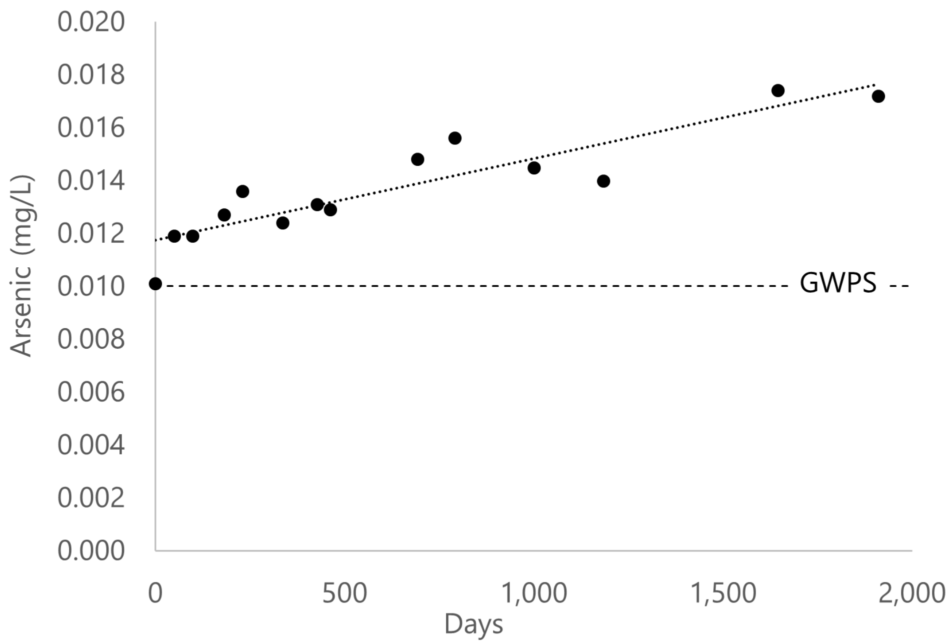


BY-AP-MW-12

Notes:
GWPS: groundwater protection standard
mg/L: milligram per liter

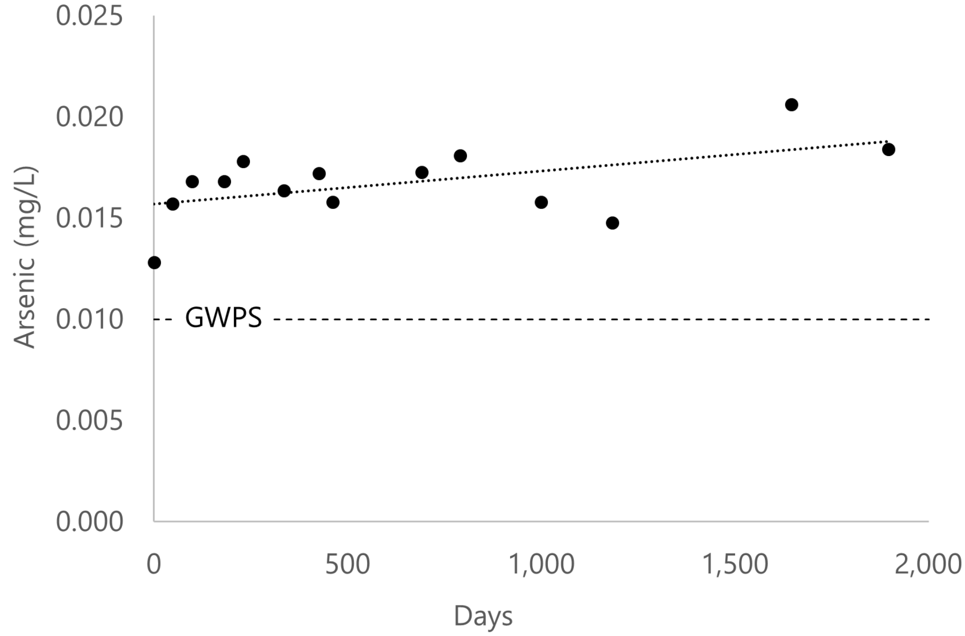


BY-AP-MW-13

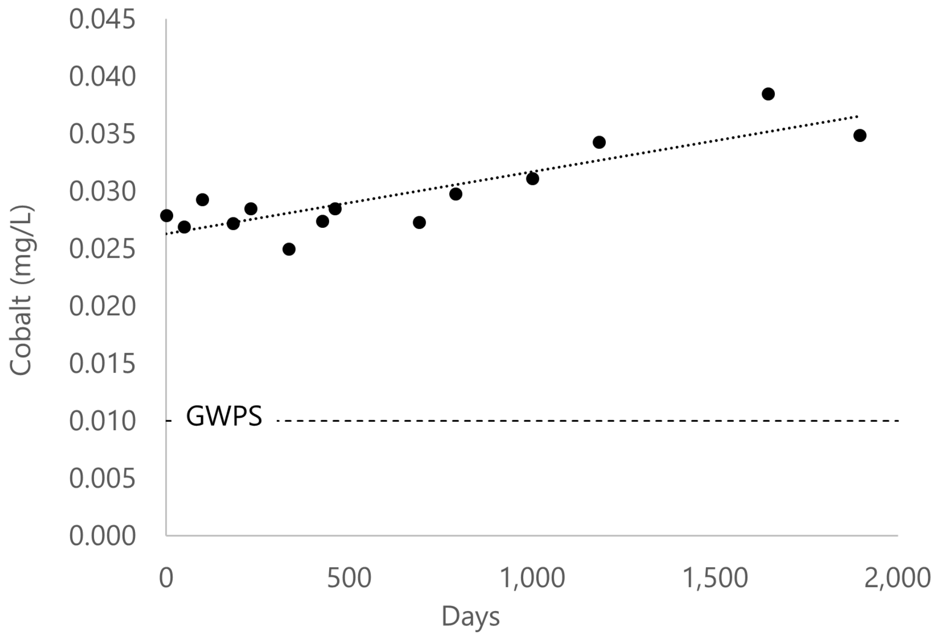


BY-AP-MW-14

Notes:
GWPS: groundwater protection standard
mg/L: milligram per liter

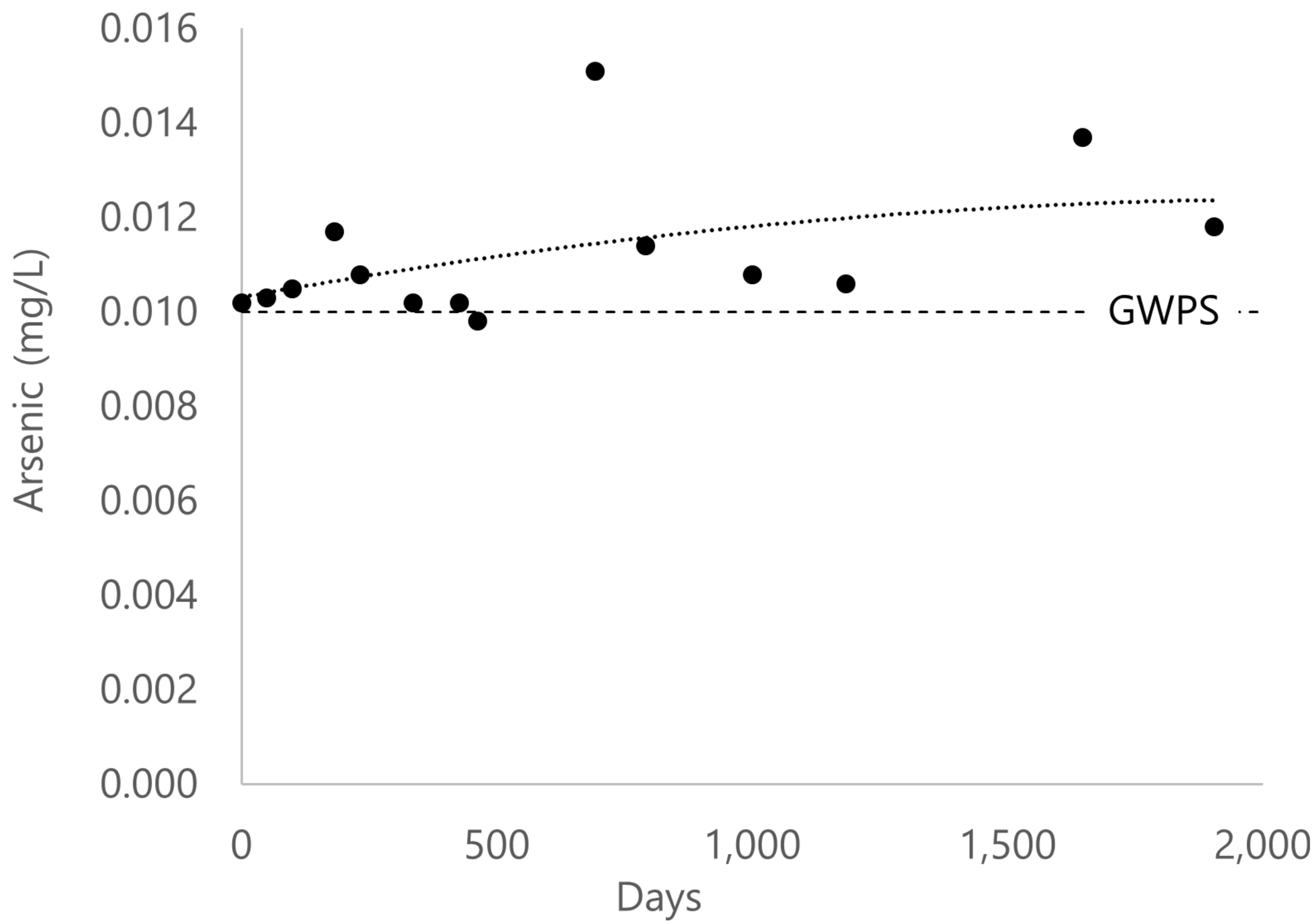


BY-AP-MW-15



BY-AP-MW-15

Notes:
GWPS: groundwater protection standard
mg/L: milligram per liter



BY-AP-MW-16

Notes:
GWPS: groundwater protection standard
mg/L: milligram per liter

Filepath: \\Athena\Mobile\Projects\Southern Company\Alabama Power ACMs - PRIVILEGED & CONFIDENTIAL\MNA Demonstration Reports\Barry\Appendices\Appendix A Concentration vs Time\Appendix A-1g - Concentration vs Time.docx

ANCHOR QEA

Figure A-1g
Concentration Versus Time Graphs

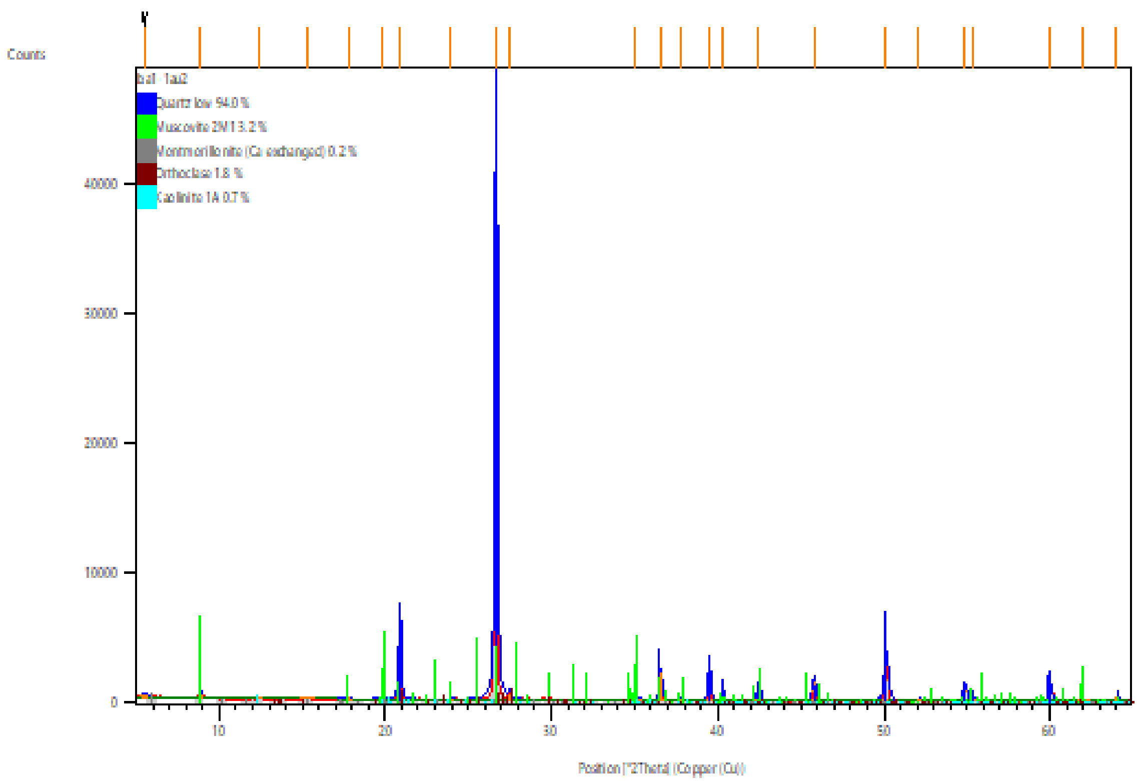
Monitored Natural Attenuation Demonstration: Appendix A
Plant Barry

Appendix B
Analytical Data

Pattern List

Ref.Code	Score	Compound Name	Chem. Formula
98-008-3849	68	Quartz low	O2 Si1
98-008-2479	20	Muscovite 2M1	H1.744 Al2.905 F0...
98-005-1636	0	Montmorillonite (C..	H8.2 Al4 Ca1.2 O27..
98-003-4782	18	Orthoclase	Al1 K0.94 Na0.06 O..
98-008-0082	14	Kaolinite 1A	H4 Al2 O9 Si2

Graphics

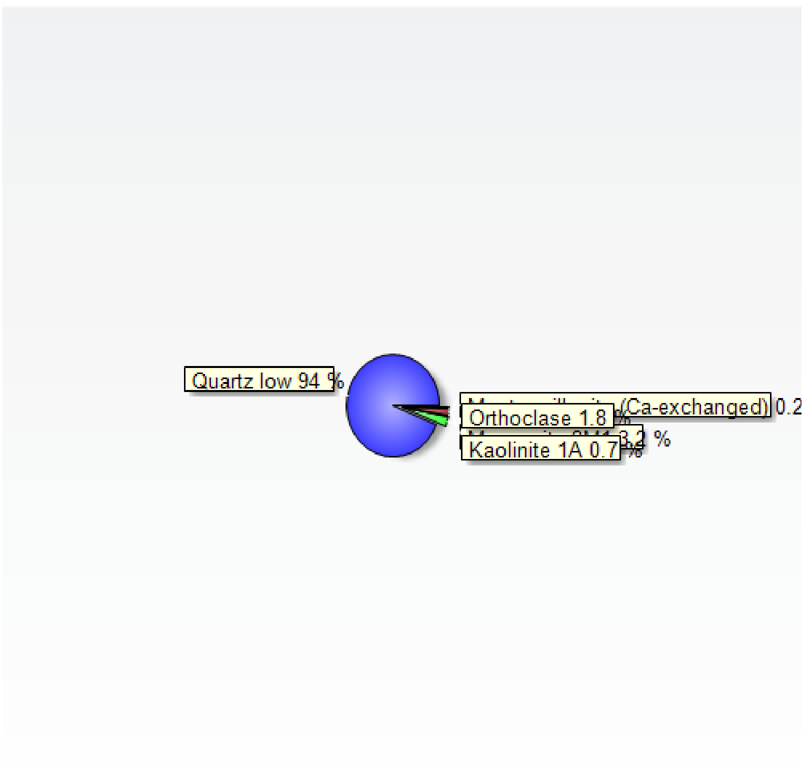


Peak List

Pos.[°2Th.]	d-spacing [Å]	Rel. Int. [%]	Matched by
5.5266	15.99135	0.77	
8.8923	9.94479	1.14	98-008-2479
12.3926	7.14258	0.17	98-008-0082
15.3130	5.78636	0.03	98-005-1636;98..
17.8373	4.97275	0.25	98-008-2479
19.8393	4.47525	0.38	98-008-2479;98..
20.8683	4.25685	14.46	98-008-3849;98..
23.9915	3.70930	0.24	98-008-2479;98..
26.6573	3.34410	100.00	98-008-3849;98..
27.4992	3.24361	1.04	98-003-4782
35.0527	2.56003	0.35	98-008-2479;98..
36.5436	2.45893	5.58	98-008-3849;98..

37.7721	2.38173	0.32	98-008-2479;98..
39.4831	2.28238	5.87	98-008-3849;98..
40.2926	2.23837	2.12	98-008-3849;98..
42.4505	2.12945	2.97	98-008-3849;98..
45.7868	1.98175	4.08	98-008-3849;98..
50.1216	1.82005	8.21	98-008-3849;98..
52.1038	1.75538	0.55	98-008-2479;98..
54.8461	1.67392	3.37	98-008-3849;98..
55.3002	1.66125	0.97	98-008-3849;98..
59.9461	1.54313	5.89	98-008-3849;98..
61.9358	1.49825	0.12	98-008-2479;98..
63.9991	1.45484	0.94	98-008-3849;98..

Quantitative Results



Phase Quartz low:	Weight fraction/ %:	94
Phase Muscovite 2M1:	Weight fraction/ %:	3
Phase Montmorillonite (Ca-exchanged):	Weight fraction/ %:	0.2
Phase Orthoclase:	Weight fraction/ %:	2
Phase Kaolinite 1A:	Weight fraction/ %:	0.7

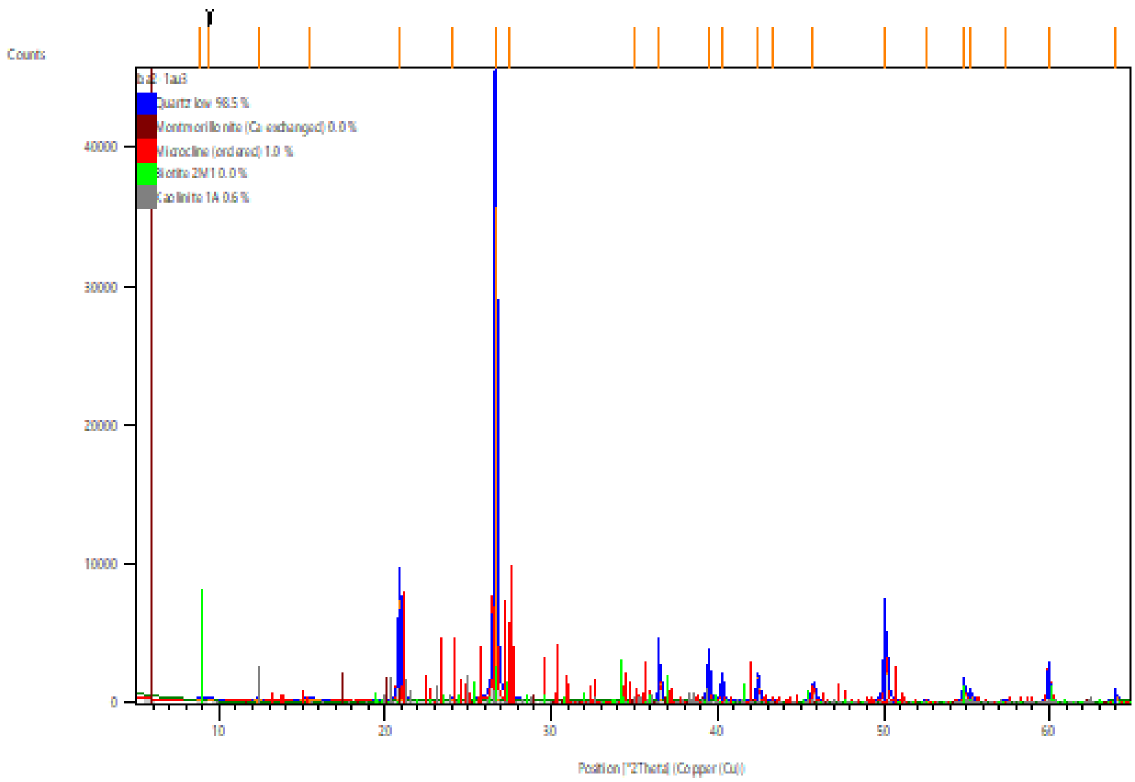
Anchor Scan Parameters

Dataset Name:	ba1-1au2
File name:	C:\Users\Rick\Documents\RCIA_Win10\AnchorQEA\AnchorQEA-2021July26\ba1-1au2.rd
Sample Identification:	BA1-1A-Unit2_55-57
Comment:	Exported by X'Pert SW Generated by hugo in project Maynard.
Measurement Date / Time:	8/3/2021 2:10:00 PM
Raw Data Origin:	PHILIPS-binary (scan) (.RD)
Scan Axis:	Gonio
Start Position [°2Th.]:	5.0200
End Position [°2Th.]:	64.9400
Step Size [°2Th.]:	0.0400
Scan Step Time [s]:	4.5000
Scan Type:	Continuous
Offset [°2Th.]:	0.0000
Divergence Slit Type:	Fixed
Divergence Slit Size [°]:	0.5000
Specimen Length [mm]:	10.00
Receiving Slit Size [mm]:	0.1000
Measurement Temperature [°C]:	0.00
Anode Material:	Cu
K-Alpha1 [Å]:	1.54060
K-Alpha2 [Å]:	1.54443
K-Beta [Å]:	1.39225
K-A2 / K-A1 Ratio:	0.50000
Generator Settings:	30 mA, 40 kV
Diffractometer Type:	XPert MPD
Diffractometer Number:	1
Goniometer Radius [mm]:	200.00
Dist. Focus-Diverg. Slit [mm]:	91.00
Incident Beam Monochromator:	No
Spinning:	No

Pattern List

Ref.Code	Score	Compound Name	Chem. Formula
98-009-0145	70	Quartz low	O2 Si1
98-005-1636	0	Montmorillonite (C..	H8.2 Al4 Ca1.2 O27..
98-008-3531	11	Microcline (ordered)	Al1 K1 O8 Si3
98-015-9336	11	Biotite 2M1	H2.548 Al2.432 Fe2..
98-006-3316	Unmatch	Kaolinite 1A	H8 Al4 O18 Si4

Graphics

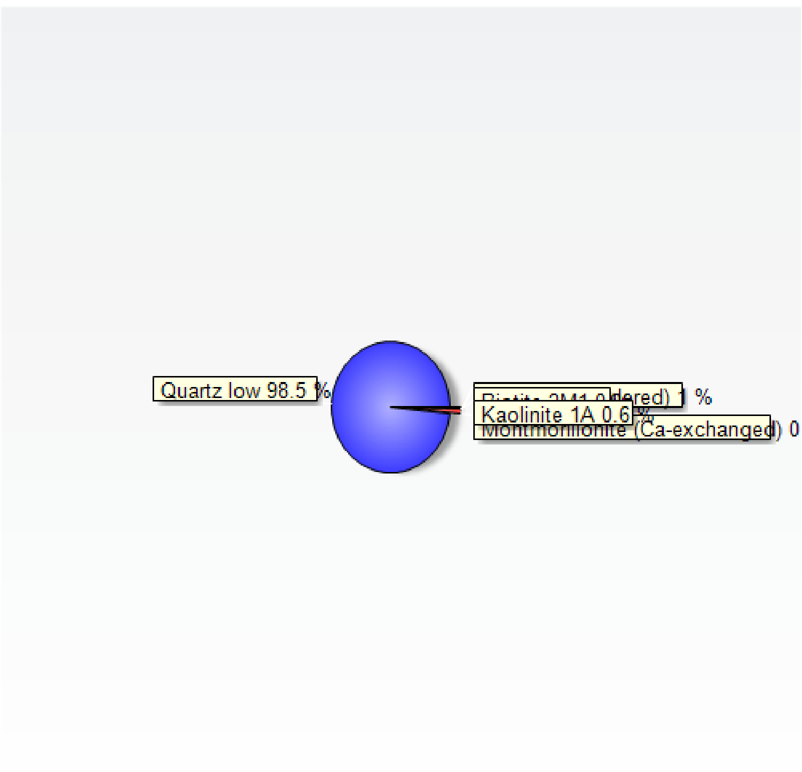


Peak List

Pos.[°2Th.]	d-spacing [Å]	Rel. Int. [%]	Matched by
8.8798	9.95875	0.43	98-015-9336
9.4355	9.37337	0.45	
12.3556	7.16388	0.33	98-006-3316
15.4524	5.73447	0.36	98-008-3531;98..
20.8612	4.25827	20.58	98-009-0145;98..
24.0290	3.70359	0.21	98-008-3531;98..
26.6423	3.34595	100.00	98-009-0145;98..
27.5167	3.24158	0.52	98-008-3531;98..
35.0435	2.56067	0.06	98-005-1636;98..
36.5194	2.46051	6.19	98-009-0145;98..
39.4561	2.28388	6.42	98-009-0145;98..
40.2751	2.23931	3.52	98-009-0145;98..

42.4304	2.13042	4.98	98-009-0145;98..
43.3607	2.08684	0.11	98-005-1636;98..
45.7662	1.98260	3.00	98-009-0145;98..
50.1040	1.82065	11.58	98-009-0145;98..
52.5366	1.74193	0.21	98-005-1636;98..
54.8351	1.67423	2.95	98-009-0145;98..
55.2818	1.66176	1.55	98-009-0145;98..
57.2793	1.60847	0.22	98-009-0145;98..
59.9221	1.54369	6.92	98-009-0145;98..
63.9962	1.45490	1.26	98-009-0145;98..

Quantitative Results



Phase Quartz low:	Weight fraction/ %:	98
Phase Montmorillonite (Ca-exchanged):	Weight fraction/ %:	0.0
Phase Microcline (ordered):	Weight fraction/ %:	1
Phase Biotite 2M1:	Weight fraction/ %:	0.0
Phase Kaolinite 1A:	Weight fraction/ %:	0.6

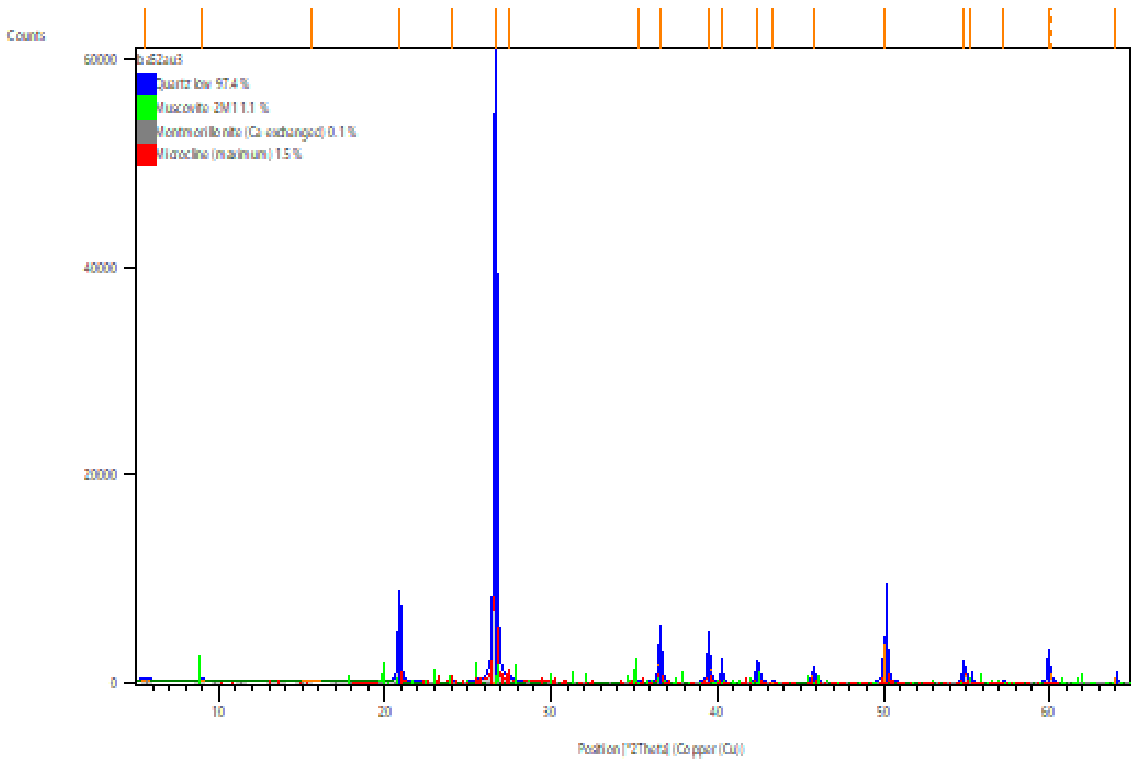
Anchor Scan Parameters

Dataset Name:	ba2-1au3
File name:	C:\Users\Rick\Documents\RCIA_Win10\AnchorQEA\AnchorQEA-2021July26\ba2-1au3.rd
Sample Identification:	BA2-1A-Unit3_62-65
Comment:	Exported by X'Pert SW Generated by hugo in project AnchorQEA-2
Measurement Date / Time:	8/5/2021 11:57:00 AM
Raw Data Origin:	PHILIPS-binary (scan) (.RD)
Scan Axis:	Gonio
Start Position [°2Th.]:	5.0200
End Position [°2Th.]:	64.9400
Step Size [°2Th.]:	0.0400
Scan Step Time [s]:	4.5000
Scan Type:	Continuous
Offset [°2Th.]:	0.0000
Divergence Slit Type:	Fixed
Divergence Slit Size [°]:	0.5000
Specimen Length [mm]:	10.00
Receiving Slit Size [mm]:	0.1000
Measurement Temperature [°C]:	0.00
Anode Material:	Cu
K-Alpha1 [Å]:	1.54060
K-Alpha2 [Å]:	1.54443
K-Beta [Å]:	1.39225
K-A2 / K-A1 Ratio:	0.50000
Generator Settings:	30 mA, 40 kV
Diffractometer Type:	XPert MPD
Diffractometer Number:	1
Goniometer Radius [mm]:	200.00
Dist. Focus-Diverg. Slit [mm]:	91.00
Incident Beam Monochromator:	No
Spinning:	No

Pattern List

Ref.Code	Score	Compound Name	Chem. Formula
98-008-3849	80	Quartz low	O2 Si1
96-900-1961	11	Muscovite-2M1	K3.68 Na0.32 Si12...
98-005-1636	22	Montmorillonite (C..	H8.2 Al4 Ca1.2 O27..
98-001-6597	17	Microcline (maximum)	Al1 K1 O8 Si3

Graphics

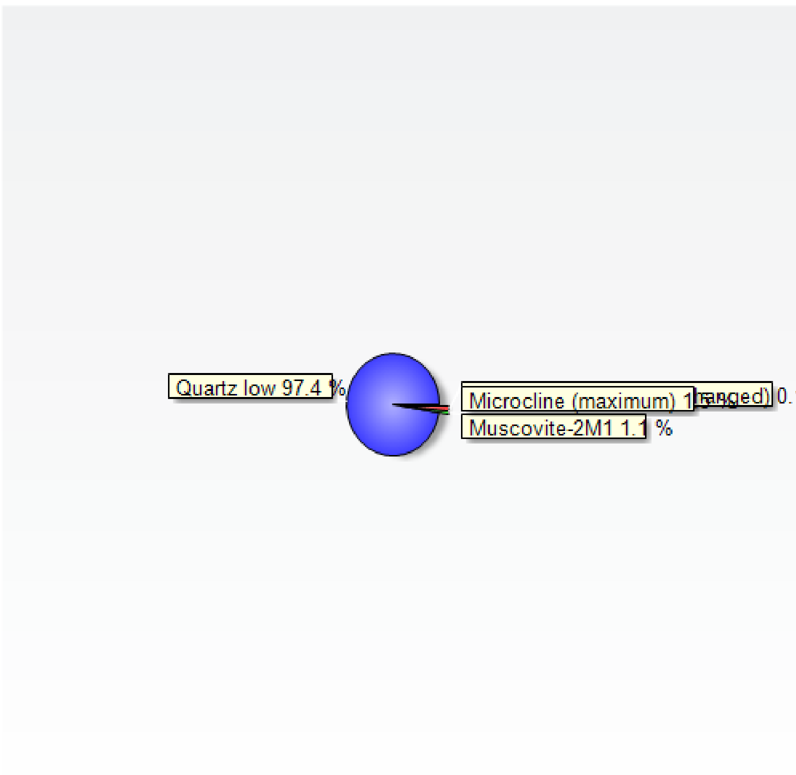


Peak List

Pos.[°2Th.]	d-spacing [Å]	Rel. Int. [%]	Matched by
5.5660	15.87799	0.39	98-005-1636
8.9276	9.90546	0.49	96-900-1961
15.5254	5.70765	0.11	98-001-6597
20.8691	4.25667	14.02	98-008-3849;96..
24.0178	3.70530	0.37	96-900-1961;98..
26.6438	3.34576	100.00	98-008-3849;96..
27.4510	3.24919	0.68	98-001-6597
35.2238	2.54798	0.22	96-900-1961;98..
36.5523	2.45837	6.30	98-008-3849;96..
39.4716	2.28302	5.13	98-008-3849;98..
40.2832	2.23887	1.99	98-008-3849;96..
42.4346	2.13021	3.44	98-008-3849;96..
43.3669	2.08656	0.13	96-900-1961;98..

45.7828	1.98192	2.12	98-008-3849;96..
50.1167	1.82022	7.78	98-008-3849;96..
54.8425	1.67403	2.72	98-008-3849;96..
55.2924	1.66147	0.85	98-008-3849;96..
57.2672	1.60878	0.14	98-008-3849;96..
59.9275	1.54229	5.29	98-008-3849;96..
64.0086	1.45344	0.89	98-008-3849;96..

Quantitative Results



Phase Quartz low:	Weight fraction/ %:	97
Phase Muscovite-2M1:	Weight fraction/ %:	1
Phase Montmorillonite (Ca-exchanged):	Weight fraction/ %:	0.1
Phase Microcline (maximum):	Weight fraction/ %:	1.5

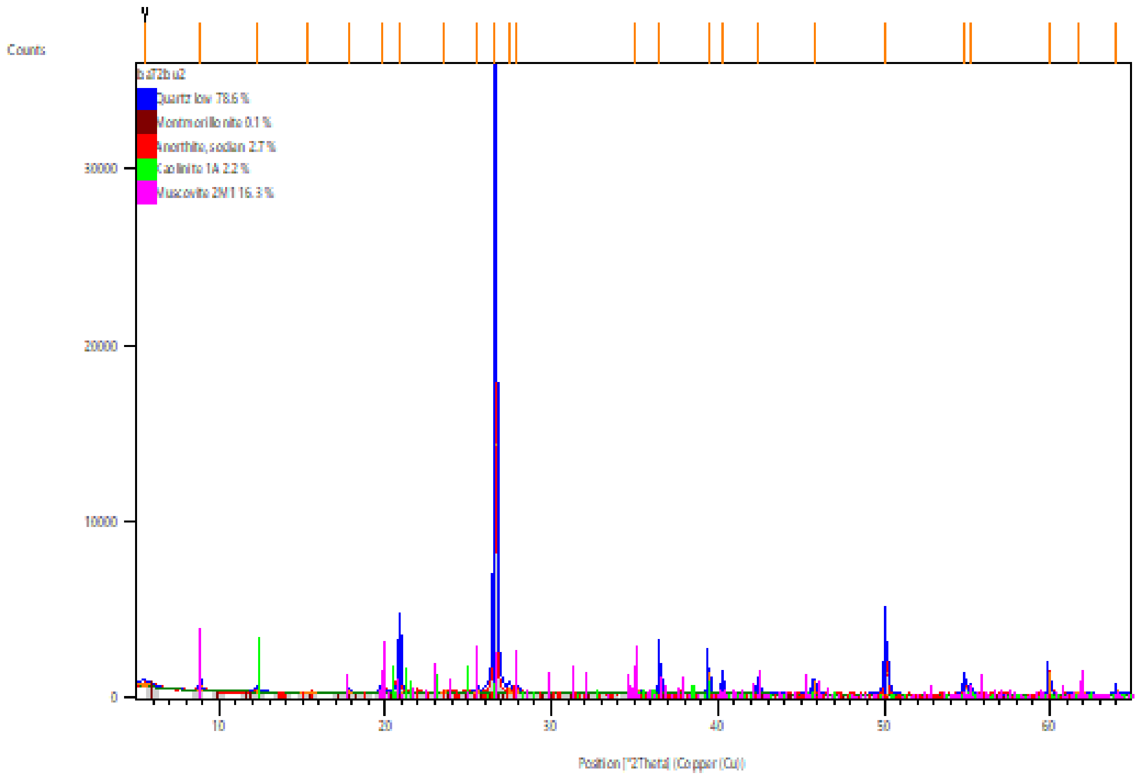
Anchor Scan Parameters

Dataset Name:	ba52au3
File name:	C:\Users\Rick\Documents\RCIA_Win10\AnchorQEA\AnchorQEA-2021July26\ba52au3.rd
Sample Identification:	BA5-2A-Unit3_43-45
Comment:	Exported by X'Pert SW Generated by hugo in project AnchorQEA-2
Measurement Date / Time:	8/5/2021 3:55:00 PM
Raw Data Origin:	PHILIPS-binary (scan) (.RD)
Scan Axis:	Gonio
Start Position [°2Th.]:	5.0200
End Position [°2Th.]:	64.9400
Step Size [°2Th.]:	0.0400
Scan Step Time [s]:	4.5000
Scan Type:	Continuous
Offset [°2Th.]:	0.0000
Divergence Slit Type:	Fixed
Divergence Slit Size [°]:	0.5000
Specimen Length [mm]:	10.00
Receiving Slit Size [mm]:	0.1000
Measurement Temperature [°C]:	0.00
Anode Material:	Cu
K-Alpha1 [Å]:	1.54060
K-Alpha2 [Å]:	1.54443
K-Beta [Å]:	1.39225
K-A2 / K-A1 Ratio:	0.50000
Generator Settings:	30 mA, 40 kV
Diffractometer Type:	XPert MPD
Diffractometer Number:	1
Goniometer Radius [mm]:	200.00
Dist. Focus-Diverg. Slit [mm]:	91.00
Incident Beam Monochromator:	No
Spinning:	No

Pattern List

Ref.Code	Score	Compound Name	Chem. Formula
98-009-0145	56	Quartz low	O2 Si1
98-016-1171	11	Montmorillonite	H1 Al2 Ca0.5 O12 Si4
98-003-4943	13	Anorthite, sodian	Al1.66 Ca0.66 Na0...
98-008-0082	Unmatch	Kaolinite 1A	H4 Al2 O9 Si2
98-008-2479	24	Muscovite 2M1	H1.744 Al2.905 F0...

Graphics

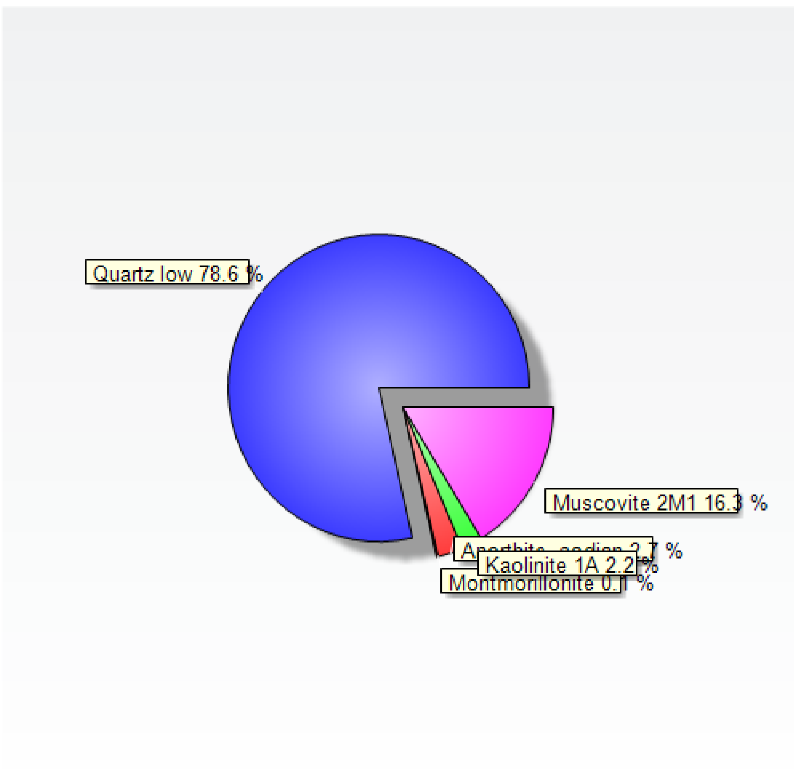


Peak List

Pos.[°2Th.]	d-spacing [Å]	Rel. Int. [%]	Matched by
5.5623	15.88872	0.74	
8.8724	9.96701	1.65	98-008-2479
12.3255	7.18131	0.69	98-008-0082
15.3727	5.76401	0.08	98-016-1171;98..
17.8336	4.97377	0.57	98-016-1171;98..
19.7768	4.48926	1.27	98-016-1171;98..
20.8522	4.26009	12.07	98-009-0145;98..
23.5490	3.77799	0.57	98-016-1171;98..
25.5209	3.49037	0.88	98-003-4943;98..
26.6210	3.34858	100.00	98-009-0145;98..
27.4388	3.25060	1.09	98-003-4943
27.9502	3.19229	0.85	98-003-4943;98..

35.0314	2.56153	0.77	98-016-1171;98..
36.5155	2.46076	5.02	98-009-0145;98..
39.4401	2.28477	4.50	98-009-0145;98..
40.2876	2.23864	2.70	98-009-0145;98..
42.4292	2.13047	2.73	98-009-0145;98..
45.7782	1.98210	2.67	98-009-0145;98..
50.0986	1.82083	8.76	98-009-0145;98..
54.8396	1.67411	2.56	98-009-0145;98..
55.2745	1.66196	1.03	98-009-0145;98..
59.9120	1.54393	4.75	98-009-0145;98..
61.7524	1.50226	0.35	98-016-1171;98..
63.9951	1.45492	0.98	98-009-0145;98..

Quantitative Results



Phase Quartz low:	Weight fraction/ %:	79
Phase Montmorillonite:	Weight fraction/ %:	0.1
Phase Anorthite, sodian:	Weight fraction/ %:	3
Phase Kaolinite 1A:	Weight fraction/ %:	2
Phase Muscovite 2M1:	Weight fraction/ %:	16

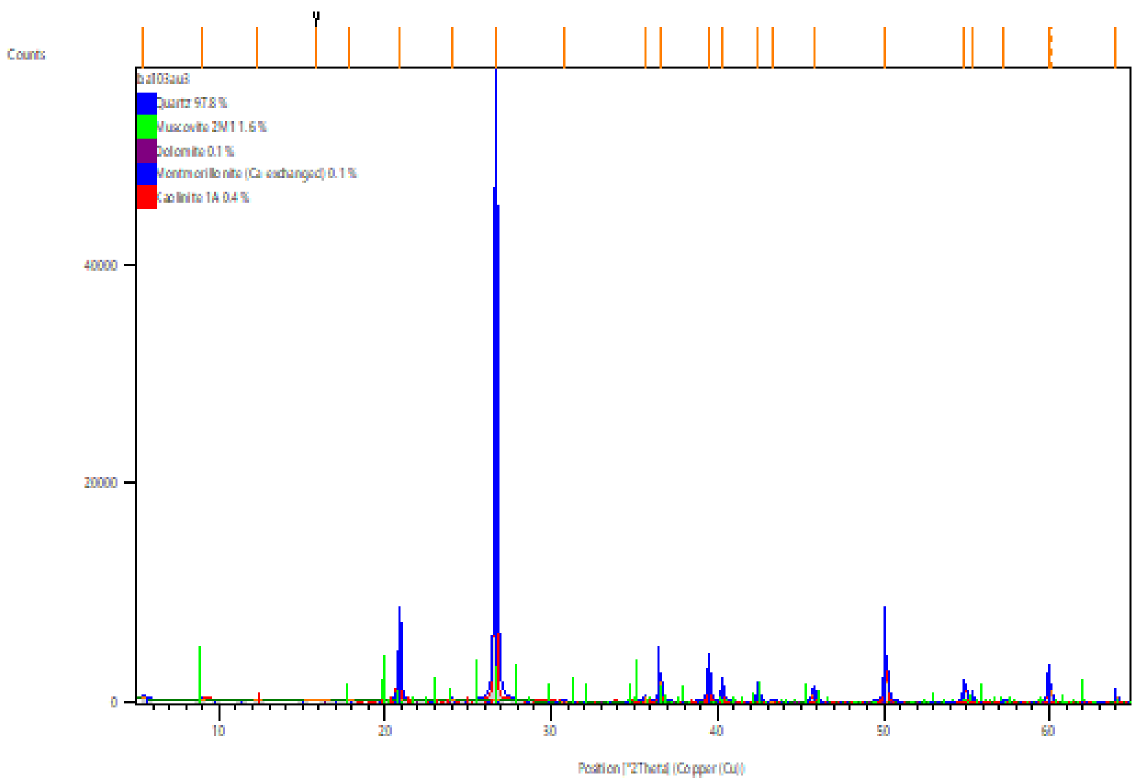
Anchor Scan Parameters

Dataset Name:	ba72bu2
File name:	C:\Users\Rick\Documents\RCIA_Win10\AnchorQEA\AnchorQEA-2021July26\ba72bu2.rd
Sample Identification:	BA7-2B-Unit2_44-45
Comment:	Exported by X'Pert SW Generated by hugo in project AnchorQEA-2
Measurement Date / Time:	8/4/2021 12:31:00 PM
Raw Data Origin:	PHILIPS-binary (scan) (.RD)
Scan Axis:	Gonio
Start Position [°2Th.]:	5.0200
End Position [°2Th.]:	64.9400
Step Size [°2Th.]:	0.0400
Scan Step Time [s]:	4.5000
Scan Type:	Continuous
Offset [°2Th.]:	0.0000
Divergence Slit Type:	Fixed
Divergence Slit Size [°]:	0.5000
Specimen Length [mm]:	10.00
Receiving Slit Size [mm]:	0.1000
Measurement Temperature [°C]:	0.00
Anode Material:	Cu
K-Alpha1 [Å]:	1.54060
K-Alpha2 [Å]:	1.54443
K-Beta [Å]:	1.39225
K-A2 / K-A1 Ratio:	0.50000
Generator Settings:	30 mA, 40 kV
Diffractometer Type:	XPert MPD
Diffractometer Number:	1
Goniometer Radius [mm]:	200.00
Dist. Focus-Diverg. Slit [mm]:	91.00
Incident Beam Monochromator:	No
Spinning:	No

Pattern List

Ref.Code	Score	Compound Name	Chem. Formula
98-015-4289	76	Quartz	O2 Si1
98-008-2479	12	Muscovite 2M1	H1.744 Al2.905 F0...
96-900-3526	12	Dolomite	Ca3.00 Mg3.00 C6.0..
98-005-1636	15	Montmorillonite (C..	H8.2 Al4 Ca1.2 O27..
98-002-7713	Unmatch	Kaolinite 1A	H4 Al2 O9 Si2

Graphics

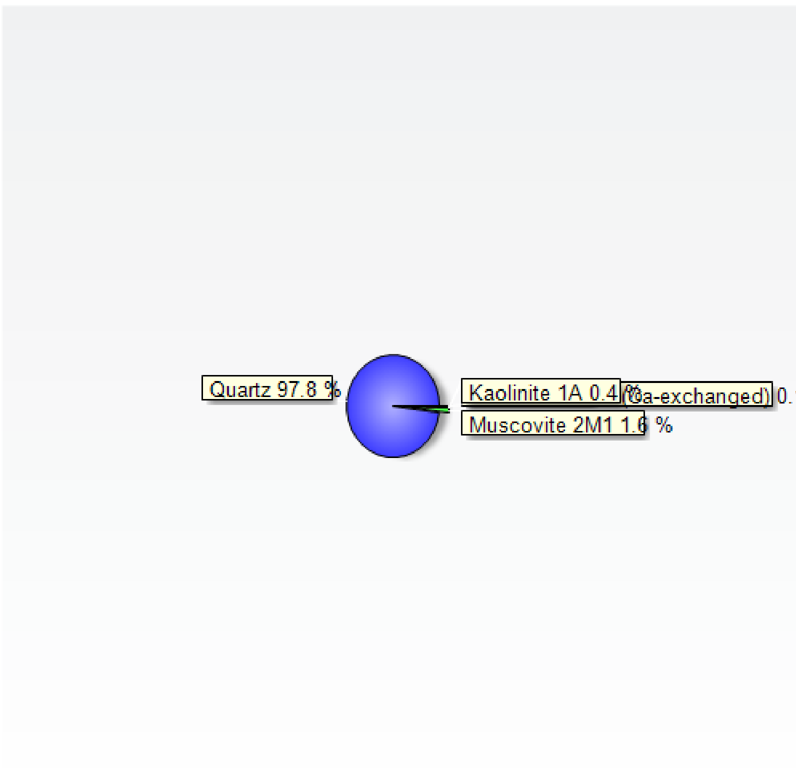


Peak List

Pos.[°2Th.]	d-spacing [Å]	Rel. Int. [%]	Matched by
5.4675	16.16392	0.39	98-005-1636
8.9304	9.90239	0.47	98-008-2479
12.3440	7.17062	0.09	98-002-7713
15.8500	5.59150	0.09	
17.8934	4.95730	0.03	98-008-2479;98..
20.8714	4.25621	13.73	98-015-4289;98..
24.0325	3.70306	0.27	98-008-2479;96..
26.6615	3.34359	100.00	98-015-4289;98..
30.7767	2.90525	0.15	96-900-3526
35.6049	2.52158	0.81	98-008-2479;98..
36.5475	2.45868	4.19	98-015-4289;98..
39.4633	2.28348	5.60	98-015-4289;98..

40.2928	2.23836	2.82	98-015-4289;98..
42.4360	2.13015	3.05	98-015-4289;98..
43.3463	2.08750	0.15	98-008-2479;98..
45.7904	1.98161	2.46	98-015-4289;98..
50.1149	1.82028	7.49	98-015-4289;98..
54.8607	1.67351	3.77	98-015-4289;98..
55.3026	1.66118	1.05	98-015-4289;98..
57.2468	1.60930	0.19	98-015-4289;98..
59.9245	1.54236	5.94	98-015-4289;98..
64.0072	1.45347	0.93	98-015-4289;98..

Quantitative Results



Phase Quartz:	Weight fraction/ %:	98
Phase Muscovite 2M1:	Weight fraction/ %:	2
Phase Dolomite:	Weight fraction/ %:	0.1
Phase Montmorillonite (Ca-exchanged):	Weight fraction/ %:	0.1
Phase Kaolinite 1A:	Weight fraction/ %:	0.4

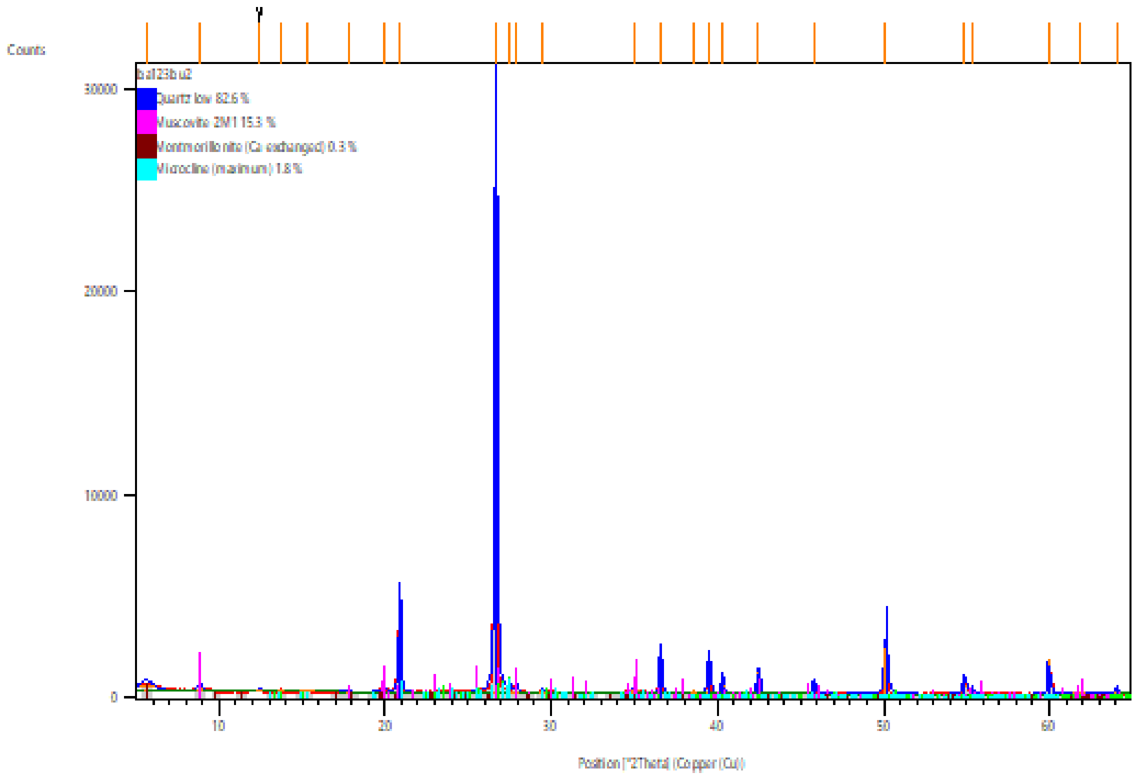
Anchor Scan Parameters

Dataset Name:	ba103au3
File name:	C:\Users\Rick\Documents\RCIA_Win10\AnchorQEA\AnchorQEA-2021July26\ba103au3.rd
Sample Identification:	BA10-3A-Unit3_34-38
Comment:	Exported by X'Pert SW Generated by hugo in project AnchorQEA-2
Measurement Date / Time:	8/4/2021 2:26:00 PM
Raw Data Origin:	PHILIPS-binary (scan) (.RD)
Scan Axis:	Gonio
Start Position [°2Th.]:	5.0200
End Position [°2Th.]:	64.9400
Step Size [°2Th.]:	0.0400
Scan Step Time [s]:	4.5000
Scan Type:	Continuous
Offset [°2Th.]:	0.0000
Divergence Slit Type:	Fixed
Divergence Slit Size [°]:	0.5000
Specimen Length [mm]:	10.00
Receiving Slit Size [mm]:	0.1000
Measurement Temperature [°C]:	0.00
Anode Material:	Cu
K-Alpha1 [Å]:	1.54060
K-Alpha2 [Å]:	1.54443
K-Beta [Å]:	1.39225
K-A2 / K-A1 Ratio:	0.50000
Generator Settings:	30 mA, 40 kV
Diffractometer Type:	XPert MPD
Diffractometer Number:	1
Goniometer Radius [mm]:	200.00
Dist. Focus-Diverg. Slit [mm]:	91.00
Incident Beam Monochromator:	No
Spinning:	No

Pattern List

Ref.Code	Score	Compound Name	Chem. Formula
98-008-3849	77	Quartz low	O2 Si1
96-900-1961	16	Muscovite-2M1	K3.68 Na0.32 Si12...
98-005-1636	26	Montmorillonite (C..	H8.2 Al4 Ca1.2 O27..
98-003-4782	21	Orthoclase	Al1 K0.94 Na0.06 O..
98-001-6597	18	Microcline (maximum)	Al1 K1 O8 Si3

Graphics

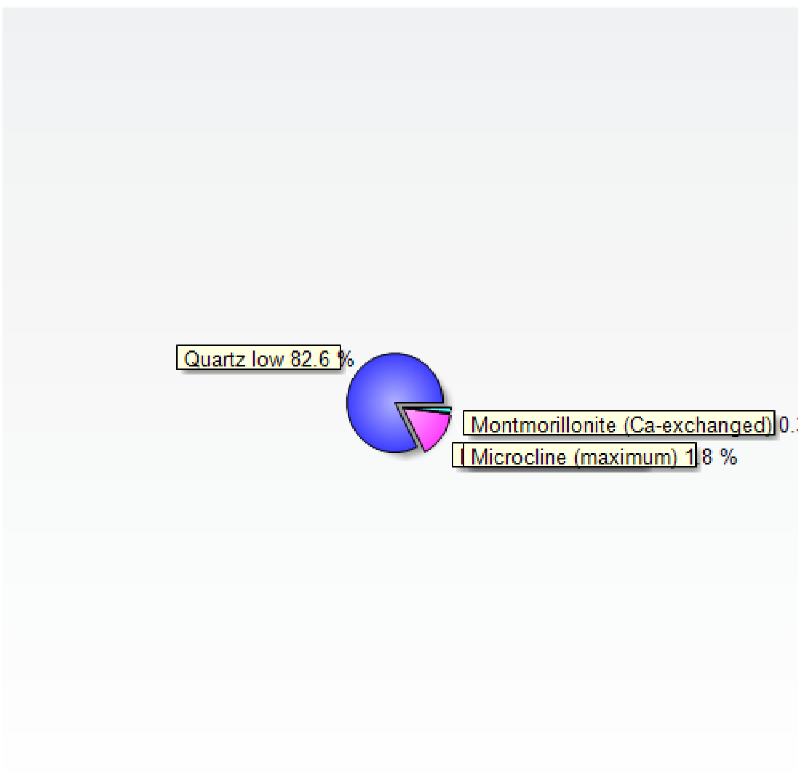


Peak List

Pos.[°2Th.]	d-spacing [Å]	Rel. Int. [%]	Matched by
5.6083	15.75832	1.36	98-005-1636
8.8477	9.99477	1.16	96-900-1961
12.4238	7.12472	0.33	
13.7435	6.44341	0.19	98-003-4782;98..
15.3468	5.77370	0.02	98-003-4782;98..
17.7992	4.98333	0.11	96-900-1961;98..
19.8876	4.46450	1.12	96-900-1961;98..
20.8742	4.25565	16.03	98-008-3849;96..
26.6626	3.34345	100.00	98-008-3849;96..
27.4623	3.24788	1.36	98-003-4782;98..
27.8891	3.19914	1.38	96-900-1961
29.4753	3.03050	0.71	98-001-6597

35.0101	2.56305	0.96	96-900-1961;98..
36.5672	2.45740	7.29	98-008-3849;96..
38.5663	2.33450	0.74	96-900-1961;98..
39.4716	2.28302	6.07	98-008-3849;98..
40.2929	2.23836	3.19	98-008-3849;96..
42.4559	2.12920	4.54	98-008-3849;96..
45.7906	1.98160	2.91	98-008-3849;96..
50.1270	1.81987	9.25	98-008-3849;96..
54.8581	1.67358	3.36	98-008-3849;96..
55.3025	1.66118	1.46	98-008-3849;96..
59.9413	1.54324	7.35	98-008-3849;96..
61.7916	1.50140	0.31	96-900-1961;98..
64.0372	1.45406	1.32	98-008-3849;96..

Quantitative Results



Phase Quartz low:	Weight fraction/ %:	83
Phase Muscovite-2M1:	Weight fraction/ %:	15
Phase Montmorillonite (Ca-exchanged):	Weight fraction/ %:	0.3
Phase Microcline (maximum):	Weight fraction/ %:	1.8

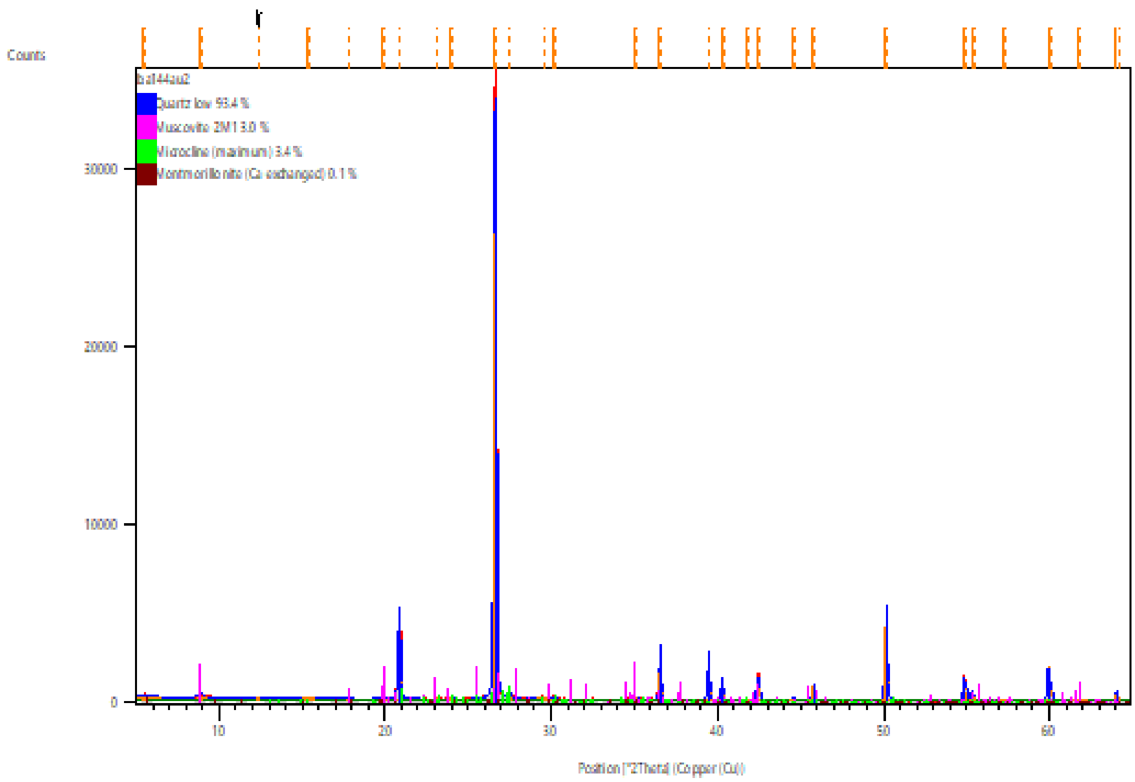
Anchor Scan Parameters

Dataset Name:	ba123bu2
File name:	C:\Users\Rick\Documents\RCIA_Win10\AnchorQEA\AnchorQEA-2021July26\ba123bu2.rd
Sample Identification:	BA12-3B-Unit2_29-33
Comment:	Exported by X'Pert SW Generated by hugo in project AnchorQEA-2
Measurement Date / Time:	8/5/2021 2:00:00 PM
Raw Data Origin:	PHILIPS-binary (scan) (.RD)
Scan Axis:	Gonio
Start Position [°2Th.]:	5.0200
End Position [°2Th.]:	64.9400
Step Size [°2Th.]:	0.0400
Scan Step Time [s]:	4.5000
Scan Type:	Continuous
Offset [°2Th.]:	0.0000
Divergence Slit Type:	Fixed
Divergence Slit Size [°]:	0.5000
Specimen Length [mm]:	10.00
Receiving Slit Size [mm]:	0.1000
Measurement Temperature [°C]:	0.00
Anode Material:	Cu
K-Alpha1 [Å]:	1.54060
K-Alpha2 [Å]:	1.54443
K-Beta [Å]:	1.39225
K-A2 / K-A1 Ratio:	0.50000
Generator Settings:	30 mA, 40 kV
Diffractometer Type:	XPert MPD
Diffractometer Number:	1
Goniometer Radius [mm]:	200.00
Dist. Focus-Diverg. Slit [mm]:	91.00
Incident Beam Monochromator:	No
Spinning:	No

Pattern List

Ref.Code	Score	Compound Name	Chem. Formula
98-008-3849	75	Quartz low	O2 Si1
96-900-4643	17	Muscovite-2M1	O46.88 F1.12 Na0.5..
98-001-6597	24	Microcline (maximum)	Al1 K1 O8 Si3
98-005-1636	15	Montmorillonite (C..	H8.2 Al4 Ca1.2 O27..

Graphics

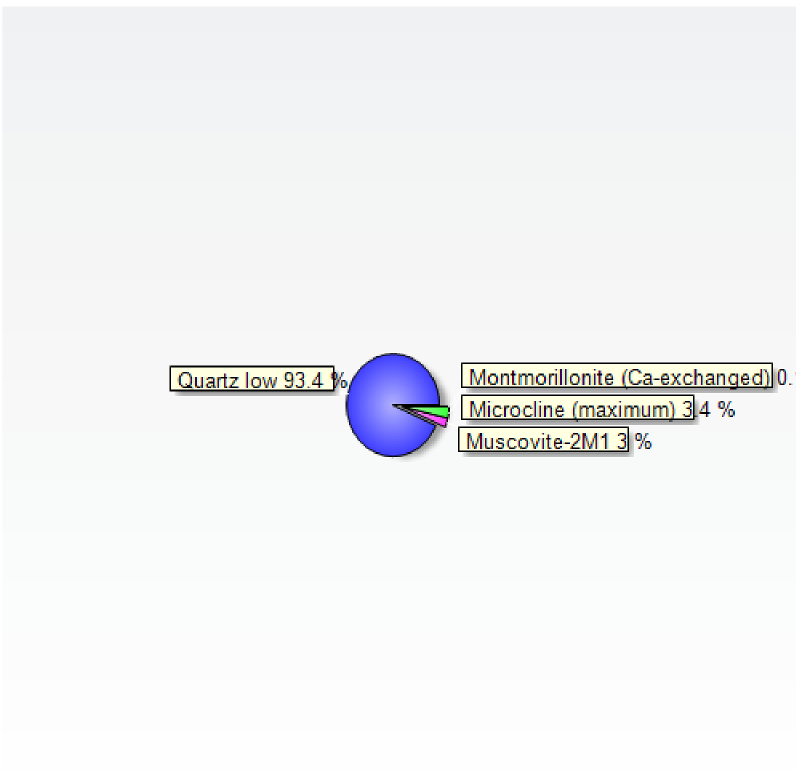


Peak List

Pos.[°2Th.]	d-spacing [Å]	Rel. Int. [%]	Matched by
5.48(4)	16.10859	0.66	98-005-1636
8.902(8)	9.92532	0.75	96-900-4643
12.373(9)	7.14772	0.32	
15.34(4)	5.77118	0.19	98-001-6597;98..
17.79(1)	4.98082	0.20	96-900-4643;98..
19.85(1)	4.46852	0.29	96-900-4643;98..
20.8428(7)	4.25846	14.38	98-008-3849;96..
23.10(1)	3.84799	0.22	96-900-4643;98..
23.959(9)	3.71117	0.34	96-900-4643;98..
26.6153(2)	3.34651	100.00	98-008-3849;96..
27.452(4)	3.24643	1.28	98-001-6597
29.52(2)	3.02362	0.29	98-001-6597;98..
30.145(5)	2.96225	0.58	96-900-4643;98..

34.98(1)	2.56279	0.30	96-900-4643;98..
36.517(1)	2.45862	5.81	98-008-3849;96..
39.447(1)	2.28249	5.85	98-008-3849;98..
40.262(2)	2.23816	2.96	98-008-3849;96..
41.75(1)	2.16197	0.21	96-900-4643;98..
42.434(1)	2.12847	4.73	98-008-3849;96..
44.575(9)	2.03107	0.37	96-900-4643;98..
45.759(2)	1.98125	3.10	98-008-3849;96..
50.1150(6)	1.81877	15.85	98-008-3849;96..
54.854(1)	1.67231	4.87	98-008-3849;96..
55.295(2)	1.66001	1.76	98-008-3849;96..
57.24(1)	1.60813	0.27	98-008-3849;96..
59.935(1)	1.54211	7.19	98-008-3849;96..
61.69(3)	1.50230	0.13	96-900-4643;98..
64.012(2)	1.45337	1.58	98-008-3849;96..

Quantitative Results



Phase Quartz low:	Weight fraction/ %:	93
Phase Muscovite-2M1:	Weight fraction/ %:	3
Phase Microcline (maximum):	Weight fraction/ %:	3
Phase Montmorillonite (Ca-exchanged):	Weight fraction/ %:	0.1

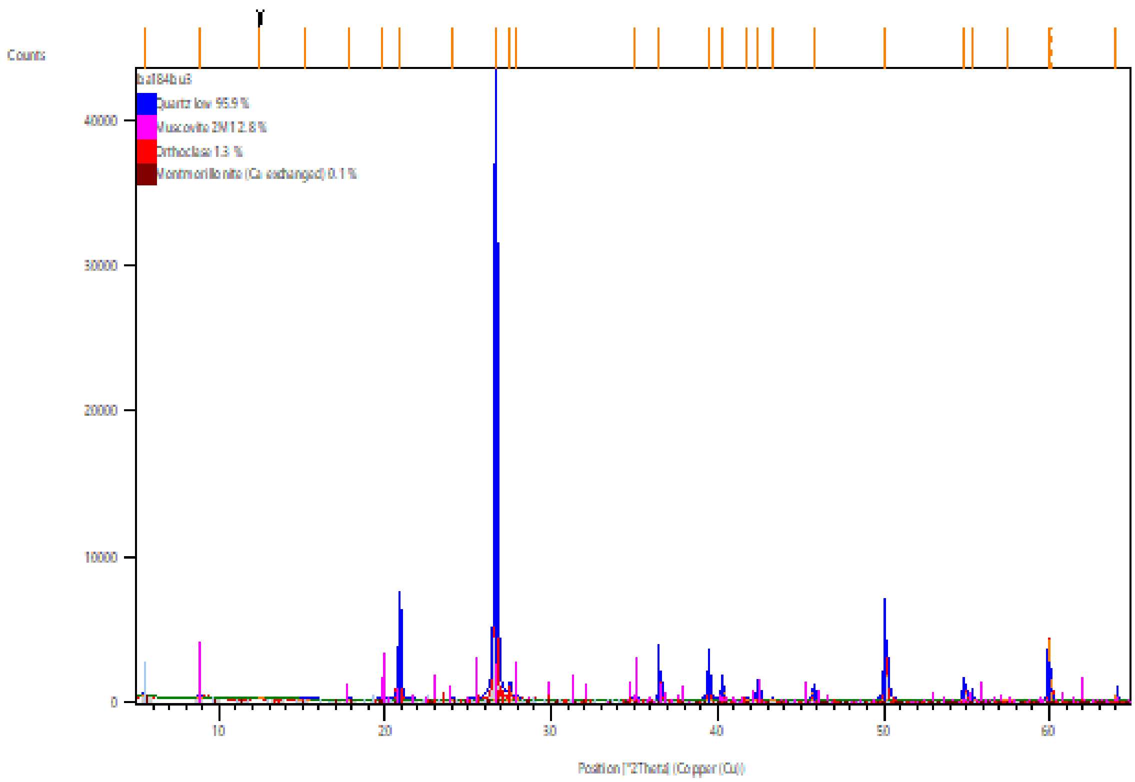
Anchor Scan Parameters

Dataset Name:	ba144au2
File name:	C:\Users\Rick\Documents\RCIA_Win10\AnchorQEA\AnchorQEA-2021July26\ba144au2.rd
Sample Identification:	BA14-4A-Unit2_38-40
Comment:	Exported by X'Pert SW Generated by hugo in project AnchorQEA-2
Measurement Date / Time:	8/4/2021 10:36:00 AM
Raw Data Origin:	PHILIPS-binary (scan) (.RD)
Scan Axis:	Gonio
Start Position [°2Th.]:	5.0200
End Position [°2Th.]:	64.9400
Step Size [°2Th.]:	0.0400
Scan Step Time [s]:	4.5000
Scan Type:	Continuous
Offset [°2Th.]:	0.0000
Divergence Slit Type:	Fixed
Divergence Slit Size [°]:	0.5000
Specimen Length [mm]:	10.00
Receiving Slit Size [mm]:	0.1000
Measurement Temperature [°C]:	0.00
Anode Material:	Cu
K-Alpha1 [Å]:	1.54060
K-Alpha2 [Å]:	1.54443
K-Beta [Å]:	1.39225
K-A2 / K-A1 Ratio:	0.50000
Generator Settings:	30 mA, 40 kV
Diffractometer Type:	XPert MPD
Diffractometer Number:	1
Goniometer Radius [mm]:	200.00
Dist. Focus-Diverg. Slit [mm]:	91.00
Incident Beam Monochromator:	No
Spinning:	No

Pattern List

Ref.Code	Score	Compound Name	Chem. Formula
98-010-0341	80	Quartz low	O2 Si1
98-008-2479	17	Muscovite 2M1	H1.744 Al2.905 F0...
98-003-4783	17	Orthoclase	Al0.97 Ba0.005 Ca0..
98-005-1636	15	Montmorillonite (C..	H8.2 Al4 Ca1.2 O27..

Graphics

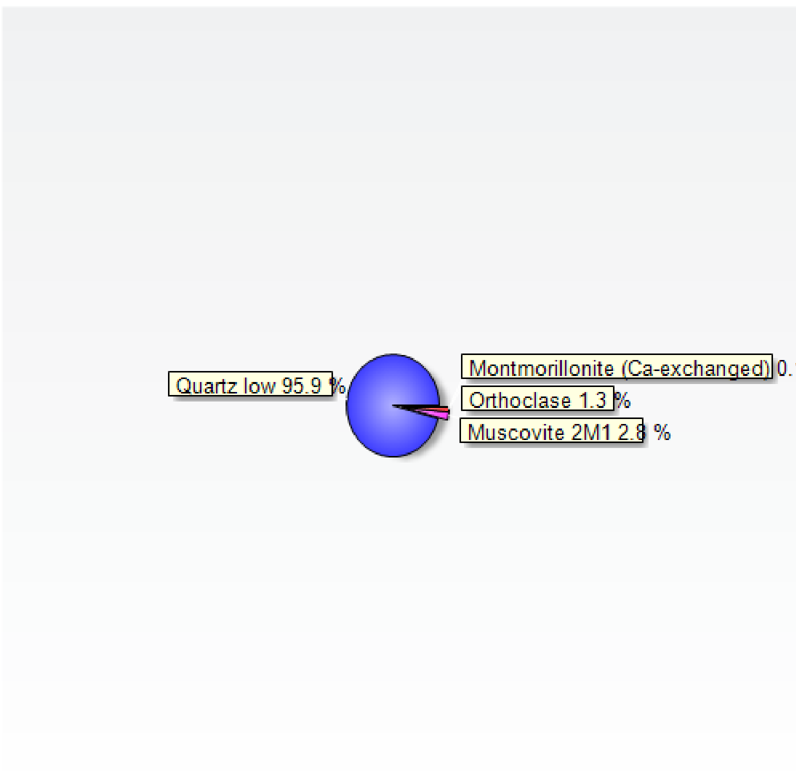


Peak List

Pos.[°2Th.]	d-spacing [Å]	Rel. Int. [%]	Matched by
5.5290	15.98423	0.34	98-005-1636
8.8245	10.02098	0.78	98-008-2479
12.4558	7.10649	0.16	
15.1405	5.85188	0.12	98-003-4783;98..
17.7949	4.98450	0.10	98-008-2479;98..
19.8261	4.47819	0.30	98-008-2479;98..
20.8742	4.25565	15.66	98-010-0341;98..
24.0125	3.70610	0.24	98-008-2479;98..
26.6538	3.34453	100.00	98-010-0341;98..
27.4991	3.24361	2.41	98-003-4783
27.9450	3.19286	0.61	98-008-2479
35.0394	2.56097	0.31	98-008-2479;98..
36.5324	2.45966	5.01	98-010-0341;98..

39.4634	2.28347	5.02	98-010-0341;98..
40.2946	2.23827	2.46	98-010-0341;98..
41.7732	2.16240	0.47	98-003-4783;98..
42.4474	2.12960	3.80	98-010-0341;98..
43.2991	2.08967	0.19	98-008-2479;98..
45.7861	1.98178	2.59	98-010-0341;98..
50.1238	1.81998	10.04	98-010-0341;98..
54.8540	1.67370	2.99	98-010-0341;98..
55.3018	1.66121	1.30	98-010-0341;98..
57.4259	1.60471	0.14	98-010-0341;98..
59.9333	1.54215	12.23	98-010-0341;98..
64.0093	1.45343	1.14	98-010-0341;98..

Quantitative Results



Phase Quartz low:	Weight fraction/ %:	96
Phase Muscovite 2M1:	Weight fraction/ %:	2.8
Phase Orthoclase:	Weight fraction/ %:	1.3
Phase Montmorillonite (Ca-exchanged):	Weight fraction/ %:	0.08

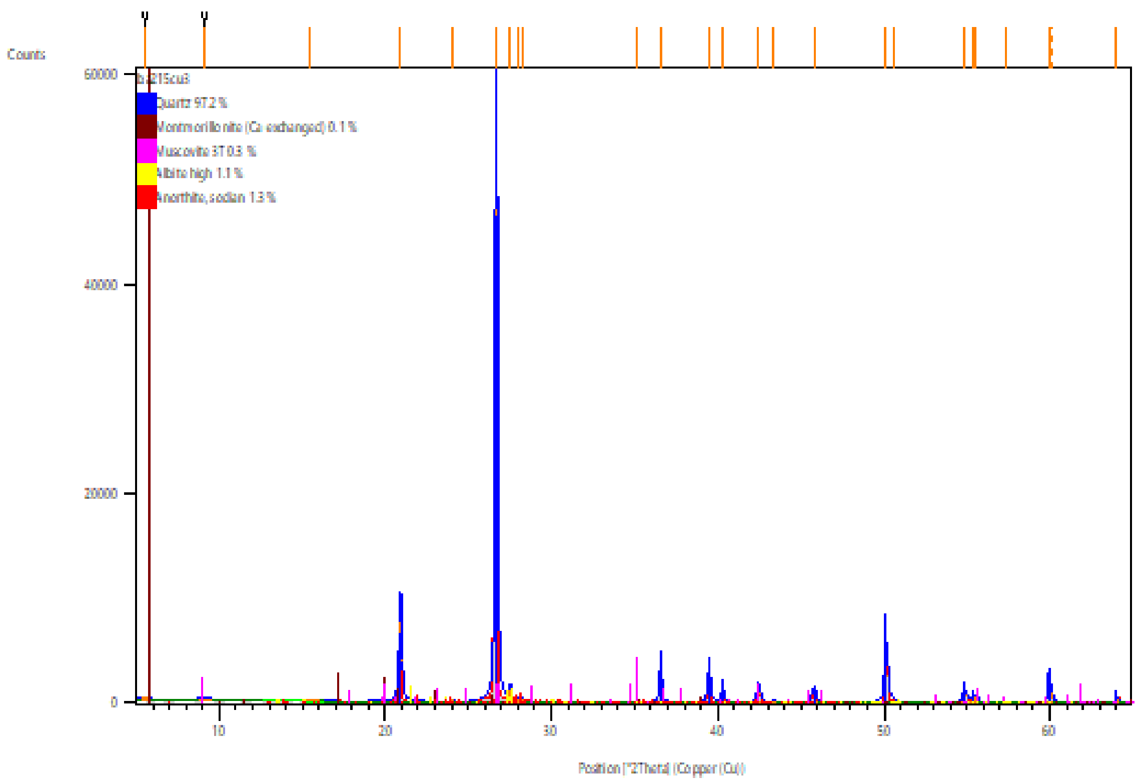
Anchor Scan Parameters

Dataset Name:	ba184bu3
File name:	C:\Users\Rick\Documents\RCIA_Win10\AnchorQEA\AnchorQEA-2021July26\ba184bu3.rd
Sample Identification:	BA18-4B-Unit3_46-48
Comment:	Exported by X'Pert SW
	Generated by hugo in project AnchorQEA-2
Measurement Date / Time:	8/3/2021 10:00:00 AM
Raw Data Origin:	PHILIPS-binary (scan) (.RD)
Scan Axis:	Gonio
Start Position [°2Th.]:	5.0200
End Position [°2Th.]:	64.9400
Step Size [°2Th.]:	0.0400
Scan Step Time [s]:	4.5000
Scan Type:	Continuous
Offset [°2Th.]:	0.0000
Divergence Slit Type:	Fixed
Divergence Slit Size [°]:	0.5000
Specimen Length [mm]:	10.00
Receiving Slit Size [mm]:	0.1000
Measurement Temperature [°C]:	0.00
Anode Material:	Cu
K-Alpha1 [Å]:	1.54060
K-Alpha2 [Å]:	1.54443
K-Beta [Å]:	1.39225
K-A2 / K-A1 Ratio:	0.50000
Generator Settings:	30 mA, 40 kV
Diffractometer Type:	XPert MPD
Diffractometer Number:	1
Goniometer Radius [mm]:	200.00
Dist. Focus-Diverg. Slit [mm]:	91.00
Incident Beam Monochromator:	No
Spinning:	No

Pattern List

Ref.Code	Score	Compound Name	Chem. Formula
98-015-4289	73	Quartz	O2 Si1
98-005-1636	4	Montmorillonite (C..	H8.2 Al4 Ca1.2 O27..
98-000-9650	9	Muscovite 3T	H2 Al3 K1 O12 Si3
98-010-0504	14	Albite high	Al1 Na1 O8 Si3
98-003-0124	11	Anorthite, sodian	Al1.52 Ca0.52 Na0...

Graphics

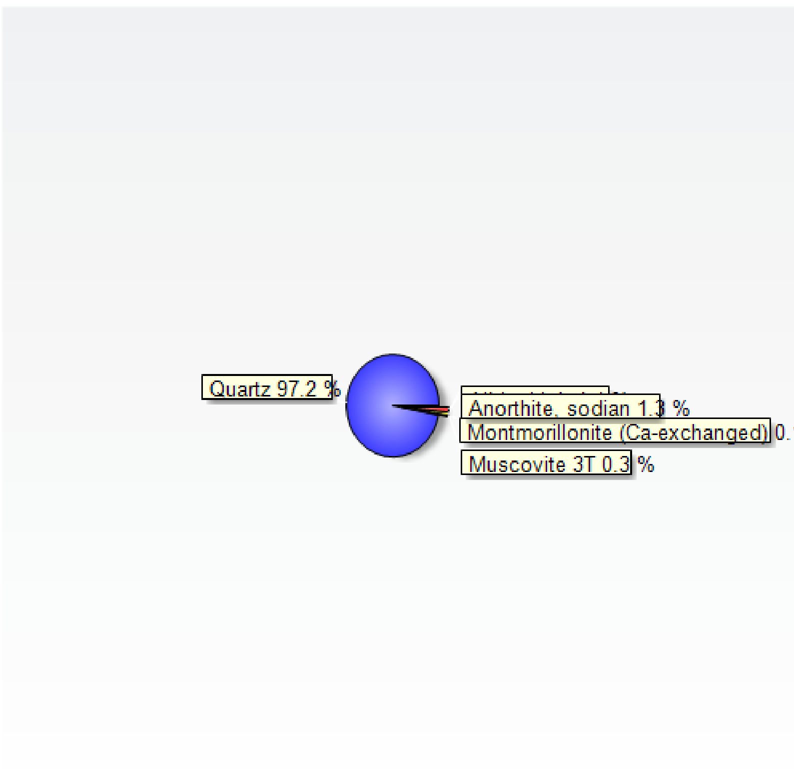


Peak List

Pos.[°2Th.]	d-spacing [Å]	Rel. Int. [%]	Matched by
5.5638	15.88450	0.23	
9.1328	9.68336	0.30	
15.5047	5.71522	0.14	98-003-0124
20.9017	4.25011	16.25	98-015-4289;98..
24.0265	3.70397	0.25	98-010-0504;98..
26.6654	3.34310	100.00	98-015-4289;98..
27.4958	3.24400	2.33	98-010-0504;98..
27.9613	3.19104	0.50	98-003-0124
28.2419	3.15997	0.44	98-003-0124
35.1707	2.55171	0.16	98-005-1636;98..
36.5434	2.45894	5.51	98-015-4289;98..
39.4613	2.28359	5.12	98-015-4289;98..

40.2768	2.23922	2.42	98-015-4289;98..
42.4442	2.12975	3.14	98-015-4289;98..
43.3940	2.08532	0.14	98-005-1636;98..
45.7793	1.98206	2.51	98-015-4289;98..
50.1134	1.82033	10.41	98-015-4289;98..
50.5839	1.80450	0.43	98-015-4289;98..
54.8404	1.67408	2.37	98-015-4289;98..
55.3017	1.65983	1.21	98-015-4289;98..
55.5467	1.65446	1.09	98-015-4289;98..
57.4145	1.60500	0.12	98-015-4289;98..
59.9390	1.54202	6.13	98-015-4289;98..
63.9962	1.45369	1.06	98-015-4289;98..

Quantitative Results



Phase Quartz:	Weight fraction/ %:	97
Phase Montmorillonite (Ca-exchanged):	Weight fraction/ %:	0.05
Phase Muscovite 3T:	Weight fraction/ %:	0.3
Phase Albite high:	Weight fraction/ %:	1.1
Phase Anorthite, sodian:	Weight fraction/ %:	1.3

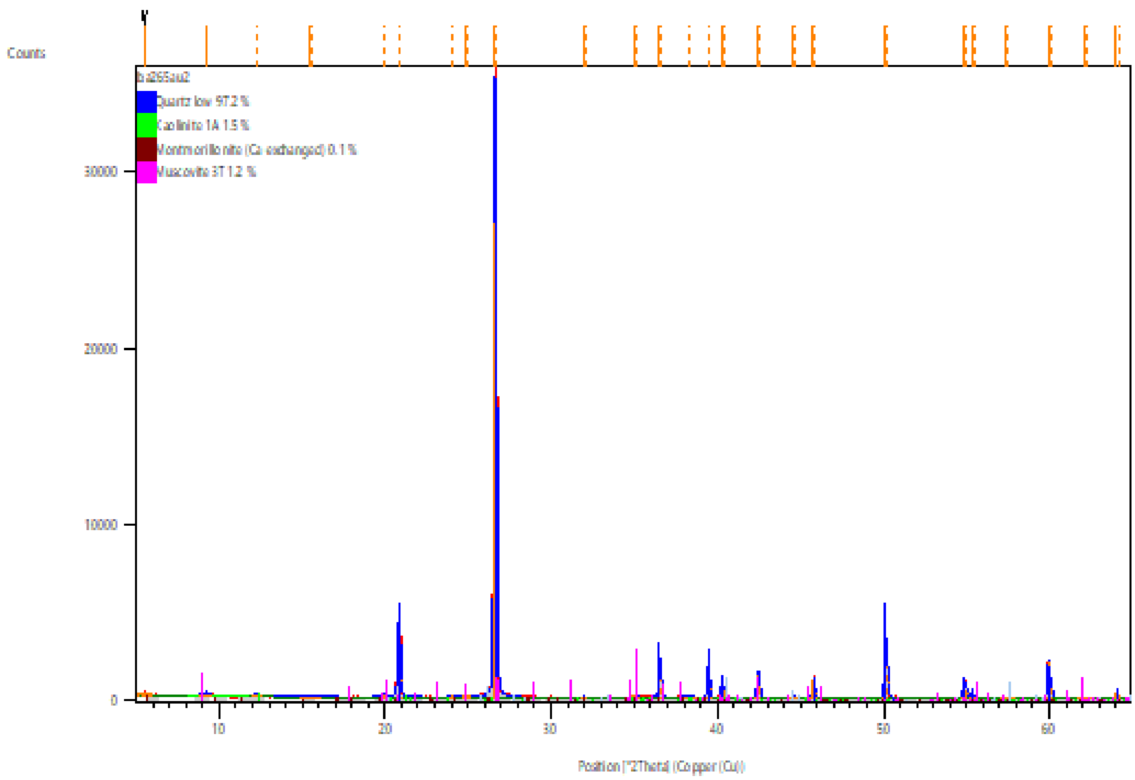
Anchor Scan Parameters

Dataset Name:	ba215cu3
File name:	C:\Users\Rick\Documents\RCIA_Win10\AnchorQEA\AnchorQEA-2021July26\ba215cu3.rd
Sample Identification:	BA21-5C-Unit3_65-70
Comment:	Exported by X'Pert SW
	Generated by hugo in project AnchorQEA-2
Measurement Date / Time:	8/5/2021 9:56:00 AM
Raw Data Origin:	PHILIPS-binary (scan) (.RD)
Scan Axis:	Gonio
Start Position [°2Th.]:	5.0200
End Position [°2Th.]:	64.9400
Step Size [°2Th.]:	0.0400
Scan Step Time [s]:	4.5000
Scan Type:	Continuous
Offset [°2Th.]:	0.0000
Divergence Slit Type:	Fixed
Divergence Slit Size [°]:	0.5000
Specimen Length [mm]:	10.00
Receiving Slit Size [mm]:	0.1000
Measurement Temperature [°C]:	0.00
Anode Material:	Cu
K-Alpha1 [Å]:	1.54060
K-Alpha2 [Å]:	1.54443
K-Beta [Å]:	1.39225
K-A2 / K-A1 Ratio:	0.50000
Generator Settings:	30 mA, 40 kV
Diffractometer Type:	XPert MPD
Diffractometer Number:	1
Goniometer Radius [mm]:	200.00
Dist. Focus-Diverg. Slit [mm]:	91.00
Incident Beam Monochromator:	No
Spinning:	No

Pattern List

Ref.Code	Score	Compound Name	Chem. Formula
98-008-3849	64	Quartz low	O2 Si1
98-006-8697	28	Kaolinite 1A	H4 Al2 O9 Si2
98-005-1636	16	Montmorillonite (C..	H8.2 Al4 Ca1.2 O27..
98-000-9650	18	Muscovite 3T	H2 Al3 K1 O12 Si3

Graphics

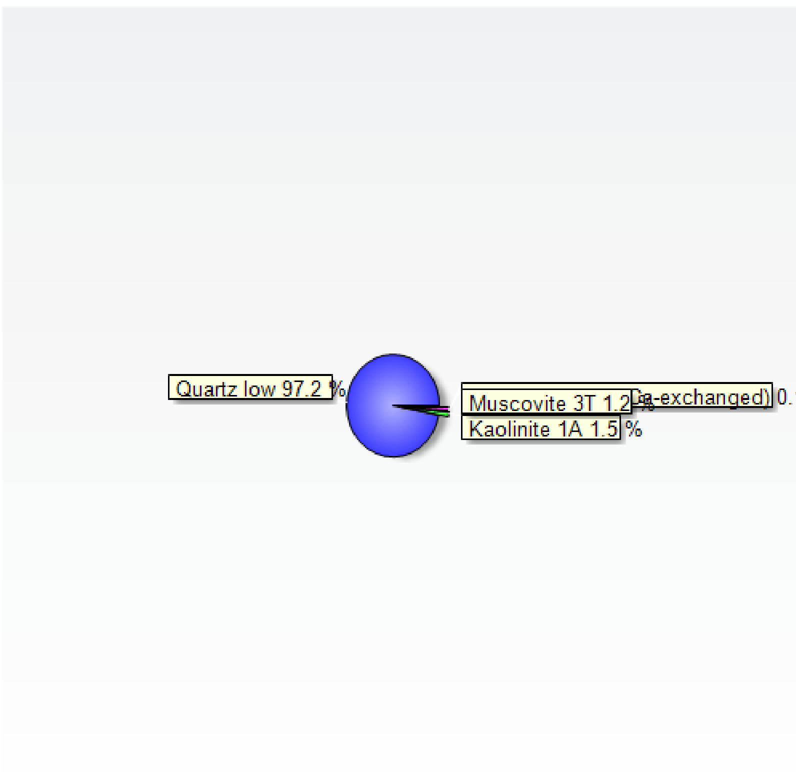


Peak List

Pos.[°2Th.]	d-spacing [Å]	Rel. Int. [%]	Matched by
5.51(3)	16.01692	0.41	
9.18(3)	9.62873	0.62	98-000-9650
12.24(1)	7.22752	0.44	98-006-8697
15.50(5)	5.71261	0.13	98-005-1636
19.93(1)	4.45099	0.41	98-006-8697;98..
20.8334(7)	4.26037	14.19	98-008-3849;98..
23.994(9)	3.70584	0.30	98-006-8697
24.87(1)	3.57775	0.36	98-006-8697;98..
26.6196(2)	3.34598	100.00	98-008-3849;98..
31.98(2)	2.79663	0.17	98-005-1636
35.02(1)	2.56045	0.32	98-006-8697;98..
36.520(1)	2.45841	7.34	98-008-3849;98..
38.25(2)	2.35096	0.21	98-006-8697;98..

39.435(1)	2.28314	6.30	98-008-3849;98..
40.270(2)	2.23773	3.11	98-008-3849;98..
42.436(1)	2.12837	5.05	98-008-3849;98..
44.554(9)	2.03198	0.36	98-005-1636;98..
45.773(1)	1.98067	4.25	98-008-3849;98..
50.1123(7)	1.81886	13.24	98-008-3849;98..
54.845(1)	1.67256	4.09	98-008-3849;98..
55.310(4)	1.65959	1.16	98-008-3849;98..
57.30(4)	1.60653	0.11	98-008-3849;98..
59.9348(9)	1.54212	7.88	98-008-3849;98..
62.04(4)	1.49470	0.12	98-006-8697;98..
64.006(3)	1.45348	1.23	98-008-3849;98..

Quantitative Results



Phase Quartz low:	Weight fraction/ %:	97
Phase Kaolinite 1A:	Weight fraction/ %:	1.5
Phase Montmorillonite (Ca-exchanged):	Weight fraction/ %:	0.1
Phase Muscovite 3T:	Weight fraction/ %:	1

Anchor Scan Parameters

Dataset Name:	ba265au2
File name:	C:\Users\Rick\Documents\RCIA_Win10\AnchorQEA\AnchorQEA-2021July26\ba265au2.rd
Sample Identification:	BA26-5a-Unit2_47-49
Comment:	Exported by X'Pert SW Generated by hugo in project Maynard.
Measurement Date / Time:	8/3/2021 12:02:00 PM
Raw Data Origin:	PHILIPS-binary (scan) (.RD)
Scan Axis:	Gonio
Start Position [°2Th.]:	5.0200
End Position [°2Th.]:	64.9400
Step Size [°2Th.]:	0.0400
Scan Step Time [s]:	4.5000
Scan Type:	Continuous
Offset [°2Th.]:	0.0000
Divergence Slit Type:	Fixed
Divergence Slit Size [°]:	0.5000
Specimen Length [mm]:	10.00
Receiving Slit Size [mm]:	0.1000
Measurement Temperature [°C]:	0.00
Anode Material:	Cu
K-Alpha1 [Å]:	1.54060
K-Alpha2 [Å]:	1.54443
K-Beta [Å]:	1.39225
K-A2 / K-A1 Ratio:	0.50000
Generator Settings:	30 mA, 40 kV
Diffractometer Type:	XPert MPD
Diffractometer Number:	1
Goniometer Radius [mm]:	200.00
Dist. Focus-Diverg. Slit [mm]:	91.00
Incident Beam Monochromator:	No
Spinning:	No

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Sunday, September 12, 2021

Anthony Dalton-Atha
Anchor QEA, LLC
6720 SW Macadam Ave. Suite 125
Portland, OR 97219

RE: A1G0828 - Alabama Power-Barry - 201114-01.02

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A1G0828, which was received by the laboratory on 7/29/2021 at 9:55:00AM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: dthomas@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample receipt, unless prior arrangements have been made.

Cooler Receipt Information

(See Cooler Receipt Form for details)

Cooler #1	2.6 degC

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.
All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darwin Thomas, Business Development Director

APEX LABORATORIES

ANALYTICAL REPORT

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.02**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1G0828 - 09 12 21 0516**

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BA-AP-CEC-1-20210728	A1G0828-01	Water	07/28/21 14:25	07/29/21 09:55
BA-AP-CEC-2-20210728	A1G0828-02	Water	07/28/21 14:30	07/29/21 09:55
BA-AP-CEC-3-20210728	A1G0828-03	Water	07/28/21 14:35	07/29/21 09:55
BA-AP-CEC-4-20210728	A1G0828-04	Water	07/28/21 14:40	07/29/21 09:55
BA-AP-CEC-5-20210728	A1G0828-05	Water	07/28/21 14:45	07/29/21 09:55
BA-AP-CEC-6-20210728	A1G0828-06	Water	07/28/21 14:50	07/29/21 09:55
BA-AP-CEC-7-20210728	A1G0828-07	Water	07/28/21 14:55	07/29/21 09:55
BA-AP-CEC-8-20210728	A1G0828-08	Water	07/28/21 15:00	07/29/21 09:55
BA-AP-CEC-9-20210728	A1G0828-09	Water	07/28/21 15:05	07/29/21 09:55
BA-AP-CEC-10-20210728	A1G0828-10	Water	07/28/21 15:10	07/29/21 09:55
BA-AP-CEC-11-20210728	A1G0828-11	Water	07/28/21 15:15	07/29/21 09:55
BA-AP-CEC-MB-20210728	A1G0828-12	Water	07/28/21 15:20	07/29/21 09:55

APEX LABORATORIES

ANALYTICAL REPORT

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

Anchor QEA, LLC	Project:	**Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number:	**201114-01.02**	**Report ID:**
Portland, OR 97219	Project Manager:	**Anthony Dalton-Atha**	**A1G0828 - 09 12 21 0516**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BA-AP-CEC-1-20210728 (A1G0828-01)				**Matrix: Water**				
Batch: 1070986								
Aluminum	ND	125	250	ug/L	5	07/30/21 23:43	EPA 6020B	R-04
Arsenic	**3.43**	2.50	5.00	ug/L	5	07/30/21 23:43	EPA 6020B	**J, R-04**
Calcium	**90200**	1500	3000	ug/L	5	07/30/21 23:43	EPA 6020B	
Cobalt	**21.5**	2.50	5.00	ug/L	5	07/30/21 23:43	EPA 6020B	
Magnesium	**22700**	375	750	ug/L	5	07/30/21 23:43	EPA 6020B	
Potassium	**12100**	250	500	ug/L	5	07/30/21 23:43	EPA 6020B	
Sodium	**6080**	250	500	ug/L	5	07/30/21 23:43	EPA 6020B	
BA-AP-CEC-2-20210728 (A1G0828-02)				**Matrix: Water**				
Batch: 1070986								
Aluminum	ND	125	250	ug/L	5	07/30/21 23:48	EPA 6020B	R-04
Arsenic	**3.92**	2.50	5.00	ug/L	5	07/30/21 23:48	EPA 6020B	**J, R-04**
Calcium	**19600**	1500	3000	ug/L	5	07/30/21 23:48	EPA 6020B	
Cobalt	**207**	2.50	5.00	ug/L	5	07/30/21 23:48	EPA 6020B	
Magnesium	**3080**	375	750	ug/L	5	07/30/21 23:48	EPA 6020B	
Potassium	**2200**	250	500	ug/L	5	07/30/21 23:48	EPA 6020B	
Sodium	**2620**	250	500	ug/L	5	07/30/21 23:48	EPA 6020B	
BA-AP-CEC-3-20210728 (A1G0828-03)				**Matrix: Water**				
Batch: 1070986								
Aluminum	ND	125	250	ug/L	5	07/30/21 23:52	EPA 6020B	R-04
Arsenic	ND	2.50	5.00	ug/L	5	07/30/21 23:52	EPA 6020B	R-04
Calcium	**94900**	1500	3000	ug/L	5	07/30/21 23:52	EPA 6020B	
Cobalt	**17.2**	2.50	5.00	ug/L	5	07/30/21 23:52	EPA 6020B	
Magnesium	**7430**	375	750	ug/L	5	07/30/21 23:52	EPA 6020B	
Potassium	**5700**	250	500	ug/L	5	07/30/21 23:52	EPA 6020B	
Sodium	**2280**	250	500	ug/L	5	07/30/21 23:52	EPA 6020B	
BA-AP-CEC-4-20210728 (A1G0828-04)				**Matrix: Water**				
Batch: 1070986								
Aluminum	ND	125	250	ug/L	5	07/30/21 23:57	EPA 6020B	R-04
Arsenic	ND	2.50	5.00	ug/L	5	07/30/21 23:57	EPA 6020B	R-04
Calcium	**185000**	1500	3000	ug/L	5	07/30/21 23:57	EPA 6020B	

Apex Laboratories

Darwin Thomas, Business Development Director

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APEX LABORATORIES

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

Anchor QEA, LLC
6720 SW Macadam Ave. Suite 125
Portland, OR 97219

Project: Alabama Power-Barry
Project Number: 201114-01.02
Project Manager: Anthony Dalton-Atha

Report ID:
A1G0828 - 09 12 21 0516

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BA-AP-CEC-4-20210728 (A1G0828-04)				Matrix: Water				
Cobalt	**87.1**	2.50	5.00	ug/L	5	07/30/21 23:57	EPA 6020B	
Magnesium	**16500**	375	750	ug/L	5	07/30/21 23:57	EPA 6020B	
Potassium	**10100**	250	500	ug/L	5	07/30/21 23:57	EPA 6020B	
Sodium	**3860**	250	500	ug/L	5	07/30/21 23:57	EPA 6020B	
BA-AP-CEC-5-20210728 (A1G0828-05)				Matrix: Water				
Batch: 1070986								
Aluminum	ND	125	250	ug/L	5	07/31/21 00:02	EPA 6020B	R-04
Arsenic	ND	2.50	5.00	ug/L	5	07/31/21 00:02	EPA 6020B	R-04
Calcium	**32300**	1500	3000	ug/L	5	07/31/21 00:02	EPA 6020B	
Cobalt	**51.7**	2.50	5.00	ug/L	5	07/31/21 00:02	EPA 6020B	
Magnesium	**8320**	375	750	ug/L	5	07/31/21 00:02	EPA 6020B	
Potassium	**5750**	250	500	ug/L	5	07/31/21 00:02	EPA 6020B	
Sodium	**3000**	250	500	ug/L	5	07/31/21 00:02	EPA 6020B	
BA-AP-CEC-6-20210728 (A1G0828-06)				Matrix: Water				
Batch: 1070986								
Aluminum	ND	125	250	ug/L	5	07/31/21 00:07	EPA 6020B	R-04
Arsenic	**2.88**	2.50	5.00	ug/L	5	07/31/21 00:07	EPA 6020B	**J, R-04**
Calcium	**139000**	1500	3000	ug/L	5	07/31/21 00:07	EPA 6020B	
Cobalt	**193**	2.50	5.00	ug/L	5	07/31/21 00:07	EPA 6020B	
Magnesium	**33100**	375	750	ug/L	5	07/31/21 00:07	EPA 6020B	
Potassium	**11200**	250	500	ug/L	5	07/31/21 00:07	EPA 6020B	
Sodium	**5490**	250	500	ug/L	5	07/31/21 00:07	EPA 6020B	
BA-AP-CEC-7-20210728 (A1G0828-07)				Matrix: Water				
Batch: 1070986								
Aluminum	ND	125	250	ug/L	5	07/31/21 00:12	EPA 6020B	R-04
Arsenic	**4.89**	2.50	5.00	ug/L	5	07/31/21 00:12	EPA 6020B	**J, R-04**
Calcium	**40900**	1500	3000	ug/L	5	07/31/21 00:12	EPA 6020B	
Cobalt	**32.2**	2.50	5.00	ug/L	5	07/31/21 00:12	EPA 6020B	
Magnesium	**20400**	375	750	ug/L	5	07/31/21 00:12	EPA 6020B	
Potassium	**9830**	250	500	ug/L	5	07/31/21 00:12	EPA 6020B	
Sodium	**4420**	250	500	ug/L	5	07/31/21 00:12	EPA 6020B	

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Darwin Thomas, Business Development Director

APEX LABORATORIES

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: 201114-01.02	**Report ID:**
Portland, OR 97219	Project Manager: Anthony Dalton-Atha	A1G0828 - 09 12 21 0516

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BA-AP-CEC-8-20210728 (A1G0828-08RE1)				**Matrix: Water**				
Batch: 1070986								
Aluminum	ND	250	500	ug/L	10	08/02/21 17:23	EPA 6020B	R-04
Arsenic	ND	5.00	10.0	ug/L	10	08/02/21 17:23	EPA 6020B	R-04
Calcium	**38400**	3000	6000	ug/L	10	08/02/21 17:23	EPA 6020B	
Cobalt	**18.7**	5.00	10.0	ug/L	10	08/02/21 17:23	EPA 6020B	
Magnesium	**14500**	750	1500	ug/L	10	08/02/21 17:23	EPA 6020B	
Potassium	**7510**	500	1000	ug/L	10	08/02/21 17:23	EPA 6020B	
Sodium	**4750**	500	1000	ug/L	10	08/02/21 17:23	EPA 6020B	
BA-AP-CEC-9-20210728 (A1G0828-09)				**Matrix: Water**				
Batch: 1070986								
Aluminum	ND	125	250	ug/L	5	07/31/21 00:22	EPA 6020B	R-04
Calcium	**26100**	1500	3000	ug/L	5	07/31/21 00:22	EPA 6020B	
Magnesium	**11800**	375	750	ug/L	5	07/31/21 00:22	EPA 6020B	
Potassium	**5570**	250	500	ug/L	5	07/31/21 00:22	EPA 6020B	
Sodium	**3690**	250	500	ug/L	5	07/31/21 00:22	EPA 6020B	
BA-AP-CEC-9-20210728 (A1G0828-09RE1)				**Matrix: Water**				
Batch: 1070986								
Arsenic	ND	5.00	10.0	ug/L	10	08/02/21 17:28	EPA 6020B	R-04
Cobalt	ND	5.00	10.0	ug/L	10	08/02/21 17:28	EPA 6020B	R-04
BA-AP-CEC-10-20210728 (A1G0828-10)				**Matrix: Water**				
Batch: 1070986								
Aluminum	ND	125	250	ug/L	5	07/31/21 00:36	EPA 6020B	R-04
Calcium	**2500**	1500	3000	ug/L	5	07/31/21 00:36	EPA 6020B	**J, R-04**
Magnesium	**1340**	375	750	ug/L	5	07/31/21 00:36	EPA 6020B	
Potassium	**1000**	250	500	ug/L	5	07/31/21 00:36	EPA 6020B	
Sodium	**3070**	250	500	ug/L	5	07/31/21 00:36	EPA 6020B	
BA-AP-CEC-10-20210728 (A1G0828-10RE1)				**Matrix: Water**				
Batch: 1070986								
Arsenic	ND	5.00	10.0	ug/L	10	08/02/21 17:33	EPA 6020B	R-04
Cobalt	**22.0**	5.00	10.0	ug/L	10	08/02/21 17:33	EPA 6020B	

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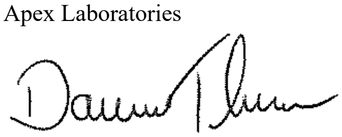

Darwin Thomas, Business Development Director

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APEX LABORATORIES

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.02**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1G0828 - 09 12 21 0516**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BA-AP-CEC-11-20210728 (A1G0828-11RE1)				**Matrix: Water**				
Batch: 1070986								
Aluminum	ND	250	500	ug/L	10	08/02/21 17:38	EPA 6020B	R-04
Arsenic	ND	5.00	10.0	ug/L	10	08/02/21 17:38	EPA 6020B	R-04
Calcium	ND	3000	6000	ug/L	10	08/02/21 17:38	EPA 6020B	R-04
Cobalt	**22.0**	5.00	10.0	ug/L	10	08/02/21 17:38	EPA 6020B	
Magnesium	**1520**	750	1500	ug/L	10	08/02/21 17:38	EPA 6020B	
Potassium	**1160**	500	1000	ug/L	10	08/02/21 17:38	EPA 6020B	
Sodium	**2830**	500	1000	ug/L	10	08/02/21 17:38	EPA 6020B	
BA-AP-CEC-MB-20210728 (A1G0828-12)				**Matrix: Water**				
Batch: 1070986								
Aluminum	ND	125	250	ug/L	5	07/31/21 00:46	EPA 6020B	R-04
Calcium	ND	1500	3000	ug/L	5	07/31/21 00:46	EPA 6020B	R-04
Magnesium	ND	375	750	ug/L	5	07/31/21 00:46	EPA 6020B	R-04
Potassium	ND	250	500	ug/L	5	07/31/21 00:46	EPA 6020B	R-04
Sodium	ND	250	500	ug/L	5	07/31/21 00:46	EPA 6020B	R-04
BA-AP-CEC-MB-20210728 (A1G0828-12RE1)				**Matrix: Water**				
Batch: 1070986								
Arsenic	ND	5.00	10.0	ug/L	10	08/02/21 17:52	EPA 6020B	R-04
Cobalt	ND	5.00	10.0	ug/L	10	08/02/21 17:52	EPA 6020B	R-04

Apex Laboratories

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Darwin Thomas, Business Development Director

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Anchor QEA, LLC 6720 SW Macadam Ave. Suite 125 Portland, OR 97219	Project: Alabama Power-Barry Project Number: 201114-01.02 Project Manager: Anthony Dalton-Atha	Report ID: A1G0828 - 09 12 21 0516

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1070986 - EPA 3015A							Water					
Blank (1070986-BLK1)			Prepared: 07/30/21 09:23		Analyzed: 07/30/21 22:59							
EPA 6020B												
Aluminum	ND	25.0	50.0	ug/L	1	---	---	---	---	---	---	
Arsenic	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Calcium	ND	300	600	ug/L	1	---	---	---	---	---	---	
Cobalt	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Magnesium	ND	75.0	150	ug/L	1	---	---	---	---	---	---	
Potassium	ND	50.0	100	ug/L	1	---	---	---	---	---	---	
Sodium	ND	50.0	100	ug/L	1	---	---	---	---	---	---	
LCS (1070986-BS1)			Prepared: 07/30/21 09:23		Analyzed: 07/30/21 23:04							
EPA 6020B												
Aluminum	2660	25.0	50.0	ug/L	1	2780	---	96	80-120%	---	---	
Arsenic	52.6	0.500	1.00	ug/L	1	55.6	---	95	80-120%	---	---	
Calcium	2710	300	600	ug/L	1	2780	---	98	80-120%	---	---	
Cobalt	52.7	0.500	1.00	ug/L	1	55.6	---	95	80-120%	---	---	
Magnesium	2720	75.0	150	ug/L	1	2780	---	98	80-120%	---	---	
Potassium	2690	50.0	100	ug/L	1	2780	---	97	80-120%	---	---	
Sodium	2660	50.0	100	ug/L	1	2780	---	96	80-120%	---	---	
Duplicate (1070986-DUP1)			Prepared: 07/30/21 09:23		Analyzed: 07/30/21 23:13							
QC Source Sample: Non-SDG (A1G0840-02)												
Aluminum	**45.5**	25.0	50.0	ug/L	1	---	48.6	---	---	6	20%	J
Arsenic	ND	0.500	1.00	ug/L	1	---	ND	---	---	---	20%	
Calcium	**13600**	300	600	ug/L	1	---	13200	---	---	3	20%	
Cobalt	ND	0.500	1.00	ug/L	1	---	ND	---	---	---	20%	
Magnesium	**5120**	75.0	150	ug/L	1	---	5020	---	---	2	20%	
Potassium	**3690**	50.0	100	ug/L	1	---	3590	---	---	3	20%	
Sodium	**6750**	50.0	100	ug/L	1	---	6620	---	---	2	20%	
Matrix Spike (1070986-MS1)			Prepared: 07/30/21 09:23		Analyzed: 07/30/21 23:18							
QC Source Sample: Non-SDG (A1G0840-02)												
EPA 6020B												
Aluminum	2720	25.0	50.0	ug/L	1	2780	48.6	96	75-125%	---	---	

Apex Laboratories

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503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.02**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1G0828 - 09 12 21 0516**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1070986 - EPA 3015A							**Water**					
Matrix Spike (1070986-MS1)			Prepared: 07/30/21 09:23			Analyzed: 07/30/21 23:18						
QC Source Sample: Non-SDG (A1G0840-02)												
Arsenic	53.0	0.500	1.00	ug/L	1	55.6	ND	95	75-125%	---	---	
Calcium	16200	300	600	ug/L	1	2780	13200	108	75-125%	---	---	
Cobalt	52.0	0.500	1.00	ug/L	1	55.6	ND	94	75-125%	---	---	
Magnesium	7840	75.0	150	ug/L	1	2780	5020	102	75-125%	---	---	
Potassium	6380	50.0	100	ug/L	1	2780	3590	100	75-125%	---	---	
Sodium	9390	50.0	100	ug/L	1	2780	6620	100	75-125%	---	---	

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503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.02**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1G0828 - 09 12 21 0516**

SAMPLE PREPARATION INFORMATION

Total Metals by EPA 6020B (ICPMS)

Prep: EPA 3015A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 1070986							
A1G0828-01	Water	EPA 6020B	07/28/21 14:25	07/30/21 09:23	45mL/50mL	45mL/50mL	1.00
A1G0828-02	Water	EPA 6020B	07/28/21 14:30	07/30/21 09:23	45mL/50mL	45mL/50mL	1.00
A1G0828-03	Water	EPA 6020B	07/28/21 14:35	07/30/21 09:23	45mL/50mL	45mL/50mL	1.00
A1G0828-04	Water	EPA 6020B	07/28/21 14:40	07/30/21 09:23	45mL/50mL	45mL/50mL	1.00
A1G0828-05	Water	EPA 6020B	07/28/21 14:45	07/30/21 09:23	45mL/50mL	45mL/50mL	1.00
A1G0828-06	Water	EPA 6020B	07/28/21 14:50	07/30/21 09:23	45mL/50mL	45mL/50mL	1.00
A1G0828-07	Water	EPA 6020B	07/28/21 14:55	07/30/21 09:23	45mL/50mL	45mL/50mL	1.00
A1G0828-08RE1	Water	EPA 6020B	07/28/21 15:00	07/30/21 09:23	45mL/50mL	45mL/50mL	1.00
A1G0828-09	Water	EPA 6020B	07/28/21 15:05	07/30/21 09:23	45mL/50mL	45mL/50mL	1.00
A1G0828-09RE1	Water	EPA 6020B	07/28/21 15:05	07/30/21 09:23	45mL/50mL	45mL/50mL	1.00
A1G0828-10	Water	EPA 6020B	07/28/21 15:10	07/30/21 09:23	45mL/50mL	45mL/50mL	1.00
A1G0828-10RE1	Water	EPA 6020B	07/28/21 15:10	07/30/21 09:23	45mL/50mL	45mL/50mL	1.00
A1G0828-11RE1	Water	EPA 6020B	07/28/21 15:15	07/30/21 09:23	45mL/50mL	45mL/50mL	1.00
A1G0828-12	Water	EPA 6020B	07/28/21 15:20	07/30/21 09:23	45mL/50mL	45mL/50mL	1.00
A1G0828-12RE1	Water	EPA 6020B	07/28/21 15:20	07/30/21 09:23	45mL/50mL	45mL/50mL	1.00

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6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.02**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1G0828 - 09 12 21 0516**

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

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J	Estimated Result. Result detected below the lowest point of the calibration curve, but above the specified MDL.
R-04	Reporting levels elevated due to preparation and/or analytical dilution necessary for analysis.

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REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.

ND Analyte NOT DETECTED at or above the detection or reporting limit.

NR Result Not Reported

RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as " dry", " wet", or " " (blank) designation.

" dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.

" wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) may not be included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).
-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.

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REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

‘B’ and ‘B-02’ qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

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LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation) -
EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation
All reported analytes are included in Apex Laboratories' current ORELAP scope.					

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.
Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provded by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

APEX LABORATORIES

Apex Laboratories, LLC
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ORELAP ID: **OR100062**

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.02**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1G0828 - 09 12 21 0516**

A1G0828

Chain of Custody Record & Laboratory Analysis Request

ANCHOR QEA

Company: Anchor QEA
Date: 7/28/2021
Project Name: Alabama Power - Barry
Project Number: 201114-01.01
Project Manager: Anthony Dalton-Atha adalton-atha@anchorqea.com
Phone Number: 201114-01.02
Shipment Method: Pick-up
Samplers: Paloma Spina

Line	Field Sample ID	Collection Date/Time		Matrix	No. of Containers	As, Co, Ca, Mg, K, Na, Al	Comments/Preservation
1	BA-AP-CEC-1-20210728	7/28/2021	14:25	Water	1	x	1 Molar (M) ammonium acetate, pH 7
2	BA-AP-CEC-2-20210728	7/28/2021	14:30	Water	1	x	1 Molar (M) ammonium acetate, pH 7
3	BA-AP-CEC-3-20210728	7/28/2021	14:35	Water	1	x	1 Molar (M) ammonium acetate, pH 7
4	BA-AP-CEC-4-20210728	7/28/2021	14:40	Water	1	x	1 Molar (M) ammonium acetate, pH 7
5	BA-AP-CEC-5-20210728	7/28/2021	14:45	Water	1	x	1 Molar (M) ammonium acetate, pH 7
6	BA-AP-CEC-6-20210728	7/28/2021	14:50	Water	1	x	1 Molar (M) ammonium acetate, pH 7
7	BA-AP-CEC-7-20210728	7/28/2021	14:55	Water	1	x	1 Molar (M) ammonium acetate, pH 7
8	BA-AP-CEC-8-20210728	7/28/2021	15:00	Water	1	x	1 Molar (M) ammonium acetate, pH 7
9	BA-AP-CEC-9-20210728	7/28/2021	15:05	Water	1	x	1 Molar (M) ammonium acetate, pH 7
10	BA-AP-CEC-10-20210728	7/28/2021	15:10	Water	1	x	1 Molar (M) ammonium acetate, pH 7
11	BA-AP-CEC-11-20210728	7/28/2021	15:15	Water	1	x	1 Molar (M) ammonium acetate, pH 7
12	BA-AP-CEC-MB-20210728	7/28/2021	15:20	Water	1	x	1 Molar (M) ammonium acetate, pH 7
13							
14							
15							
16							

Test Parameters

Comments: samples are filtered but not preserved.

Relinquished By: Anthony Dalton Atha Company: AQEA	Received By: Eli Company: APEX LABS
Signature/Printed Name Date/Time 7/29/2021 0955	Signature/Printed Name EW Date/Time 7/29/21 955
Relinquished By: Company:	Received By: Company:
Signature/Printed Name Date/Time	Signature/Printed Name Date/Time

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6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.02**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1G0828 - 09 12 21 0516**

APEX LABS COOLER RECEIPT FORM

Client: Anchor QEA Element WO#: A1 G0828

Project/Project #: Alabama Power - Barry 201114-01.01

Delivery Info:

Date/time received: 7/29/21 @ 955 By: EJ

Delivered by: Apex X Client___ ESS___ FedEx___ UPS___ Swift___ Senvoy___ SDS___ Other___

Cooler Inspection Date/time inspected: 7/29/21 @ 1030 By: EJ

Chain of Custody included? Yes X No ___ Custody seals? Yes___ No X

Signed/dated by client? Yes X No ___

Signed/dated by Apex? Yes X No ___

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	2.6						
Received on ice? (Y/N)	Y						
Temp. blanks? (Y/N)	N						
Ice type: (Gel/Real/Other)	Real						
Condition:	Good						

Cooler out of temp? (Y/N) Possible reason why: ___

Green dots applied to out of temperature samples? Yes/No

Out of temperature samples form initiated? Yes/No

Sample Inspection: Date/time inspected: 7/29/21 @ 1600 By: SD

All samples intact? Yes X No ___ Comments: ___

Bottle labels/COCs agree? Yes X No ___ Comments: ___

COC/container discrepancies form initiated? Yes ___ No X

Containers/volumes received appropriate for analysis? Yes X No ___ Comments: limited volume

Do VOA vials have visible headspace? Yes ___ No ___ NA X

Comments ___

Water samples: pH checked: Yes___No___NA X pH appropriate? Yes___No___NA X

Comments: ___

Additional information: ___

Labeled by: SD Witness: JS Cooler Inspected by: SD

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Darwin Thomas, Business Development Director

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ORELAP ID: **OR100062**

ANALYTICAL REPORT

Sunday, September 12, 2021

Anthony Dalton-Atha
Anchor QEA, LLC
6720 SW Macadam Ave. Suite 125
Portland, OR 97219

RE: A1H0072 - Alabama Power-Barry - 201114-01.01

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A1H0072, which was received by the laboratory on 8/3/2021 at 12:35:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: dthomas@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample receipt, unless prior arrangements have been made.

Cooler Receipt Information

(See Cooler Receipt Form for details)

Cooler #1 2.4 degC

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.
All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.

Apex Laboratories

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Darwin Thomas, Business Development Director

Apex Laboratories, LLC

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ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: 201114-01.01	**Report ID:**
Portland, OR 97219	Project Manager: Anthony Dalton-Atha	A1H0072 - 09 12 21 0559

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BA-AP-AAO-1-20210731	A1H0072-01	Water	07/31/21 13:00	08/03/21 12:35
BA-AP-AAO-2-20210731	A1H0072-02	Water	07/31/21 13:05	08/03/21 12:35
BA-AP-AAO-3-20210731	A1H0072-03	Water	07/31/21 13:10	08/03/21 12:35
BA-AP-AAO-4-20210731	A1H0072-04	Water	07/31/21 13:15	08/03/21 12:35
BA-AP-AAO-5-20210731	A1H0072-05	Water	07/31/21 13:20	08/03/21 12:35
BA-AP-AAO-6-20210731	A1H0072-06	Water	07/31/21 13:25	08/03/21 12:35
BA-AP-AAO-7-20210731	A1H0072-07	Water	07/31/21 13:30	08/03/21 12:35
BA-AP-AAO-8-20210731	A1H0072-08	Water	07/31/21 13:35	08/03/21 12:35
BA-AP-AAO-9-20210731	A1H0072-09	Water	07/31/21 13:40	08/03/21 12:35
BA-AP-AAO-10-20210731	A1H0072-10	Water	07/31/21 13:45	08/03/21 12:35
BA-AP-AAO-11-20210731	A1H0072-11	Water	07/31/21 13:50	08/03/21 12:35
BA-AP-AAO-MB-20210731	A1H0072-12	Water	07/31/21 13:55	08/03/21 12:35

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ANALYTICAL REPORT

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6720 SW Macadam Ave. Suite 125	Project Number: 201114-01.01	**Report ID:**
Portland, OR 97219	Project Manager: Anthony Dalton-Atha	A1H0072 - 09 12 21 0559

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BA-AP-AAO-1-20210731 (A1H0072-01)				Matrix: Water				
Batch: 1080089								
Aluminum	**3650**	125	250	ug/L	5	08/07/21 02:22	EPA 6020B	
Arsenic	**7.43**	2.50	5.00	ug/L	5	08/07/21 02:22	EPA 6020B	A-01, Q-41
Cobalt	**5.03**	2.50	5.00	ug/L	5	08/07/21 02:22	EPA 6020B	A-01
Iron	**13700**	125	250	ug/L	5	08/07/21 02:22	EPA 6020B	
Manganese	**50.3**	2.50	5.00	ug/L	5	08/07/21 02:22	EPA 6020B	A-01, Q-41
BA-AP-AAO-2-20210731 (A1H0072-02)				Matrix: Water				
Batch: 1080089								
Aluminum	**314**	125	250	ug/L	5	08/07/21 02:27	EPA 6020B	
Arsenic	**7.02**	2.50	5.00	ug/L	5	08/07/21 02:27	EPA 6020B	A-01, Q-41
Cobalt	**19.7**	2.50	5.00	ug/L	5	08/07/21 02:27	EPA 6020B	A-01
Iron	**2610**	125	250	ug/L	5	08/07/21 02:27	EPA 6020B	
Manganese	**34.1**	2.50	5.00	ug/L	5	08/07/21 02:27	EPA 6020B	A-01, Q-41
BA-AP-AAO-3-20210731 (A1H0072-03)				Matrix: Water				
Batch: 1080089								
Aluminum	**3310**	125	250	ug/L	5	08/07/21 02:42	EPA 6020B	
Arsenic	**5.43**	2.50	5.00	ug/L	5	08/07/21 02:42	EPA 6020B	
Cobalt	**8.44**	2.50	5.00	ug/L	5	08/07/21 02:42	EPA 6020B	
Iron	**18300**	125	250	ug/L	5	08/07/21 02:42	EPA 6020B	Q-41
Manganese	**402**	2.50	5.00	ug/L	5	08/07/21 02:42	EPA 6020B	
BA-AP-AAO-4-20210731 (A1H0072-04)				Matrix: Water				
Batch: 1080089								
Aluminum	**5870**	125	250	ug/L	5	08/07/21 02:47	EPA 6020B	
Arsenic	**7.12**	2.50	5.00	ug/L	5	08/07/21 02:47	EPA 6020B	
Cobalt	**29.6**	2.50	5.00	ug/L	5	08/07/21 02:47	EPA 6020B	
Iron	**43400**	125	250	ug/L	5	08/07/21 02:47	EPA 6020B	Q-41
Manganese	**488**	2.50	5.00	ug/L	5	08/07/21 02:47	EPA 6020B	
BA-AP-AAO-5-20210731 (A1H0072-05)				Matrix: Water				
Batch: 1080089								
Aluminum	**3340**	125	250	ug/L	5	08/07/21 02:52	EPA 6020B	
Arsenic	**4.13**	2.50	5.00	ug/L	5	08/07/21 02:52	EPA 6020B	J, R-04

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ANALYTICAL REPORT

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6720 SW Macadam Ave. Suite 125	Project Number: 201114-01.01	**Report ID:**
Portland, OR 97219	Project Manager: Anthony Dalton-Atha	A1H0072 - 09 12 21 0559

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BA-AP-AAO-5-20210731 (A1H0072-05)				Matrix: Water				
Cobalt	**11.4**	2.50	5.00	ug/L	5	08/07/21 02:52	EPA 6020B	
Iron	**18900**	125	250	ug/L	5	08/07/21 02:52	EPA 6020B	**Q-41**
Manganese	**303**	2.50	5.00	ug/L	5	08/07/21 02:52	EPA 6020B	
BA-AP-AAO-6-20210731 (A1H0072-06)				Matrix: Water				
Batch: 1080109								
Aluminum	**6570**	150	300	ug/L	5	08/07/21 05:24	EPA 6020B	
Arsenic	**11.5**	3.00	6.00	ug/L	5	08/07/21 05:24	EPA 6020B	
Cobalt	**48.7**	3.00	6.00	ug/L	5	08/07/21 05:24	EPA 6020B	
Iron	**53200**	150	300	ug/L	5	08/07/21 05:24	EPA 6020B	**Q-41**
Manganese	**1340**	3.00	6.00	ug/L	5	08/07/21 05:24	EPA 6020B	
BA-AP-AAO-7-20210731 (A1H0072-07)				Matrix: Water				
Batch: 1080090								
Aluminum	**4980**	150	300	ug/L	5	08/07/21 03:21	EPA 6020B	
Arsenic	**12.6**	3.00	6.00	ug/L	5	08/07/21 03:21	EPA 6020B	
Cobalt	**12.6**	3.00	6.00	ug/L	5	08/07/21 03:21	EPA 6020B	
Iron	**3880**	150	300	ug/L	5	08/07/21 03:21	EPA 6020B	**Q-41**
Manganese	**58.3**	3.00	6.00	ug/L	5	08/07/21 03:21	EPA 6020B	
BA-AP-AAO-8-20210731 (A1H0072-08)				Matrix: Water				
Batch: 1080090								
Aluminum	**3130**	150	300	ug/L	5	08/07/21 03:26	EPA 6020B	
Arsenic	**4.30**	3.00	6.00	ug/L	5	08/07/21 03:26	EPA 6020B	**J, R-04**
Cobalt	**6.69**	3.00	6.00	ug/L	5	08/07/21 03:26	EPA 6020B	
Iron	**12500**	150	300	ug/L	5	08/07/21 03:26	EPA 6020B	**Q-41**
Manganese	**139**	3.00	6.00	ug/L	5	08/07/21 03:26	EPA 6020B	
BA-AP-AAO-9-20210731 (A1H0072-09)				Matrix: Water				
Batch: 1080090								
Aluminum	**3790**	150	300	ug/L	5	08/07/21 03:41	EPA 6020B	
Arsenic	**5.62**	3.00	6.00	ug/L	5	08/07/21 03:41	EPA 6020B	**J, R-04**
Cobalt	ND	3.00	6.00	ug/L	5	08/07/21 03:41	EPA 6020B	R-04
Iron	**18400**	150	300	ug/L	5	08/07/21 03:41	EPA 6020B	**Q-41**

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Darwin Thomas, Business Development Director

APEX LABORATORIES

ANALYTICAL REPORT

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0072 - 09 12 21 0559**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BA-AP-AAO-9-20210731 (A1H0072-09)				**Matrix: Water**				
Manganese	**107**	3.00	6.00	ug/L	5	08/07/21 03:41	EPA 6020B	
BA-AP-AAO-10-20210731 (A1H0072-10)				**Matrix: Water**				
Batch: 1080090								
Aluminum	**238**	150	300	ug/L	5	08/07/21 03:46	EPA 6020B	**J, R-04**
Arsenic	ND	3.00	6.00	ug/L	5	08/07/21 03:46	EPA 6020B	R-04
Cobalt	ND	3.00	6.00	ug/L	5	08/07/21 03:46	EPA 6020B	R-04
Iron	**1170**	150	300	ug/L	5	08/07/21 03:46	EPA 6020B	**Q-41**
Manganese	**19.6**	3.00	6.00	ug/L	5	08/07/21 03:46	EPA 6020B	
BA-AP-AAO-11-20210731 (A1H0072-11)				**Matrix: Water**				
Batch: 1080090								
Aluminum	**236**	150	300	ug/L	5	08/07/21 03:51	EPA 6020B	**J, R-04**
Arsenic	ND	3.00	6.00	ug/L	5	08/07/21 03:51	EPA 6020B	R-04
Cobalt	ND	3.00	6.00	ug/L	5	08/07/21 03:51	EPA 6020B	R-04
Iron	**1270**	150	300	ug/L	5	08/07/21 03:51	EPA 6020B	**Q-41**
Manganese	**19.2**	3.00	6.00	ug/L	5	08/07/21 03:51	EPA 6020B	
BA-AP-AAO-MB-20210731 (A1H0072-12)				**Matrix: Water**				
Batch: 1080090								
Aluminum	ND	150	300	ug/L	5	08/07/21 03:56	EPA 6020B	R-04
Arsenic	ND	3.00	6.00	ug/L	5	08/07/21 03:56	EPA 6020B	R-04
Cobalt	ND	3.00	6.00	ug/L	5	08/07/21 03:56	EPA 6020B	R-04
Iron	**154**	150	300	ug/L	5	08/07/21 03:56	EPA 6020B	**J, Q-41, R-04**
Manganese	**3.39**	3.00	6.00	ug/L	5	08/07/21 03:56	EPA 6020B	**J, R-04**

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6720 SW Macadam Ave. Suite 125	Project Number: 201114-01.01	Report ID:
Portland, OR 97219	Project Manager: Anthony Dalton-Atha	A1H0072 - 09 12 21 0559

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1080089 - EPA 3015A							Water					
Blank (1080089-BLK1)			Prepared: 08/04/21 08:49	Analyzed: 08/06/21 23:50								
EPA 6020B												
Aluminum	**25.7**	25.0	50.0	ug/L	1	---	---	---	---	---	---	J
Iron	ND	25.0	50.0	ug/L	1	---	---	---	---	---	---	
Blank (1080089-BLK2)			Prepared: 08/04/21 08:49	Analyzed: 08/07/21 00:10								
EPA 6020B												
Arsenic	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	Q-16
Cobalt	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	Q-16
Manganese	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	Q-16
LCS (1080089-BS1)			Prepared: 08/04/21 08:49	Analyzed: 08/07/21 00:15								
EPA 6020B												
Aluminum	2870	25.0	50.0	ug/L	1	2780	---	103	80-120%	---	---	
Arsenic	56.0	0.500	1.00	ug/L	1	55.6	---	101	80-120%	---	---	
Cobalt	57.6	0.500	1.00	ug/L	1	55.6	---	104	80-120%	---	---	
Iron	2910	25.0	50.0	ug/L	1	2780	---	105	80-120%	---	---	
Manganese	57.8	0.500	1.00	ug/L	1	55.6	---	104	80-120%	---	---	
LCS Dup (1080089-BSD1)			Prepared: 08/04/21 08:49	Analyzed: 08/06/21 23:55								
EPA 6020B												
Aluminum	2750	25.0	50.0	ug/L	1	2780	---	99	80-120%	4	20%	
Arsenic	55.2	0.500	1.00	ug/L	1	55.6	---	99	80-120%	1	20%	
Cobalt	56.0	0.500	1.00	ug/L	1	55.6	---	101	80-120%	3	20%	
Iron	2860	25.0	50.0	ug/L	1	2780	---	103	80-120%	2	20%	
Manganese	55.6	0.500	1.00	ug/L	1	55.6	---	100	80-120%	4	20%	
Duplicate (1080089-DUP1)			Prepared: 08/04/21 08:49	Analyzed: 08/07/21 00:44								
QC Source Sample: Non-SDG (A1H0027-01)												
Aluminum	**35100**	25.0	50.0	ug/L	1	---	26600	---	---	**28**	**20%**	Q-04
Arsenic	**10.1**	0.500	1.00	ug/L	1	---	8.37	---	---	19	20%	Q-41
Cobalt	**25.2**	0.500	1.00	ug/L	1	---	21.9	---	---	14	20%	A-01
Iron	**34800**	25.0	50.0	ug/L	1	---	28600	---	---	20	20%	Q-42
Manganese	**789**	0.500	1.00	ug/L	1	---	738	---	---	7	20%	A-01, Q-41

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Darwin Thomas, Business Development Director

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503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0072 - 09 12 21 0559**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1080089 - EPA 3015A							**Water**					
Matrix Spike (1080089-MS1)			Prepared: 08/04/21 08:49		Analyzed: 08/07/21 00:49							
QC Source Sample: Non-SDG (A1H0027-01)												
EPA 6020B												
Aluminum	40400	25.0	50.0	ug/L	1	2780	26600	**497**	**75-125%**	---	---	Q-04
Arsenic	60.0	0.500	1.00	ug/L	1	55.6	8.37	93	75-125%	---	---	Q-41
Cobalt	78.8	0.500	1.00	ug/L	1	55.6	21.9	103	75-125%	---	---	A-01
Iron	38900	25.0	50.0	ug/L	1	2780	28600	**371**	**75-125%**	---	---	Q-03
Manganese	807	0.500	1.00	ug/L	1	55.6	738	125	75-125%	---	---	A-01, Q-41

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Portland, OR 97219	Project Manager: Anthony Dalton-Atha	A1H0072 - 09 12 21 0559

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1080090 - EPA 3015A							**Water**					
Blank (1080090-BLK1)			Prepared: 08/04/21 08:58 Analyzed: 08/07/21 02:57									
EPA 6020B												
Aluminum	ND	25.0	50.0	ug/L	1	---	---	---	---	---	---	
Arsenic	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Cobalt	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Iron	ND	25.0	50.0	ug/L	1	---	---	---	---	---	---	
Blank (1080090-BLK2)			Prepared: 08/04/21 08:58 Analyzed: 08/09/21 21:12									
EPA 6020B												
Manganese	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	Q-16
LCS (1080090-BS1)			Prepared: 08/04/21 08:58 Analyzed: 08/07/21 03:11									
EPA 6020B												
Aluminum	3050	25.0	50.0	ug/L	1	2780	---	110	80-120%	---	---	
Arsenic	56.3	0.500	1.00	ug/L	1	55.6	---	101	80-120%	---	---	
Cobalt	57.7	0.500	1.00	ug/L	1	55.6	---	104	80-120%	---	---	
Iron	2950	25.0	50.0	ug/L	1	2780	---	106	80-120%	---	---	Q-41
Manganese	59.2	0.500	1.00	ug/L	1	55.6	---	106	80-120%	---	---	
LCS Dup (1080090-BSD1)			Prepared: 08/04/21 08:58 Analyzed: 08/07/21 03:02									
EPA 6020B												
Aluminum	2860	25.0	50.0	ug/L	1	2780	---	103	80-120%	6	20%	
Arsenic	55.3	0.500	1.00	ug/L	1	55.6	---	100	80-120%	2	20%	
Cobalt	56.7	0.500	1.00	ug/L	1	55.6	---	102	80-120%	2	20%	
Iron	3210	25.0	50.0	ug/L	1	2780	---	116	80-120%	9	20%	Q-41
Manganese	58.7	0.500	1.00	ug/L	1	55.6	---	106	80-120%	0.8	20%	

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ORELAP ID: **OR100062**

ANALYTICAL REPORT

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6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0072 - 09 12 21 0559**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1080109 - EPA 3015A							**Water**					
Blank (1080109-BLK1)			Prepared: 08/04/21 13:07	Analyzed: 08/07/21 05:14								
EPA 6020B												
Aluminum	ND	25.0	50.0	ug/L	1	---	---	---	---	---	---	
Arsenic	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Cobalt	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Iron	ND	25.0	50.0	ug/L	1	---	---	---	---	---	---	Q-41
Blank (1080109-BLK2)			Prepared: 08/04/21 13:07	Analyzed: 08/09/21 21:17								
EPA 6020B												
Manganese	**0.903**	0.500	1.00	ug/L	1	---	---	---	---	---	---	J, B-02, Q-16
LCS (1080109-BS1)			Prepared: 08/04/21 13:07	Analyzed: 08/07/21 05:19								
EPA 6020B												
Aluminum	2840	25.0	50.0	ug/L	1	2780	---	102	80-120%	---	---	
Arsenic	54.9	0.500	1.00	ug/L	1	55.6	---	99	80-120%	---	---	
Cobalt	56.4	0.500	1.00	ug/L	1	55.6	---	101	80-120%	---	---	
Iron	3110	25.0	50.0	ug/L	1	2780	---	112	80-120%	---	---	Q-41
Manganese	57.5	0.500	1.00	ug/L	1	55.6	---	103	80-120%	---	---	
Duplicate (1080109-DUP1)			Prepared: 08/04/21 13:07	Analyzed: 08/07/21 05:54								
QC Source Sample: Non-SDG (A1H0074-03)												
Aluminum	ND	1250	2500	ug/L	50	---	ND	---	---	---	20%	R-04
Arsenic	ND	25.0	50.0	ug/L	50	---	ND	---	---	---	20%	R-04
Cobalt	ND	25.0	50.0	ug/L	50	---	ND	---	---	---	20%	R-04
Iron	ND	1250	2500	ug/L	50	---	ND	---	---	---	20%	R-04
Manganese	**162**	25.0	50.0	ug/L	50	---	173	---	---	7	20%	
Matrix Spike (1080109-MS1)			Prepared: 08/04/21 13:07	Analyzed: 08/07/21 05:59								
QC Source Sample: Non-SDG (A1H0074-03)												
EPA 6020B												
Aluminum	3000	1250	2500	ug/L	50	2780	ND	108	75-125%	---	---	
Arsenic	59.0	25.0	50.0	ug/L	50	55.6	ND	106	75-125%	---	---	
Cobalt	59.9	25.0	50.0	ug/L	50	55.6	ND	108	75-125%	---	---	
Iron	3050	1250	2500	ug/L	50	2780	ND	110	75-125%	---	---	

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Portland, OR 97219	Project Manager:	**Anthony Dalton-Atha**	**A1H0072 - 09 12 21 0559**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1080109 - EPA 3015A							**Water**					
Matrix Spike (1080109-MS1)			Prepared: 08/04/21 13:07	Analyzed: 08/07/21 05:59								
QC Source Sample: Non-SDG (A1H0074-03)												
Manganese	238	25.0	50.0	ug/L	50	55.6	173	116	75-125%	---	---	

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Project Number: **201114-01.01**
Project Manager: **Anthony Dalton-Atha**

Report ID:
A1H0072 - 09 12 21 0559

SAMPLE PREPARATION INFORMATION

Total Metals by EPA 6020B (ICPMS)

Prep: EPA 3015A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 1080089							
A1H0072-01	Water	EPA 6020B	07/31/21 13:00	08/04/21 08:49	45mL/50mL	45mL/50mL	1.00
A1H0072-02	Water	EPA 6020B	07/31/21 13:05	08/04/21 08:49	45mL/50mL	45mL/50mL	1.00
A1H0072-03	Water	EPA 6020B	07/31/21 13:10	08/04/21 08:49	45mL/50mL	45mL/50mL	1.00
A1H0072-04	Water	EPA 6020B	07/31/21 13:15	08/04/21 08:49	45mL/50mL	45mL/50mL	1.00
A1H0072-05	Water	EPA 6020B	07/31/21 13:20	08/04/21 08:49	45mL/50mL	45mL/50mL	1.00
Batch: 1080090							
A1H0072-07	Water	EPA 6020B	07/31/21 13:30	08/04/21 08:58	37.5mL/50mL	45mL/50mL	1.20
A1H0072-08	Water	EPA 6020B	07/31/21 13:35	08/04/21 08:58	37.5mL/50mL	45mL/50mL	1.20
A1H0072-09	Water	EPA 6020B	07/31/21 13:40	08/04/21 08:58	37.5mL/50mL	45mL/50mL	1.20
A1H0072-10	Water	EPA 6020B	07/31/21 13:45	08/04/21 08:58	37.5mL/50mL	45mL/50mL	1.20
A1H0072-11	Water	EPA 6020B	07/31/21 13:50	08/04/21 08:58	37.5mL/50mL	45mL/50mL	1.20
A1H0072-12	Water	EPA 6020B	07/31/21 13:55	08/04/21 08:58	37.5mL/50mL	45mL/50mL	1.20
Batch: 1080109							
A1H0072-06	Water	EPA 6020B	07/31/21 13:25	08/04/21 13:07	37.5mL/50mL	45mL/50mL	1.20

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QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

- **A-01** Results do not meet EPA 6020B and/or Apex SOP criteria. Results reported for research per client request.
- **B-02** Analyte detected in an associated blank at a level between one-half the MRL and the MRL. (See Notes and Conventions below.)
- **J** Estimated Result. Result detected below the lowest point of the calibration curve, but above the specified MDL.
- **Q-03** Spike recovery and/or RPD is outside control limits due to the high concentration of analyte present in the sample.
- **Q-04** Spike recovery and/or RPD is outside control limits due to a non-homogeneous sample matrix.
- **Q-16** Reanalysis of an original Batch QC sample.
- **Q-41** Estimated Results. Recovery of Continuing Calibration Verification sample above upper control limit for this analyte. Results are likely biased high.
- **Q-42** Matrix Spike and/or Duplicate analysis was performed on this sample. % Recovery or RPD for this analyte is outside laboratory control limits. (Refer to the QC Section of Analytical Report.)
- **R-04** Reporting levels elevated due to preparation and/or analytical dilution necessary for analysis.

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ANALYTICAL REPORT

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REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.

ND Analyte NOT DETECTED at or above the detection or reporting limit.

NR Result Not Reported

RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as " dry", " wet", or " " (blank) designation.

" dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.

" wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) may not be included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).
-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.

Apex Laboratories

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Darwin Thomas, Business Development Director

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503-718-2323
ORELAP ID: **OR100062**

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

Apex Laboratories, LLC
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503-718-2323
ORELAP ID: **OR100062**

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0072 - 09 12 21 0559**

LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation) -
EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation
All reported analytes are included in Apex Laboratories' current ORELAP scope.					

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.
Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provded by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: 201114-01.01	**Report ID:**
Portland, OR 97219	Project Manager: Anthony Dalton-Atha	A1H0072 - 09 12 21 0559

A1H0072

Chain of Custody Record & Laboratory Analysis Request

ANCHOR QEA

Company: Anchor QEA
Date: 7/31/2021
Project Name: Alabama Power - Barry
Project Number: 201114-01.01
Project Manager: Anthony Dalton-Atha adalton-atha@anchorqea.com
Phone Number: 201114-01.02
Shipment Method: Pick-up
Samplers: Paloma Spina

Line	Field Sample ID	Collection Date/Time		Matrix	No. of Containers	As, Co, Fe, Al Mn	Comments/Preservation
1	BA-AP-AAO-1-20210731	7/31/2021	13:00	Water	1	x	0.2 M ammonium oxalate in 0.1 M oxalic acid
2	BA-AP-AAO-2-20210731	7/31/2021	13:05	Water	1	x	0.2 M ammonium oxalate in 0.1 M oxalic acid
3	BA-AP-AAO-3-20210731	7/31/2021	13:10	Water	1	x	0.2 M ammonium oxalate in 0.1 M oxalic acid
4	BA-AP-AAO-4-20210731	7/31/2021	13:15	Water	1	x	0.2 M ammonium oxalate in 0.1 M oxalic acid
5	BA-AP-AAO-5-20210731	7/31/2021	13:20	Water	1	x	0.2 M ammonium oxalate in 0.1 M oxalic acid
6	BA-AP-AAO-6-20210731	7/31/2021	13:25	Water	1	x	0.2 M ammonium oxalate in 0.1 M oxalic acid
7	BA-AP-AAO-7-20210731	7/31/2021	13:30	Water	1	x	0.2 M ammonium oxalate in 0.1 M oxalic acid
8	BA-AP-AAO-8-20210731	7/31/2021	13:35	Water	1	x	0.2 M ammonium oxalate in 0.1 M oxalic acid
9	BA-AP-AAO-9-20210731	7/31/2021	13:40	Water	1	x	0.2 M ammonium oxalate in 0.1 M oxalic acid
10	BA-AP-AAO-10-20210731	7/31/2021	13:45	Water	1	x	0.2 M ammonium oxalate in 0.1 M oxalic acid
11	BA-AP-AAO-11-20210731	7/31/2021	13:50	Water	1	x	0.2 M ammonium oxalate in 0.1 M oxalic acid
12	BA-AP-AAO-MB-20210731	7/31/2021	13:55	Water	1	x	0.2 M ammonium oxalate in 0.1 M oxalic acid
13							
14							
15							
16							

Test Parameters

Comments: samples are filtered and preserved with nitric acid.

Relinquished By: Anthony Dalton-Atha	Company: AQEA	Received By: Eli Joyner	Company: Apex Labs
Signature/Printed Name	Date/Time 6/3/2021 0945	Signature/Printed Name	Date/Time 8/3/21 1235
Relinquished By:	Company:	Received By:	Company:
Signature/Printed Name	Date/Time	Signature/Printed Name	Date/Time

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Apex Laboratories, LLC
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ORELAP ID: **OR100062**

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0072 - 09 12 21 0559**

APEX LABS COOLER RECEIPT FORM

Client: Anchor QEA Element WO#: A1 H0072

Project/Project #: Alabama Power - Barry 201114-01.01

Delivery Info:

Date/time received: 8/3/21 @ 1235 By: EJ

Delivered by: Apex X Client ___ ESS ___ FedEx ___ UPS ___ Swift ___ Senvoy ___ SDS ___ Other ___

Cooler Inspection Date/time inspected: 8/3/21 @ 1403 By: EJ

Chain of Custody included? Yes X No ___ Custody seals? Yes X No ___

Signed/dated by client? Yes X No ___

Signed/dated by Apex? Yes X No ___

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	2.4						
Received on ice? (Y/N)	Y						
Temp. blanks? (Y/N)	N						
Ice type: (Gel/Real/Other)	Gel						
Condition:	Good						

Cooler out of temp? (Y/N) Possible reason why: ___
Green dots applied to ~~out of~~ temperature samples? Yes/No
Out of temperature samples form initiated? Yes/No

Sample Inspection: Date/time inspected: 8/3/21 @ 1950 By: MAS

All samples intact? Yes X No ___ Comments: ___

Bottle labels/COCs agree? Yes ___ No X Comments: Times vary on all containers

COC/container discrepancies form initiated? Yes ___ No X

Containers/volumes received appropriate for analysis? Yes X No ___ Comments: ___

Do VOA vials have visible headspace? Yes ___ No ___ NA X

Comments ___

Water samples: pH checked: Yes ~~X~~ No ___ NA X pH appropriate? Yes ~~X~~ No ___ NA X

Comments: MAS 8/3/21 MAS 8/3/21

Additional information: ___

Labeled by: MAS Witness: JAM Cooler Inspected by: TAG

Apex Laboratories, LLC
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ORELAP ID: OR100062

ANALYTICAL REPORT

Sunday, September 12, 2021

Anthony Dalton-Atha
Anchor QEA, LLC
6720 SW Macadam Ave. Suite 125
Portland, OR 97219

RE: A1H0074 - Alabama Power-Barry - 201114-01.01

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A1H0074, which was received by the laboratory on 8/3/2021 at 12:35:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: dthomas@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample receipt, unless prior arrangements have been made.

Cooler Receipt Information

(See Cooler Receipt Form for details)

Cooler #1	0.8 degC	Cooler #2	5.7 degC

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.
All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.

Apex Laboratories

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Darwin Thomas, Business Development Director

Apex Laboratories, LLC
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Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0074 - 09 12 21 0555**

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
AP-SSE-F1-B1	A1H0074-01	Water	07/28/21 10:00	08/03/21 12:35
AP-SSE-F1-B2	A1H0074-02	Water	07/28/21 10:05	08/03/21 12:35
AP-SSE-F1-B3	A1H0074-03	Water	07/28/21 10:10	08/03/21 12:35
AP-SSE-F1-B4	A1H0074-04	Water	07/28/21 10:15	08/03/21 12:35
AP-SSE-F1-B5	A1H0074-05	Water	07/28/21 10:20	08/03/21 12:35
AP-SSE-F1-B6	A1H0074-06	Water	07/28/21 10:25	08/03/21 12:35
AP-SSE-F1-B7	A1H0074-07	Water	07/28/21 10:30	08/03/21 12:35
AP-SSE-F1-B8	A1H0074-08	Water	07/28/21 10:35	08/03/21 12:35
AP-SSE-F1-B9	A1H0074-09	Water	07/28/21 10:40	08/03/21 12:35
AP-SSE-F1-B10	A1H0074-10	Water	07/28/21 10:45	08/03/21 12:35
AP-SSE-F1-B7D	A1H0074-11	Water	07/28/21 10:50	08/03/21 12:35
AP-SSE-F1-MB	A1H0074-12	Water	07/28/21 10:55	08/03/21 12:35
AP-SSE-F2-B1	A1H0074-13	Water	07/29/21 10:00	08/03/21 12:35
AP-SSE-F2-B2	A1H0074-14	Water	07/29/21 10:05	08/03/21 12:35
AP-SSE-F2-B3	A1H0074-15	Water	07/29/21 10:10	08/03/21 12:35
AP-SSE-F2-B4	A1H0074-16	Water	07/29/21 10:15	08/03/21 12:35
AP-SSE-F2-B5	A1H0074-17	Water	07/29/21 10:20	08/03/21 12:35
AP-SSE-F2-B6	A1H0074-18	Water	07/29/21 10:25	08/03/21 12:35
AP-SSE-F2-B7	A1H0074-19	Water	07/29/21 10:30	08/03/21 12:35
AP-SSE-F2-B8	A1H0074-20	Water	07/29/21 10:35	08/03/21 12:35
AP-SSE-F2-B9	A1H0074-21	Water	07/29/21 10:40	08/03/21 12:35
AP-SSE-F2-B10	A1H0074-22	Water	07/29/21 10:45	08/03/21 12:35
AP-SSE-F2-B7D	A1H0074-23	Water	07/29/21 10:50	08/03/21 12:35
AP-SSE-F2-MB	A1H0074-24	Water	07/29/21 10:55	08/03/21 12:35
AP-SSE-F3-B1	A1H0074-25	Water	07/30/21 10:00	08/03/21 12:35
AP-SSE-F3-B2	A1H0074-26	Water	07/30/21 10:05	08/03/21 12:35
AP-SSE-F3-B3	A1H0074-27	Water	07/30/21 10:10	08/03/21 12:35
AP-SSE-F3-B4	A1H0074-28	Water	07/30/21 10:15	08/03/21 12:35
AP-SSE-F3-B5	A1H0074-29	Water	07/30/21 10:20	08/03/21 12:35
AP-SSE-F3-B6	A1H0074-30	Water	07/30/21 10:25	08/03/21 12:35
AP-SSE-F3-B7	A1H0074-31	Water	07/30/21 10:30	08/03/21 12:35
AP-SSE-F3-B8	A1H0074-32	Water	07/30/21 10:35	08/03/21 12:35
AP-SSE-F3-B9	A1H0074-33	Water	07/30/21 10:40	08/03/21 12:35

Apex Laboratories

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Darwin Thomas, Business Development Director

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503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0074 - 09 12 21 0555**

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
AP-SSE-F3-B10	A1H0074-34	Water	07/30/21 10:45	08/03/21 12:35
AP-SSE-F3-B7D	A1H0074-35	Water	07/30/21 10:50	08/03/21 12:35
AP-SSE-F3-MB	A1H0074-36	Water	07/30/21 10:55	08/03/21 12:35
AP-SSE-F4-B1	A1H0074-37	Water	08/02/21 10:00	08/03/21 12:35
AP-SSE-F4-B2	A1H0074-38	Water	08/02/21 10:05	08/03/21 12:35
AP-SSE-F4-B3	A1H0074-39	Water	08/02/21 10:10	08/03/21 12:35
AP-SSE-F4-B4	A1H0074-40	Water	08/02/21 10:15	08/03/21 12:35
AP-SSE-F4-B5	A1H0074-41	Water	08/02/21 10:20	08/03/21 12:35
AP-SSE-F4-B6	A1H0074-42	Water	08/02/21 10:25	08/03/21 12:35
AP-SSE-F4-B7	A1H0074-43	Water	08/02/21 10:30	08/03/21 12:35
AP-SSE-F4-B8	A1H0074-44	Water	08/02/21 10:35	08/03/21 12:35
AP-SSE-F4-B9	A1H0074-45	Water	08/02/21 10:40	08/03/21 12:35
AP-SSE-F4-B10	A1H0074-46	Water	08/02/21 10:45	08/03/21 12:35
AP-SSE-F4-B7D	A1H0074-47	Water	08/02/21 10:50	08/03/21 12:35
AP-SSE-F4-MB	A1H0074-48	Water	08/02/21 10:55	08/03/21 12:35
AP-SSE-F5-B1	A1H0074-49	Solid	08/03/21 08:00	08/03/21 12:35
AP-SSE-F5-B2	A1H0074-50	Solid	08/03/21 08:05	08/03/21 12:35
AP-SSE-F5-B3	A1H0074-51	Solid	08/03/21 08:10	08/03/21 12:35
AP-SSE-F5-B4	A1H0074-52	Solid	08/03/21 08:15	08/03/21 12:35
AP-SSE-F5-B5	A1H0074-53	Solid	08/03/21 08:20	08/03/21 12:35
AP-SSE-F5-B6	A1H0074-54	Solid	08/03/21 08:25	08/03/21 12:35
AP-SSE-F5-B7	A1H0074-55	Solid	08/03/21 08:30	08/03/21 12:35
AP-SSE-F5-B8	A1H0074-56	Solid	08/03/21 08:35	08/03/21 12:35
AP-SSE-F5-B9	A1H0074-57	Solid	08/03/21 08:40	08/03/21 12:35
AP-SSE-F5-B10	A1H0074-58	Solid	08/03/21 08:45	08/03/21 12:35
AP-SSE-F5-B7D	A1H0074-59	Solid	08/03/21 08:50	08/03/21 12:35

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APEX LABORATORIES

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ORELAP ID: **OR100062**

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0074 - 09 12 21 0555**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
AP-SSE-F1-B1 (A1H0074-01)				**Matrix: Water**				
Batch: 1080109								
Arsenic	ND	25.0	50.0	ug/L	50	08/07/21 05:39	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/07/21 05:39	EPA 6020B	R-04
AP-SSE-F1-B2 (A1H0074-02)				**Matrix: Water**				
Batch: 1080109								
Arsenic	ND	25.0	50.0	ug/L	50	08/07/21 05:44	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/07/21 05:44	EPA 6020B	R-04
AP-SSE-F1-B3 (A1H0074-03)				**Matrix: Water**				
Batch: 1080109								
Arsenic	ND	25.0	50.0	ug/L	50	08/07/21 05:49	EPA 6020B	Q-42, R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/07/21 05:49	EPA 6020B	Q-42, R-04
AP-SSE-F1-B4 (A1H0074-04)				**Matrix: Water**				
Batch: 1080109								
Arsenic	ND	25.0	50.0	ug/L	50	08/07/21 06:04	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/07/21 06:04	EPA 6020B	R-04
AP-SSE-F1-B5 (A1H0074-05)				**Matrix: Water**				
Batch: 1080109								
Arsenic	ND	25.0	50.0	ug/L	50	08/07/21 06:08	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/07/21 06:08	EPA 6020B	R-04
AP-SSE-F1-B6 (A1H0074-06)				**Matrix: Water**				
Batch: 1080109								
Arsenic	ND	25.0	50.0	ug/L	50	08/07/21 06:13	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/07/21 06:13	EPA 6020B	R-04
AP-SSE-F1-B7 (A1H0074-07)				**Matrix: Water**				
Batch: 1080109								
Arsenic	ND	25.0	50.0	ug/L	50	08/07/21 06:18	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/07/21 06:18	EPA 6020B	R-04
AP-SSE-F1-B8 (A1H0074-08)				**Matrix: Water**				
Batch: 1080109								

APEX LABORATORIES

Apex Laboratories, LLC
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ORELAP ID: **OR100062**

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0074 - 09 12 21 0555**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
AP-SSE-F1-B8 (A1H0074-08)				**Matrix: Water**				
Arsenic	ND	25.0	50.0	ug/L	50	08/07/21 06:23	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/07/21 06:23	EPA 6020B	R-04
AP-SSE-F1-B9 (A1H0074-09)				**Matrix: Water**				
Batch: 1080109								
Arsenic	ND	25.0	50.0	ug/L	50	08/07/21 06:38	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/07/21 06:38	EPA 6020B	R-04
AP-SSE-F1-B10 (A1H0074-10)				**Matrix: Water**				
Batch: 1080109								
Arsenic	ND	25.0	50.0	ug/L	50	08/07/21 06:43	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/07/21 06:43	EPA 6020B	R-04
AP-SSE-F1-B7D (A1H0074-11)				**Matrix: Water**				
Batch: 1080109								
Arsenic	ND	25.0	50.0	ug/L	50	08/07/21 06:48	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/07/21 06:48	EPA 6020B	R-04
AP-SSE-F1-MB (A1H0074-12)				**Matrix: Water**				
Batch: 1080109								
Arsenic	ND	25.0	50.0	ug/L	50	08/07/21 06:53	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/07/21 06:53	EPA 6020B	R-04
AP-SSE-F2-B1 (A1H0074-13)				**Matrix: Water**				
Batch: 1080109								
Arsenic	ND	25.0	50.0	ug/L	50	08/07/21 06:58	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/07/21 06:58	EPA 6020B	R-04
Iron	ND	1250	2500	ug/L	50	08/07/21 06:58	EPA 6020B	R-04
Manganese	**55.2**	25.0	50.0	ug/L	50	08/07/21 06:58	EPA 6020B	
AP-SSE-F2-B2 (A1H0074-14)				**Matrix: Water**				
Batch: 1080109								
Arsenic	ND	25.0	50.0	ug/L	50	08/07/21 07:02	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/07/21 07:02	EPA 6020B	R-04
Iron	ND	1250	2500	ug/L	50	08/07/21 07:02	EPA 6020B	R-04

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Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

Anchor QEA, LLC 6720 SW Macadam Ave. Suite 125 Portland, OR 97219	Project: Alabama Power-Barry Project Number: 201114-01.01 Project Manager: Anthony Dalton-Atha	Report ID: A1H0074 - 09 12 21 0555

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
AP-SSE-F2-B2 (A1H0074-14)				**Matrix: Water**				
Manganese	**53.7**	25.0	50.0	ug/L	50	08/07/21 07:02	EPA 6020B	
AP-SSE-F2-B3 (A1H0074-15)				**Matrix: Water**				
Batch: 1080109								
Arsenic	ND	25.0	50.0	ug/L	50	08/07/21 07:07	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/07/21 07:07	EPA 6020B	R-04
Iron	ND	1250	2500	ug/L	50	08/07/21 07:07	EPA 6020B	R-04
Manganese	**97.8**	25.0	50.0	ug/L	50	08/07/21 07:07	EPA 6020B	
AP-SSE-F2-B4 (A1H0074-16)				**Matrix: Water**				
Batch: 1080109								
Arsenic	ND	25.0	50.0	ug/L	50	08/07/21 07:10	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/07/21 07:10	EPA 6020B	R-04
Iron	ND	1250	2500	ug/L	50	08/07/21 07:10	EPA 6020B	R-04
Manganese	**89.4**	25.0	50.0	ug/L	50	08/07/21 07:10	EPA 6020B	
AP-SSE-F2-B5 (A1H0074-17)				**Matrix: Water**				
Batch: 1080109								
Arsenic	ND	25.0	50.0	ug/L	50	08/07/21 07:15	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/07/21 07:15	EPA 6020B	R-04
Iron	ND	1250	2500	ug/L	50	08/07/21 07:15	EPA 6020B	R-04
Manganese	**164**	25.0	50.0	ug/L	50	08/07/21 07:15	EPA 6020B	
AP-SSE-F2-B6 (A1H0074-18)				**Matrix: Water**				
Batch: 1080109								
Arsenic	ND	25.0	50.0	ug/L	50	08/07/21 07:20	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/07/21 07:20	EPA 6020B	R-04
Iron	ND	1250	2500	ug/L	50	08/07/21 07:20	EPA 6020B	R-04
Manganese	**133**	25.0	50.0	ug/L	50	08/07/21 07:20	EPA 6020B	
AP-SSE-F2-B7 (A1H0074-19)				**Matrix: Water**				
Batch: 1080114								
Arsenic	ND	25.0	50.0	ug/L	50	08/05/21 22:18	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/05/21 22:18	EPA 6020B	R-04
Iron	ND	1250	2500	ug/L	50	08/05/21 22:18	EPA 6020B	R-04

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ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: 201114-01.01	**Report ID:**
Portland, OR 97219	Project Manager: Anthony Dalton-Atha	A1H0074 - 09 12 21 0555

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
AP-SSE-F2-B7 (A1H0074-19)				Matrix: Water				
Manganese	**162**	25.0	50.0	ug/L	50	08/05/21 22:18	EPA 6020B	
AP-SSE-F2-B8 (A1H0074-20)				Matrix: Water				
Batch: 1080114								
Arsenic	ND	25.0	50.0	ug/L	50	08/05/21 22:23	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/05/21 22:23	EPA 6020B	R-04
Iron	ND	1250	2500	ug/L	50	08/05/21 22:23	EPA 6020B	R-04
Manganese	**38.1**	25.0	50.0	ug/L	50	08/05/21 22:23	EPA 6020B	**J, R-04**
AP-SSE-F2-B9 (A1H0074-21)				Matrix: Water				
Batch: 1080114								
Arsenic	ND	25.0	50.0	ug/L	50	08/05/21 22:28	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/05/21 22:28	EPA 6020B	R-04
Iron	ND	1250	2500	ug/L	50	08/05/21 22:28	EPA 6020B	R-04
Manganese	ND	25.0	50.0	ug/L	50	08/05/21 22:28	EPA 6020B	R-04
AP-SSE-F2-B10 (A1H0074-22)				Matrix: Water				
Batch: 1080114								
Arsenic	ND	25.0	50.0	ug/L	50	08/05/21 22:33	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/05/21 22:33	EPA 6020B	R-04
Iron	ND	1250	2500	ug/L	50	08/05/21 22:33	EPA 6020B	R-04
Manganese	ND	25.0	50.0	ug/L	50	08/05/21 22:33	EPA 6020B	R-04
AP-SSE-F2-B7D (A1H0074-23)				Matrix: Water				
Batch: 1080114								
Arsenic	ND	25.0	50.0	ug/L	50	08/05/21 22:38	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/05/21 22:38	EPA 6020B	R-04
Iron	ND	1250	2500	ug/L	50	08/05/21 22:38	EPA 6020B	R-04
Manganese	**97.2**	25.0	50.0	ug/L	50	08/05/21 22:38	EPA 6020B	
AP-SSE-F2-MB (A1H0074-24)				Matrix: Water				
Batch: 1080114								
Arsenic	ND	25.0	50.0	ug/L	50	08/05/21 22:42	EPA 6020B	R-04
Cobalt	ND	25.0	50.0	ug/L	50	08/05/21 22:42	EPA 6020B	R-04
Iron	ND	1250	2500	ug/L	50	08/05/21 22:42	EPA 6020B	R-04

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ANALYTICAL REPORT

Anchor QEA, LLC 6720 SW Macadam Ave. Suite 125 Portland, OR 97219	Project: **Alabama Power-Barry** Project Number: **201114-01.01** Project Manager: **Anthony Dalton-Atha**	**Report ID:** **A1H0074 - 09 12 21 0555**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
AP-SSE-F2-MB (A1H0074-24)				**Matrix: Water**				
Manganese	ND	25.0	50.0	ug/L	50	08/05/21 22:42	EPA 6020B	R-04
AP-SSE-F3-B1 (A1H0074-25)				**Matrix: Water**				
Batch: 1080114								
Arsenic	ND	2.50	5.00	ug/L	5	08/05/21 22:47	EPA 6020B	R-04
Cobalt	ND	2.50	5.00	ug/L	5	08/05/21 22:47	EPA 6020B	R-04
Iron	**4620**	125	250	ug/L	5	08/05/21 22:47	EPA 6020B	
Manganese	**15.1**	2.50	5.00	ug/L	5	08/05/21 22:47	EPA 6020B	
AP-SSE-F3-B2 (A1H0074-26)				**Matrix: Water**				
Batch: 1080114								
Arsenic	ND	2.50	5.00	ug/L	5	08/05/21 22:52	EPA 6020B	R-04
Cobalt	ND	2.50	5.00	ug/L	5	08/05/21 22:52	EPA 6020B	R-04
Iron	**839**	125	250	ug/L	5	08/05/21 22:52	EPA 6020B	
Manganese	**5.60**	2.50	5.00	ug/L	5	08/05/21 22:52	EPA 6020B	
AP-SSE-F3-B3 (A1H0074-27)				**Matrix: Water**				
Batch: 1080114								
Arsenic	ND	2.50	5.00	ug/L	5	08/05/21 22:57	EPA 6020B	R-04
Cobalt	ND	2.50	5.00	ug/L	5	08/05/21 22:57	EPA 6020B	R-04
Iron	**7200**	125	250	ug/L	5	08/05/21 22:57	EPA 6020B	
Manganese	**116**	2.50	5.00	ug/L	5	08/05/21 22:57	EPA 6020B	
AP-SSE-F3-B4 (A1H0074-28)				**Matrix: Water**				
Batch: 1080114								
Arsenic	ND	2.50	5.00	ug/L	5	08/05/21 23:02	EPA 6020B	R-04
Cobalt	ND	2.50	5.00	ug/L	5	08/05/21 23:02	EPA 6020B	R-04
Iron	**7040**	125	250	ug/L	5	08/05/21 23:02	EPA 6020B	
Manganese	**77.1**	2.50	5.00	ug/L	5	08/05/21 23:02	EPA 6020B	
AP-SSE-F3-B5 (A1H0074-29)				**Matrix: Water**				
Batch: 1080114								
Arsenic	ND	2.50	5.00	ug/L	5	08/05/21 23:16	EPA 6020B	R-04
Cobalt	**9.20**	2.50	5.00	ug/L	5	08/05/21 23:16	EPA 6020B	
Iron	**18300**	125	250	ug/L	5	08/05/21 23:16	EPA 6020B	

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Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0074 - 09 12 21 0555**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
AP-SSE-F3-B5 (A1H0074-29)				Matrix: Water				
Manganese	**154**	2.50	5.00	ug/L	5	08/05/21 23:16	EPA 6020B	
AP-SSE-F3-B6 (A1H0074-30)				Matrix: Water				
Batch: 1080114								
Arsenic	ND	2.50	5.00	ug/L	5	08/05/21 23:21	EPA 6020B	R-04
Cobalt	**12.4**	2.50	5.00	ug/L	5	08/05/21 23:21	EPA 6020B	
Iron	**16800**	125	250	ug/L	5	08/05/21 23:21	EPA 6020B	
Manganese	**216**	2.50	5.00	ug/L	5	08/05/21 23:21	EPA 6020B	
AP-SSE-F3-B7 (A1H0074-31)				Matrix: Water				
Batch: 1080114								
Arsenic	**2.78**	2.50	5.00	ug/L	5	08/05/21 23:26	EPA 6020B	**J, R-04**
Cobalt	ND	2.50	5.00	ug/L	5	08/05/21 23:26	EPA 6020B	R-04
Iron	**1640**	125	250	ug/L	5	08/05/21 23:26	EPA 6020B	
Manganese	**21.3**	2.50	5.00	ug/L	5	08/05/21 23:26	EPA 6020B	
AP-SSE-F3-B8 (A1H0074-32)				Matrix: Water				
Batch: 1080114								
Arsenic	ND	2.50	5.00	ug/L	5	08/05/21 23:31	EPA 6020B	R-04
Cobalt	ND	2.50	5.00	ug/L	5	08/05/21 23:31	EPA 6020B	R-04
Iron	**4090**	125	250	ug/L	5	08/05/21 23:31	EPA 6020B	
Manganese	**33.2**	2.50	5.00	ug/L	5	08/05/21 23:31	EPA 6020B	
AP-SSE-F3-B9 (A1H0074-33)				Matrix: Water				
Batch: 1080114								
Arsenic	ND	2.50	5.00	ug/L	5	08/05/21 23:36	EPA 6020B	R-04
Cobalt	ND	2.50	5.00	ug/L	5	08/05/21 23:36	EPA 6020B	R-04
Iron	**4850**	125	250	ug/L	5	08/05/21 23:36	EPA 6020B	
Manganese	**4.51**	2.50	5.00	ug/L	5	08/05/21 23:36	EPA 6020B	**J, R-04**
AP-SSE-F3-B10 (A1H0074-34)				Matrix: Water				
Batch: 1080114								
Arsenic	ND	2.50	5.00	ug/L	5	08/05/21 23:41	EPA 6020B	R-04
Cobalt	ND	2.50	5.00	ug/L	5	08/05/21 23:41	EPA 6020B	R-04
Iron	**1390**	125	250	ug/L	5	08/05/21 23:41	EPA 6020B	

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6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0074 - 09 12 21 0555**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
AP-SSE-F3-B10 (A1H0074-34)				**Matrix: Water**				
Manganese	ND	2.50	5.00	ug/L	5	08/05/21 23:41	EPA 6020B	R-04
AP-SSE-F3-B7D (A1H0074-35)				**Matrix: Water**				
Batch: 1080114								
Arsenic	ND	2.50	5.00	ug/L	5	08/05/21 23:46	EPA 6020B	R-04
Cobalt	ND	2.50	5.00	ug/L	5	08/05/21 23:46	EPA 6020B	R-04
Iron	**1590**	125	250	ug/L	5	08/05/21 23:46	EPA 6020B	
Manganese	**12.8**	2.50	5.00	ug/L	5	08/05/21 23:46	EPA 6020B	
AP-SSE-F3-MB (A1H0074-36)				**Matrix: Water**				
Batch: 1080114								
Arsenic	ND	2.50	5.00	ug/L	5	08/05/21 23:51	EPA 6020B	R-04
Cobalt	ND	2.50	5.00	ug/L	5	08/05/21 23:51	EPA 6020B	R-04
Iron	ND	125	250	ug/L	5	08/05/21 23:51	EPA 6020B	R-04
Manganese	ND	2.50	5.00	ug/L	5	08/05/21 23:51	EPA 6020B	R-04
AP-SSE-F4-B1 (A1H0074-37)				**Matrix: Water**				
Batch: 1080114								
Arsenic	**4.47**	2.50	5.00	ug/L	5	08/05/21 23:55	EPA 6020B	**J, R-04**
Cobalt	**2.68**	2.50	5.00	ug/L	5	08/05/21 23:55	EPA 6020B	**J, R-04**
Iron	**5550**	125	250	ug/L	5	08/05/21 23:55	EPA 6020B	
Manganese	**16.1**	2.50	5.00	ug/L	5	08/05/21 23:55	EPA 6020B	
AP-SSE-F4-B2 (A1H0074-38RE1)				**Matrix: Water**				
Batch: 1080194								
Arsenic	**5.97**	2.50	5.00	ug/L	5	08/09/21 19:50	EPA 6020B	
Cobalt	**10.2**	2.50	5.00	ug/L	5	08/09/21 19:50	EPA 6020B	
Iron	**1290**	125	250	ug/L	5	08/09/21 19:50	EPA 6020B	
Manganese	**19.8**	2.50	5.00	ug/L	5	08/09/21 19:50	EPA 6020B	
AP-SSE-F4-B3 (A1H0074-39)				**Matrix: Water**				
Batch: 1080194								
Arsenic	**4.59**	2.50	5.00	ug/L	5	08/09/21 19:55	EPA 6020B	**J, R-04**
Cobalt	**4.95**	2.50	5.00	ug/L	5	08/09/21 19:55	EPA 6020B	**J, R-04**
Iron	**5150**	125	250	ug/L	5	08/09/21 19:55	EPA 6020B	

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ORELAP ID: **OR100062**

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0074 - 09 12 21 0555**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
AP-SSE-F4-B3 (A1H0074-39)				**Matrix: Water**				
Manganese	**151**	2.50	5.00	ug/L	5	08/09/21 19:55	EPA 6020B	
AP-SSE-F4-B4 (A1H0074-40)				**Matrix: Water**				
Batch: 1080194								
Arsenic	**6.18**	2.50	5.00	ug/L	5	08/09/21 20:00	EPA 6020B	
Cobalt	**7.34**	2.50	5.00	ug/L	5	08/09/21 20:00	EPA 6020B	
Iron	**7050**	125	250	ug/L	5	08/09/21 20:00	EPA 6020B	
Manganese	**110**	2.50	5.00	ug/L	5	08/09/21 20:00	EPA 6020B	
AP-SSE-F4-B5 (A1H0074-41)				**Matrix: Water**				
Batch: 1080194								
Arsenic	**8.50**	2.50	5.00	ug/L	5	08/09/21 20:05	EPA 6020B	
Cobalt	**14.1**	2.50	5.00	ug/L	5	08/09/21 20:05	EPA 6020B	
Iron	**27000**	125	250	ug/L	5	08/09/21 20:05	EPA 6020B	
Manganese	**342**	2.50	5.00	ug/L	5	08/09/21 20:05	EPA 6020B	
AP-SSE-F4-B6 (A1H0074-42)				**Matrix: Water**				
Batch: 1080194								
Arsenic	**9.09**	2.50	5.00	ug/L	5	08/09/21 20:10	EPA 6020B	
Cobalt	**19.7**	2.50	5.00	ug/L	5	08/09/21 20:10	EPA 6020B	
Iron	**25200**	125	250	ug/L	5	08/09/21 20:10	EPA 6020B	
Manganese	**576**	2.50	5.00	ug/L	5	08/09/21 20:10	EPA 6020B	
AP-SSE-F4-B7 (A1H0074-43)				**Matrix: Water**				
Batch: 1080194								
Arsenic	**10.9**	2.50	5.00	ug/L	5	08/09/21 20:15	EPA 6020B	
Cobalt	**10.1**	2.50	5.00	ug/L	5	08/09/21 20:15	EPA 6020B	
Iron	**5590**	125	250	ug/L	5	08/09/21 20:15	EPA 6020B	
Manganese	**12.9**	2.50	5.00	ug/L	5	08/09/21 20:15	EPA 6020B	
AP-SSE-F4-B8 (A1H0074-44)				**Matrix: Water**				
Batch: 1080194								
Arsenic	**3.34**	2.50	5.00	ug/L	5	08/09/21 20:20	EPA 6020B	**J, R-04**
Cobalt	**5.39**	2.50	5.00	ug/L	5	08/09/21 20:20	EPA 6020B	
Iron	**20300**	125	250	ug/L	5	08/09/21 20:20	EPA 6020B	

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ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: 201114-01.01	**Report ID:**
Portland, OR 97219	Project Manager: Anthony Dalton-Atha	A1H0074 - 09 12 21 0555

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
AP-SSE-F4-B8 (A1H0074-44)				**Matrix: Water**				
Manganese	**231**	2.50	5.00	ug/L	5	08/09/21 20:20	EPA 6020B	
AP-SSE-F4-B9 (A1H0074-45)				**Matrix: Water**				
Batch: 1080194								
Arsenic	**5.64**	2.50	5.00	ug/L	5	08/09/21 20:24	EPA 6020B	
Cobalt	ND	2.50	5.00	ug/L	5	08/09/21 20:24	EPA 6020B	R-04
Iron	**13700**	125	250	ug/L	5	08/09/21 20:24	EPA 6020B	
Manganese	**60.7**	2.50	5.00	ug/L	5	08/09/21 20:24	EPA 6020B	
AP-SSE-F4-B10 (A1H0074-46)				**Matrix: Water**				
Batch: 1080194								
Arsenic	ND	2.50	5.00	ug/L	5	08/09/21 20:39	EPA 6020B	R-04
Cobalt	ND	2.50	5.00	ug/L	5	08/09/21 20:39	EPA 6020B	R-04
Iron	**4110**	125	250	ug/L	5	08/09/21 20:39	EPA 6020B	
Manganese	**11.4**	2.50	5.00	ug/L	5	08/09/21 20:39	EPA 6020B	
AP-SSE-F4-B7D (A1H0074-47)				**Matrix: Water**				
Batch: 1080194								
Arsenic	**8.98**	2.50	5.00	ug/L	5	08/09/21 20:48	EPA 6020B	
Cobalt	**12.3**	2.50	5.00	ug/L	5	08/09/21 20:48	EPA 6020B	
Iron	**6070**	125	250	ug/L	5	08/09/21 20:48	EPA 6020B	
Manganese	**17.9**	2.50	5.00	ug/L	5	08/09/21 20:48	EPA 6020B	
AP-SSE-F4-MB (A1H0074-48)				**Matrix: Water**				
Batch: 1080194								
Arsenic	ND	2.50	5.00	ug/L	5	08/09/21 20:57	EPA 6020B	R-04
Cobalt	ND	2.50	5.00	ug/L	5	08/09/21 20:57	EPA 6020B	R-04
Iron	ND	125	250	ug/L	5	08/09/21 20:57	EPA 6020B	R-04
Manganese	**9.83**	2.50	5.00	ug/L	5	08/09/21 20:57	EPA 6020B	
AP-SSE-F5-B1 (A1H0074-49)				**Matrix: Solid**				
Batch: 1080219								
Arsenic	ND	0.533	1.07	mg/kg	10	08/07/21 03:02	EPA 6020B	
Cobalt	**0.889**	0.533	1.07	mg/kg	10	08/07/21 03:02	EPA 6020B	**J**
Iron	**2970**	26.7	53.3	mg/kg	10	08/07/21 03:02	EPA 6020B	

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Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

Anchor QEA, LLC
6720 SW Macadam Ave. Suite 125
Portland, OR 97219

Project: Alabama Power-Barry
Project Number: 201114-01.01
Project Manager: Anthony Dalton-Atha

Report ID:
A1H0074 - 09 12 21 0555

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
AP-SSE-F5-B1 (A1H0074-49)				**Matrix: Solid**				
Manganese	**6.46**	0.533	1.07	mg/kg	10	08/07/21 03:02	EPA 6020B	
AP-SSE-F5-B2 (A1H0074-50)				**Matrix: Solid**				
Batch: 1080219								
Arsenic	ND	0.536	1.07	mg/kg	10	08/07/21 03:07	EPA 6020B	
Cobalt	ND	0.536	1.07	mg/kg	10	08/07/21 03:07	EPA 6020B	
Iron	**144**	26.8	53.6	mg/kg	10	08/07/21 03:07	EPA 6020B	
Manganese	**0.742**	0.536	1.07	mg/kg	10	08/07/21 03:07	EPA 6020B	J
AP-SSE-F5-B3 (A1H0074-51)				**Matrix: Solid**				
Batch: 1080219								
Arsenic	ND	0.518	1.04	mg/kg	10	08/07/21 03:11	EPA 6020B	
Cobalt	**0.530**	0.518	1.04	mg/kg	10	08/07/21 03:11	EPA 6020B	J
Iron	**1010**	25.9	51.8	mg/kg	10	08/07/21 03:11	EPA 6020B	
Manganese	**4.62**	0.518	1.04	mg/kg	10	08/07/21 03:11	EPA 6020B	
AP-SSE-F5-B4 (A1H0074-52)				**Matrix: Solid**				
Batch: 1080219								
Arsenic	ND	0.529	1.06	mg/kg	10	08/07/21 03:16	EPA 6020B	
Cobalt	ND	0.529	1.06	mg/kg	10	08/07/21 03:16	EPA 6020B	
Iron	**1230**	26.4	52.9	mg/kg	10	08/07/21 03:16	EPA 6020B	
Manganese	**3.73**	0.529	1.06	mg/kg	10	08/07/21 03:16	EPA 6020B	
AP-SSE-F5-B5 (A1H0074-53)				**Matrix: Solid**				
Batch: 1080219								
Arsenic	**0.796**	0.492	0.984	mg/kg	10	08/07/21 03:21	EPA 6020B	J
Cobalt	**1.75**	0.492	0.984	mg/kg	10	08/07/21 03:21	EPA 6020B	
Iron	**4400**	24.6	49.2	mg/kg	10	08/07/21 03:21	EPA 6020B	
Manganese	**19.2**	0.492	0.984	mg/kg	10	08/07/21 03:21	EPA 6020B	
AP-SSE-F5-B6 (A1H0074-54)				**Matrix: Solid**				
Batch: 1080219								
Arsenic	**1.01**	0.542	1.08	mg/kg	10	08/07/21 03:26	EPA 6020B	J
Cobalt	**1.87**	0.542	1.08	mg/kg	10	08/07/21 03:26	EPA 6020B	
Iron	**5340**	27.1	54.2	mg/kg	10	08/07/21 03:26	EPA 6020B	

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ORELAP ID: OR100062

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: 201114-01.01	**Report ID:**
Portland, OR 97219	Project Manager: Anthony Dalton-Atha	A1H0074 - 09 12 21 0555

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
AP-SSE-F5-B6 (A1H0074-54)				Matrix: Solid				
Manganese	**21.8**	0.542	1.08	mg/kg	10	08/07/21 03:26	EPA 6020B	
AP-SSE-F5-B7 (A1H0074-55)				Matrix: Solid				
Batch: 1080219								
Arsenic	ND	0.513	1.03	mg/kg	10	08/07/21 03:31	EPA 6020B	
Cobalt	ND	0.513	1.03	mg/kg	10	08/07/21 03:31	EPA 6020B	
Iron	**427**	25.7	51.3	mg/kg	10	08/07/21 03:31	EPA 6020B	
Manganese	**2.82**	0.513	1.03	mg/kg	10	08/07/21 03:31	EPA 6020B	
AP-SSE-F5-B8 (A1H0074-56)				Matrix: Solid				
Batch: 1080219								
Arsenic	ND	0.520	1.04	mg/kg	10	08/07/21 03:36	EPA 6020B	
Cobalt	ND	0.520	1.04	mg/kg	10	08/07/21 03:36	EPA 6020B	
Iron	**527**	26.0	52.0	mg/kg	10	08/07/21 03:36	EPA 6020B	
Manganese	**3.01**	0.520	1.04	mg/kg	10	08/07/21 03:36	EPA 6020B	
AP-SSE-F5-B9 (A1H0074-57)				Matrix: Solid				
Batch: 1080219								
Arsenic	ND	0.536	1.07	mg/kg	10	08/07/21 03:50	EPA 6020B	
Cobalt	ND	0.536	1.07	mg/kg	10	08/07/21 03:50	EPA 6020B	
Iron	**649**	26.8	53.6	mg/kg	10	08/07/21 03:50	EPA 6020B	
Manganese	**2.18**	0.536	1.07	mg/kg	10	08/07/21 03:50	EPA 6020B	
AP-SSE-F5-B10 (A1H0074-58)				Matrix: Solid				
Batch: 1080219								
Arsenic	ND	0.551	1.10	mg/kg	10	08/07/21 03:55	EPA 6020B	
Cobalt	ND	0.551	1.10	mg/kg	10	08/07/21 03:55	EPA 6020B	
Iron	**78.4**	27.5	55.1	mg/kg	10	08/07/21 03:55	EPA 6020B	
Manganese	ND	0.551	1.10	mg/kg	10	08/07/21 03:55	EPA 6020B	
AP-SSE-F5-B7D (A1H0074-59)				Matrix: Solid				
Batch: 1080219								
Arsenic	ND	0.548	1.10	mg/kg	10	08/07/21 04:00	EPA 6020B	
Cobalt	ND	0.548	1.10	mg/kg	10	08/07/21 04:00	EPA 6020B	
Iron	**438**	27.4	54.8	mg/kg	10	08/07/21 04:00	EPA 6020B	

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ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0074 - 09 12 21 0555**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
AP-SSE-F5-B7D (A1H0074-59)				Matrix: Solid				
Manganese	**2.74**	0.548	1.10	mg/kg	10	08/07/21 04:00	EPA 6020B	

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ANALYTICAL REPORT

Anchor QEA, LLC
6720 SW Macadam Ave. Suite 125
Portland, OR 97219

Project: **Alabama Power-Barry**
Project Number: **201114-01.01**
Project Manager: **Anthony Dalton-Atha**

Report ID:
A1H0074 - 09 12 21 0555

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1080109 - EPA 3015A							**Water**					
Blank (1080109-BLK1)			Prepared: 08/04/21 13:07 Analyzed: 08/07/21 05:14									
EPA 6020B												
Arsenic	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Cobalt	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Iron	ND	25.0	50.0	ug/L	1	---	---	---	---	---	---	Q-41
Blank (1080109-BLK2)			Prepared: 08/04/21 13:07 Analyzed: 08/09/21 21:17									
EPA 6020B												
Manganese	**0.903**	0.500	1.00	ug/L	1	---	---	---	---	---	---	B-02, Q-16, J
LCS (1080109-BS1)			Prepared: 08/04/21 13:07 Analyzed: 08/07/21 05:19									
EPA 6020B												
Arsenic	54.9	0.500	1.00	ug/L	1	55.6	---	99	80-120%	---	---	
Cobalt	56.4	0.500	1.00	ug/L	1	55.6	---	101	80-120%	---	---	
Iron	3110	25.0	50.0	ug/L	1	2780	---	112	80-120%	---	---	Q-41
Manganese	57.5	0.500	1.00	ug/L	1	55.6	---	103	80-120%	---	---	
Duplicate (1080109-DUP1)			Prepared: 08/04/21 13:07 Analyzed: 08/07/21 05:54									
QC Source Sample: AP-SSE-F1-B3 (A1H0074-03)												
EPA 6020B												
Arsenic	ND	25.0	50.0	ug/L	50	---	ND	---	---	---	20%	R-04
Cobalt	ND	25.0	50.0	ug/L	50	---	ND	---	---	---	20%	R-04
Iron	ND	1250	2500	ug/L	50	---	ND	---	---	---	20%	R-04
Manganese	**162**	25.0	50.0	ug/L	50	---	173	---	---	7	20%	
Matrix Spike (1080109-MS1)			Prepared: 08/04/21 13:07 Analyzed: 08/07/21 05:59									
QC Source Sample: AP-SSE-F1-B3 (A1H0074-03)												
EPA 6020B												
Arsenic	59.0	25.0	50.0	ug/L	50	55.6	ND	106	75-125%	---	---	
Cobalt	59.9	25.0	50.0	ug/L	50	55.6	ND	108	75-125%	---	---	
Iron	3050	1250	2500	ug/L	50	2780	ND	110	75-125%	---	---	
Manganese	238	25.0	50.0	ug/L	50	55.6	173	116	75-125%	---	---	
Batch 1080114 - EPA 3015A							**Water**					

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ANALYTICAL REPORT

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6720 SW Macadam Ave. Suite 125	Project Number:	**201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager:	**Anthony Dalton-Atha**	**A1H0074 - 09 12 21 0555**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1080114 - EPA 3015A							Water					
Blank (1080114-BLK1)			Prepared: 08/04/21 15:03	Analyzed: 08/05/21 21:39								
EPA 6020B												
Arsenic	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Cobalt	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Iron	ND	25.0	50.0	ug/L	1	---	---	---	---	---	---	
Manganese	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
LCS (1080114-BS1)			Prepared: 08/04/21 15:03	Analyzed: 08/05/21 21:44								
EPA 6020B												
Arsenic	59.2	0.500	1.00	ug/L	1	55.6	---	106	80-120%	---	---	
Cobalt	60.0	0.500	1.00	ug/L	1	55.6	---	108	80-120%	---	---	
Iron	2800	25.0	50.0	ug/L	1	2780	---	101	80-120%	---	---	
Manganese	56.1	0.500	1.00	ug/L	1	55.6	---	101	80-120%	---	---	
Duplicate (1080114-DUP1)			Prepared: 08/04/21 15:03	Analyzed: 08/05/21 21:54								
QC Source Sample: Non-SDG (A1H0011-01)												
Arsenic	**1.51**	0.500	1.00	ug/L	1	---	1.49	---	---	1	20%	
Cobalt	ND	0.500	1.00	ug/L	1	---	ND	---	---	---	20%	
Iron	**113**	25.0	50.0	ug/L	1	---	129	---	---	13	20%	
Manganese	**5.40**	0.500	1.00	ug/L	1	---	5.26	---	---	3	20%	
Matrix Spike (1080114-MS1)			Prepared: 08/04/21 15:03	Analyzed: 08/05/21 21:59								
QC Source Sample: Non-SDG (A1H0011-01)												
EPA 6020B												
Arsenic	60.1	0.500	1.00	ug/L	1	55.6	1.49	106	75-125%	---	---	
Cobalt	58.1	0.500	1.00	ug/L	1	55.6	ND	105	75-125%	---	---	
Iron	2860	25.0	50.0	ug/L	1	2780	129	98	75-125%	---	---	
Manganese	60.8	0.500	1.00	ug/L	1	55.6	5.26	100	75-125%	---	---	

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ANALYTICAL REPORT

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Anchor QEA, LLC 6720 SW Macadam Ave. Suite 125 Portland, OR 97219	Project: Alabama Power-Barry Project Number: 201114-01.01 Project Manager: Anthony Dalton-Atha	Report ID: A1H0074 - 09 12 21 0555

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1080194 - EPA 3015A							Water					
Blank (1080194-BLK1)			Prepared: 08/06/21 09:09 Analyzed: 08/06/21 18:59									
EPA 6020B												
Arsenic	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Cobalt	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Iron	ND	25.0	50.0	ug/L	1	---	---	---	---	---	---	
Manganese	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
LCS (1080194-BS1)			Prepared: 08/06/21 09:09 Analyzed: 08/06/21 19:04									
EPA 6020B												
Arsenic	56.6	0.500	1.00	ug/L	1	55.6	---	102	80-120%	---	---	
Cobalt	58.0	0.500	1.00	ug/L	1	55.6	---	104	80-120%	---	---	
Iron	2730	25.0	50.0	ug/L	1	2780	---	98	80-120%	---	---	
Manganese	54.6	0.500	1.00	ug/L	1	55.6	---	98	80-120%	---	---	
Duplicate (1080194-DUP1)			Prepared: 08/06/21 09:09 Analyzed: 08/06/21 19:13									
QC Source Sample: Non-SDG (A1H0148-01)												
Arsenic	**21.9**	2.50	5.00	ug/L	5	---	23.8	---	---	8	20%	
Cobalt	**232**	2.50	5.00	ug/L	5	---	258	---	---	11	20%	
Iron	**203000**	125	250	ug/L	5	---	217000	---	---	7	20%	
Manganese	**8880**	2.50	5.00	ug/L	5	---	9730	---	---	9	20%	
Matrix Spike (1080194-MS1)			Prepared: 08/06/21 09:09 Analyzed: 08/06/21 19:18									
QC Source Sample: Non-SDG (A1H0148-01)												
EPA 6020B												
Arsenic	79.5	2.50	5.00	ug/L	5	55.6	23.8	100	75-125%	---	---	
Cobalt	373	2.50	5.00	ug/L	5	55.6	258	**207**	**75-125%**	---	---	Q-03, Q-04
Manganese	11600	2.50	5.00	ug/L	5	55.6	9730	**3440**	**75-125%**	---	---	Q-03, Q-04
Matrix Spike (1080194-MS2)			Prepared: 08/06/21 09:09 Analyzed: 08/09/21 21:02									
QC Source Sample: Non-SDG (A1H0148-01)												
EPA 6020B												
Iron	370000	1250	2500	ug/L	50	2780	217000	**5510**	**75-125%**	---	---	Q-03, Q-04, Q-16

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ORELAP ID: **OR100062**

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0074 - 09 12 21 0555**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1080219 - EPA 3051A							**Solid**					
Blank (1080219-BLK1)			Prepared: 08/06/21 13:11		Analyzed: 08/07/21 02:37							
EPA 6020B												
Arsenic	ND	0.481	0.962	mg/kg	10	---	---	---	---	---	---	
Cobalt	ND	0.481	0.962	mg/kg	10	---	---	---	---	---	---	
Iron	ND	24.0	48.1	mg/kg	10	---	---	---	---	---	---	
Manganese	ND	0.481	0.962	mg/kg	10	---	---	---	---	---	---	
LCS (1080219-BS1)			Prepared: 08/06/21 13:11		Analyzed: 08/07/21 02:57							
EPA 6020B												
Arsenic	50.2	0.500	1.00	mg/kg	10	50.0	---	100	80-120%	---	---	
Cobalt	51.0	0.500	1.00	mg/kg	10	50.0	---	102	80-120%	---	---	
Iron	2490	25.0	50.0	mg/kg	10	2500	---	100	80-120%	---	---	
Manganese	48.5	0.500	1.00	mg/kg	10	50.0	---	97	80-120%	---	---	
LCS Dup (1080219-BSD1)			Prepared: 08/06/21 13:11		Analyzed: 08/07/21 02:52							
EPA 6020B												
Arsenic	50.9	0.500	1.00	mg/kg	10	50.0	---	102	80-120%	1	20%	
Cobalt	52.2	0.500	1.00	mg/kg	10	50.0	---	104	80-120%	2	20%	
Iron	2500	25.0	50.0	mg/kg	10	2500	---	100	80-120%	0.3	20%	
Manganese	49.8	0.500	1.00	mg/kg	10	50.0	---	100	80-120%	3	20%	

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6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0074 - 09 12 21 0555**

SAMPLE PREPARATION INFORMATION

Total Metals by EPA 6020B (ICPMS)

Prep: EPA 3015A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 1080109							
A1H0074-01	Water	EPA 6020B	07/28/21 10:00	08/04/21 13:07	45mL/50mL	45mL/50mL	1.00
A1H0074-02	Water	EPA 6020B	07/28/21 10:05	08/04/21 13:07	45mL/50mL	45mL/50mL	1.00
A1H0074-03	Water	EPA 6020B	07/28/21 10:10	08/04/21 13:07	45mL/50mL	45mL/50mL	1.00
A1H0074-04	Water	EPA 6020B	07/28/21 10:15	08/04/21 13:07	45mL/50mL	45mL/50mL	1.00
A1H0074-05	Water	EPA 6020B	07/28/21 10:20	08/04/21 13:07	45mL/50mL	45mL/50mL	1.00
A1H0074-06	Water	EPA 6020B	07/28/21 10:25	08/04/21 13:07	45mL/50mL	45mL/50mL	1.00
A1H0074-07	Water	EPA 6020B	07/28/21 10:30	08/04/21 13:07	45mL/50mL	45mL/50mL	1.00
A1H0074-08	Water	EPA 6020B	07/28/21 10:35	08/04/21 13:07	45mL/50mL	45mL/50mL	1.00
A1H0074-09	Water	EPA 6020B	07/28/21 10:40	08/04/21 13:07	45mL/50mL	45mL/50mL	1.00
A1H0074-10	Water	EPA 6020B	07/28/21 10:45	08/04/21 13:07	45mL/50mL	45mL/50mL	1.00
A1H0074-11	Water	EPA 6020B	07/28/21 10:50	08/04/21 13:07	45mL/50mL	45mL/50mL	1.00
A1H0074-12	Water	EPA 6020B	07/28/21 10:55	08/04/21 13:07	45mL/50mL	45mL/50mL	1.00
A1H0074-13	Water	EPA 6020B	07/29/21 10:00	08/04/21 13:07	45mL/50mL	45mL/50mL	1.00
A1H0074-14	Water	EPA 6020B	07/29/21 10:05	08/04/21 13:07	45mL/50mL	45mL/50mL	1.00
A1H0074-15	Water	EPA 6020B	07/29/21 10:10	08/04/21 13:07	45mL/50mL	45mL/50mL	1.00
A1H0074-16	Water	EPA 6020B	07/29/21 10:15	08/04/21 13:07	45mL/50mL	45mL/50mL	1.00
A1H0074-17	Water	EPA 6020B	07/29/21 10:20	08/04/21 13:07	45mL/50mL	45mL/50mL	1.00
A1H0074-18	Water	EPA 6020B	07/29/21 10:25	08/04/21 13:07	45mL/50mL	45mL/50mL	1.00
Batch: 1080114							
A1H0074-19	Water	EPA 6020B	07/29/21 10:30	08/04/21 15:03	45mL/50mL	45mL/50mL	1.00
A1H0074-20	Water	EPA 6020B	07/29/21 10:35	08/04/21 15:03	45mL/50mL	45mL/50mL	1.00
A1H0074-21	Water	EPA 6020B	07/29/21 10:40	08/04/21 15:03	45mL/50mL	45mL/50mL	1.00
A1H0074-22	Water	EPA 6020B	07/29/21 10:45	08/04/21 15:03	45mL/50mL	45mL/50mL	1.00
A1H0074-23	Water	EPA 6020B	07/29/21 10:50	08/04/21 15:03	45mL/50mL	45mL/50mL	1.00
A1H0074-24	Water	EPA 6020B	07/29/21 10:55	08/04/21 15:03	45mL/50mL	45mL/50mL	1.00
A1H0074-25	Water	EPA 6020B	07/30/21 10:00	08/04/21 15:03	45mL/50mL	45mL/50mL	1.00
A1H0074-26	Water	EPA 6020B	07/30/21 10:05	08/04/21 15:03	45mL/50mL	45mL/50mL	1.00
A1H0074-27	Water	EPA 6020B	07/30/21 10:10	08/04/21 15:03	45mL/50mL	45mL/50mL	1.00
A1H0074-28	Water	EPA 6020B	07/30/21 10:15	08/04/21 15:03	45mL/50mL	45mL/50mL	1.00
A1H0074-29	Water	EPA 6020B	07/30/21 10:20	08/04/21 15:03	45mL/50mL	45mL/50mL	1.00
A1H0074-30	Water	EPA 6020B	07/30/21 10:25	08/04/21 15:03	45mL/50mL	45mL/50mL	1.00
A1H0074-31	Water	EPA 6020B	07/30/21 10:30	08/04/21 15:03	45mL/50mL	45mL/50mL	1.00
A1H0074-32	Water	EPA 6020B	07/30/21 10:35	08/04/21 15:03	45mL/50mL	45mL/50mL	1.00
A1H0074-33	Water	EPA 6020B	07/30/21 10:40	08/04/21 15:03	45mL/50mL	45mL/50mL	1.00
A1H0074-34	Water	EPA 6020B	07/30/21 10:45	08/04/21 15:03	45mL/50mL	45mL/50mL	1.00
A1H0074-35	Water	EPA 6020B	07/30/21 10:50	08/04/21 15:03	45mL/50mL	45mL/50mL	1.00

Apex Laboratories

Darwin Thomas, Business Development Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

APEX LABORATORIES

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

Anchor QEA, LLC 6720 SW Macadam Ave. Suite 125 Portland, OR 97219	Project: Alabama Power-Barry Project Number: 201114-01.01 Project Manager: Anthony Dalton-Atha	Report ID: A1H0074 - 09 12 21 0555

SAMPLE PREPARATION INFORMATION

Total Metals by EPA 6020B (ICPMS)

Prep: EPA 3015A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A1H0074-36	Water	EPA 6020B	07/30/21 10:55	08/04/21 15:03	45mL/50mL	45mL/50mL	1.00
A1H0074-37	Water	EPA 6020B	08/02/21 10:00	08/04/21 15:03	45mL/50mL	45mL/50mL	1.00
Batch: 1080194							
A1H0074-38RE1	Water	EPA 6020B	08/02/21 10:05	08/06/21 09:09	45mL/50mL	45mL/50mL	1.00
A1H0074-39	Water	EPA 6020B	08/02/21 10:10	08/06/21 09:09	45mL/50mL	45mL/50mL	1.00
A1H0074-40	Water	EPA 6020B	08/02/21 10:15	08/06/21 09:09	45mL/50mL	45mL/50mL	1.00
A1H0074-41	Water	EPA 6020B	08/02/21 10:20	08/06/21 09:09	45mL/50mL	45mL/50mL	1.00
A1H0074-42	Water	EPA 6020B	08/02/21 10:25	08/06/21 09:09	45mL/50mL	45mL/50mL	1.00
A1H0074-43	Water	EPA 6020B	08/02/21 10:30	08/06/21 09:09	45mL/50mL	45mL/50mL	1.00
A1H0074-44	Water	EPA 6020B	08/02/21 10:35	08/06/21 09:09	45mL/50mL	45mL/50mL	1.00
A1H0074-45	Water	EPA 6020B	08/02/21 10:40	08/06/21 09:09	45mL/50mL	45mL/50mL	1.00
A1H0074-46	Water	EPA 6020B	08/02/21 10:45	08/06/21 09:09	45mL/50mL	45mL/50mL	1.00
A1H0074-47	Water	EPA 6020B	08/02/21 10:50	08/06/21 09:09	45mL/50mL	45mL/50mL	1.00
A1H0074-48	Water	EPA 6020B	08/02/21 10:55	08/06/21 09:09	45mL/50mL	45mL/50mL	1.00

Prep: EPA 3051A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 1080219							
A1H0074-49	Solid	EPA 6020B	08/03/21 08:00	08/06/21 13:11	0.469g/50mL	0.5g/50mL	1.07
A1H0074-50	Solid	EPA 6020B	08/03/21 08:05	08/06/21 13:11	0.466g/50mL	0.5g/50mL	1.07
A1H0074-51	Solid	EPA 6020B	08/03/21 08:10	08/06/21 13:11	0.483g/50mL	0.5g/50mL	1.04
A1H0074-52	Solid	EPA 6020B	08/03/21 08:15	08/06/21 13:11	0.473g/50mL	0.5g/50mL	1.06
A1H0074-53	Solid	EPA 6020B	08/03/21 08:20	08/06/21 13:11	0.508g/50mL	0.5g/50mL	0.98
A1H0074-54	Solid	EPA 6020B	08/03/21 08:25	08/06/21 13:11	0.461g/50mL	0.5g/50mL	1.08
A1H0074-55	Solid	EPA 6020B	08/03/21 08:30	08/06/21 13:11	0.487g/50mL	0.5g/50mL	1.03
A1H0074-56	Solid	EPA 6020B	08/03/21 08:35	08/06/21 13:11	0.481g/50mL	0.5g/50mL	1.04
A1H0074-57	Solid	EPA 6020B	08/03/21 08:40	08/06/21 13:11	0.466g/50mL	0.5g/50mL	1.07
A1H0074-58	Solid	EPA 6020B	08/03/21 08:45	08/06/21 13:11	0.454g/50mL	0.5g/50mL	1.10
A1H0074-59	Solid	EPA 6020B	08/03/21 08:50	08/06/21 13:11	0.456g/50mL	0.5g/50mL	1.10

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

B-02	Analyte detected in an associated blank at a level between one-half the MRL and the MRL. (See Notes and Conventions below.)
J	Estimated Result. Result detected below the lowest point of the calibration curve, but above the specified MDL.
Q-03	Spike recovery and/or RPD is outside control limits due to the high concentration of analyte present in the sample.
Q-04	Spike recovery and/or RPD is outside control limits due to a non-homogeneous sample matrix.
Q-16	Reanalysis of an original Batch QC sample.
Q-41	Estimated Results. Recovery of Continuing Calibration Verification sample above upper control limit for this analyte. Results are likely biased high.
Q-42	Matrix Spike and/or Duplicate analysis was performed on this sample. % Recovery or RPD for this analyte is outside laboratory control limits. (Refer to the QC Section of Analytical Report.)
R-04	Reporting levels elevated due to preparation and/or analytical dilution necessary for analysis.

ANALYTICAL REPORT

Anchor QEA, LLC	Project:	**Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number:	**201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager:	**Anthony Dalton-Atha**	**A1H0074 - 09 12 21 0555**

REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.

ND Analyte NOT DETECTED at or above the detection or reporting limit.

NR Result Not Reported

RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as " dry", " wet", or " " (blank) designation.

" dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.

" wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) may not be included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).
-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.

Apex Laboratories, LLC

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Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0074 - 09 12 21 0555**

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

ANALYTICAL REPORT

Anchor QEA, LLC **6720 SW Macadam Ave. Suite 125** **Portland, OR 97219**	Project: **Alabama Power-Barry** Project Number: **201114-01.01** Project Manager: **Anthony Dalton-Atha**	**Report ID:** **A1H0074 - 09 12 21 0555**

LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation) -
EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation
All reported analytes are included in Apex Laboratories' current ORELAP scope.					

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.
Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provded by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0074 - 09 12 21 0555**

A1H0074

Chain of Custody Record & Laboratory Analysis Request

ANCHOR QEA

Company: Anchor QEA
Date: 8/3/2021
Project Name: Alabama Power - Barry
Project Number:
Project Manager: Anthony Dalton-Atha adalton-atha@anchorqea.com
Phone Number:
Shipment Method:
Samplers: Modi Raduma

Line	Field Sample ID	Collection Date/Time		Matrix	No. of Containers	As,Co	Comments/Preservation
1	AP-SSE-F1-B1	7/28/2021	10:00	Water	1	x	1M MgCL used in extraction
2	AP-SSE-F1-B2	7/28/2021	10:05	Water	1	x	1M MgCL used in extraction
3	AP-SSE-F1-B3	7/28/2021	10:10	Water	1	x	1M MgCL used in extraction
4	AP-SSE-F1-B4	7/28/2021	10:15	Water	1	x	1M MgCL used in extraction
5	AP-SSE-F1-B5	7/28/2021	10:20	Water	1	x	1M MgCL used in extraction
6	AP-SSE-F1-B6	7/28/2021	10:25	Water	1	x	1M MgCL used in extraction
7	AP-SSE-F1-B7	7/28/2021	10:30	Water	1	x	1M MgCL used in extraction
8	AP-SSE-F1-B8	7/28/2021	10:35	Water	1	x	1M MgCL used in extraction
9	AP-SSE-F1-B9	7/28/2021	10:40	Water	1	x	1M MgCL used in extraction
10	AP-SSE-F1-B10	7/28/2021	10:45	Water	1	x	1M MgCL used in extraction
11	AP-SSE-F1-B7D	7/28/2021	10:50	Water	1	x	1M MgCL used in extraction
12	AP-SSE-F1-MB	7/28/2021	10:55	Water	1	x	1M MgCL used in extraction

Test Parameters

Comments: Samples may contain elevated Mg and Ca levels. Please analyze with minimal dilution to achieve best DLs. Samples have been preserved with nitric acid.

Relinquished By: Anthony Dalton-Atha Company: AQEA	Received By: Eli Joyner Company: APEX LABS
Signature/Printed Name Date/Time 8/3/21 0945	Signature/Printed Name EJ Date/Time 8/3/21 1235
Relinquished By: Company:	Received By: Company:
Signature/Printed Name Date/Time	Signature/Printed Name Date/Time

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Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: 201114-01.01	**Report ID:**
Portland, OR 97219	Project Manager: Anthony Dalton-Atha	A1H0074 - 09 12 21 0555

A1H0074

Chain of Custody Record & Laboratory Analysis Request

ANCHOR QEA

Company: Anchor QEA
Date: 8/3/2021
Project Name: Alabama Power - Barry
Project Number:
Project Manager: Anthony Dalton-Atha adalton-atha@anchorqea.com
Phone Number:
Shipment Method:
Samplers: Modi Raduma

Line	Field Sample ID	Collection Date/Time		Matrix	No. of Containers	As, Co, Fe, Mn	Comments/Preservation
1	AP-SSE-F2-B1	7/29/2021	10:00	Water	1	x	1M Monosodium phosphate used
2	AP-SSE-F2-B2	7/29/2021	10:05	Water	1	x	1M Monosodium phosphate used
3	AP-SSE-F2-B3	7/29/2021	10:10	Water	1	x	1M Monosodium phosphate used
4	AP-SSE-F2-B4	7/29/2021	10:15	Water	1	x	1M Monosodium phosphate used
5	AP-SSE-F2-B5	7/29/2021	10:20	Water	1	x	1M Monosodium phosphate used
6	AP-SSE-F2-B6	7/29/2021	10:25	Water	1	x	1M Monosodium phosphate used
7	AP-SSE-F2-B7	7/29/2021	10:30	Water	1	x	1M Monosodium phosphate used
8	AP-SSE-F2-B8	7/29/2021	10:35	Water	1	x	1M Monosodium phosphate used
9	AP-SSE-F2-B9	7/29/2021	10:40	Water	1	x	1M Monosodium phosphate used
10	AP-SSE-F2-B10	7/29/2021	10:45	Water	1	x	1M Monosodium phosphate used
11	AP-SSE-F2-B7D	7/29/2021	10:50	Water	1	x	1M Monosodium phosphate used
12	AP-SSE-F2-MB	7/29/2021	10:55	Water	1	x	1M Monosodium phosphate used

Comments: Samples may contain elevated Mg and Ca levels. Please analyze with minimal dilution to achieve best DLs. Samples have been preserved with nitric acid.

Relinquished By: Anthony Dalton-Atha	Company: AQEA
Signature/Printed Name	Date/Time: 8/3/2021 0845
Received By: Eli Joyner	Company: APEX LABS
Signature/Printed Name	Date/Time: 8/3/21 1235
Relinquished By:	Company:
Signature/Printed Name	Date/Time
Received By:	Company:
Signature/Printed Name	Date/Time

Page 2 of 5

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The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darwin Thomas, Business Development Director

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Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0074 - 09 12 21 0555**

A1H0074

Chain of Custody Record & Laboratory Analysis Request

ANCHOR QEA

Company: Anchor QEA
Date: 8/3/2021
Project Name: Alabama Power - Barry
Project Number:
Project Manager: Anthony Dalton-Atha adalton-atha@anchorqea.com
Phone Number:
Shipment Method:
Samplers: Modi Raduma

Line	Field Sample ID	Collection Date/Time		Matrix	No. of Containers	As, Co, Fe, Mn	Comments/Preservation
1	AP-SSE-F3-B1	7/30/2021	10:00	Water	1	x	0.1M Hydroxylamine hydrochloride used
2	AP-SSE-F3-B2	7/30/2021	10:05	Water	1	x	0.1M Hydroxylamine hydrochloride used
3	AP-SSE-F3-B3	7/30/2021	10:10	Water	1	x	0.1M Hydroxylamine hydrochloride used
4	AP-SSE-F3-B4	7/30/2021	10:15	Water	1	x	0.1M Hydroxylamine hydrochloride used
5	AP-SSE-F3-B5	7/30/2021	10:20	Water	1	x	0.1M Hydroxylamine hydrochloride used
6	AP-SSE-F3-B6	7/30/2021	10:25	Water	1	x	0.1M Hydroxylamine hydrochloride used
7	AP-SSE-F3-B7	7/30/2021	10:30	Water	1	x	0.1M Hydroxylamine hydrochloride used
8	AP-SSE-F3-B8	7/30/2021	10:35	Water	1	x	0.1M Hydroxylamine hydrochloride used
9	AP-SSE-F3-B9	7/30/2021	10:40	Water	1	x	0.1M Hydroxylamine hydrochloride used
10	AP-SSE-F3-B10	7/30/2021	10:45	Water	1	x	0.1M Hydroxylamine hydrochloride used
11	AP-SSE-F3-B7D	7/30/2021	10:50	Water	1	x	0.1M Hydroxylamine hydrochloride used
12	AP-SSE-F3-MB	7/30/2021	10:55	Water	1	x	0.1M Hydroxylamine hydrochloride used

Test Parameters

Comments: Samples may contain elevated Mg and Ca levels. Please analyze with minimal dilution to achieve best DLs. Samples have been preserved with nitric acid.

Relinquished By: Anthony Dalton-Atha	Company: AQEA	Received By: Eli Joyner	Company: APEX LABS
Signature/Printed Name	Date/Time 8/3/2021 0945	Signature/Printed Name	Date/Time 8/3/21 1235
Relinquished By:	Company:	Received By:	Company:
Signature/Printed Name	Date/Time	Signature/Printed Name	Date/Time

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Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: 201114-01.01	**Report ID:**
Portland, OR 97219	Project Manager: Anthony Dalton-Atha	A1H0074 - 09 12 21 0555

A1H0074

Chain of Custody Record & Laboratory Analysis Request

ANCHOR QEA

Company: Anchor QEA
Date: 8/3/2021
Project Name: Alabama Power - Barry
Project Number:
Project Manager: Anthony Dalton-Atha adalton-atha@anchorqea.com
Phone Number:
Shipment Method:
Samplers: Modi Raduma

Line	Field Sample ID	Collection Date/Time		Matrix	No. of Containers	As, Co, Fe, Mn	Comments/Preservation
1	AP-SSE-F4-B1	8/2/2021	10:00	Water	1	x	Caution! Conc. Nitric acid.
2	AP-SSE-F4-B2	8/2/2021	10:05	Water	1	x	Caution! Conc. Nitric acid.
3	AP-SSE-F4-B3	8/2/2021	10:10	Water	1	x	Caution! Conc. Nitric acid.
4	AP-SSE-F4-B4	8/2/2021	10:15	Water	1	x	Caution! Conc. Nitric acid.
5	AP-SSE-F4-B5	8/2/2021	10:20	Water	1	x	Caution! Conc. Nitric acid.
6	AP-SSE-F4-B6	8/2/2021	10:25	Water	1	x	Caution! Conc. Nitric acid.
7	AP-SSE-F4-B7	8/2/2021	10:30	Water	1	x	Caution! Conc. Nitric acid.
8	AP-SSE-F4-B8	8/2/2021	10:35	Water	1	x	Caution! Conc. Nitric acid.
9	AP-SSE-F4-B9	8/2/2021	10:40	Water	1	x	Caution! Conc. Nitric acid.
10	AP-SSE-F4-B10	8/2/2021	10:45	Water	1	x	Caution! Conc. Nitric acid.
11	AP-SSE-F4-B7D	8/2/2021	10:50	Water	1	x	Caution! Conc. Nitric acid.
12	AP-SSE-F4-MB	8/2/2021	10:55	Water	1	x	Caution! Conc. Nitric acid.

Comments: Samples may contain elevated Mg and Ca levels. Please analyze with minimal dilution to achieve best DLs. Samples have been preserved with nitric acid.

Relinquished By: Anthony Dalton-Atha	Company: AQEA	Received By: Eli Joyner	Company: APEX LAB
Signature/Printed Name	Date/Time 8/3/2021 0945	Signature/Printed Name	Date/Time 8/3/21 1235
Relinquished By:	Company:	Received By:	Company:
Signature/Printed Name	Date/Time	Signature/Printed Name	Date/Time

Page 4 of 5

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	A1H0074 - 09 12 21 0555

A1H0074

ANCHOR QEA

Chain of Custody Record & Laboratory Analysis Request

Company: Anchor QEA
Date: 8/3/2021
Project Name: Alabama Power - Barry
Project Number:
Project Manager: Anthony Dalton-Atha adalton-atha@anchorqea.com
Phone Number:
Shipment Method:
Samplers: Modi Raduma

Test Parameters

Line	Field Sample ID	Collection Date/Time		Matrix	No. of Containers	As, Co, Fe, Mn	Comments/Preservation
1	AP-SSE-F4-B1	8/3/2021	8:00	Soil	1	x	
2	AP-SSE-F4-B2	8/3/2021	8:05	Soil	1	x	
3	AP-SSE-F4-B3	8/3/2021	8:10	Soil	1	x	
4	AP-SSE-F4-B4	8/3/2021	8:15	Soil	1	x	
5	AP-SSE-F4-B5	8/3/2021	8:20	Soil	1	x	
6	AP-SSE-F4-B6	8/3/2021	8:25	Soil	1	x	
7	AP-SSE-F4-B7	8/3/2021	8:30	Soil	1	x	
8	AP-SSE-F4-B8	8/3/2021	8:35	Soil	1	x	
9	AP-SSE-F4-B9	8/3/2021	8:40	Soil	1	x	
10	AP-SSE-F4-B10	8/3/2021	8:45	Soil	1	x	
11	AP-SSE-F4-B7D	8/3/2021	8:50	Soil	1	x	
12							

Comments: Samples may contain elevated Mg and Ca levels. Please analyze with minimal dilution to achieve best DLs. Samples have been preserved with nitric acid.

Relinquished By: Anthony Dalton-Atha	Company: AQEA	Received By: Eli [illegible]	Company: APEX LABS
Signature/Printed Name	Date/Time 8/3/2021 0925	Signature/Printed Name	Date/Time 8/3/21 1235
Relinquished By:	Company:	Received By:	Company:
Signature/Printed Name	Date/Time	Signature/Printed Name	Date/Time

Page 5 of 5

Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darwin Thomas, Business Development Director

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Barry**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0074 - 09 12 21 0555**

APEX LABS COOLER RECEIPT FORM

Client: Anchor QEA Element WO#: A1 H0074

Project/Project #: Alabama Power - Barry

Delivery Info:

Date/time received: 8/3/21 @ 1235 By: EJ

Delivered by: Apex X Client____ESS____FedEx____UPS____Swift____Senvoy____SDS____Other____

Cooler Inspection Date/time inspected: 8/3/21 @ 1403 By: EJ

Chain of Custody included? Yes X No ____ Custody seals? Yes X No ____

Signed/dated by client? Yes X No ____

Signed/dated by Apex? Yes X No ____

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	0.8	*5.7					
Received on ice? (Y/N)	Y	Y					
Temp. blanks? (Y/N)	N	N					
Ice type: (Gel/Real/Other)	Gel	gel					
Condition:	Good	good					

Cooler out of temp? (Y/N) Possible reason why:

Green dots applied to ~~out~~ of temperature samples? Yes/No

Out of temperature samples form initiated? Yes/No

Sample Inspection: Date/time inspected: 8/3/21 @ ~~18~~ 2010 By: TAG
arc 8/3/21

All samples intact? Yes X No ___ Comments:

Bottle labels/COCs agree? Yes ___ No X Comments: "AP-SSE-F4" listed twice on COC, ID prefixes on containers for page 5 read "AP-SSE-F5"

COC/container discrepancies form initiated? Yes ___ No X

Containers/volumes received appropriate for analysis? Yes X No ___ Comments:

Do VOA vials have visible headspace? Yes ___ No ___ NA X

Comments

Water samples: pH checked: Yes___No___NA X pH appropriate? Yes___No___NA X

Comments:

Additional information: *5.7 cooler received At 1526 8/3/21 JS

Labeled by: MAS ~~8/3~~ arc 8/3/21 Witness: TAG Cooler Inspected by: TAG

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darwin Thomas, Business Development Director

July 12, 2021

Service Request No:K2106547

Masa Kanematsu
Anchor QEA, LLC
6720 SW Macadam Avenue
Suite 125
Portland, OR 97219

Laboratory Results for: Barry

Dear Masa,

Enclosed are the results of the sample(s) submitted to our laboratory June 08, 2021
For your reference, these analyses have been assigned our service request number **K2106547.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at Mark.Harris@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Mark Harris
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental

Narrative Documents

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: Anchor QEA, LLC
Project: Barry
Sample Matrix: Water

Service Request: K2106547
Date Received: 06/08/2021

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

Three water samples were received for analysis at ALS Environmental on 06/08/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Metals:

No significant anomalies were noted with this analysis.

General Chemistry:

Method 300.0, 06/08/2021: The matrix spike recoveries of Chloride for sample BRY-MW-8-20210604 were outside control criteria. Recovery in the Laboratory Control Sample (LCS) was acceptable, which indicated the analytical batch was in control. The matrix spike outliers suggested a potential high bias in this matrix. No further corrective action was appropriate.

Method 300.0, 06/08/2021: All samples in this delivery group were received past holding time. The analysis was performed as soon as possible after receipt by the laboratory. The data was flagged to indicate the holding time violation.

Method SM 4500-P E, 06/10/2021: All samples in this delivery group were received past holding time. The analysis was performed as soon as possible after receipt by the laboratory. The data was flagged to indicate the holding time violation.

Approved by Noel D. Dai

Date 07/12/2021

ALS Environmental

SAMPLE DETECTION SUMMARY

CLIENT ID: BRY-MW-8-20210604		Lab ID: K2106547-001				
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Alkalinity as CaCO3, Total	143		3	15	mg/L	SM 2320 B
Ammonia as Nitrogen	0.503		0.020	0.050	mg/L	350.1
Bicarbonate as CaCO3	143			15	mg/L	SM 2320 B
Carbon, Total Organic	9.70		0.07	0.50	mg/L	SM 5310 C
Chloride	19.4		0.04	0.50	mg/L	300.0
Sulfate	0.26	J	0.04	0.40	mg/L	300.0
Aluminum, Dissolved	4	J	3	20	ug/L	200.8
Arsenic, Dissolved	3.5		0.5	2.5	ug/L	200.8
Barium, Dissolved	62.7		0.10	0.25	ug/L	200.8
Boron, Dissolved	1040		3	10	ug/L	200.8
Calcium, Dissolved	6760		3	21	ug/L	6010C
Chromium, Dissolved	0.5	J	0.2	1.0	ug/L	200.8
Cobalt, Dissolved	0.55		0.05	0.10	ug/L	200.8
Iron, Dissolved	40100		2	10	ug/L	200.8
Lithium, Dissolved	1.86		0.50	0.50	ug/L	200.8
Magnesium, Dissolved	5010		0.4	5.3	ug/L	6010C
Manganese, Dissolved	1620		0.2	1.0	ug/L	200.8
Molybdenum, Dissolved	0.16	J	0.15	0.50	ug/L	200.8
Nickel, Dissolved	0.3	J	0.2	1.0	ug/L	200.8
Potassium, Dissolved	2300		60	210	ug/L	6010C
Silicon, Dissolved	5470		30	210	ug/L	6010C
Sodium, Dissolved	35200		30	210	ug/L	6010C
Aluminum	3	J	3	20	ug/L	200.8
Iron	41000		2	10	ug/L	200.8
Manganese	1600		0.2	1.0	ug/L	200.8

CLIENT ID: BRY-MW-10-20210604		Lab ID: K2106547-002				
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Alkalinity as CaCO3, Total	236		3	15	mg/L	SM 2320 B
Ammonia as Nitrogen	1.45		0.020	0.050	mg/L	350.1
Bicarbonate as CaCO3	236			15	mg/L	SM 2320 B
Carbon, Total Organic	11.7		0.07	0.50	mg/L	SM 5310 C
Chloride	23.7		0.04	0.50	mg/L	300.0
Sulfate	0.26	J	0.04	0.40	mg/L	300.0
Aluminum, Dissolved	4	J	3	20	ug/L	200.8
Arsenic, Dissolved	1.5	J	0.5	2.5	ug/L	200.8
Barium, Dissolved	45.6		0.10	0.25	ug/L	200.8
Boron, Dissolved	2020		3	10	ug/L	200.8
Calcium, Dissolved	58000		6	42	ug/L	6010C
Chromium, Dissolved	0.3	J	0.2	1.0	ug/L	200.8
Cobalt, Dissolved	0.59		0.05	0.10	ug/L	200.8
Iron, Dissolved	43400		2	10	ug/L	200.8

ALS Environmental

SAMPLE DETECTION SUMMARY

CLIENT ID: BRY-MW-10-20210604			Lab ID: K2106547-002			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Lithium, Dissolved	2.35		0.50	0.50	ug/L	200.8
Magnesium, Dissolved	17500		0.8	11	ug/L	6010C
Manganese, Dissolved	1520		0.2	1.0	ug/L	200.8
Nickel, Dissolved	0.2	J	0.2	1.0	ug/L	200.8
Potassium, Dissolved	1630		130	420	ug/L	6010C
Silicon, Dissolved	12100		60	420	ug/L	6010C
Sodium, Dissolved	25000		60	420	ug/L	6010C
Aluminum	5	J	3	20	ug/L	200.8
Iron	53000		2	10	ug/L	200.8
Manganese	1510		0.2	1.0	ug/L	200.8

CLIENT ID: BRY-MW-15-20210604			Lab ID: K2106547-003			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Alkalinity as CaCO3, Total	30		3	15	mg/L	SM 2320 B
Ammonia as Nitrogen	0.250		0.020	0.050	mg/L	350.1
Bicarbonate as CaCO3	30			15	mg/L	SM 2320 B
Carbon, Total Organic	3.80		0.07	0.50	mg/L	SM 5310 C
Chloride	76.0		0.2	2.0	mg/L	300.0
Sulfate	0.11	J	0.04	0.40	mg/L	300.0
Aluminum, Dissolved	3	J	3	20	ug/L	200.8
Arsenic, Dissolved	0.8	J	0.5	2.5	ug/L	200.8
Barium, Dissolved	68.0		0.10	0.25	ug/L	200.8
Boron, Dissolved	18		3	10	ug/L	200.8
Calcium, Dissolved	31500		3	21	ug/L	6010C
Cobalt, Dissolved	32.5		0.05	0.10	ug/L	200.8
Iron, Dissolved	74400		2	10	ug/L	200.8
Lead, Dissolved	1.01		0.03	0.10	ug/L	200.8
Lithium, Dissolved	3.69		0.50	0.50	ug/L	200.8
Magnesium, Dissolved	10400		0.4	5.3	ug/L	6010C
Manganese, Dissolved	721		0.2	1.0	ug/L	200.8
Molybdenum, Dissolved	0.18	J	0.15	0.50	ug/L	200.8
Nickel, Dissolved	3.3		0.2	1.0	ug/L	200.8
Potassium, Dissolved	910		60	210	ug/L	6010C
Silicon, Dissolved	14700		30	210	ug/L	6010C
Sodium, Dissolved	19400		30	210	ug/L	6010C
Aluminum	3	J	3	20	ug/L	200.8
Iron	82700		2	10	ug/L	200.8
Manganese	717		0.2	1.0	ug/L	200.8

Sample Receipt Information

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: Anchor QEA, LLC **Service Request:** K2106547
Project: Barry/201114-01.02 Task 02

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K2106547-001	BRY-MW-8-20210604	6/4/2021	1230
K2106547-002	BRY-MW-10-20210604	6/4/2021	1400
K2106547-003	BRY-MW-15-20210604	6/4/2021	1200

K2106547

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number:	503-972-5019
Date:	6/8/2021
Project Name:	Barry
Project Number:	201114-01.02 Task 02
Project Manager:	Masa Kanematsu
Phone Number:	503-972-5001 (Masa Kanematsu)
Shipment Method:	Fedex Overnight

ANCHOR QEA
Jessica Goin
6720 SW Macadam Ave
Suite 125
Portland OR 97219

Line	Field Sample ID	Collection Date	Collection Time	Matrix	No. of Containers	Arsenic (diss.) 3d TAT	Arsenic, Cobalt (diss.) 3d TAT	Dissolved metals	Total Metals (Al, Fe, Mn)	Anions	Ortho-Phosphate	Alkalinity	Total Organic Carbon	Ammonia as N								Comments/Preservation
1	BRY-MW-8-20210604	6/4/2021	12:30	Water	6	X		X	X	X	X	X	X	X								
2	BRY-MW-10-20210604	6/4/2021	14:00	Water	6	X		X	X	X	X	X	X	X								
3	BRY-MW-15-20210604	6/4/2021	12:00	Water	6		X	X	X	X	X	X	X	X								
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						
13																						
14																						
15																						

Notes: **Please analyze all analytes with Standard TAT on this page otherwise noted.** For specific dissolved metals (As, Co), please analyze by EPA 200.8 with 3 day TAT if possible.
Dissolved metals: Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Fe, Pb, Li, Mg, Mn, Mo, Ni, K, Se, Si, Ag, Na, Tl, Zn), Anions (Cl, F, nitrate, nitrite, Sulfate)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	K Moore	ALS
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
	6/8/2020 9:00		6/8/21 1300

Relinquished by:	Company:	Received by:	Company:
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original.

Page 1 of 1

K2106547

Laboratory Parameters			
Constituent*	Analytical Method	Constituent*	Analytical Method
Alkalinity (Total as $CaCO_3$)	SM 2320 B	Lead	USEPA 200.8
Aluminum	USEPA 200.8	Lithium	USEPA 200.7
Aluminum (Total)	USEPA 200.8	Magnesium	USEPA 200.7
Ammonia as N	USEPA 350.1	Manganese	USEPA 200.8
Antimony	USEPA 200.8	Manganese (Total)	USEPA 200.8
Arsenic	USEPA 200.8	Molybdenum	USEPA 200.8
Barium	USEPA 200.8	Nickel	USEPA 200.8
Beryllium	USEPA 200.8	Nitrogen Nitrate/Nitrite	USEPA 353.2
Bicarbonate Alkalinity (Calculated)	SM 4500CO2 D	Ortho Phosphate	SM 4500PF-OP
Boron	USEPA 200.7	Potassium	USEPA 200.8
Cadmium	USEPA 200.8	Selenium	USEPA 200.8
Calcium	USEPA 200.7	Silicon	USEPA 200.7
Carbonate Alkalinity (Calculated)	SM 4500CO2 D	Silver	USEPA 200.8
Chloride	SM4500Cl E	Sodium	USEPA 200.7
Chromium	USEPA 200.8	Sulfate	SM 4500SO4 E
Cobalt	USEPA 200.8	Thallium	USEPA 200.8
Fluoride	SM 4500F G 2017	Total Organic Carbon	SM 5310 B
Iron	USEPA 200.7	Zinc	USEPA 200.8
Iron (Total)	USEPA 200.7		

PM MH

Cooler Receipt and Preservation Form

Client Anchor Service Request K21 06547

Received: 6/8/21 Opened: 6/8/21 By: Kr Unloaded: 6/8/21 By: K

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* ______ *NA*
3. Were custody seals on coolers? NA Y N If yes, how many and where? ______
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N
4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number / NA	Filed
	10.1	IR01		X	X		

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* ______
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: Rec'd opttos past Hold. Rec-d out of temp-

SHORT HOLD TIME

Miscellaneous Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
  DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
  DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
  DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Analyst Summary report

Client: Anchor QEA, LLC **Service Request:** K2106547
Project: Barry/201114-01.02 Task 02

Sample Name: BRY-MW-8-20210604 **Date Collected:** 06/4/21
Lab Code: K2106547-001 **Date Received:** 06/8/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE
300.0		KABROWN
350.1	ESCHLOSS	ESCHLOSS
6010C	ABOYER	RMOORE
SM 2320 B		GOLSON
SM 4500-P E		KABROWN
SM 5310 C		MSPECHT

Sample Name: BRY-MW-8-20210604 **Date Collected:** 06/4/21
Lab Code: K2106547-001.R01 **Date Received:** 06/8/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		KABROWN

Sample Name: BRY-MW-10-20210604 **Date Collected:** 06/4/21
Lab Code: K2106547-002 **Date Received:** 06/8/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE
300.0		KABROWN
350.1	ESCHLOSS	ESCHLOSS
6010C	ABOYER	RMOORE
SM 2320 B		GOLSON
SM 4500-P E		KABROWN
SM 5310 C		MSPECHT

Client: Anchor QEA, LLC
Project: Barry/201114-01.02 Task 02
Service Request: K2106547

Sample Name: BRY-MW-10-20210604
Lab Code: K2106547-002.R01
Sample Matrix: Water
Date Collected: 06/4/21
Date Received: 06/8/21

Analysis Method	Extracted/Digested By	Analyzed By
300.0		KABROWN

Sample Name: BRY-MW-15-20210604
Lab Code: K2106547-003
Sample Matrix: Water
Date Collected: 06/4/21
Date Received: 06/8/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE
300.0		KABROWN
350.1	ESCHLOSS	ESCHLOSS
6010C	ABOYER	RMOORE
SM 2320 B		GOLSON
SM 4500-P E		KABROWN
SM 5310 C		MSPECHT

Sample Name: BRY-MW-15-20210604
Lab Code: K2106547-003.R01
Sample Matrix: Water
Date Collected: 06/4/21
Date Received: 06/8/21

Analysis Method	Extracted/Digested By	Analyzed By
300.0		KABROWN

Sample Results

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Metals

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2106547
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	06/04/21 12:30
Sample Matrix:	Water	**Date Received:**	06/08/21 13:00
Sample Name:	BRY-MW-8-20210604	**Basis:**	NA
Lab Code:	K2106547-001		

Dissolved Metals

Analyte Name	Analysis Method	Result		Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	200.8	**4**	**J**	ug/L	20	3	5	07/10/21 08:53	06/15/21	
Antimony	200.8	ND	U	ug/L	0.25	0.10	5	07/10/21 08:53	06/15/21	
Arsenic	200.8	**3.5**		ug/L	2.5	0.5	5	07/10/21 08:53	06/15/21	
Barium	200.8	**62.7**		ug/L	0.25	0.10	5	07/10/21 08:53	06/15/21	
Beryllium	200.8	ND	U	ug/L	0.10	0.03	5	07/10/21 08:53	06/15/21	
Boron	200.8	**1040**		ug/L	10	3	5	07/10/21 08:53	06/15/21	
Cadmium	200.8	ND	U	ug/L	0.10	0.04	5	07/10/21 08:53	06/15/21	
Calcium	6010C	**6760**		ug/L	21	3	1	06/18/21 19:18	06/15/21	
Chromium	200.8	**0.5**	**J**	ug/L	1.0	0.2	5	07/10/21 08:53	06/15/21	
Cobalt	200.8	**0.55**		ug/L	0.10	0.05	5	07/10/21 08:53	06/15/21	
Iron	200.8	**40100**		ug/L	10	2	5	07/10/21 08:53	06/15/21	
Lead	200.8	ND	U	ug/L	0.10	0.03	5	07/10/21 08:53	06/15/21	
Lithium	200.8	**1.86**		ug/L	0.50	0.50	5	07/10/21 08:53	06/15/21	
Magnesium	6010C	**5010**		ug/L	5.3	0.4	1	06/18/21 19:18	06/15/21	
Manganese	200.8	**1620**		ug/L	1.0	0.2	5	07/10/21 08:53	06/15/21	
Molybdenum	200.8	**0.16**	**J**	ug/L	0.50	0.15	5	07/10/21 08:53	06/15/21	
Nickel	200.8	**0.3**	**J**	ug/L	1.0	0.2	5	07/10/21 08:53	06/15/21	
Potassium	6010C	**2300**		ug/L	210	60	1	06/18/21 19:18	06/15/21	
Selenium	200.8	ND	U	ug/L	5.0	1.0	5	07/10/21 08:53	06/15/21	
Silicon	6010C	**5470**		ug/L	210	30	1	06/18/21 19:18	06/15/21	
Silver	200.8	ND	U	ug/L	0.20	0.05	5	07/10/21 08:53	06/15/21	
Sodium	6010C	**35200**		ug/L	210	30	1	06/18/21 19:18	06/15/21	
Thallium	200.8	ND	U	ug/L	0.10	0.05	5	07/10/21 08:53	06/15/21	
Zinc	200.8	ND	U	ug/L	10	3	5	07/10/21 08:53	06/15/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2106547
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	06/04/21 12:30
Sample Matrix:	Water	**Date Received:**	06/08/21 13:00
Sample Name:	BRY-MW-8-20210604	**Basis:**	NA
Lab Code:	K2106547-001		

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	200.8	**3 J**	ug/L	20	3	5	07/10/21 08:36	06/15/21	
Iron	200.8	**41000**	ug/L	10	2	5	07/10/21 08:36	06/15/21	
Manganese	200.8	**1600**	ug/L	1.0	0.2	5	07/10/21 08:36	06/15/21	

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2106547
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	06/04/21 14:00
Sample Matrix:	Water	**Date Received:**	06/08/21 13:00
Sample Name:	BRY-MW-10-20210604	**Basis:**	NA
Lab Code:	K2106547-002		

Dissolved Metals

Analyte Name	Analysis Method	Result		Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	200.8	**4**	**J**	ug/L	20	3	5	07/10/21 08:50	06/15/21	
Antimony	200.8	ND	U	ug/L	0.25	0.10	5	07/10/21 08:50	06/15/21	
Arsenic	200.8	**1.5**	**J**	ug/L	2.5	0.5	5	07/10/21 08:50	06/15/21	
Barium	200.8	**45.6**		ug/L	0.25	0.10	5	07/10/21 08:50	06/15/21	
Beryllium	200.8	ND	U	ug/L	0.10	0.03	5	07/10/21 08:50	06/15/21	
Boron	200.8	**2020**		ug/L	10	3	5	07/10/21 08:50	06/15/21	
Cadmium	200.8	ND	U	ug/L	0.10	0.04	5	07/10/21 08:50	06/15/21	
Calcium	6010C	**58000**		ug/L	42	6	1	06/18/21 19:20	06/15/21	
Chromium	200.8	**0.3**	**J**	ug/L	1.0	0.2	5	07/10/21 08:50	06/15/21	
Cobalt	200.8	**0.59**		ug/L	0.10	0.05	5	07/10/21 08:50	06/15/21	
Iron	200.8	**43400**		ug/L	10	2	5	07/10/21 08:50	06/15/21	
Lead	200.8	ND	U	ug/L	0.10	0.03	5	07/10/21 08:50	06/15/21	
Lithium	200.8	**2.35**		ug/L	0.50	0.50	5	07/10/21 08:50	06/15/21	
Magnesium	6010C	**17500**		ug/L	11	0.8	1	06/18/21 19:20	06/15/21	
Manganese	200.8	**1520**		ug/L	1.0	0.2	5	07/10/21 08:50	06/15/21	
Molybdenum	200.8	ND	U	ug/L	0.50	0.15	5	07/10/21 08:50	06/15/21	
Nickel	200.8	**0.2**	**J**	ug/L	1.0	0.2	5	07/10/21 08:50	06/15/21	
Potassium	6010C	**1630**		ug/L	420	130	1	06/18/21 19:20	06/15/21	
Selenium	200.8	ND	U	ug/L	5.0	1.0	5	07/10/21 08:50	06/15/21	
Silicon	6010C	**12100**		ug/L	420	60	1	06/18/21 19:20	06/15/21	
Silver	200.8	ND	U	ug/L	0.20	0.05	5	07/10/21 08:50	06/15/21	
Sodium	6010C	**25000**		ug/L	420	60	1	06/18/21 19:20	06/15/21	
Thallium	200.8	ND	U	ug/L	0.10	0.05	5	07/10/21 08:50	06/15/21	
Zinc	200.8	ND	U	ug/L	10	3	5	07/10/21 08:50	06/15/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2106547
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	06/04/21 14:00
Sample Matrix:	Water		**Date Received:**	06/08/21 13:00
Sample Name:	BRY-MW-10-20210604		**Basis:**	NA
Lab Code:	K2106547-002			

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	200.8	**5 J**	ug/L	20	3	5	07/10/21 08:43	06/15/21	
Iron	200.8	**53000**	ug/L	10	2	5	07/10/21 08:43	06/15/21	
Manganese	200.8	**1510**	ug/L	1.0	0.2	5	07/10/21 08:43	06/15/21	

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2106547
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	06/04/21 12:00
Sample Matrix:	Water	**Date Received:**	06/08/21 13:00
Sample Name:	BRY-MW-15-20210604	**Basis:**	NA
Lab Code:	K2106547-003		

Dissolved Metals

Analyte Name	Analysis Method	Result		Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	200.8	**3**	**J**	ug/L	20	3	5	07/10/21 08:48	06/15/21	
Antimony	200.8	ND	U	ug/L	0.25	0.10	5	07/10/21 08:48	06/15/21	
Arsenic	200.8	**0.8**	**J**	ug/L	2.5	0.5	5	07/10/21 08:48	06/15/21	
Barium	200.8	**68.0**		ug/L	0.25	0.10	5	07/10/21 08:48	06/15/21	
Beryllium	200.8	ND	U	ug/L	0.10	0.03	5	07/10/21 08:48	06/15/21	
Boron	200.8	**18**		ug/L	10	3	5	07/10/21 09:49	06/15/21	
Cadmium	200.8	ND	U	ug/L	0.10	0.04	5	07/10/21 08:48	06/15/21	
Calcium	6010C	**31500**		ug/L	21	3	1	06/18/21 19:43	06/15/21	
Chromium	200.8	ND	U	ug/L	1.0	0.2	5	07/10/21 08:48	06/15/21	
Cobalt	200.8	**32.5**		ug/L	0.10	0.05	5	07/10/21 08:48	06/15/21	
Iron	200.8	**74400**		ug/L	10	2	5	07/10/21 08:48	06/15/21	
Lead	200.8	**1.01**		ug/L	0.10	0.03	5	07/10/21 08:48	06/15/21	
Lithium	200.8	**3.69**		ug/L	0.50	0.50	5	07/10/21 08:48	06/15/21	
Magnesium	6010C	**10400**		ug/L	5.3	0.4	1	06/18/21 19:43	06/15/21	
Manganese	200.8	**721**		ug/L	1.0	0.2	5	07/10/21 08:48	06/15/21	
Molybdenum	200.8	**0.18**	**J**	ug/L	0.50	0.15	5	07/10/21 08:48	06/15/21	
Nickel	200.8	**3.3**		ug/L	1.0	0.2	5	07/10/21 08:48	06/15/21	
Potassium	6010C	**910**		ug/L	210	60	1	06/18/21 19:43	06/15/21	
Selenium	200.8	ND	U	ug/L	5.0	1.0	5	07/10/21 08:48	06/15/21	
Silicon	6010C	**14700**		ug/L	210	30	1	06/18/21 19:43	06/15/21	
Silver	200.8	ND	U	ug/L	0.20	0.05	5	07/10/21 08:48	06/15/21	
Sodium	6010C	**19400**		ug/L	210	30	1	06/18/21 19:43	06/15/21	
Thallium	200.8	ND	U	ug/L	0.10	0.05	5	07/10/21 08:48	06/15/21	
Zinc	200.8	ND	U	ug/L	10	3	5	07/10/21 08:48	06/15/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2106547
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	06/04/21 12:00
Sample Matrix:	Water	**Date Received:**	06/08/21 13:00
Sample Name:	BRY-MW-15-20210604	**Basis:**	NA
Lab Code:	K2106547-003		

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	200.8	**3 J**	ug/L	20	3	5	07/10/21 08:46	06/15/21	
Iron	200.8	**82700**	ug/L	10	2	5	07/10/21 08:46	06/15/21	
Manganese	200.8	**717**	ug/L	1.0	0.2	5	07/10/21 08:46	06/15/21	

General Chemistry

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2106547
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	06/04/21 12:30
Sample Matrix:	Water	**Date Received:**	06/08/21 13:00
Sample Name:	BRY-MW-8-20210604	**Basis:**	NA
Lab Code:	K2106547-001		

General Chemistry Parameters

Analyte Name	Analysis Method	Result		Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Alkalinity as CaCO3, Total	SM 2320 B	**143**		mg/L	15	3	1	06/11/21 16:16	NA	
Ammonia as Nitrogen	350.1	**0.503**		mg/L	0.050	0.020	1	06/09/21 10:31	06/09/21	
Bicarbonate as CaCO3	SM 2320 B	**143**		mg/L	15	3	1	06/11/21 16:16	NA	
Carbon, Total Organic	SM 5310 C	**9.70**		mg/L	0.50	0.07	1	06/17/21 16:02	NA	
Carbonate as CaCO3	SM 2320 B	ND	U	mg/L	15	3	1	06/11/21 16:16	NA	
Chloride	300.0	**19.4**		mg/L	0.50	0.04	5	06/09/21 16:54	NA	
Fluoride	300.0	ND	U	mg/L	0.20	0.01	2	06/08/21 17:54	NA	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.10	0.02	2	06/08/21 17:54	NA	*
Nitrite as Nitrogen	300.0	ND	U	mg/L	0.10	0.006	2	06/08/21 17:54	NA	*
Orthophosphate as Phosphorus	SM 4500-P E	ND	U	mg/L	0.050	0.020	1	06/10/21 10:00	NA	*
Sulfate	300.0	**0.26**	**J**	mg/L	0.40	0.04	2	06/08/21 17:54	NA	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2106547
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	06/04/21 14:00
Sample Matrix:	Water	**Date Received:**	06/08/21 13:00
Sample Name:	BRY-MW-10-20210604	**Basis:**	NA
Lab Code:	K2106547-002		

General Chemistry Parameters

Analyte Name	Analysis Method	Result		Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Alkalinity as CaCO3, Total	SM 2320 B	**236**		mg/L	15	3	1	06/11/21 16:16	NA	
Ammonia as Nitrogen	350.1	**1.45**		mg/L	0.050	0.020	1	06/09/21 10:31	06/09/21	
Bicarbonate as CaCO3	SM 2320 B	**236**		mg/L	15	3	1	06/11/21 16:16	NA	
Carbon, Total Organic	SM 5310 C	**11.7**		mg/L	0.50	0.07	1	06/17/21 16:02	NA	
Carbonate as CaCO3	SM 2320 B	ND	U	mg/L	15	3	1	06/11/21 16:16	NA	
Chloride	300.0	**23.7**		mg/L	0.50	0.04	5	06/09/21 17:05	NA	
Fluoride	300.0	ND	U	mg/L	0.20	0.01	2	06/08/21 18:50	NA	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.10	0.02	2	06/08/21 18:50	NA	*
Nitrite as Nitrogen	300.0	ND	U	mg/L	0.10	0.006	2	06/08/21 18:50	NA	*
Orthophosphate as Phosphorus	SM 4500-P E	ND	U	mg/L	0.050	0.020	1	06/10/21 10:00	NA	*
Sulfate	300.0	**0.26**	**J**	mg/L	0.40	0.04	2	06/08/21 18:50	NA	

Client:	Anchor QEA, LLC		**Service Request:**	K2106547
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	06/04/21 12:00
Sample Matrix:	Water		**Date Received:**	06/08/21 13:00
Sample Name:	BRY-MW-15-20210604		**Basis:**	NA
Lab Code:	K2106547-003			

General Chemistry Parameters

Analyte Name	Analysis Method	Result		Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Alkalinity as CaCO3, Total	SM 2320 B	**30**		mg/L	15	3	1	06/11/21 16:16	NA	
Ammonia as Nitrogen	350.1	**0.250**		mg/L	0.050	0.020	1	06/09/21 10:31	06/09/21	
Bicarbonate as CaCO3	SM 2320 B	**30**		mg/L	15	3	1	06/11/21 16:16	NA	
Carbon, Total Organic	SM 5310 C	**3.80**		mg/L	0.50	0.07	1	06/17/21 16:02	NA	
Carbonate as CaCO3	SM 2320 B	ND	U	mg/L	15	3	1	06/11/21 16:16	NA	
Chloride	300.0	**76.0**		mg/L	2.0	0.2	20	06/09/21 17:40	NA	
Fluoride	300.0	ND	U	mg/L	0.20	0.01	2	06/08/21 19:01	NA	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.10	0.02	2	06/08/21 19:01	NA	*
Nitrite as Nitrogen	300.0	ND	U	mg/L	0.10	0.006	2	06/08/21 19:01	NA	*
Orthophosphate as Phosphorus	SM 4500-P E	ND	U	mg/L	0.050	0.020	1	06/10/21 10:00	NA	*
Sulfate	300.0	**0.11**	**J**	mg/L	0.40	0.04	2	06/08/21 19:01	NA	

QC Summary Forms

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Metals

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2106547
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	KQ2110915-02		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	6010C	ND U	ug/L	21	3	1	06/18/21 19:15	06/15/21	
Magnesium	6010C	ND U	ug/L	5.3	0.4	1	06/18/21 19:15	06/15/21	
Potassium	6010C	ND U	ug/L	210	60	1	06/18/21 19:15	06/15/21	
Silicon	6010C	**40 J**	ug/L	210	30	1	06/18/21 19:15	06/15/21	
Sodium	6010C	ND U	ug/L	210	30	1	06/18/21 19:15	06/15/21	

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Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2106547
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	NA
Sample Matrix:	Water		**Date Received:**	NA
Sample Name:	Method Blank		**Basis:**	NA
Lab Code:	KQ2110916-01			

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	200.8	**0.9 J**	ug/L	4.0	0.5	1	07/10/21 08:32	06/15/21	
Antimony	200.8	ND U	ug/L	0.050	0.020	1	07/10/21 08:32	06/15/21	
Arsenic	200.8	ND U	ug/L	0.50	0.09	1	07/10/21 08:32	06/15/21	
Barium	200.8	ND U	ug/L	0.050	0.020	1	07/10/21 08:32	06/15/21	
Beryllium	200.8	ND U	ug/L	0.020	0.005	1	07/10/21 08:32	06/15/21	
Boron	200.8	ND U	ug/L	2.0	0.5	1	07/10/21 08:32	06/15/21	
Cadmium	200.8	ND U	ug/L	0.020	0.008	1	07/10/21 08:32	06/15/21	
Chromium	200.8	ND U	ug/L	0.20	0.03	1	07/10/21 08:32	06/15/21	
Cobalt	200.8	ND U	ug/L	0.020	0.009	1	07/10/21 08:32	06/15/21	
Iron	200.8	ND U	ug/L	2.0	0.3	1	07/10/21 08:32	06/15/21	
Lead	200.8	ND U	ug/L	0.020	0.006	1	07/10/21 08:32	06/15/21	
Lithium	200.8	ND U	ug/L	0.10	0.10	1	07/10/21 08:32	06/15/21	
Manganese	200.8	ND U	ug/L	0.20	0.04	1	07/10/21 08:32	06/15/21	
Molybdenum	200.8	**0.04 J**	ug/L	0.10	0.03	1	07/10/21 08:32	06/15/21	
Nickel	200.8	ND U	ug/L	0.20	0.04	1	07/10/21 08:32	06/15/21	
Selenium	200.8	ND U	ug/L	1.0	0.2	1	07/10/21 08:32	06/15/21	
Silver	200.8	ND U	ug/L	0.040	0.009	1	07/10/21 08:32	06/15/21	
Thallium	200.8	ND U	ug/L	0.020	0.009	1	07/10/21 08:32	06/15/21	
Zinc	200.8	ND U	ug/L	2.0	0.5	1	07/10/21 08:32	06/15/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2106547
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	06/04/21
Sample Matrix:	Water	**Date Received:**	06/08/21
		Date Analyzed:	06/18/21
		Date Extracted:	06/15/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	BRY-MW-10-20210604	**Units:**	ug/L
Lab Code:	K2106547-002	**Basis:**	NA
Analysis Method:	6010C		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2110915-07

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Calcium	58000	79300	20000	106	75-125
Magnesium	17500	37900	20000	102	75-125
Potassium	1630	22000	20000	102	75-125
Sodium	25000	46100	20000	105	75-125

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

Client:	Anchor QEA, LLC	**Service Request:**	K2106547
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	06/04/21
Sample Matrix:	Water	**Date Received:**	06/08/21
		Date Analyzed:	06/18/21
		Date Extracted:	06/15/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	BRY-MW-10-20210604	**Units:**	ug/L
Lab Code:	K2106547-002	**Basis:**	NA
Analysis Method:	6010C		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2110915-08

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Silicon	12100	32700	20000	103	75-125

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Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

Client: Anchor QEA, LLC
Project: Barry/201114-01.02 Task 02
Sample Matrix: Water

Service Request: K2106547
Date Collected: 06/04/21
Date Received: 06/08/21
Date Analyzed: 7/10/21

Matrix Spike Summary
Total Metals

Sample Name: BRY-MW-8-20210604
Lab Code: K2106547-001

Units: ug/L
Basis: NA

Matrix Spike
KQ2110916-04

Analyte Name	Method	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	200.8	3 J	101	100	97	70-130
Antimony	200.8	ND U	10.6	10.0	106	70-130
Arsenic	200.8	5.1	53.3	50.0	96	70-130
Barium	200.8	63.8	166	100	102	70-130
Beryllium	200.8	ND U	2.54	2.50	101	70-130
Boron	200.8	897	986	25	357 #	70-130
Cadmium	200.8	ND U	25.6	25.0	102	70-130
Chromium	200.8	0.6 J	10.6	10.0	100	70-130
Cobalt	200.8	0.57	25.1	25.0	98	70-130
Iron	200.8	41000	40200	50	-1613 #	70-130
Lead	200.8	0.03 J	51.8	50.0	104	70-130
Lithium	200.8	1.93	53.3	50.0	103	70-130
Manganese	200.8	1600	1620	25.0	56 #	70-130
Molybdenum	200.8	0.18 J	26.4	25.0	105	70-130
Nickel	200.8	0.4 J	25.1	25.0	99	70-130
Selenium	200.8	ND U	51.9	50.0	104	70-130
Silver	200.8	0.18 J	12.6	12.5	99	70-130
Thallium	200.8	ND U	52.1	50.0	104	70-130
Zinc	200.8	ND U	26	25	102	70-130

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QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2106547
Project	Barry/201114-01.02 Task 02	**Date Collected:**	06/04/21
Sample Matrix:	Water	**Date Received:**	06/08/21
		Date Analyzed:	06/18/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	BRY-MW-10-20210604	**Units:**	ug/L
Lab Code:	K2106547-002	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2110915-06 Result	Average	RPD	RPD Limit
Calcium	6010C	42	6	58000	59300	58700	2	20
Magnesium	6010C	11	0.8	17500	17400	17500	<1	20
Potassium	6010C	420	130	1630	1570	1600	4	20
Silicon	6010C	420	60	12100	12100	12100	<1	20
Sodium	6010C	420	60	25000	24900	25000	<1	20

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QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2106547
Project	Barry/201114-01.02 Task 02	**Date Collected:**	06/04/21
Sample Matrix:	Water	**Date Received:**	06/08/21
		Date Analyzed:	07/10/21

Replicate Sample Summary
Total Metals

Sample Name:	BRY-MW-8-20210604	**Units:**	ug/L
Lab Code:	K2106547-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2110916-03 Result	Average	RPD	RPD Limit
Aluminum	200.8	20	3	3 J	3 J	3	<1	20
Antimony	200.8	0.25	0.10	ND U	ND U	ND	-	20
Arsenic	200.8	2.5	0.5	5.1	5.4	5.3	6	20
Barium	200.8	0.25	0.10	63.8	65.2	64.5	2	20
Beryllium	200.8	0.10	0.03	ND U	ND U	ND	-	20
Boron	200.8	10	3	897	961	929	7	20
Cadmium	200.8	0.10	0.04	ND U	ND U	ND	-	20
Chromium	200.8	1.0	0.2	0.6 J	0.5 J	0.6	18	20
Cobalt	200.8	0.10	0.05	0.57	0.53	0.55	7	20
Iron	200.8	10	2	41000	41100	41100	<1	20
Lead	200.8	0.10	0.03	0.03 J	ND U	NC	NC	20
Lithium	200.8	0.50	0.50	1.93	1.86	1.90	4	20
Manganese	200.8	1.0	0.2	1600	1610	1610	<1	20
Molybdenum	200.8	0.50	0.15	0.18 J	0.16 J	0.17	12	20
Nickel	200.8	1.0	0.2	0.4 J	0.3 J	0.4	29 #	20
Selenium	200.8	5.0	1.0	ND U	ND U	ND	-	20
Silver	200.8	0.20	0.05	0.18 J	ND U	NC	NC	20
Thallium	200.8	0.10	0.05	ND U	ND U	ND	-	20
Zinc	200.8	10	3	ND U	ND U	ND	-	20

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Anchor QEA, LLC
Project: Barry/201114-01.02 Task 02
Sample Matrix: Water

Service Request: K2106547
Date Analyzed: 06/18/21

Lab Control Sample Summary
Dissolved Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2110915-01

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Calcium	6010C	12000	12500	96	80-120
Magnesium	6010C	12200	12500	97	80-120
Potassium	6010C	12100	12500	96	80-120
Sodium	6010C	12100	12500	97	80-120

Client: Anchor QEA, LLC
Project: Barry/201114-01.02 Task 02
Sample Matrix: Water

Service Request: K2106547
Date Analyzed: 06/18/21

Lab Control Sample Summary
Dissolved Metals

Units: ug/L
Basis: NA

Lab Control Sample
KQ2110915-05

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Silicon	6010C	9940	10000	99	80-120

Client: Anchor QEA, LLC
Project: Barry/201114-01.02 Task 02
Sample Matrix: Water

Service Request: K2106547
Date Analyzed: 07/10/21

Lab Control Sample Summary
Total Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2110916-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	200.8	94.7	100	95	85-115
Iron	200.8	46.9	50.0	94	85-115
Manganese	200.8	23.8	25.0	95	85-115

Client:	Anchor QEA, LLC	**Service Request:**	K2106547
Project:	Barry/201114-01.02 Task 02	**Date Analyzed:**	07/10/21
Sample Matrix:	Water		

Lab Control Sample Summary
Total Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2110916-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Antimony	200.8	9.87	10.0	99	85-115
Arsenic	200.8	47.3	50.0	95	85-115
Barium	200.8	94.4	100	94	85-115
Beryllium	200.8	2.36	2.50	94	85-115
Boron	200.8	21.7	25.0	87	85-115
Cadmium	200.8	24.8	25.0	99	85-115
Chromium	200.8	9.13	10.0	91	85-115
Cobalt	200.8	23.3	25.0	93	85-115
Lead	200.8	50.0	50.0	100	85-115
Lithium	200.8	48.5	50.0	97	85-115
Molybdenum	200.8	25.0	25.0	100	85-115
Nickel	200.8	23.6	25.0	94	85-115
Selenium	200.8	49.4	50.0	99	85-115
Silver	200.8	11.9	12.5	96	85-115
Thallium	200.8	50.6	50.0	101	85-115
Zinc	200.8	24.2	25.0	97	85-115

General Chemistry

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Client:	Anchor QEA, LLC	**Service Request:**	K2106547
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K2106547-MB1		

General Chemistry Parameters

Analyte Name	Analysis Method	Result		Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Alkalinity as CaCO3, Total	SM 2320 B	**5**	**J**	mg/L	15	3	1	06/11/21 16:16	NA	
Ammonia as Nitrogen	350.1	ND	U	mg/L	0.050	0.020	1	06/09/21 10:31	06/09/21	
Bicarbonate as CaCO3	SM 2320 B	ND	U	mg/L	15	3	1	06/11/21 16:16	NA	
Carbon, Total Organic	SM 5310 C	ND	U	mg/L	0.50	0.07	1	06/17/21 16:02	NA	
Carbonate as CaCO3	SM 2320 B	ND	U	mg/L	15	3	1	06/11/21 16:16	NA	
Chloride	300.0	ND	U	mg/L	0.10	0.007	1	06/08/21 13:26	NA	
Fluoride	300.0	ND	U	mg/L	0.10	0.005	1	06/08/21 13:26	NA	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.050	0.007	1	06/08/21 13:26	NA	
Nitrite as Nitrogen	300.0	ND	U	mg/L	0.050	0.003	1	06/08/21 13:26	NA	
Orthophosphate as Phosphorus	SM 4500-P E	ND	U	mg/L	0.050	0.020	1	06/10/21 10:00	NA	
Sulfate	300.0	ND	U	mg/L	0.20	0.02	1	06/08/21 13:26	NA	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2106547
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K2106547-MB2		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Q
Carbon, Total Organic	SM 5310 C	ND U	mg/L	0.50	0.07	1	06/17/21 16:02	
Chloride	300.0	ND U	mg/L	0.10	0.007	1	06/08/21 20:47	
Fluoride	300.0	ND U	mg/L	0.10	0.005	1	06/08/21 20:47	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.050	0.007	1	06/08/21 20:47	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.050	0.003	1	06/08/21 20:47	
Sulfate	300.0	ND U	mg/L	0.20	0.02	1	06/08/21 20:47	

Client:	Anchor QEA, LLC		**Service Request:**	K2106547
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	NA
Sample Matrix:	Water		**Date Received:**	NA
Sample Name:	Method Blank		**Basis:**	NA
Lab Code:	K2106547-MB3			

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Q
Chloride	300.0	ND U	mg/L	0.10	0.007	1	06/09/21 15:33	

Client:	Anchor QEA, LLC	**Service Request:**	K2106547
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K2106547-MB4		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Q
Chloride	300.0	ND U	mg/L	0.10	0.007	1	06/09/21 23:06	

Client: Anchor QEA, LLC
Project: Barry/201114-01.02 Task 02
Sample Matrix: Water

Service Request: K2106547
Date Collected: 06/04/21
Date Received: 06/08/21
Date Analyzed: 06/08/21 - 06/10/21

Duplicate Matrix Spike Summary
General Chemistry Parameters

Sample Name: BRY-MW-8-20210604
Lab Code: K2106547-001

Units: mg/L
Basis: NA

			Matrix Spike K2106547-001MS			Duplicate Matrix Spike K2106547-001DMS					
Analyte Name	**Method**	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Orthophosphate as Phosphorus	SM 4500-P E	ND U	2.07	2.00	104	2.06	2.00	103	75-125	<1	20
Fluoride	300.0	ND U	8.56	8.00	107	8.51	8.00	106	90-110	<1	20
Chloride	300.0	19.4	28.5	8.00	114 *	28.5	8.00	113 *	90-110	<1	20
Nitrate as Nitrogen	300.0	ND U	7.82	8.00	98	7.86	8.00	98	90-110	<1	20
Sulfate	300.0	0.26 J	7.98	8.00	96	8.01	8.00	97	90-110	<1	20
Nitrite as Nitrogen	300.0	ND U	7.79	8.00	97	7.84	8.00	98	90-110	<1	20

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	Anchor QEA, LLC	**Service Request:**	K2106547
Project	Barry/201114-01.02 Task 02	**Date Collected:**	06/04/21
Sample Matrix:	Water	**Date Received:**	06/08/21
		Date Analyzed:	06/08/21 - 06/10/21

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	BRY-MW-8-20210604	**Units:**	mg/L
Lab Code:	K2106547-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K2106547-001DUP Result	Average	RPD	RPD Limit
Chloride	300.0	0.20	0.02	19.4	21.0	20.2	8	20
Fluoride	300.0	0.20	0.01	ND U	ND U	NC	NC	20
Nitrate as Nitrogen	300.0	0.10	0.02	ND U	ND U	NC	NC	20
Orthophosphate as Phosphorus	SM 4500-P E	0.050	0.020	ND U	ND U	NC	NC	20
Sulfate	300.0	0.40	0.04	0.26 J	0.25 J	0.255	5	20
Nitrite as Nitrogen	300.0	0.10	0.006	ND U	ND U	NC	NC	20

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Anchor QEA, LLC
Project: Barry/201114-01.02 Task 02
Sample Matrix: Water

Service Request: K2106547
Date Analyzed: 06/08/21 - 06/17/21

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Lab Control Sample
K2106547-LCS2

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Alkalinity as CaCO3, Total	SM 2320 B	107	109	98	90-110
Ammonia as Nitrogen	350.1	5.35	5.36	100	86-114
Bicarbonate as CaCO3	SM 2320 B	107	109	98	85-115
Carbon, Total Organic	SM 5310 C	24.3	25.0	97	83-117
Carbonate as CaCO3	SM 2320 B	107	109	98	85-115
Chloride	300.0	4.83	5.00	97	90-110
Fluoride	300.0	5.05	5.00	101	90-110
Nitrate as Nitrogen	300.0	2.43	2.50	97	90-110
Nitrite as Nitrogen	300.0	2.45	2.50	98	90-110
Orthophosphate as Phosphorus	SM 4500-P E	0.169	0.157	108	85-115
Sulfate	300.0	4.91	5.00	98	90-110

Client: Anchor QEA, LLC
Project: Barry/201114-01.02 Task 02
Sample Matrix: Water

Service Request: K2106547
Date Analyzed: 06/08/21 - 06/11/21

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
K2106547-LCS3

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Alkalinity as CaCO3, Total	SM 2320 B	108	109	99	90-110
Bicarbonate as CaCO3	SM 2320 B	108	109	99	85-115
Carbonate as CaCO3	SM 2320 B	108	109	99	85-115
Chloride	300.0	4.86	5.00	97	90-110
Fluoride	300.0	5.14	5.00	103	90-110
Nitrate as Nitrogen	300.0	2.45	2.50	98	90-110
Nitrite as Nitrogen	300.0	2.46	2.50	98	90-110
Sulfate	300.0	4.95	5.00	99	90-110

Client:	Anchor QEA, LLC	**Service Request:**	K2106547
Project:	Barry/201114-01.02 Task 02	**Date Analyzed:**	06/09/21
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Chloride

Analysis Method:	300.0	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	726817

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2106547-LCS4	4.72	5.00	94	90-110

Client:	Anchor QEA, LLC	**Service Request:**	K2106547
Project:	Barry/201114-01.02 Task 02	**Date Analyzed:**	06/09/21
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Chloride

Analysis Method:	300.0	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	726817

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2106547-LCS5	4.84	5.00	97	90-110

Client:	Anchor QEA, LLC	**Service Request:**	K2106547
Project:	Barry/201114-01.02 Task 02	**Date Analyzed:**	06/17/21
Sample Matrix:	Water	**Date Extracted:**	NA

Duplicate Lab Control Sample Summary
General Chemistry Parameters

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	727852

	Lab Control Sample K2106547-LCS1			Duplicate Lab Control Sample K2106547-DLCS1					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Carbon, Total Organic	24.2	25.0	97	24.5	25.0	98	83-117	1	10

August 16, 2021 Service Request No:K2108365

Masa Kanematsu
Anchor QEA, LLC
6720 SW Macadam Avenue
Suite 125
Portland, OR 97219

Laboratory Results for: Barry

Dear Masa,

Enclosed are the results of the sample(s) submitted to our laboratory July 19, 2021
For your reference, these analyses have been assigned our service request number **K2108365.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at Mark.Harris@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Mark D. Harris

Mark Harris
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental

Narrative Documents

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client:	Anchor QEA, LLC	**Service Request:**	K2108365
Project:	Barry	**Date Received:**	07/19/2021
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

Twenty water samples were received for analysis at ALS Environmental on 07/19/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Metals:

No significant anomalies were noted with this analysis.

Approved by ____________ Date 08/16/2021

SAMPLE DETECTION SUMMARY

CLIENT ID: BR-COL-INF-MW-8-1	Lab ID: K2108365-001					
Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	192		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-INF-MW-10-1	Lab ID: K2108365-002					
Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	54.4		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-1-1	Lab ID: K2108365-003					
Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	2.4	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-2-1	Lab ID: K2108365-004					
Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	1.9	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-3-1	Lab ID: K2108365-005					
Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	3.7		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-4-1	Lab ID: K2108365-006					
Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	0.7	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-5-1	Lab ID: K2108365-007					
Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	1.1	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-6-1	Lab ID: K2108365-008					
Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	0.7	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-7-1	Lab ID: K2108365-009					
Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	3.6		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-8-1	Lab ID: K2108365-010					
Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	1.1	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-INF-MW-8-2	Lab ID: K2108365-011					
Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	1.4	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-INF-MW-10-2	Lab ID: K2108365-012					
Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	1.6	J	0.5	2.5	ug/L	200.8

SAMPLE DETECTION SUMMARY

CLIENT ID: BR-COL-1-2	Lab ID: K2108365-013					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	1.1	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-2-2	Lab ID: K2108365-014					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	3.6		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-3-2	Lab ID: K2108365-015					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	2.1	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-4-2	Lab ID: K2108365-016					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	0.8	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-5-2	Lab ID: K2108365-017					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	0.8	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-6-2	Lab ID: K2108365-018					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	0.9	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-7-2	Lab ID: K2108365-019					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	2.1	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-8-2	Lab ID: K2108365-020					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	0.9	J	0.5	2.5	ug/L	200.8

Sample Receipt Information

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: Anchor QEA, LLC **Service Request:** K2108365
Project: Barry/201114-01.02 Task 02

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K2108365-001	BR-COL-INF-MW-8-1	7/7/2021	1200
K2108365-002	BR-COL-INF-MW-10-1	7/7/2021	1200
K2108365-003	BR-COL-1-1	7/7/2021	1200
K2108365-004	BR-COL-2-1	7/7/2021	1200
K2108365-005	BR-COL-3-1	7/7/2021	1200
K2108365-006	BR-COL-4-1	7/7/2021	1200
K2108365-007	BR-COL-5-1	7/7/2021	1200
K2108365-008	BR-COL-6-1	7/7/2021	1200
K2108365-009	BR-COL-7-1	7/7/2021	1200
K2108365-010	BR-COL-8-1	7/7/2021	1200
K2108365-011	BR-COL-INF-MW-8-2	7/8/2021	1400
K2108365-012	BR-COL-INF-MW-10-2	7/8/2021	1400
K2108365-013	BR-COL-1-2	7/8/2021	1400
K2108365-014	BR-COL-2-2	7/8/2021	1400
K2108365-015	BR-COL-3-2	7/8/2021	1400
K2108365-016	BR-COL-4-2	7/8/2021	1400
K2108365-017	BR-COL-5-2	7/8/2021	1400
K2108365-018	BR-COL-6-2	7/8/2021	1400
K2108365-019	BR-COL-7-2	7/8/2021	1400
K2108365-020	BR-COL-8-2	7/8/2021	1400

K2108365

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number: 503-972-5019

Date:	7/19/2021
Project Name:	Barry
Project Number:	201114-01.02 Task 02
Project Manager:	Masa Kanematsu
Phone Number:	503-972-5001 (Masa Kanematsu)
Shipment Method:	ALS Carrier

ANCHOR QEA

Jessica Goin
6720 SW Macadam Ave
Suite 125
Portland OR 97219

Line	Field Sample ID	Collection Date	Collection Time	Matrix	No. of Containers	Parameters: Arsenic (dissolved, Method 200.8)	Comments/Preservation
1	BR-COL-INF-MW-8-1	7/7/2021	12:00	Water	1	X	HNO_3 preserved, filtered
2	BR-COL-INF-MW-10-1	7/7/2021	12:00	Water	1	X	HNO_3 preserved, filtered
3	BR-COL-1-1	7/7/2021	12:00	Water	1	X	HNO_3 preserved, filtered
4	BR-COL-2-1	7/7/2021	12:00	Water	1	X	HNO_3 preserved, filtered
5	BR-COL-3-1	7/7/2021	12:00	Water	1	X	HNO_3 preserved, filtered
6	BR-COL-4-1	7/7/2021	12:00	Water	1	X	HNO_3 preserved, filtered
7	BR-COL-5-1	7/7/2021	12:00	Water	1	X	HNO_3 preserved, filtered
8	BR-COL-6-1	7/7/2021	12:00	Water	1	X	HNO_3 preserved, filtered
9	BR-COL-7-1	7/7/2021	12:00	Water	1	X	HNO_3 preserved, filtered
10	BR-COL-8-1	7/7/2021	12:00	Water	1	X	HNO_3 preserved, filtered
11	BR-COL-INF-MW-8-2	7/8/2021	14:00	Water	1	X	HNO_3 preserved, filtered
12	BR-COL-INF-MW-10-2	7/8/2021	14:00	Water	1	X	HNO_3 preserved, filtered
13	BR-COL-1-2	7/8/2021	14:00	Water	1	X	HNO_3 preserved, filtered
14	BR-COL-2-2	7/8/2021	14:00	Water	1	X	HNO_3 preserved, filtered
15	BR-COL-3-2	7/8/2021	14:00	Water	1	X	HNO_3 preserved, filtered

Notes: **Please analyze with standard TAT. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L). Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	Jessica Pejic	ALS
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
(signature)	7/19/2021 9:00	(signature)	7/19/21 1500

Relinquished by:	Company:	Received by:	Company:
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original.

K2108365

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number: 503-972-5019

Date:	7/19/2021
Project Name:	Barry
Project Number:	201114-01.02 Task 02
Project Manager:	Masa Kanematsu
Phone Number:	503-972-5001 (Masa Kanematsu)
Shipment Method:	ALS Carrier

ANCHOR QEA

Jessica Goin
6720 SW Macadam Ave
Suite 125
Portland OR 97219

Line	Field Sample ID	Collection Date	Collection Time	Matrix	No. of Containers	Arsenic (dissolved, Method 200.8)	Comments/Preservation
16	BR-COL-4-2	7/8/2021	14:00	Water	1	X	HNO_3 preserved, filtered
17	BR-COL-5-2	7/8/2021	14:00	Water	1	X	HNO_3 preserved, filtered
18	BR-COL-6-2	7/8/2021	14:00	Water	1	X	HNO_3 preserved, filtered
19	BR-COL-7-2	7/8/2021	14:00	Water	1	X	HNO_3 preserved, filtered
20	BR-COL-8-2	7/8/2021	14:00	Water	1	X	HNO_3 preserved, filtered
21	BR-COL-INF-MW-8-3	7/9/2021	11:40	Water	1	X	HNO_3 preserved, filtered
22	BR-COL-INF-MW-10-3	7/9/2021	11:40	Water	1	X	HNO_3 preserved, filtered
23	BR-COL-1-3	7/9/2021	11:40	Water	1	X	HNO_3 preserved, filtered
24	BR-COL-2-3	7/9/2021	11:40	Water	1	X	HNO_3 preserved, filtered
25	BR-COL-3-3	7/9/2021	11:40	Water	1	X	HNO_3 preserved, filtered
26	BR-COL-4-3	7/9/2021	14:00	Water	1	X	HNO_3 preserved, filtered
27	BR-COL-5-3	7/9/2021	14:00	Water	1	X	HNO_3 preserved, filtered
28	BR-COL-6-3	7/9/2021	14:00	Water	1	X	HNO_3 preserved, filtered
29	BR-COL-7-3	7/9/2021	14:00	Water	1	X	HNO_3 preserved, filtered
30	BR-COL-8-3	7/9/2021	14:00	Water	1	X	HNO_3 preserved, filtered

Notes: **Please analyze with standard TAT. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L). Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	Jessica [illegible]	ALS
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
[signature]	7/19/2021 9:00	[signature]	7/19/21 1500
Relinquished by:	Company:	Received by:	Company:
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original.

K2108365

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number:	503-972-5019
Date:	7/19/2021
Project Name:	Barry
Project Number:	201114-01.02 Task 02
Project Manager:	Masa Kanematsu
Phone Number:	503-972-5001 (Masa Kanematsu)
Shipment Method:	ALS Carrier

ANCHOR QEA
Jessica Goin
6720 SW Macadam Ave
Suite 125
Portland OR 97219

Line	Field Sample ID	Collection Date	Collection Time	Matrix	No. of Containers	Arsenic (dissolved, Method 200.8)	Comments/Preservation
31	BR-COL-INF-MW-8-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
32	BR-COL-INF-MW-10-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
33	BR-COL-1-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
34	BR-COL-2-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
35	BR-COL-3-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
36	BR-COL-4-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
37	BR-COL-5-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
38	BR-COL-6-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
39	BR-COL-7-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
40	BR-COL-8-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
41	BR-COL-INF-MW-8-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
42	BR-COL-INF-MW-10-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
43	BR-COL-1-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
44	BR-COL-2-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
45	BR-COL-3-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered

Notes: **Please analyze with standard TAT. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L). Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	Jessie Price	ALS
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
[signature]	7/19/2021 9:00	[signature]	7/19/21 1500
Relinquished by:	Company:	Received by:	Company:
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original.

KZ10 8365

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number:	503-972-5019
Date:	7/19/2021
Project Name:	Barry
Project Number:	201114-01.02 Task 02
Project Manager:	Masa Kanematsu
Phone Number:	503-972-5001 (Masa Kanematsu)
Shipment Method:	ALS Carrier

ANCHOR QEA

Jessica Goin
6720 SW Macadam Ave
Suite 125
Portland OR 97219

Line	Field Sample ID	Collection Date	Collection Time	Matrix	No. of Containers	Arsenic (dissolved, Method 200.8)	Comments/Preservation
46	BR-COL-4-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
47	BR-COL-5-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
48	BR-COL-6-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
49	BR-COL-7-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
50	BR-COL-8-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
51	BR-COL-INF-MW-8-6	7/13/2021	12:30	Water	1	X	HNO_3 preserved, filtered
52	BR-COL-INF-MW-10-6	7/13/2021	12:30	Water	1	X	HNO_3 preserved, filtered
53	BR-COL-1-6	7/13/2021	12:30	Water	1	X	HNO_3 preserved, filtered
54	BR-COL-2-6	7/13/2021	12:30	Water	1	X	HNO_3 preserved, filtered
55	BR-COL-3-6	7/13/2021	12:30	Water	1	X	HNO_3 preserved, filtered
56	BR-COL-4-6	7/13/2021	12:30	Water	1	X	HNO_3 preserved, filtered
57	BR-COL-5-6	7/13/2021	12:30	Water	1	X	HNO_3 preserved, filtered
58	BR-COL-6-6	7/13/2021	12:30	Water	1	X	HNO_3 preserved, filtered
59	BR-COL-7-6	7/13/2021	12:30	Water	1	X	HNO_3 preserved, filtered
60	BR-COL-8-6	7/13/2021	12:30	Water	1	X	HNO_3 preserved, filtered

Notes: **Please analyze with standard TAT. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L). Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	Jessi Rude	ALS
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
[signature]	7/19/2021 9:00	[signature]	7/19/21 1500
Relinquished by:	Company:	Received by:	Company:
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original.

Page 4 of 6

K2108365

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number:	503-972-5019
Date:	7/19/2021
Project Name:	Barry
Project Number:	201114-01.02 Task 02
Project Manager:	Masa Kanematsu
Phone Number:	503-972-5001 (Masa Kanematsu)
Shipment Method:	ALS Carrier

ANCHOR QEA

Jessica Goin
6720 SW Macadam Ave
Suite 125
Portland OR 97219

Line	Field Sample ID	Collection Date	Collection Time	Matrix	No. of Containers	Arsenic (dissolved, Method 200.8)	Comments/Preservation
61	BR-COL-INF-MW-8-7	7/14/2021	14:40	Water	1	X	HNO_3 preserved, filtered
62	BR-COL-INF-MW-10-7	7/14/2021	14:40	Water	1	X	HNO_3 preserved, filtered
63	BR-COL-1-7	7/14/2021	14:40	Water	1	X	HNO_3 preserved, filtered
64	BR-COL-2-7	7/14/2021	14:40	Water	1	X	HNO_3 preserved, filtered
65	BR-COL-3-7	7/14/2021	14:40	Water	1	X	HNO_3 preserved, filtered
66	BR-COL-4-7	7/14/2021	14:40	Water	1	X	HNO_3 preserved, filtered
67	BR-COL-5-7	7/14/2021	14:40	Water	1	X	HNO_3 preserved, filtered
68	BR-COL-6-7	7/14/2021	14:40	Water	1	X	HNO_3 preserved, filtered
69	BR-COL-7-7	7/14/2021	14:40	Water	1	X	HNO_3 preserved, filtered
70	BR-COL-8-7	7/14/2021	14:40	Water	1	X	HNO_3 preserved, filtered
71	BR-COL-INF-MW-8-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
72	BR-COL-INF-MW-10-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
73	BR-COL-1-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
74	BR-COL-2-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
75	BR-COL-3-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered

Notes: **Please analyze with standard TAT. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L). Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	Jessie Purdue	ALS
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
	7/19/2021 9:00		7/15/21 1500
Relinquished by:	Company:	Received by:	Company:
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original.

Page 5 of 6

K2108365

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number: 503-972-5019	
Date:	7/19/2021
Project Name:	Barry
Project Number:	201114-01.02 Task 02
Project Manager:	Masa Kanematsu
Phone Number:	503-972-5001 (Masa Kanematsu)
Shipment Method:	ALS Carrier

ANCHOR QEA

Jessica Goin
6720 SW Macadam Ave
Suite 125
Portland OR 97219

Line	Field Sample ID	Collection Date	Collection Time	Matrix	No. of Containers	Parameters: Arsenic (dissolved, Method 200.8)	Comments/Preservation
76	BR-COL-4-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
77	BR-COL-5-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
78	BR-COL-6-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
79	BR-COL-7-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
80	BR-COL-8-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
81	BR-COL-INF-MW-8-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
82	BR-COL-INF-MW-10-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
83	BR-COL-1-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
84	BR-COL-2-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
85	BR-COL-3-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
86	BR-COL-4-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
87	BR-COL-5-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
88	BR-COL-6-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
89	BR-COL-7-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
90	BR-COL-8-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered

Notes: **Please analyze with standard TAT. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L). Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	Jessie P[illegible]	ALS
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
[signature]	7/19/2021 9:00	[signature]	7/15/21, 1500
Relinquished by:	Company:	Received by:	Company:
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original.

PM MH

Cooler Receipt and Preservation Form

Client Anchor QEA Service Request K21 08365

Received: 7/15/21 Opened: 7/15/21 By: JP Unloaded: 7/15/21 By: JP

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* ***Courier*** ~~*Hand Delivered*~~ JP
2. Samples were received in: (circle) ***Cooler*** *Box* *Envelope* *Other* ______ *NA*
3. Were custody seals on coolers? ~~NA~~ JP Y **N** If yes, how many and where? ______
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N
4. Was a Temperature Blank present in cooler? NA Y **N** If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA **Y** ~~N~~ JP
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. **NA** ~~Y~~ JP N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number (NA)	Filed
	20.1	IR01					

6. Packing material: *Inserts* ***Baggies*** ***Bubble Wrap*** *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* ______
7. Were custody papers properly filled out (ink, signed, etc.)? NA **Y** N
8. Were samples received in good condition (unbroken) NA **Y** N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA **Y** N
10. Did all sample labels and tags agree with custody papers? NA **Y** N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA **Y** N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* **NA** Y ~~N~~ JP
13. Were VOA vials received without headspace? *Indicate in the table below.* **NA** Y N
14. Was C12/Res negative? **NA** Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: Did not pH due to limited volume

Miscellaneous Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

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Inorganic Data Qualifiers

- ***** The result is an outlier. See case narrative.
- **#** The control limit criteria is not applicable. See case narrative.
- **B** The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- **E** The result is an estimate amount because the value exceeded the instrument calibration range.
- **J** The result is an estimated value.
- **U** The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- **i** The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- **X** See case narrative.
- **Q** See case narrative. One or more quality control criteria was outside the limits.
- **H** The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- **#** The control limit criteria is not applicable. See case narrative.
- **J** The result is an estimated value.
- **E** The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- **M** The duplicate injection precision was not met.
- **N** The Matrix Spike sample recovery is not within control limits. See case narrative.
- **S** The reported value was determined by the Method of Standard Additions (MSA).
- **U** The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- **W** The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- **i** The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- **X** See case narrative.
- **+** The correlation coefficient for the MSA is less than 0.995.
- **Q** See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- ***** The result is an outlier. See case narrative.
- **#** The control limit criteria is not applicable. See case narrative.
- **A** A tentatively identified compound, a suspected aldol-condensation product.
- **B** The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- **C** The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- **D** The reported result is from a dilution.
- **E** The result is an estimated value.
- **J** The result is an estimated value.
- **N** The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- **P** The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- **U** The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- **i** The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- **X** See case narrative.
- **Q** See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- **F** The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- **L** The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- **H** The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- **O** The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- **Y** The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- **Z** The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Client: Anchor QEA, LLC **Service Request:** K2108365
Project: Barry/201114-01.02 Task 02

Sample Name: BR-COL-INF-MW-8-1 **Date Collected:** 07/7/21
Lab Code: K2108365-001 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-INF-MW-10-1 **Date Collected:** 07/7/21
Lab Code: K2108365-002 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-1-1 **Date Collected:** 07/7/21
Lab Code: K2108365-003 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-2-1 **Date Collected:** 07/7/21
Lab Code: K2108365-004 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-3-1 **Date Collected:** 07/7/21
Lab Code: K2108365-005 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Client: Anchor QEA, LLC **Service Request:** K2108365
Project: Barry/201114-01.02 Task 02

Sample Name: BR-COL-4-1 **Date Collected:** 07/7/21
Lab Code: K2108365-006 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-5-1 **Date Collected:** 07/7/21
Lab Code: K2108365-007 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-6-1 **Date Collected:** 07/7/21
Lab Code: K2108365-008 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-7-1 **Date Collected:** 07/7/21
Lab Code: K2108365-009 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-8-1 **Date Collected:** 07/7/21
Lab Code: K2108365-010 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Client: Anchor QEA, LLC **Service Request:** K2108365
Project: Barry/201114-01.02 Task 02

Sample Name: BR-COL-INF-MW-8-2 **Date Collected:** 07/8/21
Lab Code: K2108365-011 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-INF-MW-10-2 **Date Collected:** 07/8/21
Lab Code: K2108365-012 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-1-2 **Date Collected:** 07/8/21
Lab Code: K2108365-013 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-2-2 **Date Collected:** 07/8/21
Lab Code: K2108365-014 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-3-2 **Date Collected:** 07/8/21
Lab Code: K2108365-015 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Client: Anchor QEA, LLC **Service Request:** K2108365
Project: Barry/201114-01.02 Task 02

Sample Name: BR-COL-4-2 **Date Collected:** 07/8/21
Lab Code: K2108365-016 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-5-2 **Date Collected:** 07/8/21
Lab Code: K2108365-017 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-6-2 **Date Collected:** 07/8/21
Lab Code: K2108365-018 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-7-2 **Date Collected:** 07/8/21
Lab Code: K2108365-019 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-8-2 **Date Collected:** 07/8/21
Lab Code: K2108365-020 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Results

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

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Metals

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1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/07/21 12:00
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-INF-MW-8-1	**Basis:**	NA
Lab Code:	K2108365-001		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**192**	ug/L	2.5	0.5	5	08/13/21 17:50	07/30/21	

Printed 8/16/2021 3:20:56 PM　　Superset Reference:21-0000600053 rev 00

Client:	Anchor QEA, LLC	**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/07/21 12:00
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-INF-MW-10-1	**Basis:**	NA
Lab Code:	K2108365-002		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**54.4**	ug/L	2.5	0.5	5	08/13/21 17:54	07/30/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/07/21 12:00
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-1-1		**Basis:**	NA
Lab Code:	K2108365-003			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**2.4 J**	ug/L	2.5	0.5	5	08/13/21 17:58	07/30/21	

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/07/21 12:00
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-2-1	**Basis:**	NA
Lab Code:	K2108365-004		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.9 J**	ug/L	2.5	0.5	5	08/13/21 17:59	07/30/21	

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/07/21 12:00
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-3-1	**Basis:**	NA
Lab Code:	K2108365-005		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**3.7**	ug/L	2.5	0.5	5	08/13/21 18:03	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/07/21 12:00
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-4-1	**Basis:**	NA
Lab Code:	K2108365-006		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.7 J**	ug/L	2.5	0.5	5	08/13/21 18:05	07/30/21	

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Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/07/21 12:00
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-5-1		**Basis:**	NA
Lab Code:	K2108365-007			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.1 J**	ug/L	2.5	0.5	5	08/13/21 18:06	07/30/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/07/21 12:00
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-6-1		**Basis:**	NA
Lab Code:	K2108365-008			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.7 J**	ug/L	2.5	0.5	5	08/13/21 18:07	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/07/21 12:00
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-7-1	**Basis:**	NA
Lab Code:	K2108365-009		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**3.6**	ug/L	2.5	0.5	5	08/13/21 18:08	07/30/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/07/21 12:00
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-8-1	**Basis:**	NA
Lab Code:	K2108365-010		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.1 J**	ug/L	2.5	0.5	5	08/13/21 18:10	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/08/21 14:00
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-INF-MW-8-2	**Basis:**	NA
Lab Code:	K2108365-011		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.4 J**	ug/L	2.5	0.5	5	08/13/21 18:11	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/08/21 14:00
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-INF-MW-10-2	**Basis:**	NA
Lab Code:	K2108365-012		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.6 J**	ug/L	2.5	0.5	5	08/13/21 18:12	07/30/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/08/21 14:00
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-1-2		**Basis:**	NA
Lab Code:	K2108365-013			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.1 J**	ug/L	2.5	0.5	5	08/13/21 18:14	07/30/21	

Analytical Report

Client: Anchor QEA, LLC
Project: Barry/201114-01.02 Task 02
Sample Matrix: Water

Service Request: K2108365
Date Collected: 07/08/21 14:00
Date Received: 07/19/21 15:00

Sample Name: BR-COL-2-2
Lab Code: K2108365-014

Basis: NA

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**3.6**	ug/L	2.5	0.5	5	08/13/21 18:15	07/30/21	

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dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/08/21 14:00
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-3-2	**Basis:**	NA
Lab Code:	K2108365-015		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**2.1 J**	ug/L	2.5	0.5	5	08/13/21 18:19	07/30/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/08/21 14:00
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-4-2	**Basis:**	NA
Lab Code:	K2108365-016		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.8 J**	ug/L	2.5	0.5	5	08/13/21 18:20	07/30/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/08/21 14:00
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-5-2		**Basis:**	NA
Lab Code:	K2108365-017			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.8 J**	ug/L	2.5	0.5	5	08/13/21 18:22	07/30/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/08/21 14:00
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-6-2	**Basis:**	NA
Lab Code:	K2108365-018		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.9 J**	ug/L	2.5	0.5	5	08/13/21 18:23	07/30/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/08/21 14:00
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-7-2	**Basis:**	NA
Lab Code:	K2108365-019		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**2.1 J**	ug/L	2.5	0.5	5	08/13/21 18:24	07/30/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/08/21 14:00
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-8-2		**Basis:**	NA
Lab Code:	K2108365-020			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.9 J**	ug/L	2.5	0.5	5	08/13/21 18:26	07/30/21	

QC Summary Forms

ALS Environmental—Kelso Laboratory
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Metals

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1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client:	Anchor QEA, LLC		**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	NA
Sample Matrix:	Water		**Date Received:**	NA
Sample Name:	Method Blank		**Basis:**	NA
Lab Code:	KQ2114006-01			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	0.50	0.09	1	08/13/21 17:47	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/07/21
Sample Matrix:	Water	**Date Received:**	07/19/21
		Date Analyzed:	08/13/21
		Date Extracted:	07/30/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	BR-COL-INF-MW-8-1	**Units:**	ug/L
Lab Code:	K2108365-001	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2114006-04

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	192	240	50.0	97	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

Client:	Anchor QEA, LLC	**Service Request:**	K2108365
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/07/21
Sample Matrix:	Water	**Date Received:**	07/19/21
		Date Analyzed:	08/13/21
		Date Extracted:	07/30/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	BR-COL-INF-MW-10-1	**Units:**	ug/L
Lab Code:	K2108365-002	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2114006-06

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	54.4	105	50.0	101	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

Client:	Anchor QEA, LLC	**Service Request:**	K2108365
Project	Barry/201114-01.02 Task 02	**Date Collected:**	07/07/21
Sample Matrix:	Water	**Date Received:**	07/19/21
		Date Analyzed:	08/13/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	BR-COL-INF-MW-8-1	**Units:**	ug/L
Lab Code:	K2108365-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2114006-03 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	192	192	192	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108365
Project	Barry/201114-01.02 Task 02	**Date Collected:**	07/07/21
Sample Matrix:	Water	**Date Received:**	07/19/21
		Date Analyzed:	08/13/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	BR-COL-INF-MW-10-1	**Units:**	ug/L
Lab Code:	K2108365-002	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2114006-05 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	54.4	55.9	55.2	3	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Anchor QEA, LLC
Project: Barry/201114-01.02 Task 02
Sample Matrix: Water

Service Request: K2108365
Date Analyzed: 08/13/21

Lab Control Sample Summary
Dissolved Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2114006-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	200.8	49.8	50.0	100	85-115

August 16, 2021

Service Request No:K2108367

Masa Kanematsu
Anchor QEA, LLC
6720 SW Macadam Avenue
Suite 125
Portland, OR 97219

Laboratory Results for: Barry

Dear Masa,

Enclosed are the results of the sample(s) submitted to our laboratory July 19, 2021
For your reference, these analyses have been assigned our service request number **K2108367.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at Mark.Harris@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Mark Harris
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental

Narrative Documents

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental

Client:	Anchor QEA, LLC	**Service Request:**	K2108367
Project:	Barry	**Date Received:**	07/19/2021
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

Twenty water samples were received for analysis at ALS Environmental on 07/19/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Metals:

No significant anomalies were noted with this analysis.

Approved by ____________________ Date 08/16/2021

SAMPLE DETECTION SUMMARY

CLIENT ID: BR-COL-INF-MW-8-3	Lab ID: K2108367-001					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	2.2	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-INF-MW-10-3	Lab ID: K2108367-002					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	0.7	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-1-3	Lab ID: K2108367-003					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	1.4	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-2-3	Lab ID: K2108367-004					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	3.3		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-3-3	Lab ID: K2108367-005					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	1.8	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-4-3	Lab ID: K2108367-006					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	0.7	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-5-3	Lab ID: K2108367-007					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	1.0	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-6-3	Lab ID: K2108367-008					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	0.9	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-7-3	Lab ID: K2108367-009					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	1.4	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-8-3	Lab ID: K2108367-010					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	0.9	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-INF-MW-8-4	Lab ID: K2108367-011					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	14.4		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-INF-MW-10-4	Lab ID: K2108367-012					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	4.6		0.5	2.5	ug/L	200.8

SAMPLE DETECTION SUMMARY

CLIENT ID: BR-COL-1-4	Lab ID: K2108367-013					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	1.2	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-2-4	Lab ID: K2108367-014					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	8.6		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-3-4	Lab ID: K2108367-015					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	3.0		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-4-4	Lab ID: K2108367-016					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	1.4	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-5-4	Lab ID: K2108367-017					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	0.7	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-6-4	Lab ID: K2108367-018					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	0.6	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-7-4	Lab ID: K2108367-019					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	1.3	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-8-4	Lab ID: K2108367-020					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	0.7	J	0.5	2.5	ug/L	200.8

Sample Receipt Information

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: Anchor QEA, LLC **Service Request:** K2108367
Project: Barry/201114-01.02 Task

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K2108367-001	BR-COL-INF-MW-8-3	7/9/2021	1140
K2108367-002	BR-COL-INF-MW-10-3	7/9/2021	1140
K2108367-003	BR-COL-1-3	7/9/2021	1140
K2108367-004	BR-COL-2-3	7/9/2021	1140
K2108367-005	BR-COL-3-3	7/9/2021	1140
K2108367-006	BR-COL-4-3	7/9/2021	1400
K2108367-007	BR-COL-5-3	7/9/2021	1400
K2108367-008	BR-COL-6-3	7/9/2021	1400
K2108367-009	BR-COL-7-3	7/9/2021	1400
K2108367-010	BR-COL-8-3	7/9/2021	1400
K2108367-011	BR-COL-INF-MW-8-4	7/11/2021	1340
K2108367-012	BR-COL-INF-MW-10-4	7/11/2021	1340
K2108367-013	BR-COL-1-4	7/11/2021	1340
K2108367-014	BR-COL-2-4	7/11/2021	1340
K2108367-015	BR-COL-3-4	7/11/2021	1340
K2108367-016	BR-COL-4-4	7/11/2021	1340
K2108367-017	BR-COL-5-4	7/11/2021	1340
K2108367-018	BR-COL-6-4	7/11/2021	1340
K2108367-019	BR-COL-7-4	7/11/2021	1340
K2108367-020	BR-COL-8-4	7/11/2021	1340

2

K2108367

Chain of Custody Record & Laboratory Analysis Request

ANCHOR QEA

Jessica Goin
6720 SW Macadam Ave
Suite 125
Portland OR 97219

Laboratory Number:	503-972-5019
Date:	7/19/2021
Project Name:	Barry
Project Number:	201114-01.02 Task 02
Project Manager:	Masa Kanematsu
Phone Number:	503-972-5001 (Masa Kanematsu)
Shipment Method:	ALS Carrier

Line	Field Sample ID	Collection Date	Collection Time	Matrix	No. of Containers	Arsenic (dissolved, Method 200.8)	Comments/Preservation
16	BR-COL-4-2	7/8/2021	14:00	Water	1	X	HNO_3 preserved, filtered
17	BR-COL-5-2	7/8/2021	14:00	Water	1	X	HNO_3 preserved, filtered
18	BR-COL-6-2	7/8/2021	14:00	Water	1	X	HNO_3 preserved, filtered
19	BR-COL-7-2	7/8/2021	14:00	Water	1	X	HNO_3 preserved, filtered
20	BR-COL-8-2	7/8/2021	14:00	Water	1	X	HNO_3 preserved, filtered
1 21	BR-COL-INF-MW-8-3	7/9/2021	11:40	Water	1	X	HNO_3 preserved, filtered
2 22	BR-COL-INF-MW-10-3	7/9/2021	11:40	Water	1	X	HNO_3 preserved, filtered
3 23	BR-COL-1-3	7/9/2021	11:40	Water	1	X	HNO_3 preserved, filtered
4 24	BR-COL-2-3	7/9/2021	11:40	Water	1	X	HNO_3 preserved, filtered
5 25	BR-COL-3-3	7/9/2021	11:40	Water	1	X	HNO_3 preserved, filtered
6 26	BR-COL-4-3	7/9/2021	14:00	Water	1	X	HNO_3 preserved, filtered
7 27	BR-COL-5-3	7/9/2021	14:00	Water	1	X	HNO_3 preserved, filtered
8 28	BR-COL-6-3	7/9/2021	14:00	Water	1	X	HNO_3 preserved, filtered
9 29	BR-COL-7-3	7/9/2021	14:00	Water	1	X	HNO_3 preserved, filtered
10 30	BR-COL-8-3	7/9/2021	14:00	Water	1	X	HNO_3 preserved, filtered

Notes: **Please analyze with standard TAT. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L). Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	Jessica P[illegible]	ALS
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
[signature]	7/19/2021 9:00	[signature]	7/19/21 1500
Relinquished by:	Company:	Received by:	Company:
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original.

K2108367 2

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number:	503-972-5019
Date:	7/19/2021
Project Name:	Barry
Project Number:	201114-01.02 Task 02
Project Manager:	Masa Kanematsu
Phone Number:	503-972-5001 (Masa Kanematsu)
Shipment Method:	ALS Carrier

ANCHOR QEA

Jessica Goin
6720 SW Macadam Ave
Suite 125
Portland OR 97219

	Line	Field Sample ID	Collection Date	Collection Time	Matrix	No. of Containers	Arsenic (dissolved, Method 200.8)	Comments/Preservation
11	31	BR-COL-INF-MW-8-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
12	32	BR-COL-INF-MW-10-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
13	33	BR-COL-1-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
14	34	BR-COL-2-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
15	35	BR-COL-3-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
16	36	BR-COL-4-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
17	37	BR-COL-5-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
18	38	BR-COL-6-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
19	39	BR-COL-7-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
20	40	BR-COL-8-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
	41	BR-COL-INF-MW-8-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
	42	BR-COL-INF-MW-10-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
	43	BR-COL-1-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
	44	BR-COL-2-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
	45	BR-COL-3-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered

Notes: **Please analyze with standard TAT. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L). Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	Jessie P[illegible]	ALS
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
[signature]	7/19/2021 9:00	[signature]	7/19/21 1500
Relinquished by:	Company:	Received by:	Company:
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original.

Page 3 of 6

PM MH

Cooler Receipt and Preservation Form

Client: Anchor QEA Service Request K21 08367

Received: 7/15/21 Opened: 7/15/21 By: JP Unloaded: 7/15/21 By: JP

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* ***Courier*** *Hand Delivered* JP
2. Samples were received in: (circle) ***Cooler*** *Box* *Envelope* *Other* ______ *NA*
3. Were custody seals on coolers? ~~NA~~ JP Y **N** If yes, how many and where? ______
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N
4. Was a Temperature Blank present in cooler? NA Y **N** If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA **Y** ~~N~~ JP
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. **NA** ~~Y~~ JP N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number (NA)	Filed
	20.1	IR01					

6. Packing material: *Inserts* ***Baggies*** ***Bubble Wrap*** *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* ______
7. Were custody papers properly filled out (ink, signed, etc.)? NA **Y** N
8. Were samples received in good condition (unbroken) NA **Y** N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA **Y** N
10. Did all sample labels and tags agree with custody papers? NA **Y** N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA **Y** N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* **NA** Y ~~N~~ JP
13. Were VOA vials received without headspace? *Indicate in the table below.* **NA** Y N
14. Was C12/Res negative? **NA** Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: Did not pH due to limited volume

Miscellaneous Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Inorganic Data Qualifiers

- ***** The result is an outlier. See case narrative.
- **#** The control limit criteria is not applicable. See case narrative.
- **B** The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- **E** The result is an estimate amount because the value exceeded the instrument calibration range.
- **J** The result is an estimated value.
- **U** The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
  DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- **i** The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- **X** See case narrative.
- **Q** See case narrative. One or more quality control criteria was outside the limits.
- **H** The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- **#** The control limit criteria is not applicable. See case narrative.
- **J** The result is an estimated value.
- **E** The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- **M** The duplicate injection precision was not met.
- **N** The Matrix Spike sample recovery is not within control limits. See case narrative.
- **S** The reported value was determined by the Method of Standard Additions (MSA).
- **U** The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
  DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- **W** The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- **i** The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- **X** See case narrative.
- **+** The correlation coefficient for the MSA is less than 0.995.
- **Q** See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- ***** The result is an outlier. See case narrative.
- **#** The control limit criteria is not applicable. See case narrative.
- **A** A tentatively identified compound, a suspected aldol-condensation product.
- **B** The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- **C** The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- **D** The reported result is from a dilution.
- **E** The result is an estimated value.
- **J** The result is an estimated value.
- **N** The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- **P** The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- **U** The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
  DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- **i** The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- **X** See case narrative.
- **Q** See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- **F** The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- **L** The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- **H** The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- **O** The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- **Y** The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- **Z** The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Anchor QEA, LLC
Project: Barry/201114-01.02 Task
Service Request: K2108367

Sample Name: BR-COL-INF-MW-8-3
Lab Code: K2108367-001
Sample Matrix: Water
Date Collected: 07/9/21
Date Received: 07/19/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-INF-MW-10-3
Lab Code: K2108367-002
Sample Matrix: Water
Date Collected: 07/9/21
Date Received: 07/19/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-1-3
Lab Code: K2108367-003
Sample Matrix: Water
Date Collected: 07/9/21
Date Received: 07/19/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-2-3
Lab Code: K2108367-004
Sample Matrix: Water
Date Collected: 07/9/21
Date Received: 07/19/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-3-3
Lab Code: K2108367-005
Sample Matrix: Water
Date Collected: 07/9/21
Date Received: 07/19/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Client: Anchor QEA, LLC | **Service Request:** K2108367
Project: Barry/201114-01.02 Task

Sample Name: BR-COL-4-3 | **Date Collected:** 07/9/21
Lab Code: K2108367-006 | **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-5-3 | **Date Collected:** 07/9/21
Lab Code: K2108367-007 | **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-6-3 | **Date Collected:** 07/9/21
Lab Code: K2108367-008 | **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-7-3 | **Date Collected:** 07/9/21
Lab Code: K2108367-009 | **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-8-3 | **Date Collected:** 07/9/21
Lab Code: K2108367-010 | **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Client: Anchor QEA, LLC
Service Request: K2108367
Project: Barry/201114-01.02 Task

Sample Name: BR-COL-INF-MW-8-4
Date Collected: 07/11/21
Lab Code: K2108367-011
Date Received: 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-INF-MW-10-4
Date Collected: 07/11/21
Lab Code: K2108367-012
Date Received: 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-1-4
Date Collected: 07/11/21
Lab Code: K2108367-013
Date Received: 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-2-4
Date Collected: 07/11/21
Lab Code: K2108367-014
Date Received: 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-3-4
Date Collected: 07/11/21
Lab Code: K2108367-015
Date Received: 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Client: Anchor QEA, LLC **Service Request:** K2108367
Project: Barry/201114-01.02 Task

Sample Name: BR-COL-4-4 **Date Collected:** 07/11/21
Lab Code: K2108367-016 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-5-4 **Date Collected:** 07/11/21
Lab Code: K2108367-017 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-6-4 **Date Collected:** 07/11/21
Lab Code: K2108367-018 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-7-4 **Date Collected:** 07/11/21
Lab Code: K2108367-019 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-8-4 **Date Collected:** 07/11/21
Lab Code: K2108367-020 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Results

ALS Environmental—Kelso Laboratory
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Metals

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www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task	**Date Collected:**	07/09/21 11:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-INF-MW-8-3	**Basis:**	NA
Lab Code:	K2108367-001		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**2.2 J**	ug/L	2.5	0.5	5	08/13/21 18:32	07/30/21	

Printed 8/16/2021 3:22:18 PM

Superset Reference:21-0000600054 rev 00

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task	**Date Collected:**	07/09/21 11:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-INF-MW-10-3	**Basis:**	NA
Lab Code:	K2108367-002		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.7 J**	ug/L	2.5	0.5	5	08/13/21 18:36	07/30/21	

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task	**Date Collected:**	07/09/21 11:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-1-3	**Basis:**	NA
Lab Code:	K2108367-003		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.4 J**	ug/L	2.5	0.5	5	08/13/21 18:40	07/30/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task		**Date Collected:**	07/09/21 11:40
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-2-3		**Basis:**	NA
Lab Code:	K2108367-004			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**3.3**	ug/L	2.5	0.5	5	08/13/21 18:42	07/30/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task	**Date Collected:**	07/09/21 11:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-3-3	**Basis:**	NA
Lab Code:	K2108367-005		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.8 J**	ug/L	2.5	0.5	5	08/13/21 18:46	07/30/21	

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task	**Date Collected:**	07/09/21 14:00
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-4-3	**Basis:**	NA
Lab Code:	K2108367-006		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.7 J**	ug/L	2.5	0.5	5	08/13/21 18:47	07/30/21	

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task	**Date Collected:**	07/09/21 14:00
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-5-3	**Basis:**	NA
Lab Code:	K2108367-007		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.0 J**	ug/L	2.5	0.5	5	08/13/21 18:48	07/30/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task		**Date Collected:**	07/09/21 14:00
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-6-3		**Basis:**	NA
Lab Code:	K2108367-008			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.9 J**	ug/L	2.5	0.5	5	08/13/21 18:50	07/30/21	

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task	**Date Collected:**	07/09/21 14:00
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-7-3	**Basis:**	NA
Lab Code:	K2108367-009		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.4 J**	ug/L	2.5	0.5	5	08/13/21 18:51	07/30/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task		**Date Collected:**	07/09/21 14:00
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-8-3		**Basis:**	NA
Lab Code:	K2108367-010			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.9 J**	ug/L	2.5	0.5	5	08/13/21 18:52	07/30/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task		**Date Collected:**	07/11/21 13:40
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-INF-MW-8-4		**Basis:**	NA
Lab Code:	K2108367-011			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**14.4**	ug/L	2.5	0.5	5	08/13/21 18:54	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task	**Date Collected:**	07/11/21 13:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-INF-MW-10-4	**Basis:**	NA
Lab Code:	K2108367-012		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**4.6**	ug/L	2.5	0.5	5	08/13/21 18:55	07/30/21	

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task	**Date Collected:**	07/11/21 13:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-1-4	**Basis:**	NA
Lab Code:	K2108367-013		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.2 J**	ug/L	2.5	0.5	5	08/13/21 18:56	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task	**Date Collected:**	07/11/21 13:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-2-4	**Basis:**	NA
Lab Code:	K2108367-014		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**8.6**	ug/L	2.5	0.5	5	08/13/21 18:57	07/30/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task	**Date Collected:**	07/11/21 13:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-3-4	**Basis:**	NA
Lab Code:	K2108367-015		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**3.0**	ug/L	2.5	0.5	5	08/13/21 19:02	07/30/21	

Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task		**Date Collected:**	07/11/21 13:40
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-4-4		**Basis:**	NA
Lab Code:	K2108367-016			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.4 J**	ug/L	2.5	0.5	5	08/13/21 19:03	07/30/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task	**Date Collected:**	07/11/21 13:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-5-4	**Basis:**	NA
Lab Code:	K2108367-017		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.7 J**	ug/L	2.5	0.5	5	08/13/21 19:04	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task	**Date Collected:**	07/11/21 13:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-6-4	**Basis:**	NA
Lab Code:	K2108367-018		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.6 J**	ug/L	2.5	0.5	5	08/13/21 19:05	07/30/21	

Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task		**Date Collected:**	07/11/21 13:40
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-7-4		**Basis:**	NA
Lab Code:	K2108367-019			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.3 J**	ug/L	2.5	0.5	5	08/13/21 19:07	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task	**Date Collected:**	07/11/21 13:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-8-4	**Basis:**	NA
Lab Code:	K2108367-020		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.7 J**	ug/L	2.5	0.5	5	08/13/21 19:08	07/30/21	

QC Summary Forms

ALS Environmental—Kelso Laboratory
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Metals

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dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	KQ2114013-05		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	0.50	0.09	1	08/13/21 18:30	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task	**Date Collected:**	07/09/21
Sample Matrix:	Water	**Date Received:**	07/19/21
		Date Analyzed:	08/13/21
		Date Extracted:	07/30/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	BR-COL-INF-MW-8-3	**Units:**	ug/L
Lab Code:	K2108367-001	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2114013-02

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	2.2 J	51.0	50.0	97	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

Client:	Anchor QEA, LLC	**Service Request:**	K2108367
Project:	Barry/201114-01.02 Task	**Date Collected:**	07/09/21
Sample Matrix:	Water	**Date Received:**	07/19/21
		Date Analyzed:	08/13/21
		Date Extracted:	07/30/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	BR-COL-INF-MW-10-3	**Units:**	ug/L
Lab Code:	K2108367-002	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2114013-04

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	0.7 J	50.1	50.0	99	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

Client:	Anchor QEA, LLC	**Service Request:**	K2108367
Project	Barry/201114-01.02 Task	**Date Collected:**	07/09/21
Sample Matrix:	Water	**Date Received:**	07/19/21
		Date Analyzed:	08/13/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	BR-COL-INF-MW-8-3	**Units:**	ug/L
Lab Code:	K2108367-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2114013-01 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	2.2 J	1.8 J	2.0	20	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108367
Project	Barry/201114-01.02 Task	**Date Collected:**	07/09/21
Sample Matrix:	Water	**Date Received:**	07/19/21
		Date Analyzed:	08/13/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	BR-COL-INF-MW-10-3	**Units:**	ug/L
Lab Code:	K2108367-002	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2114013-03 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	0.7 J	0.9 J	0.8	25 #	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Anchor QEA, LLC
Project: Barry/201114-01.02 Task
Sample Matrix: Water

Service Request: K2108367
Date Analyzed: 08/13/21

Lab Control Sample Summary
Dissolved Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2114013-06

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	200.8	46.3	50.0	93	85-115

August 16, 2021 Service Request No:K2108369

Masa Kanematsu
Anchor QEA, LLC
6720 SW Macadam Avenue
Suite 125
Portland, OR 97219

Laboratory Results for: Barry

Dear Masa,

Enclosed are the results of the sample(s) submitted to our laboratory July 19, 2021
For your reference, these analyses have been assigned our service request number **K2108369.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at Mark.Harris@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Mark Harris
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental

Narrative Documents

ALS Environmental—Kelso Laboratory
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RIGHT SOLUTIONS | RIGHT PARTNER

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Client: Anchor QEA, LLC
Project: Barry
Sample Matrix: Water

Service Request: K2108369
Date Received: 07/19/2021

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

Twenty water samples were received for analysis at ALS Environmental on 07/19/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Metals:

No significant anomalies were noted with this analysis.

Approved by ________________ Date 08/16/2021

SAMPLE DETECTION SUMMARY

CLIENT ID: BR-COL-INF-MW-8-5	Lab ID: K2108369-001					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	18.2		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-INF-MW-10-5	Lab ID: K2108369-002					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	4.4		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-1-5	Lab ID: K2108369-003					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	1.0	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-2-5	Lab ID: K2108369-004					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	12.4		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-3-5	Lab ID: K2108369-005					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	5.9		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-4-5	Lab ID: K2108369-006					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	2.8		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-5-5	Lab ID: K2108369-007					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	0.8	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-6-5	Lab ID: K2108369-008					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	0.6	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-7-5	Lab ID: K2108369-009					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	2.0	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-8-5	Lab ID: K2108369-010					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	1.0	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-INF-MW-8-6	Lab ID: K2108369-011					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	23.9		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-INF-MW-10-6	Lab ID: K2108369-012					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	4.5		0.5	2.5	ug/L	200.8

SAMPLE DETECTION SUMMARY

CLIENT ID: BR-COL-1-6	Lab ID: K2108369-013					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	1.3	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-2-6	Lab ID: K2108369-014					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	17.2		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-3-6	Lab ID: K2108369-015					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	10.0		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-4-6	Lab ID: K2108369-016					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	6.6		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-5-6	Lab ID: K2108369-017					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	0.9	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-6-6	Lab ID: K2108369-018					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	1.0	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-7-6	Lab ID: K2108369-019					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	2.4	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-8-6	Lab ID: K2108369-020					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	1.0	J	0.5	2.5	ug/L	200.8

Sample Receipt Information

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: Anchor QEA, LLC **Service Request:** K2108369
Project: Barry/201114-01.02 Task 02

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K2108369-001	BR-COL-INF-MW-8-5	7/12/2021	1325
K2108369-002	BR-COL-INF-MW-10-5	7/12/2021	1325
K2108369-003	BR-COL-1-5	7/12/2021	1325
K2108369-004	BR-COL-2-5	7/12/2021	1325
K2108369-005	BR-COL-3-5	7/12/2021	1325
K2108369-006	BR-COL-4-5	7/12/2021	1325
K2108369-007	BR-COL-5-5	7/12/2021	1325
K2108369-008	BR-COL-6-5	7/12/2021	1325
K2108369-009	BR-COL-7-5	7/12/2021	1325
K2108369-010	BR-COL-8-5	7/12/2021	1325
K2108369-011	BR-COL-INF-MW-8-6	7/13/2021	1230
K2108369-012	BR-COL-INF-MW-10-6	7/13/2021	1230
K2108369-013	BR-COL-1-6	7/13/2021	1230
K2108369-014	BR-COL-2-6	7/13/2021	1230
K2108369-015	BR-COL-3-6	7/13/2021	1230
K2108369-016	BR-COL-4-6	7/13/2021	1230
K2108369-017	BR-COL-5-6	7/13/2021	1230
K2108369-018	BR-COL-6-6	7/13/2021	1230
K2108369-019	BR-COL-7-6	7/13/2021	1230
K2108369-020	BR-COL-8-6	7/13/2021	1230

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Chain of Custody Record & Laboratory Analysis Request

Laboratory Number:	503-972-5019
Date:	7/19/2021
Project Name:	Barry
Project Number:	201114-01.02 Task 02
Project Manager:	Masa Kanematsu
Phone Number:	503-972-5001 (Masa Kanematsu)
Shipment Method:	ALS Carrier

ANCHOR QEA
Jessica Goin
6720 SW Macadam Ave
Suite 125
Portland OR 97219

Line	Field Sample ID	Collection Date	Collection Time	Matrix	No. of Containers	Arsenic (dissolved, Method 200.8)	Comments/Preservation
31	BR-COL-INF-MW-8-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
32	BR-COL-INF-MW-10-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
33	BR-COL-1-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
34	BR-COL-2-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
35	BR-COL-3-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
36	BR-COL-4-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
37	BR-COL-5-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
38	BR-COL-6-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
39	BR-COL-7-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
40	BR-COL-8-4	7/11/2021	13:40	Water	1	X	HNO_3 preserved, filtered
1 41	BR-COL-INF-MW-8-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
2 42	BR-COL-INF-MW-10-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
3 43	BR-COL-1-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
4 44	BR-COL-2-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
5 45	BR-COL-3-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered

Notes: **Please analyze with standard TAT. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L). Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	Jessie Pedro	ALS
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
[signature]	7/19/2021 9:00	[signature]	7/19/21 1500
Relinquished by:	Company:	Received by:	Company:
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original.

Page 3 of 6

K2108369 3

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number: 503-972-5019	
Date:	7/19/2021
Project Name:	Barry
Project Number:	201114-01.02 Task 02
Project Manager:	Masa Kanematsu
Phone Number:	503-972-5001 (Masa Kanematsu)
Shipment Method:	ALS Carrier

ANCHOR QEA
Jessica Goin
6720 SW Macadam Ave
Suite 125
Portland OR 97219

	Line	Field Sample ID	Collection Date	Collection Time	Matrix	No. of Containers	Arsenic (dissolved, Method 200.8)	Comments/Preservation
6	46	BR-COL-4-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
7	47	BR-COL-5-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
8	48	BR-COL-6-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
9	49	BR-COL-7-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
10	50	BR-COL-8-5	7/12/2021	13:25	Water	1	X	HNO_3 preserved, filtered
11	51	BR-COL-INF-MW-8-6	7/13/2021	12:30	Water	1	X	HNO_3 preserved, filtered
12	52	BR-COL-INF-MW-10-6	7/13/2021	12:30	Water	1	X	HNO_3 preserved, filtered
13	53	BR-COL-1-6	7/13/2021	12:30	Water	1	X	HNO_3 preserved, filtered
14	54	BR-COL-2-6	7/13/2021	12:30	Water	1	X	HNO_3 preserved, filtered
15	55	BR-COL-3-6	7/13/2021	12:30	Water	1	X	HNO_3 preserved, filtered
16	56	BR-COL-4-6	7/13/2021	12:30	Water	1	X	HNO_3 preserved, filtered
17	57	BR-COL-5-6	7/13/2021	12:30	Water	1	X	HNO_3 preserved, filtered
18	58	BR-COL-6-6	7/13/2021	12:30	Water	1	X	HNO_3 preserved, filtered
19	59	BR-COL-7-6	7/13/2021	12:30	Water	1	X	HNO_3 preserved, filtered
20	60	BR-COL-8-6	7/13/2021	12:30	Water	1	X	HNO_3 preserved, filtered

Notes: **Please analyze with standard TAT. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L). Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	Jessie Rode	ALS
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
[signature]	7/19/2021 9:00	[signature]	7/19/21 1500
Relinquished by:	Company:	Received by:	Company:
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original.

Page 4 of 6

PM MH

Cooler Receipt and Preservation Form

Client Anchor QEA Service Request K21 08369

Received: 7/15/21 Opened: 7/15/21 By: JP Unloaded: 7/15/21 By: JP

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered* JP
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* ________ *NA*
3. Were custody seals on coolers? ~~NA~~ JP Y N If yes, how many and where? ________
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N
4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y ~~N~~ JP
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA ~~Y~~ JP N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number (NA)	Filed
	20.1	IR03					

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* ________
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y ~~N~~ JP
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: Did not pH due to limited volume

Miscellaneous Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Client: Anchor QEA, LLC
Project: Barry/201114-01.02 Task 02
Service Request: K2108369

Sample Name: BR-COL-INF-MW-8-5
Lab Code: K2108369-001
Sample Matrix: Water
Date Collected: 07/12/21
Date Received: 07/19/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-INF-MW-10-5
Lab Code: K2108369-002
Sample Matrix: Water
Date Collected: 07/12/21
Date Received: 07/19/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-1-5
Lab Code: K2108369-003
Sample Matrix: Water
Date Collected: 07/12/21
Date Received: 07/19/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-2-5
Lab Code: K2108369-004
Sample Matrix: Water
Date Collected: 07/12/21
Date Received: 07/19/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-3-5
Lab Code: K2108369-005
Sample Matrix: Water
Date Collected: 07/12/21
Date Received: 07/19/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Analyst Summary report

Client: Anchor QEA, LLC **Service Request:** K2108369
Project: Barry/201114-01.02 Task 02

Sample Name: BR-COL-4-5 **Date Collected:** 07/12/21
Lab Code: K2108369-006 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-5-5 **Date Collected:** 07/12/21
Lab Code: K2108369-007 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-6-5 **Date Collected:** 07/12/21
Lab Code: K2108369-008 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-7-5 **Date Collected:** 07/12/21
Lab Code: K2108369-009 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-8-5 **Date Collected:** 07/12/21
Lab Code: K2108369-010 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Client:	Anchor QEA, LLC	**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02		

Sample Name:	BR-COL-INF-MW-8-6	**Date Collected:**	07/13/21
Lab Code:	K2108369-011	**Date Received:**	07/19/21
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name:	BR-COL-INF-MW-10-6	**Date Collected:**	07/13/21
Lab Code:	K2108369-012	**Date Received:**	07/19/21
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name:	BR-COL-1-6	**Date Collected:**	07/13/21
Lab Code:	K2108369-013	**Date Received:**	07/19/21
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name:	BR-COL-2-6	**Date Collected:**	07/13/21
Lab Code:	K2108369-014	**Date Received:**	07/19/21
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name:	BR-COL-3-6	**Date Collected:**	07/13/21
Lab Code:	K2108369-015	**Date Received:**	07/19/21
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Client: Anchor QEA, LLC **Service Request:** K2108369
Project: Barry/201114-01.02 Task 02

Sample Name: BR-COL-4-6 **Date Collected:** 07/13/21
Lab Code: K2108369-016 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-5-6 **Date Collected:** 07/13/21
Lab Code: K2108369-017 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-6-6 **Date Collected:** 07/13/21
Lab Code: K2108369-018 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-7-6 **Date Collected:** 07/13/21
Lab Code: K2108369-019 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-8-6 **Date Collected:** 07/13/21
Lab Code: K2108369-020 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Results

ALS Environmental—Kelso Laboratory
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Metals

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Client:	Anchor QEA, LLC		**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/12/21 13:25
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-INF-MW-8-5		**Basis:**	NA
Lab Code:	K2108369-001			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**18.2**	ug/L	2.5	0.5	5	08/13/21 19:15	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/12/21 13:25
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-INF-MW-10-5	**Basis:**	NA
Lab Code:	K2108369-002		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**4.4**	ug/L	2.5	0.5	5	08/13/21 19:19	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/12/21 13:25
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-1-5	**Basis:**	NA
Lab Code:	K2108369-003		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.0 J**	ug/L	2.5	0.5	5	08/13/21 19:23	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/12/21 13:25
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-2-5	**Basis:**	NA
Lab Code:	K2108369-004		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**12.4**	ug/L	2.5	0.5	5	08/13/21 19:24	07/30/21	

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/12/21 13:25
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-3-5	**Basis:**	NA
Lab Code:	K2108369-005		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**5.9**	ug/L	2.5	0.5	5	08/13/21 19:28	07/30/21	

Client: Anchor QEA, LLC
Project: Barry/201114-01.02 Task 02
Sample Matrix: Water

Service Request: K2108369
Date Collected: 07/12/21 13:25
Date Received: 07/19/21 15:00

Sample Name: BR-COL-4-5
Lab Code: K2108369-006

Basis: NA

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**2.8**	ug/L	2.5	0.5	5	08/13/21 19:29	07/30/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/12/21 13:25
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-5-5		**Basis:**	NA
Lab Code:	K2108369-007			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.8 J**	ug/L	2.5	0.5	5	08/13/21 19:31	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/12/21 13:25
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-6-5	**Basis:**	NA
Lab Code:	K2108369-008		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.6 J**	ug/L	2.5	0.5	5	08/13/21 19:32	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/12/21 13:25
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-7-5	**Basis:**	NA
Lab Code:	K2108369-009		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**2.0 J**	ug/L	2.5	0.5	5	08/13/21 19:33	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/12/21 13:25
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-8-5	**Basis:**	NA
Lab Code:	K2108369-010		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.0 J**	ug/L	2.5	0.5	5	08/13/21 19:35	07/30/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/13/21 12:30
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-INF-MW-8-6		**Basis:**	NA
Lab Code:	K2108369-011			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**23.9**	ug/L	2.5	0.5	5	08/13/21 19:36	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/13/21 12:30
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-INF-MW-10-6	**Basis:**	NA
Lab Code:	K2108369-012		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**4.5**	ug/L	2.5	0.5	5	08/13/21 19:37	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/13/21 12:30
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-1-6	**Basis:**	NA
Lab Code:	K2108369-013		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.3 J**	ug/L	2.5	0.5	5	08/13/21 19:39	07/30/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/13/21 12:30
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-2-6		**Basis:**	NA
Lab Code:	K2108369-014			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**17.2**	ug/L	2.5	0.5	5	08/13/21 19:40	07/30/21	

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/13/21 12:30
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-3-6	**Basis:**	NA
Lab Code:	K2108369-015		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**10.0**	ug/L	2.5	0.5	5	08/13/21 19:47	07/30/21	

Client: Anchor QEA, LLC
Project: Barry/201114-01.02 Task 02
Sample Matrix: Water

Service Request: K2108369
Date Collected: 07/13/21 12:30
Date Received: 07/19/21 15:00

Sample Name: BR-COL-4-6
Lab Code: K2108369-016

Basis: NA

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**6.6**	ug/L	2.5	0.5	5	08/13/21 19:48	07/30/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/13/21 12:30
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-5-6		**Basis:**	NA
Lab Code:	K2108369-017			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.9 J**	ug/L	2.5	0.5	5	08/13/21 19:49	07/30/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/13/21 12:30
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-6-6	**Basis:**	NA
Lab Code:	K2108369-018		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.0 J**	ug/L	2.5	0.5	5	08/13/21 19:51	07/30/21	

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/13/21 12:30
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-7-6	**Basis:**	NA
Lab Code:	K2108369-019		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**2.4 J**	ug/L	2.5	0.5	5	08/13/21 19:52	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/13/21 12:30
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-8-6	**Basis:**	NA
Lab Code:	K2108369-020		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.0 J**	ug/L	2.5	0.5	5	08/13/21 19:53	07/30/21	

QC Summary Forms

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1317 South 13th Avenue, Kelso, WA 98626
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Metals

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Client:	Anchor QEA, LLC	**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	KQ2114017-01		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	0.50	0.09	1	08/13/21 19:12	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/12/21
Sample Matrix:	Water	**Date Received:**	07/19/21
		Date Analyzed:	08/13/21
		Date Extracted:	07/30/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	BR-COL-INF-MW-8-5	**Units:**	ug/L
Lab Code:	K2108369-001	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2114017-04

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	18.2	65.1	50.0	94	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

Client:	Anchor QEA, LLC	**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/12/21
Sample Matrix:	Water	**Date Received:**	07/19/21
		Date Analyzed:	08/13/21
		Date Extracted:	07/30/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	BR-COL-INF-MW-10-5	**Units:**	ug/L
Lab Code:	K2108369-002	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2114017-06

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	4.4	50.9	50.0	93	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108369
Project	Barry/201114-01.02 Task 02	**Date Collected:**	07/12/21
Sample Matrix:	Water	**Date Received:**	07/19/21
		Date Analyzed:	08/13/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	BR-COL-INF-MW-8-5	**Units:**	ug/L
Lab Code:	K2108369-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2114017-03 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	18.2	18.4	18.3	1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Printed 8/16/2021 3:19:35 PM

Superset Reference:21-0000600055 rev 00

Client:	Anchor QEA, LLC	**Service Request:**	K2108369
Project	Barry/201114-01.02 Task 02	**Date Collected:**	07/12/21
Sample Matrix:	Water	**Date Received:**	07/19/21
		Date Analyzed:	08/13/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	BR-COL-INF-MW-10-5	**Units:**	ug/L
Lab Code:	K2108369-002	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2114017-05 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	4.4	4.3	4.4	2	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	Anchor QEA, LLC	**Service Request:**	K2108369
Project:	Barry/201114-01.02 Task 02	**Date Analyzed:**	08/13/21
Sample Matrix:	Water		

Lab Control Sample Summary
Dissolved Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2114017-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	200.8	47.2	50.0	94	85-115

August 16, 2021

Service Request No:K2108427

Masa Kanematsu
Anchor QEA, LLC
6720 SW Macadam Avenue
Suite 125
Portland, OR 97219

Laboratory Results for: Barry

Dear Masa,

Enclosed are the results of the sample(s) submitted to our laboratory July 19, 2021
For your reference, these analyses have been assigned our service request number **K2108427.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at Mark.Harris@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Mark Harris
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental

Narrative Documents

ALS Environmental—Kelso Laboratory
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ALS Environmental

Client:	Anchor QEA, LLC	**Service Request:**	K2108427
Project:	Barry	**Date Received:**	07/19/2021
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

Twenty water samples were received for analysis at ALS Environmental on 07/19/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Metals:

No significant anomalies were noted with this analysis.

Approved by ____________________ Date 08/16/2021

SAMPLE DETECTION SUMMARY

CLIENT ID: BR-COL-INF-MW-8-7 — **Lab ID: K2108427-001**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	29.9		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-INF-MW-10-7 — **Lab ID: K2108427-002**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	7.4		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-1-7 — **Lab ID: K2108427-003**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	3.0		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-2-7 — **Lab ID: K2108427-004**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	22.1		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-3-7 — **Lab ID: K2108427-005**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	13.6		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-4-7 — **Lab ID: K2108427-006**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	10.6		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-5-7 — **Lab ID: K2108427-007**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	0.8	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-6-7 — **Lab ID: K2108427-008**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	0.9	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-7-7 — **Lab ID: K2108427-009**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	2.9		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-8-7 — **Lab ID: K2108427-010**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	1.6	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-INF-MW-8-8 — **Lab ID: K2108427-011**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	34.6		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-INF-MW-10-8 — **Lab ID: K2108427-012**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	7.4		0.5	2.5	ug/L	200.8

SAMPLE DETECTION SUMMARY

CLIENT ID: BR-COL-1-8	Lab ID: K2108427-013					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	3.7		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-2-8	Lab ID: K2108427-014					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	22.0		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-3-8	Lab ID: K2108427-015					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	15.8		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-4-8	Lab ID: K2108427-016					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	11.9		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-5-8	Lab ID: K2108427-017					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	0.9	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-6-8	Lab ID: K2108427-018					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	1.1	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-7-8	Lab ID: K2108427-019					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	3.6		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-8-8	Lab ID: K2108427-020					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	1.4	J	0.5	2.5	ug/L	200.8

Sample Receipt Information

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K2108427-001	BR-COL-INF-MW-8-7	7/14/2021	1440
K2108427-002	BR-COL-INF-MW-10-7	7/14/2021	1440
K2108427-003	BR-COL-1-7	7/14/2021	1440
K2108427-004	BR-COL-2-7	7/14/2021	1440
K2108427-005	BR-COL-3-7	7/14/2021	1440
K2108427-006	BR-COL-4-7	7/14/2021	1440
K2108427-007	BR-COL-5-7	7/14/2021	1440
K2108427-008	BR-COL-6-7	7/14/2021	1440
K2108427-009	BR-COL-7-7	7/14/2021	1440
K2108427-010	BR-COL-8-7	7/14/2021	1440
K2108427-011	BR-COL-INF-MW-8-8	7/15/2021	0810
K2108427-012	BR-COL-INF-MW-10-8	7/15/2021	0810
K2108427-013	BR-COL-1-8	7/15/2021	0810
K2108427-014	BR-COL-2-8	7/15/2021	0810
K2108427-015	BR-COL-3-8	7/15/2021	0810
K2108427-016	BR-COL-4-8	7/15/2021	0810
K2108427-017	BR-COL-5-8	7/15/2021	0810
K2108427-018	BR-COL-6-8	7/15/2021	0810
K2108427-019	BR-COL-7-8	7/15/2021	0810
K2108427-020	BR-COL-8-8	7/15/2021	0810

K2108427 4

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number: 503-972-5019

Date:	7/19/2021
Project Name:	Barry
Project Number:	201114-01.02 Task 02
Project Manager:	Masa Kanematsu
Phone Number:	503-972-5001 (Masa Kanematsu)
Shipment Method:	ALS Carrier

ANCHOR QEA
Jessica Goin
6720 SW Macadam Ave
Suite 125
Portland OR 97219

	Line	Field Sample ID	Collection Date	Collection Time	Matrix	No. of Containers	Arsenic (dissolved, Method 200.8)	Comments/Preservation
1	61	BR-COL-INF-MW-8-7	7/14/2021	14:40	Water	1	X	HNO_3 preserved, filtered
2	62	BR-COL-INF-MW-10-7	7/14/2021	14:40	Water	1	X	HNO_3 preserved, filtered
3	63	BR-COL-1-7	7/14/2021	14:40	Water	1	X	HNO_3 preserved, filtered
4	64	BR-COL-2-7	7/14/2021	14:40	Water	1	X	HNO_3 preserved, filtered
5	65	BR-COL-3-7	7/14/2021	14:40	Water	1	X	HNO_3 preserved, filtered
6	66	BR-COL-4-7	7/14/2021	14:40	Water	1	X	HNO_3 preserved, filtered
7	67	BR-COL-5-7	7/14/2021	14:40	Water	1	X	HNO_3 preserved, filtered
8	68	BR-COL-6-7	7/14/2021	14:40	Water	1	X	HNO_3 preserved, filtered
9	69	BR-COL-7-7	7/14/2021	14:40	Water	1	X	HNO_3 preserved, filtered
10	70	BR-COL-8-7	7/14/2021	14:40	Water	1	X	HNO_3 preserved, filtered
11	71	BR-COL-INF-MW-8-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
12	72	BR-COL-INF-MW-10-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
13	73	BR-COL-1-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
14	74	BR-COL-2-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
15	75	BR-COL-3-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered

Notes: **Please analyze with standard TAT. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L). Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	Jessica R[illegible]	ALS
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
[signature]	7/19/2021 9:00	[signature]	7/15/21 1500
Relinquished by:	Company:	Received by:	Company:
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original.

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K2108427

4

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number: 503-972-5019	
Date:	7/19/2021
Project Name:	Barry
Project Number:	201114-01.02 Task 02
Project Manager:	Masa Kanematsu
Phone Number:	503-972-5001 (Masa Kanematsu)
Shipment Method:	ALS Carrier

ANCHOR QEA

Jessica Goin
6720 SW Macadam Ave
Suite 125
Portland OR 97219

	Line	Field Sample ID	Collection Date	Collection Time	Matrix	No. of Containers	Parameters: Arsenic (dissolved, Method 200.8)	Comments/Preservation
16	76	BR-COL-4-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
17	77	BR-COL-5-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
18	78	BR-COL-6-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
19	79	BR-COL-7-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
20	80	BR-COL-8-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
	81	BR-COL-INF-MW-8-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
	82	BR-COL-INF-MW-10-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
	83	BR-COL-1-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
	84	BR-COL-2-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
	85	BR-COL-3-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
	86	BR-COL-4-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
	87	BR-COL-5-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
	88	BR-COL-6-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
	89	BR-COL-7-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
	90	BR-COL-8-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered

Notes: **Please analyze with standard TAT. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L). Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	Jessie Pedro	ALS
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
[signature]	7/19/2021 9:00	[signature]	7/19/21 1500
Relinquished by:	Company:	Received by:	Company:
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original.

Page 6 of 6

PM MH

Cooler Receipt and Preservation Form

Client Anchor QEA Service Request K21 08427

Received: 7/15/21 Opened: 7/15/21 By: JP Unloaded: 7/15/21 By: JP

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* ***Courier*** *Hand Delivered* JP
2. Samples were received in: (circle) ***Cooler*** *Box* *Envelope* *Other* ______ *NA*
3. Were custody seals on coolers? ~~NA~~ JP Y **N** If yes, how many and where? ______
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N
4. Was a Temperature Blank present in cooler? NA Y **N** If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA **Y** ~~N~~ JP
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. **NA** ~~Y~~ JP N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp Indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
	22.1	IR01					

6. Packing material: *Inserts* ***Baggies*** ***Bubble Wrap*** *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* ______
7. Were custody papers properly filled out (ink, signed, etc.)? NA **Y** N
8. Were samples received in good condition (unbroken) NA **Y** N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA **Y** N
10. Did all sample labels and tags agree with custody papers? NA **Y** N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA **Y** N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* **NA** Y ~~N~~ JP
13. Were VOA vials received without headspace? *Indicate in the table below.* **NA** Y N
14. Was C12/Res negative? **NA** Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: Did not pH due to limited volume

Miscellaneous Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Inorganic Data Qualifiers

- ***** The result is an outlier. See case narrative.
- **#** The control limit criteria is not applicable. See case narrative.
- **B** The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- **E** The result is an estimate amount because the value exceeded the instrument calibration range.
- **J** The result is an estimated value.
- **U** The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
  DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- **i** The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- **X** See case narrative.
- **Q** See case narrative. One or more quality control criteria was outside the limits.
- **H** The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- **#** The control limit criteria is not applicable. See case narrative.
- **J** The result is an estimated value.
- **E** The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- **M** The duplicate injection precision was not met.
- **N** The Matrix Spike sample recovery is not within control limits. See case narrative.
- **S** The reported value was determined by the Method of Standard Additions (MSA).
- **U** The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
  DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- **W** The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- **i** The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- **X** See case narrative.
- **+** The correlation coefficient for the MSA is less than 0.995.
- **Q** See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- ***** The result is an outlier. See case narrative.
- **#** The control limit criteria is not applicable. See case narrative.
- **A** A tentatively identified compound, a suspected aldol-condensation product.
- **B** The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- **C** The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- **D** The reported result is from a dilution.
- **E** The result is an estimated value.
- **J** The result is an estimated value.
- **N** The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- **P** The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- **U** The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
  DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- **i** The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- **X** See case narrative.
- **Q** See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- **F** The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- **L** The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- **H** The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- **O** The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- **Y** The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- **Z** The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

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Analyst Summary report

Client: Anchor QEA, LLC **Service Request:** K2108427
Project: Barry/201114-01.02 Task 02

Sample Name: BR-COL-INF-MW-8-7 **Date Collected:** 07/14/21
Lab Code: K2108427-001 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-INF-MW-10-7 **Date Collected:** 07/14/21
Lab Code: K2108427-002 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-1-7 **Date Collected:** 07/14/21
Lab Code: K2108427-003 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-2-7 **Date Collected:** 07/14/21
Lab Code: K2108427-004 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-3-7 **Date Collected:** 07/14/21
Lab Code: K2108427-005 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Analyst Summary report

Client: Anchor QEA, LLC **Service Request:** K2108427
Project: Barry/201114-01.02 Task 02

Sample Name: BR-COL-4-7 **Date Collected:** 07/14/21
Lab Code: K2108427-006 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-5-7 **Date Collected:** 07/14/21
Lab Code: K2108427-007 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-6-7 **Date Collected:** 07/14/21
Lab Code: K2108427-008 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-7-7 **Date Collected:** 07/14/21
Lab Code: K2108427-009 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-8-7 **Date Collected:** 07/14/21
Lab Code: K2108427-010 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Client:	Anchor QEA, LLC	**Service Request:** K2108427
Project:	Barry/201114-01.02 Task 02	

Sample Name:	BR-COL-INF-MW-8-8	**Date Collected:** 07/15/21
Lab Code:	K2108427-011	**Date Received:** 07/19/21
Sample Matrix:	Water	

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name:	BR-COL-INF-MW-10-8	**Date Collected:** 07/15/21
Lab Code:	K2108427-012	**Date Received:** 07/19/21
Sample Matrix:	Water	

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name:	BR-COL-1-8	**Date Collected:** 07/15/21
Lab Code:	K2108427-013	**Date Received:** 07/19/21
Sample Matrix:	Water	

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name:	BR-COL-2-8	**Date Collected:** 07/15/21
Lab Code:	K2108427-014	**Date Received:** 07/19/21
Sample Matrix:	Water	

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name:	BR-COL-3-8	**Date Collected:** 07/15/21
Lab Code:	K2108427-015	**Date Received:** 07/19/21
Sample Matrix:	Water	

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Analyst Summary report

Client: Anchor QEA, LLC
Service Request: K2108427
Project: Barry/201114-01.02 Task 02

Sample Name: BR-COL-4-8
Date Collected: 07/15/21
Lab Code: K2108427-016
Date Received: 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-5-8
Date Collected: 07/15/21
Lab Code: K2108427-017
Date Received: 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-6-8
Date Collected: 07/15/21
Lab Code: K2108427-018
Date Received: 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-7-8
Date Collected: 07/15/21
Lab Code: K2108427-019
Date Received: 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-8-8
Date Collected: 07/15/21
Lab Code: K2108427-020
Date Received: 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Results

ALS Environmental—Kelso Laboratory
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Metals

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/14/21 14:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-INF-MW-8-7	**Basis:**	NA
Lab Code:	K2108427-001		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**29.9**	ug/L	2.5	0.5	5	08/13/21 20:03	07/30/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/14/21 14:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-INF-MW-10-7	**Basis:**	NA
Lab Code:	K2108427-002		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**7.4**	ug/L	2.5	0.5	5	08/13/21 20:06	07/30/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/14/21 14:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-1-7	**Basis:**	NA
Lab Code:	K2108427-003		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**3.0**	ug/L	2.5	0.5	5	08/13/21 20:10	07/30/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/14/21 14:40
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-2-7		**Basis:**	NA
Lab Code:	K2108427-004			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**22.1**	ug/L	2.5	0.5	5	08/13/21 20:12	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/14/21 14:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-3-7	**Basis:**	NA
Lab Code:	K2108427-005		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**13.6**	ug/L	2.5	0.5	5	08/13/21 20:16	07/30/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/14/21 14:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-4-7	**Basis:**	NA
Lab Code:	K2108427-006		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**10.6**	ug/L	2.5	0.5	5	08/13/21 20:17	07/30/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/14/21 14:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-5-7	**Basis:**	NA
Lab Code:	K2108427-007		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.8 J**	ug/L	2.5	0.5	5	08/13/21 20:18	07/30/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/14/21 14:40
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-6-7		**Basis:**	NA
Lab Code:	K2108427-008			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.9 J**	ug/L	2.5	0.5	5	08/13/21 20:20	07/30/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/14/21 14:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-7-7	**Basis:**	NA
Lab Code:	K2108427-009		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**2.9**	ug/L	2.5	0.5	5	08/13/21 20:21	07/30/21	

ALS Group USA, Corp.
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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/14/21 14:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-8-7	**Basis:**	NA
Lab Code:	K2108427-010		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.6 J**	ug/L	2.5	0.5	5	08/13/21 20:22	07/30/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/15/21 08:10
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-INF-MW-8-8		**Basis:**	NA
Lab Code:	K2108427-011			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**34.6**	ug/L	2.5	0.5	5	08/13/21 20:24	07/30/21	

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/15/21 08:10
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-INF-MW-10-8	**Basis:**	NA
Lab Code:	K2108427-012		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**7.4**	ug/L	2.5	0.5	5	08/13/21 20:25	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/15/21 08:10
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-1-8	**Basis:**	NA
Lab Code:	K2108427-013		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**3.7**	ug/L	2.5	0.5	5	08/13/21 20:26	07/30/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/15/21 08:10
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-2-8	**Basis:**	NA
Lab Code:	K2108427-014		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**22.0**	ug/L	2.5	0.5	5	08/13/21 20:28	07/30/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/15/21 08:10
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-3-8		**Basis:**	NA
Lab Code:	K2108427-015			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**15.8**	ug/L	2.5	0.5	5	08/13/21 20:32	07/30/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/15/21 08:10
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-4-8	**Basis:**	NA
Lab Code:	K2108427-016		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**11.9**	ug/L	2.5	0.5	5	08/13/21 20:33	07/30/21	

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/15/21 08:10
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-5-8	**Basis:**	NA
Lab Code:	K2108427-017		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.9 J**	ug/L	2.5	0.5	5	08/13/21 20:34	07/30/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/15/21 08:10
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-6-8		**Basis:**	NA
Lab Code:	K2108427-018			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.1 J**	ug/L	2.5	0.5	5	08/13/21 20:36	07/30/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/15/21 08:10
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-7-8	**Basis:**	NA
Lab Code:	K2108427-019		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**3.6**	ug/L	2.5	0.5	5	08/13/21 20:37	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/15/21 08:10
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-8-8	**Basis:**	NA
Lab Code:	K2108427-020		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.4 J**	ug/L	2.5	0.5	5	08/13/21 20:38	07/30/21	

QC Summary Forms

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Metals

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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	NA
Sample Matrix:	Water		**Date Received:**	NA
Sample Name:	Method Blank		**Basis:**	NA
Lab Code:	KQ2114112-01			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	0.50	0.09	1	08/13/21 20:00	07/30/21	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/14/21
Sample Matrix:	Water	**Date Received:**	07/19/21
		Date Analyzed:	08/13/21
		Date Extracted:	07/30/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	BR-COL-INF-MW-8-7	**Units:**	ug/L
Lab Code:	K2108427-001	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2114112-04

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	29.9	74.4	50.0	89	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

Client:	Anchor QEA, LLC	**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/14/21
Sample Matrix:	Water	**Date Received:**	07/19/21
		Date Analyzed:	08/13/21
		Date Extracted:	07/30/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	BR-COL-INF-MW-10-7	**Units:**	ug/L
Lab Code:	K2108427-002	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2114112-06

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	7.4	55.2	50.0	96	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108427
Project	Barry/201114-01.02 Task 02	**Date Collected:**	07/14/21
Sample Matrix:	Water	**Date Received:**	07/19/21
		Date Analyzed:	08/13/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	BR-COL-INF-MW-8-7	**Units:**	ug/L
Lab Code:	K2108427-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2114112-03 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	29.9	29.2	29.6	2	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108427
Project	Barry/201114-01.02 Task 02	**Date Collected:**	07/14/21
Sample Matrix:	Water	**Date Received:**	07/19/21
		Date Analyzed:	08/13/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	BR-COL-INF-MW-10-7	**Units:**	ug/L
Lab Code:	K2108427-002	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2114112-05 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	7.4	7.1	7.3	4	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Printed 8/16/2021 3:21:37 PM Superset Reference:21-0000600056 rev 00

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108427
Project:	Barry/201114-01.02 Task 02	**Date Analyzed:**	08/13/21
Sample Matrix:	Water		

Lab Control Sample Summary
Dissolved Metals

Units: ug/L
Basis: NA

Lab Control Sample
KQ2114112-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	200.8	45.4	50.0	91	85-115

Printed 8/16/2021 3:21:37 PM Superset Reference:21-0000600056 rev 00

August 16, 2021 Service Request No:K2108430

Masa Kanematsu
Anchor QEA, LLC
6720 SW Macadam Avenue
Suite 125
Portland, OR 97219

Laboratory Results for: Barry

Dear Masa,

Enclosed are the results of the sample(s) submitted to our laboratory July 19, 2021
For your reference, these analyses have been assigned our service request number **K2108430.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at Mark.Harris@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Mark Harris
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental

Narrative Documents

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ALS Environmental

Client: Anchor QEA, LLC
Project: Barry
Sample Matrix: Water

Service Request: K2108430
Date Received: 07/19/2021

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

Ten water samples were received for analysis at ALS Environmental on 07/19/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Metals:

No significant anomalies were noted with this analysis.

Approved by ____________________ Date 08/16/2021

SAMPLE DETECTION SUMMARY

CLIENT ID: BR-COL-INF-MW-8-9	Lab ID: K2108430-001					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	43.2		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-INF-MW-10-9	Lab ID: K2108430-002					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	12.9		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-1-9	Lab ID: K2108430-003					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	5.4		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-2-9	Lab ID: K2108430-004					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	30.2		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-3-9	Lab ID: K2108430-005					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	20.3		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-4-9	Lab ID: K2108430-006					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	17.1		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-5-9	Lab ID: K2108430-007					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	0.7	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-6-9	Lab ID: K2108430-008					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	1.0	J	0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-7-9	Lab ID: K2108430-009					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	4.4		0.5	2.5	ug/L	200.8

CLIENT ID: BR-COL-8-9	Lab ID: K2108430-010					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	1.9	J	0.5	2.5	ug/L	200.8

Sample Receipt Information

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www.alsglobal.com

Client: Anchor QEA, LLC **Service Request:** K2108430
Project: Barry/201114-01.02 Task 02

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K2108430-001	BR-COL-INF-MW-8-9	7/16/2021	0740
K2108430-002	BR-COL-INF-MW-10-9	7/16/2021	0740
K2108430-003	BR-COL-1-9	7/16/2021	0740
K2108430-004	BR-COL-2-9	7/16/2021	0740
K2108430-005	BR-COL-3-9	7/16/2021	0740
K2108430-006	BR-COL-4-9	7/16/2021	0740
K2108430-007	BR-COL-5-9	7/16/2021	0740
K2108430-008	BR-COL-6-9	7/16/2021	0740
K2108430-009	BR-COL-7-9	7/16/2021	0740
K2108430-010	BR-COL-8-9	7/16/2021	0740

KL108430 5

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number: 503-972-5019	
Date:	7/19/2021
Project Name:	Barry
Project Number:	201114-01.02 Task 02
Project Manager:	Masa Kanematsu
Phone Number:	503-972-5001 (Masa Kanematsu)
Shipment Method:	ALS Carrier

ANCHOR QEA

Jessica Goin
6720 SW Macadam Ave
Suite 125
Portland OR 97219

	Line	Field Sample ID	Collection Date	Collection Time	Matrix	No. of Containers	Arsenic (dissolved, Method 200.8)	Comments/Preservation
	76	BR-COL-4-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
	77	BR-COL-5-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
	78	BR-COL-6-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
	79	BR-COL-7-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
	80	BR-COL-8-8	7/15/2021	8:10	Water	1	X	HNO_3 preserved, filtered
1	81	BR-COL-INF-MW-8-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
2	82	BR-COL-INF-MW-10-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
3	83	BR-COL-1-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
4	84	BR-COL-2-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
5	85	BR-COL-3-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
6	86	BR-COL-4-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
7	87	BR-COL-5-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
8	88	BR-COL-6-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
9	89	BR-COL-7-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
10	90	BR-COL-8-9	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered

Notes: **Please analyze with standard TAT. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L). Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:
Masa Kanematsu	Anchor QEA
Signature/Print Name:	Date/Time:
[signature]	7/19/2021 9:00

Received by:	Company:
Jessie Peden	ALS
Signature/Print Name:	Date/Time:
[signature]	7/19/21 1500

Relinquished by:	Company:
Signature/Print Name:	Date/Time:

Received by:	Company:
Signature/Print Name:	Date/Time:

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original.

PM MH

Cooler Receipt and Preservation Form

Client Anchor QEA Service Request K21 08430

Received: 7/13/21 Opened: 7/13/21 By: JP Unloaded: 7/13/21 By: JP

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered* JP
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* ______ *NA*
3. Were custody seals on coolers? ~~NA~~ JP Y N If yes, how many and where? ______
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N
4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y ~~N~~ JP
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA ~~Y~~ JP N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
	20.1	IR01					

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* ______
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y ~~N~~ JP
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: Did not pH due to limited volume

Miscellaneous Forms

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Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Analyst Summary report

Client:	Anchor QEA, LLC	**Service Request:**	K2108430
Project:	Barry/201114-01.02 Task 02		

Sample Name:	BR-COL-INF-MW-8-9	**Date Collected:**	07/16/21
Lab Code:	K2108430-001	**Date Received:**	07/19/21
Sample Matrix:	Water		

Analysis Method	**Extracted/Digested By**	**Analyzed By**
200.8	ABOYER	EMCALLISTER

Sample Name:	BR-COL-INF-MW-10-9	**Date Collected:**	07/16/21
Lab Code:	K2108430-002	**Date Received:**	07/19/21
Sample Matrix:	Water		

Analysis Method	**Extracted/Digested By**	**Analyzed By**
200.8	ABOYER	EMCALLISTER

Sample Name:	BR-COL-1-9	**Date Collected:**	07/16/21
Lab Code:	K2108430-003	**Date Received:**	07/19/21
Sample Matrix:	Water		

Analysis Method	**Extracted/Digested By**	**Analyzed By**
200.8	ABOYER	EMCALLISTER

Sample Name:	BR-COL-2-9	**Date Collected:**	07/16/21
Lab Code:	K2108430-004	**Date Received:**	07/19/21
Sample Matrix:	Water		

Analysis Method	**Extracted/Digested By**	**Analyzed By**
200.8	ABOYER	EMCALLISTER

Sample Name:	BR-COL-3-9	**Date Collected:**	07/16/21
Lab Code:	K2108430-005	**Date Received:**	07/19/21
Sample Matrix:	Water		

Analysis Method	**Extracted/Digested By**	**Analyzed By**
200.8	ABOYER	EMCALLISTER

Analyst Summary report

Client: Anchor QEA, LLC **Service Request:** K2108430
Project: Barry/201114-01.02 Task 02

Sample Name: BR-COL-4-9 **Date Collected:** 07/16/21
Lab Code: K2108430-006 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-5-9 **Date Collected:** 07/16/21
Lab Code: K2108430-007 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-6-9 **Date Collected:** 07/16/21
Lab Code: K2108430-008 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-7-9 **Date Collected:** 07/16/21
Lab Code: K2108430-009 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: BR-COL-8-9 **Date Collected:** 07/16/21
Lab Code: K2108430-010 **Date Received:** 07/19/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Results

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Metals

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Client:	Anchor QEA, LLC		**Service Request:**	K2108430
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/16/21 07:40
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-INF-MW-8-9		**Basis:**	NA
Lab Code:	K2108430-001			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**43.2**	ug/L	2.5	0.5	5	08/13/21 17:26	07/30/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108430
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/16/21 07:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-INF-MW-10-9	**Basis:**	NA
Lab Code:	K2108430-002		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**12.9**	ug/L	2.5	0.5	5	08/13/21 17:30	07/30/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108430
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/16/21 07:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-1-9	**Basis:**	NA
Lab Code:	K2108430-003		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**5.4**	ug/L	2.5	0.5	5	08/13/21 17:31	07/30/21	

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108430
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/16/21 07:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-2-9	**Basis:**	NA
Lab Code:	K2108430-004		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**30.2**	ug/L	2.5	0.5	5	08/13/21 17:33	07/30/21	

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108430
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/16/21 07:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-3-9	**Basis:**	NA
Lab Code:	K2108430-005		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**20.3**	ug/L	2.5	0.5	5	08/13/21 17:34	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108430
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/16/21 07:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-4-9	**Basis:**	NA
Lab Code:	K2108430-006		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**17.1**	ug/L	2.5	0.5	5	08/13/21 17:35	07/30/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2108430
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/16/21 07:40
Sample Matrix:	Water		**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-5-9		**Basis:**	NA
Lab Code:	K2108430-007			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.7 J**	ug/L	2.5	0.5	5	08/13/21 17:39	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108430
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/16/21 07:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-6-9	**Basis:**	NA
Lab Code:	K2108430-008		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.0 J**	ug/L	2.5	0.5	5	08/13/21 17:41	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108430
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/16/21 07:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-7-9	**Basis:**	NA
Lab Code:	K2108430-009		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**4.4**	ug/L	2.5	0.5	5	08/13/21 17:42	07/30/21	

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dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108430
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/16/21 07:40
Sample Matrix:	Water	**Date Received:**	07/19/21 15:00
Sample Name:	BR-COL-8-9	**Basis:**	NA
Lab Code:	K2108430-010		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.9 J**	ug/L	2.5	0.5	5	08/13/21 17:43	07/30/21	

QC Summary Forms

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108430
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	KQ2114120-01		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	0.50	0.09	1	08/13/21 17:23	07/30/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108430
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/16/21
Sample Matrix:	Water	**Date Received:**	07/19/21
		Date Analyzed:	08/13/21
		Date Extracted:	07/30/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	BR-COL-INF-MW-8-9	**Units:**	ug/L
Lab Code:	K2108430-001	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2114120-04

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	43.2	91.4	50.0	96	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108430
Project	Barry/201114-01.02 Task 02	**Date Collected:**	07/16/21
Sample Matrix:	Water	**Date Received:**	07/19/21
		Date Analyzed:	08/13/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	BR-COL-INF-MW-8-9	**Units:**	ug/L
Lab Code:	K2108430-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2114120-03 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	43.2	42.2	42.7	2	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108430
Project:	Barry/201114-01.02 Task 02	**Date Analyzed:**	08/13/21
Sample Matrix:	Water		

Lab Control Sample Summary
Dissolved Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2114120-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	200.8	48.2	50.0	96	85-115

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August 25, 2021

Analytical Report for Service Request No: K2108800

Masa Kanematsu
Anchor QEA, LLC
6720 SW Macadam Avenue
Suite 125
Portland, OR 97219

RE: Barry / 201114-01.02 Task 02

Dear Masa,

Enclosed are the results of the sample(s) submitted to our laboratory July 29, 2021
For your reference, these analyses have been assigned our service request number **K2108800.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at Mark.Harris@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Mark Harris
Project Manager

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory’s NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

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ALS Environmental

Client: Anchor QEA, LLC
Project: Barry
Sample Matrix: Water

Service Request: K2108800
Date Received: 07/29/2021

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level II requested by the client.

Sample Receipt:

Twenty seven water samples were received for analysis at ALS Environmental on 07/29/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Metals:

No significant anomalies were noted with this analysis.

Approved by Noe D. Oar

Date 08/25/2021

Chain of Custody

ALS Environmental—Kelso Laboratory
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K2108800

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number: 503-972-5019

Date:	7/29/2021
Project Name:	Barry
Project Number:	201114-01.02 Task 02
Project Manager:	Masa Kanematsu
Phone Number:	503-972-5001 (Masa Kanematsu)
Shipment Method:	ALS Carrier

ANCHOR QEA

Jessica Goin
6720 SW Macadam Ave
Suite 125
Portland OR 97219

Line	Field Sample ID	Collection Date	Collection Time	Matrix	No. of Containers	Arsenic, cobalt (dissolved, Method 200.8)	Comments/Preservation
1	BR-COL-INF-MW-15-1	7/15/2021	10:40	Water	1	X	HNO_3 preserved, filtered
2	BR-COL-9-1	7/15/2021	10:40	Water	1	X	HNO_3 preserved, filtered
3	BR-COL-10-1	7/15/2021	10:40	Water	1	X	HNO_3 preserved, filtered
4	BR-COL-INF-MW-15-2	7/15/2021	20:00	Water	1	X	HNO_3 preserved, filtered
5	BR-COL-9-2	7/15/2021	20:00	Water	1	X	HNO_3 preserved, filtered
6	BR-COL-10-2	7/15/2021	20:00	Water	1	X	HNO_3 preserved, filtered
7	BR-COL-INF-MW-15-3	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
8	BR-COL-9-3	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
9	BR-COL-10-3	7/16/2021	7:40	Water	1	X	HNO_3 preserved, filtered
10	BR-COL-INF-MW-15-4	7/16/2021	15:10	Water	1	X	HNO_3 preserved, filtered
11	BR-COL-9-4	7/16/2021	15:10	Water	1	X	HNO_3 preserved, filtered
12	BR-COL-10-4	7/16/2021	15:10	Water	1	X	HNO_3 preserved, filtered
13	BR-COL-INF-MW-15-5	7/17/2021	11:15	Water	1	X	HNO_3 preserved, filtered
14	BR-COL-9-5	7/17/2021	11:15	Water	1	X	HNO_3 preserved, filtered
15	BR-COL-10-5	7/17/2021	11:15	Water	1	X	HNO_3 preserved, filtered

Notes: **Please analyze with standard TAT. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L), Co (<1 ug/L). Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:
Masa Kanematsu	Anchor QEA
Signature/Print Name:	Date/Time:
	7/29/2021 9:00

Received by:	Company:
Fran Allan	ALS
Signature/Print Name:	Date/Time:
	7/29/21 1145

Relinquished by:	Company:
Signature/Print Name:	Date/Time:

Received by:	Company:
Signature/Print Name:	Date/Time:

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original.

Page 1 of 2

Chain of Custody Record & Laboratory Analysis Request

K2108800

Laboratory Number:	503-972-5019
Date:	7/29/2021
Project Name:	Barry
Project Number:	201114-01.02 Task 02
Project Manager:	Masa Kanematsu
Phone Number:	503-972-5001 (Masa Kanematsu)
Shipment Method:	ALS Carrier

ANCHOR QEA

Jessica Goin
6720 SW Macadam Ave
Suite 125
Portland OR 97219

Line	Field Sample ID	Collection Date	Collection Time	Matrix	No. of Containers	Parameters: Arsenic, cobalt (dissolved, Method 200.8)	Comments/Preservation
16	BR-COL-INF-MW-15-6	7/18/2021	9:40	Water	1	X	HNO_3 preserved, filtered
17	BR-COL-9-6	7/18/2021	9:40	Water	1	X	HNO_3 preserved, filtered
18	BR-COL-10-6	7/18/2021	9:40	Water	1	X	HNO_3 preserved, filtered
19	BR-COL-INF-MW-15-7	7/20/2021	14:00	Water	1	X	HNO_3 preserved, filtered
20	BR-COL-9-7	7/20/2021	14:00	Water	1	X	HNO_3 preserved, filtered
21	BR-COL-10-7	7/20/2021	14:00	Water	1	X	HNO_3 preserved, filtered
22	BR-COL-INF-MW-15-8	7/22/2021	15:45	Water	1	X	HNO_3 preserved, filtered
23	BR-COL-9-8	7/22/2021	15:45	Water	1	X	HNO_3 preserved, filtered
24	BR-COL-10-8	7/22/2021	15:45	Water	1	X	HNO_3 preserved, filtered
25	BR-COL-INF-MW-15-9	7/24/2021	12:00	Water	1	X	HNO_3 preserved, filtered
26	BR-COL-9-9	7/24/2021	12:00	Water	1	X	HNO_3 preserved, filtered
27	BR-COL-10-9	7/24/2021	12:00	Water	1	X	HNO_3 preserved, filtered
28							
29							
30							

Notes: **Please analyze with standard TAT. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L), Co (<1 ug/L). Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	Fran Aldair	ALS
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
	7/29/2021 9:00		7/29/21 1145

Relinquished by:	Company:	Received by:	Company:
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:

Distribution: A copy will be made for the laboratory and client. The Project file will retain the original.

PM Mark

Cooler Receipt and Preservation Form

Client Anchor Service Request K21 08800

Received: 7/29/21 Opened: 7/29/21 By: NP Unloaded: 7/29/21 By: NP

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* ______ *NA*
3. Were custody seals on coolers? NA Y N If yes, how many and where? ______
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N
4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
8.7		IR02					
3.5		IR02					
7.7		IR02					

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* ______
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:
GST-COL-INF-MW-~~13P~~ 16-6	GGS-COL-INF-MW-16-6	Date/Time/Process
GST-COL-INF-MW-17-6	GGS-COL-INF-MW-17-6	

Sample ID	Bottle Count Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: Did not PH Due to Limited Volume All Samples for Metals analysis, temp not an issue

Metals

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/15/21 10:40
Sample Matrix:	Water	**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-INF-MW-15-1	**Basis:**	NA
Lab Code:	K2108800-001		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**6.6**	ug/L	2.5	0.5	5	08/23/21 12:36	08/05/21	
Cobalt	200.8	**73.8**	ug/L	0.10	0.05	5	08/23/21 12:36	08/05/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/15/21 10:40
Sample Matrix:	Water	**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-9-1	**Basis:**	NA
Lab Code:	K2108800-002		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.7 J**	ug/L	2.5	0.5	5	08/23/21 12:40	08/05/21	
Cobalt	200.8	**23.0**	ug/L	0.10	0.05	5	08/23/21 12:40	08/05/21	

Printed 8/24/2021 5:10:37 PM

Superset Reference:

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/15/21 10:40
Sample Matrix:	Water	**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-10-1	**Basis:**	NA
Lab Code:	K2108800-003		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	2.5	0.5	5	08/23/21 12:44	08/05/21	
Cobalt	200.8	**82.3**	ug/L	0.10	0.05	5	08/23/21 12:44	08/05/21	

ALS Group USA, Corp.
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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/15/21 20:00
Sample Matrix:	Water	**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-INF-MW-15-2	**Basis:**	NA
Lab Code:	K2108800-004		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**3.2**	ug/L	2.5	0.5	5	08/23/21 12:48	08/05/21	
Cobalt	200.8	**69.8**	ug/L	0.10	0.05	5	08/23/21 12:48	08/05/21	

Printed 8/24/2021 5:10:38 PM   Superset Reference:

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/15/21 20:00
Sample Matrix:	Water	**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-9-2	**Basis:**	NA
Lab Code:	K2108800-005		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.8 J**	ug/L	2.5	0.5	5	08/23/21 12:49	08/05/21	
Cobalt	200.8	**32.7**	ug/L	0.10	0.05	5	08/23/21 12:49	08/05/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/15/21 20:00
Sample Matrix:	Water		**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-10-2		**Basis:**	NA
Lab Code:	K2108800-006			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	2.5	0.5	5	08/23/21 12:51	08/05/21	
Cobalt	200.8	**64.8**	ug/L	0.10	0.05	5	08/23/21 12:51	08/05/21	

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Superset Reference:

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/16/21 07:40
Sample Matrix:	Water	**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-INF-MW-15-3	**Basis:**	NA
Lab Code:	K2108800-007		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**2.8**	ug/L	2.5	0.5	5	08/23/21 12:52	08/05/21	
Cobalt	200.8	**71.6**	ug/L	0.10	0.05	5	08/23/21 12:52	08/05/21	

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Superset Reference:

Client:	Anchor QEA, LLC		**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/16/21 07:40
Sample Matrix:	Water		**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-9-3		**Basis:**	NA
Lab Code:	K2108800-008			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	2.5	0.5	5	08/23/21 12:53	08/05/21	
Cobalt	200.8	**43.8**	ug/L	0.10	0.05	5	08/23/21 12:53	08/05/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/16/21 07:40
Sample Matrix:	Water	**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-10-3	**Basis:**	NA
Lab Code:	K2108800-009		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	2.5	0.5	5	08/23/21 12:55	08/05/21	
Cobalt	200.8	**67.0**	ug/L	0.10	0.05	5	08/23/21 12:55	08/05/21	

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Superset Reference:

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dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/16/21 15:10
Sample Matrix:	Water	**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-INF-MW-15-4	**Basis:**	NA
Lab Code:	K2108800-010		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.0 J**	ug/L	2.5	0.5	5	08/23/21 12:56	08/05/21	
Cobalt	200.8	**72.5**	ug/L	0.10	0.05	5	08/23/21 12:56	08/05/21	

ALS Group USA, Corp.
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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/16/21 15:10
Sample Matrix:	Water	**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-9-4	**Basis:**	NA
Lab Code:	K2108800-011		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	2.5	0.5	5	08/23/21 12:57	08/05/21	
Cobalt	200.8	**46.3**	ug/L	0.10	0.05	5	08/23/21 12:57	08/05/21	

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Superset Reference:

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/16/21 15:10
Sample Matrix:	Water	**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-10-4	**Basis:**	NA
Lab Code:	K2108800-012		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	2.5	0.5	5	08/23/21 12:59	08/05/21	
Cobalt	200.8	**64.2**	ug/L	0.10	0.05	5	08/23/21 12:59	08/05/21	

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Superset Reference:

Client:	Anchor QEA, LLC		**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/17/21 11:15
Sample Matrix:	Water		**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-INF-MW-15-5		**Basis:**	NA
Lab Code:	K2108800-013			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.6 J**	ug/L	2.5	0.5	5	08/23/21 13:00	08/05/21	
Cobalt	200.8	**61.8**	ug/L	0.10	0.05	5	08/23/21 13:00	08/05/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/17/21 11:15
Sample Matrix:	Water		**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-9-5		**Basis:**	NA
Lab Code:	K2108800-014			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	2.5	0.5	5	08/23/21 13:04	08/05/21	
Cobalt	200.8	**44.9**	ug/L	0.10	0.05	5	08/23/21 13:04	08/05/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/17/21 11:15
Sample Matrix:	Water	**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-10-5	**Basis:**	NA
Lab Code:	K2108800-015		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	2.5	0.5	5	08/23/21 13:05	08/05/21	
Cobalt	200.8	**62.1**	ug/L	0.10	0.05	5	08/23/21 13:05	08/05/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/18/21 09:40
Sample Matrix:	Water	**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-INF-MW-15-6	**Basis:**	NA
Lab Code:	K2108800-016		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.9 J**	ug/L	2.5	0.5	5	08/23/21 13:07	08/05/21	
Cobalt	200.8	**52.0**	ug/L	0.10	0.05	5	08/23/21 13:07	08/05/21	

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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/18/21 09:40
Sample Matrix:	Water	**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-9-6	**Basis:**	NA
Lab Code:	K2108800-017		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	2.5	0.5	5	08/23/21 13:08	08/05/21	
Cobalt	200.8	**42.1**	ug/L	0.10	0.05	5	08/23/21 13:08	08/05/21	

Printed 8/24/2021 5:10:39 PM Superset Reference:

Client:	Anchor QEA, LLC		**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/18/21 09:40
Sample Matrix:	Water		**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-10-6		**Basis:**	NA
Lab Code:	K2108800-018			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	2.5	0.5	5	08/23/21 13:09	08/05/21	
Cobalt	200.8	**53.4**	ug/L	0.10	0.05	5	08/23/21 13:09	08/05/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/20/21 14:00
Sample Matrix:	Water	**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-INF-MW-15-7	**Basis:**	NA
Lab Code:	K2108800-019		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.8 J**	ug/L	2.5	0.5	5	08/23/21 13:11	08/05/21	
Cobalt	200.8	**36.5**	ug/L	0.10	0.05	5	08/23/21 13:11	08/05/21	

Printed 8/24/2021 5:10:39 PM   Superset Reference:

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/20/21 14:00
Sample Matrix:	Water	**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-9-7	**Basis:**	NA
Lab Code:	K2108800-020		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	2.5	0.5	5	08/23/21 13:12	08/05/21	
Cobalt	200.8	**31.0**	ug/L	0.10	0.05	5	08/23/21 13:12	08/05/21	

Printed 8/24/2021 5:10:39 PM

Superset Reference:

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/20/21 14:00
Sample Matrix:	Water	**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-10-7	**Basis:**	NA
Lab Code:	K2108800-021		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	2.5	0.5	5	08/23/21 13:19	08/04/21	
Cobalt	200.8	**40.4**	ug/L	0.10	0.05	5	08/23/21 13:19	08/04/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/22/21 15:45
Sample Matrix:	Water	**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-INF-MW-15-8	**Basis:**	NA
Lab Code:	K2108800-022		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**0.9 J**	ug/L	2.5	0.5	5	08/23/21 13:23	08/04/21	
Cobalt	200.8	**26.6**	ug/L	0.10	0.05	5	08/23/21 13:23	08/04/21	

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Superset Reference:

Client:	Anchor QEA, LLC		**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/22/21 15:45
Sample Matrix:	Water		**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-9-8		**Basis:**	NA
Lab Code:	K2108800-023			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	2.5	0.5	5	08/23/21 13:24	08/04/21	
Cobalt	200.8	**22.6**	ug/L	0.10	0.05	5	08/23/21 13:24	08/04/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/22/21 15:45
Sample Matrix:	Water	**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-10-8	**Basis:**	NA
Lab Code:	K2108800-024		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	2.5	0.5	5	08/23/21 13:26	08/04/21	
Cobalt	200.8	**27.5**	ug/L	0.10	0.05	5	08/23/21 13:26	08/04/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/24/21 12:00
Sample Matrix:	Water	**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-INF-MW-15-9	**Basis:**	NA
Lab Code:	K2108800-025		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**1.7 J**	ug/L	2.5	0.5	5	08/23/21 13:27	08/04/21	
Cobalt	200.8	**17.3**	ug/L	0.10	0.05	5	08/23/21 13:27	08/04/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/24/21 12:00
Sample Matrix:	Water	**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-9-9	**Basis:**	NA
Lab Code:	K2108800-026		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	2.5	0.5	5	08/23/21 13:28	08/04/21	
Cobalt	200.8	**17.0**	ug/L	0.10	0.05	5	08/23/21 13:28	08/04/21	

Printed 8/24/2021 5:10:40 PM Superset Reference:

Client:	Anchor QEA, LLC		**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02		**Date Collected:**	07/24/21 12:00
Sample Matrix:	Water		**Date Received:**	07/29/21 11:45
Sample Name:	BR-COL-10-9		**Basis:**	NA
Lab Code:	K2108800-027			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	2.5	0.5	5	08/23/21 13:32	08/04/21	
Cobalt	200.8	**18.8**	ug/L	0.10	0.05	5	08/23/21 13:32	08/04/21	

ALS Group USA, Corp.
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Analytical Report

Client: Anchor QEA, LLC
Project: Barry/201114-01.02 Task 02
Sample Matrix: Water

Service Request: K2108800
Date Collected: NA
Date Received: NA

Sample Name: Method Blank
Lab Code: KQ2114525-01

Basis: NA

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	0.50	0.09	1	08/23/21 12:33	08/05/21	
Cobalt	200.8	ND U	ug/L	0.020	0.009	1	08/23/21 12:33	08/05/21	

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Superset Reference:

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	KQ2114526-01		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	ND U	ug/L	0.50	0.09	1	08/23/21 13:16	08/04/21	
Cobalt	200.8	ND U	ug/L	0.020	0.009	1	08/23/21 13:16	08/04/21	

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QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project	Barry/201114-01.02 Task 02	**Date Collected:**	07/15/21
Sample Matrix:	Water	**Date Received:**	07/29/21
		Date Analyzed:	08/23/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	BR-COL-INF-MW-15-1	**Units:**	ug/L
Lab Code:	K2108800-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2114525-03 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	6.6	6.6	6.6	<1	20
Cobalt	200.8	0.10	0.05	73.8	75.5	74.7	2	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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dba ALS Environmental

QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project	Barry/201114-01.02 Task 02	**Date Collected:**	07/15/21
Sample Matrix:	Water	**Date Received:**	07/29/21
		Date Analyzed:	08/23/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	BR-COL-9-1	**Units:**	ug/L
Lab Code:	K2108800-002	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2114525-05 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	0.7 J	0.6 J	0.7	15	20
Cobalt	200.8	0.10	0.05	23.0	23.1	23.1	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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Superset Reference:

ALS Group USA, Corp.

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QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project	Barry/201114-01.02 Task 02	**Date Collected:**	07/20/21
Sample Matrix:	Water	**Date Received:**	07/29/21
		Date Analyzed:	08/23/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	BR-COL-10-7	**Units:**	ug/L
Lab Code:	K2108800-021	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2114526-03 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	ND U	ND U	ND	-	20
Cobalt	200.8	0.10	0.05	40.4	40.7	40.6	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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Superset Reference:

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/15/21
Sample Matrix:	Water	**Date Received:**	07/29/21
		Date Analyzed:	08/23/21
		Date Extracted:	08/5/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	BR-COL-INF-MW-15-1	**Units:**	ug/L
Lab Code:	K2108800-001	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2114525-04

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	6.6	56.3	50.0	99	70-130
Cobalt	73.8	97.6	25.0	95	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/15/21
Sample Matrix:	Water	**Date Received:**	07/29/21
		Date Analyzed:	08/23/21
		Date Extracted:	08/5/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	BR-COL-9-1	**Units:**	ug/L
Lab Code:	K2108800-002	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2114525-06

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	0.7 J	50.6	50.0	100	70-130
Cobalt	23.0	48.5	25.0	102	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Collected:**	07/20/21
Sample Matrix:	Water	**Date Received:**	07/29/21
		Date Analyzed:	08/23/21
		Date Extracted:	08/4/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	BR-COL-10-7	**Units:**	ug/L
Lab Code:	K2108800-021	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2114526-04

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	ND U	50.1	50.0	100	70-130
Cobalt	40.4	65.3	25.0	100	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

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QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108800
Project:	Barry/201114-01.02 Task 02	**Date Analyzed:**	08/23/21
Sample Matrix:	Water		

Lab Control Sample Summary
Dissolved Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2114525-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	200.8	49.2	50.0	98	85-115
Cobalt	200.8	24.6	25.0	98	85-115

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Superset Reference:

Client: Anchor QEA, LLC
Project: Barry/201114-01.02 Task 02
Sample Matrix: Water

Service Request: K2108800
Date Analyzed: 08/23/21

Lab Control Sample Summary
Dissolved Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2114526-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	200.8	50.2	50.0	100	85-115
Cobalt	200.8	24.8	25.0	99	85-115