December 2021
Plant Gorgas

ANCHOR QEA

Groundwater Remedy Selection Report

Prepared for Alabama Power Company

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Prepared for
Alabama Power Company
600 18th Street North
Birmingham, Alabama 35203

Prepared by
Anchor QEA, LLC
9797 Timber Circle, Suite B
Daphne, Alabama 36527

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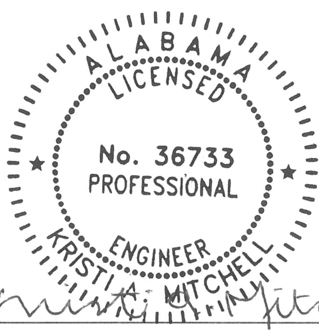
Engineer's Certification

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).



Kristi A. Mitchell 12/15/21

Kristi A. Mitchell, Senior Engineer
Alabama Professional Engineer No. 36733

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ABBREVIATIONS

ACM	*Assessment of Corrective Measures*
ADEM	Alabama Department of Environmental Management
Admin. Code	Administrative Code
APC	Alabama Power Company
ASD	alternative source demonstration
BALF	Bottom Ash Landfill
bgs	below ground surface
CCR	coal combustion residuals
CFR	Code of Federal Regulations
cm/sec	centimeters per second
COI	constituent of interest
CSM	conceptual site model
GWPS	groundwater protection standard
HDPE	high-density polyethylene
MNA	monitored natural attenuation
RCRA	Resource Conservation and Recovery Act
RO	reverse osmosis
Site	William Crawford Gorgas Electric Generating Plant
SSE	selective sequential extraction
SSL	statistically significant level
Unit	CCR management facility
USEPA	U.S. Environmental Protection Agency

Executive Summary

Since submittal of the initial *Assessment of Corrective Measures* (ACM) in June 2019 (Anchor QEA 2019a), extensive investigations have been performed to select effective corrective measures for arsenic, lithium, and molybdenum, also known as constituents of interest (COIs), in groundwater at the William Crawford Gorgas Electric Generating Plant (Site). The following corrective measures were selected:

- Source control (for the Ash Pond, Gypsum Pond, and Bottom Ash Landfill [BALF]), including dewatering, consolidation, and capping (as applicable)
- Permeation grouting (for the Ash Pond)
- Monitored natural attenuation (MNA) over the entire Site (for the Ash Pond, Gypsum Pond, BALF, Coal Combustion Residuals (CCR) Landfill, and Gypsum Landfill)

CCR management facility (Unit) closure will reduce the potential for source contributions to groundwater. Closure of BALF was completed in 2020, and closure of the Ash Pond and Gypsum Pond began in 2019 and 2021, respectively. Liner systems at the Gypsum Pond, CCR Landfill, and Gypsum Landfill will also reduce the potential for source contributions to groundwater. Permeation grouting was selected for the Ash Pond because, as a corollary to barrier walls, it impedes groundwater flow and helps prevents migration of COIs from the source area and facility boundary. MNA was selected because substantial evidence indicates it is currently occurring at the Site.

Permeation grouting will be used to create a groundwater cutoff wall in areas near the Ash Pond where COI distribution is linear. Being linear, a grout wall is not amenable to areas with isolated impacts such as the Gypsum Pond, BALF, CCR Landfill, and Gypsum Landfill. Existing monitoring wells will be used to monitor the effectiveness of the permeation grouting, and piezometers will be installed in the vicinity of the grout wall to demonstrate that the wall has cut off or greatly reduced groundwater flow as demonstrated by lower groundwater elevations downgradient of the wall. Reduction in groundwater flow will also reduce or eliminate mass flux of COIs away from the pond.

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 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 (GWPSs) considered reasonable when compared to other corrective action alternatives. The ACM identified other corrective measures that could be used in conjunction with MNA should MNA not perform as expected. One of these corrective measures, permeation grouting, is already planned for the Ash Pond.

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 solids 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 stability of the COIs and their host minerals; 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, even without source control. Concentration versus distance graphs along upgradient-to-downgradient well transects indicate that arsenic, lithium, and molybdenum concentrations are generally decreasing with distance from the respective Unit boundary. Arsenic and lithium concentrations have been decreasing with time or remaining stable in several areas of the Site, particularly in the last 2 years.

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 molybdenum), cation exchange on clays (for lithium), and precipitation of arsenate and molybdate phases (for arsenic and molybdenum, respectively). 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 Units.

Column studies indicate arsenic, lithium, and molybdenum are attenuated by aquifer media (soils). The attenuation capacity of aquifer soils determined from column testing was scaled up to the entire volume of the aquifer downgradient of the Unit but within the property boundary. The extrapolation showed attenuating capacity of the aquifer greatly exceeds the mass of arsenic, lithium, and molybdenum 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. Arsenic, lithium, and molybdenum are expected to remain immobile because they are attenuated primarily in stable mineral phases or occur in areas that will be treated by permeation grouting to prevent impacted groundwater flow beyond the closed pond boundary.

Depending on the COI and well (area), MNA alone is estimated to achieve GWPSs within 24 years, not considering the benefits of closure and permeation grouting. This time frame is reasonable compared to other, more aggressive corrective action technologies, which are not expected to achieve GWPSs in less than 24 years. However, due to short-term perturbations in groundwater flow and geochemistry due to consolidation (moving CCR) and dewatering, temporary increases in COI concentrations may be observed in some wells.

Extensive sitewide monitoring will be performed to evaluate the remedial effectiveness of individual corrective actions such as permeation grouting, as well as the cumulative effects of closure (source control), grouting, and MNA. The certified compliance monitoring network will be supplemented to establish a comprehensive corrective action groundwater monitoring program meeting the requirements of CCR Rule 40 Code of Federal Regulations § 257.98(a) and Alabama Department of Environmental Management Administrative 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 include sample locations and data collection and evaluation that demonstrate compliance with GWPSs.

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) may be implemented as needed. Details on the sitewide corrective action groundwater monitoring program, including adaptive triggers, will be provided in the detailed groundwater monitoring plan.

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 Administrative Order (AO 18-096-GW) Part C at Alabama Power Company's (APC's) William Crawford Gorgas Electric Generating Plant (Site). Specifically, this report has been prepared to present a groundwater corrective action plan to address the occurrence of arsenic, lithium, and molybdenum in groundwater at the Site and addresses those occurrences at the following regulated CCR management facilities (Units):

- Ash Pond
- Gypsum Pond
- Bottom Ash Landfill[1] (BALF)
- CCR Landfill
- Gypsum Landfill

As required by the rules and administrative order, semiannual progress reports were prepared to describe the progress made in evaluating remedy alternatives and designing a remedy plan (Anchor QEA 2019a, 2019b, 2020b, 2020c, 2021).

1.2 Site Location and Description

As shown in Figure 1, the Site is located in southeastern Walker County, Alabama, approximately 15 miles south of Jasper, Alabama. The physical address is 460 Gorgas Road, Parrish, Alabama 35580. The Site lies in Sections 7, 8, 9, 16, 17, 18, 19, 20, 21, 28, and 29, Township 16 South, Range 6 West, and Sections 12, 13, and 24, Township 16 South, Range 7 West. Section, township, and range data are based on visual inspection of U.S. Geological Survey topographic quadrangle maps and GIS maps (USGS 2018a, 2018b).

At the Site, the Ash Pond is located east-southeast of the main plant, on the opposite side of the Mulberry Fork of the Black Warrior River. The Gypsum Pond is located west-northwest of the main plant and to the north of Mulberry Fork. BALF, CCR Landfill, and Gypsum Landfill are adjacent to each

[1] An alternate source demonstration (ASD) was prepared for BALF to document that elevated arsenic concentrations are not the result of a release from the Unit and that the Unit should not be in corrective action pursuant to the rules. Per the rules, pending ADEM approval of the ASD, the Unit is categorized as being in corrective action and is included in this *Groundwater Remedy Selection Report*.

other to the northeast of the Site proper and located between Highway 269 to the north and the Mulberry Fork of the Black Warrior River to the south.

1.3 Unit Closure

The following describes the closure of each of the five Units addressed in this report.

- The Ash Pond will be closed by removing the free liquid from CCR and consolidating and capping CCR with a final cover system. Consolidation will reduce the closure footprint from approximately 420 acres to 274 acres. The Ash Pond will initially be dewatered sufficiently to remove the free liquids and provide a stable base for the construction of a CCR containment structure (at the northern end of the capped area), CCR outside the consolidated footprint will be removed, and the final cover system will be constructed. CCR will be excavated from the area outside the consolidated footprint, transported, and disposed of in the consolidated footprint to create a subgrade for the final cover system. Closure of the Ash Pond is anticipated to be complete by late 2030.
- The Gypsum Pond will be closed by excavating all the CCR from above the high-density polyethylene (HDPE) liner. Subsequently, the HDPE liner and the underlying 12 inches of granular material will be removed, and the area will be regraded for management of stormwater runoff for the closed Unit. Closure is anticipated to be completed by early 2023.
- Closure of BALF was completed in 2020 by consolidation and capping. Consolidation reduced the footprint from approximately 56 acres to 27 acres, and a final composite cover system of an HDPE geomembrane overlain with a geocomposite and protective soil cover was installed over the consolidated area. Additional information on Ash Pond, Gypsum Pond, and BALF closure is included in Section 3.1.
- Closure plans have been prepared for the CCR Landfill (APC 2016a) and Gypsum Landfill (APC 2016b); however, these units remain operational, and immediate closure is not planned pursuant to applicable rules. Therefore, these units will continue to operate until closed according to ADEM rules and Site permits.

1.4 Hydrogeology and Groundwater Flow

The bedrock geology at each regulated Unit at the Site is dominated by clastic sedimentary rocks of the Lower Pottsville Formation and underlain by rock belonging to the Pratt and Cobb Coal groups of the Lower Pottsville Formation. Geologic profiles have been developed across the Site to depict subsurface geologic conditions based on borings completed at the Site and are included in Appendix B for reference. Groundwater generally flows by fracture flow radially away from the Ash Pond at flow rates ranging from 120 to 1,146 feet per year (SCS 2018a). The Ash Pond is considered to have representative flow conditions for the Site. Maps depicting groundwater flow direction inferred from groundwater elevation contour maps are presented in Appendix C.

The major components of the hydrogeological conceptual site model (CSM) for the Ash Pond (SCS 2018a) include the following:

- Stratigraphy (see geologic profiles presented in Appendix B): complex lithologic sequences of shale, mudstone, sandstone, and coal seams separated by sandstone beds with lesser amounts of claystone and mudstone with significant vertical and horizontal heterogeneity due to depositional environment.
- Uppermost Aquifer (Pratt Coal group and Pratt to Cobb Coal group transition): described locally as the Pottsville aquifer; depth to the uppermost aquifer ranges from 30 to 240 feet below ground surface (bgs); aquifer is generally considered confined due to large permeability contrasts within the Pottsville Formation; groundwater yield is generally via interconnected fractures, bedding planes, and coal seams; groundwater yield is often insufficient for low-flow purging of monitoring wells; successful wells generally yield between 0.01 and 0.4 gallons per minute.
- Based on testing performed at the Site, the horizontal hydraulic conductivity of the Pottsville Formation ranges from 6.0×10^{-7} to 6.0×10^{-3} centimeters per second (cm/sec; SCS 2018b).

Groundwater flow characteristics are as follows:

- Groundwater flow occurs primarily by means of fracture flow, where groundwater flows along more conductive discontinuities in the rock mass such as high-angle fractures and bedding planes.
- Fractures at the Unit are typically high angle to near vertical (75° to 88°).
- Bedding planes at the Unit are near flat lying, with dips ranging from 0° to 6° toward the south.
- Paired well locations and heat pulse flowmeter logging indicate that downward vertical flow is an important component of groundwater flow within the uppermost aquifer at the Unit.
- Complex lithostratigraphy, sharp permeability contrasts, and the fractured nature of the Pottsville Formation contribute to vertical groundwater flow at the Unit.
- Horizontal hydraulic conductivity values in the uppermost aquifer are typically in the range of 10^{-5} to 10^{-4} cm/sec with an average of 6.15×10^{-4} cm/sec (1.74 feet per day).
- Groundwater flows radially away from the Unit, and the flow velocities are estimated to range from 0.33 to 3.14 feet per day.
- In general, groundwater elevation data indicate water levels tend to be higher in the early spring and lower during the fall and winter seasons.
- Groundwater elevations fluctuate in response to rainfall. Seasonal variations of 0.2 to 14.0 feet are typical. Fluctuations are typically greater in magnitude in wells to the south. Piezometers PZ-16, PZ-18, and PZ-22 installed in the American Seam display uniform variations with respect to one another and level changes on the order of 20 feet over the monitoring period. The groundwater response in these locations show that the American Seam and Maxine Mine

are hydraulically disconnected from the uppermost aquifer at the Unit. A typical Ash Pond potentiometric surface map is shown in Appendix C.

The major components of the hydrogeological CSM for the Gypsum Pond (SCS 2018c) include the following:

- The Unit is directly underlain by bedrock belonging to the Pratt Coal group. In general, the Pratt group consists of mudstone, shale, fine-grained sandstone, and interbedded coal.
- Much of the narrow valley the Gypsum Pond occupies was strip mined for the Pratt Seam, and some of this area has seen the American Seam underground mined.
- The overburden beneath the Gypsum Pond is dominated by backfilled mine overburden and is characterized by weathered shale and sandstone boulders with lenses of fine sediments and small amounts of coal fragments and coarse sediments.
- Where mining did not occur, there may be a shallow layer of mine overburden overlying natural overburden materials before transitioning into Pratt Coal group strata.
- Uppermost Aquifer: beneath the Gypsum Pond, groundwater-producing zones are sparse. Where present, two water-bearing zones are identified beneath the Unit as follows: 1) the mine overburden/top-of-rock interface; and 2) the underlying Pottsville aquifer.
- Groundwater Flow Characteristics: groundwater flow is influenced by natural topography, in which gravity is the dominant force driving flow. Groundwater flows from higher topographic elevations north of the Gypsum Pond to lower topographic elevations to the south. Mine spoil layering and complex Pottsville Formation lithofacies contribute to the vertical and horizontal heterogeneity present within the aquifer system. This heterogeneity focuses groundwater flow along more permeable coal seams, bedding planes, or vertical or subvertical discontinuities in the rock fabric. Slug testing provided horizontal hydraulic conductivities for the uppermost aquifer between 0.46 cm/sec and 2.47×10^{-4} cm/sec. A typical potentiometric surface map for the Gypsum Pond area is presented in Appendix C.

Geologic cross sections for the landfills are included in Appendix B. The major components of the hydrogeological CSM for BALF, CCR Landfill, and Gypsum Landfill include the following (SCS 2018d):

- Strip mining was conducted over a large portion of the landfills down to the American Seam. As a result, the overburden is dominated by backfilled mine spoil materials and is characterized by a heterogeneous mixture of weathered shale and sandstone boulders with lenses of fine sediments and small amounts of coal fragments and coarse sediments. Geologic logs indicate the depth to rock varies significantly, ranging from as little as 5 feet bgs (unmined areas) to as much as 155 feet bgs.
- The upper saturated zone beneath the landfills generally corresponds to the mine overburden/top-of-rock interface zone at which the mine spoil overburden transitions to bedrock of the Pottsville Formation. The depth of the first saturated zone is generally between

105 and 115 feet bgs, with potentiometric surfaces typically rising above the top of the well screens.

- Monitoring wells installed at the mine overburden/top-of-rock interface monitor quality of water passing to the Pottsville Formation. The ambient water quality can be variable and enriched in trace metals owing to the heterogeneity of mine backfill deposits and mineralogy (e.g., clay and sulfide minerals). Based on published data, groundwater quality produced from the Pottsville Formation can be characterized by high concentrations of sulfate, iron, and other trace metals. Trace metals in Pottsville Formation groundwater are associated with sulfide minerals contained in organic-rich strata and siliceous/carbonate healed fractures and joints. Trace element enrichment is likely the result of migrating hydrothermal fluids generated during the late Paleozoic Allegheny orogeny. Arsenic, antimony, molybdenum, selenium, copper, thallium, and mercury are naturally elevated in Black Warrior Basin coal strata (Diehl et al. 2004).
- The Pottsville aquifer is the uppermost aquifer beneath the landfills for groundwater monitoring purposes and primarily comprises Pennsylvanian Age sandstones, shales, conglomerates, and coal.
- Recharge to the Pottsville Formation is primarily through infiltration of precipitation and, to a lesser extent, surface water flows at hydraulically favored locations. Recharge is accommodated by fracture-enhanced permeability. Recharge zones into the Pottsville Formation also include geologic structures such as fault zones or systematic fold axes.
- Slug testing provided horizontal hydraulic conductivities for the uppermost aquifer between 5.11×10^{-3} cm/sec and 2.47×10^{-4} cm/sec. The average hydraulic conductivity value derived from slug testing is 2.83×10^{-3} cm/sec or 8.01 feet per day.
- Groundwater flows from higher topographic elevations north of the Site to lower topographic elevations to the south and generally toward the Mulberry Fork of the Black Warrior River (Appendix C).

1.5 Nature and Extent of Groundwater Exceedances

Based on groundwater monitoring performed pursuant to the federal CCR rule and ADEM's rules, arsenic, lithium, and molybdenum have been identified in Site groundwater at concentrations exceeding the groundwater protection standard (GWPS). Figures 2 through 4 depict the extent of the arsenic, lithium, and molybdenum exceedances at the Ash Pond, Gypsum Pond, and BALF, respectively, based on recent delineation data. The geologic sections in Appendix B show isocontours of constituents of interest (COIs) in relation to site stratigraphy and demonstrate the interpreted vertical distribution in section view.

As shown in Figure 2, at the Ash Pond, lithium concentrations at statistically significant levels (SSLs) occur across the northern and southern portions of the Unit, while arsenic and molybdenum SSLs are constrained to smaller areas only at the northern portion of the Unit. As shown in Figures 3 and 4, respectively, SSLs of lithium at the Gypsum Pond and arsenic at BALF are constrained to isolated areas. Also, since the Gypsum Pond is lined (SCS 2018e), the elevated lithium may be naturally occurring. Elevated arsenic is reported to occur naturally in Black Warrior Basin Paleozoic rocks such as those underlying BALF (Diehl et al. 2004). Geologic cross sections presented in Appendix B include isoconcentration lines depicting GWPS exceedances referenced to Site stratigraphy.

An alternate source demonstration (ASD) was prepared for arsenic at BALF and submitted to ADEM in June 2019. The ASD provided multiple lines of evidence that arsenic is naturally occurring and not related to BALF (SCS 2019a). ASDs were also prepared for lithium at the CCR Landfill (SCS 2019b) and Gypsum Landfill (SCS 2019c) and submitted to ADEM in 2018 and 2019, respectively. Each provided evidence that elevated lithium is a result of the presence of mine spoils and natural groundwater chemistry variability not accounted for by statistics. ADEM has not yet approved any of the submitted ASDs; therefore, semiannual assessment monitoring has continued at each Unit. Upon approval, the proposed groundwater remedy and subsequent monitoring performance standards will be adjusted accordingly.

2 Groundwater Remedy Selection Process

Groundwater remedy selection has occurred in the following two stages: 1) completing an *Assessment of Corrective Measures* (ACM) to identify potentially feasible remedies for the Site after the initial determination that GWPSs have been exceeded (Anchor QEA 2020a); and 2) evaluating potential remedies to develop this specific remedy plan.

2.1 Assessment of Corrective Measures

In February 2020, a revised ACM was prepared to address GWPS exceedances at each of the five Units. The ACM was prepared pursuant to USEPA's CCR rule (40 CFR § 257.96), ADEM's Admin. Code r. 335-13-15, and an Administrative Order issued by ADEM (AO 18-096-GW) to evaluate potentially feasible groundwater corrective measures for the occurrence of arsenic, lithium, and molybdenum in groundwater (Anchor QEA 2020a). The 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 potentially feasible groundwater corrective measures for each Unit:

- Monitored natural attenuation (MNA)
- Hydraulic containment (pump-and-treat)
- Geochemical manipulation via injection of treatment solutions
- Permeation grouting

As part of the ACM, some potential remedies were eliminated from consideration because they were technically infeasible or not applicable to the Site. Specifically, permeable reactive barrier walls and vertical barrier walls would need to be installed deep into bedrock, which is not technically feasible. Due to its shallow depth of effectiveness, phytoremediation is not applicable at the Site. 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 2020b, 2020c).

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 five performance criteria listed 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 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, considering factors such as avoiding inappropriate disturbances of sensitive ecosystems.[2]
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, consideration 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 containment
    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:

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[2] 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.

   i. The extent to which containment practices will reduce further releases
   ii. The extent to which treatment technologies may be used
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 40 CFR § 257.97(c) and ADEM Admin. Code r. 335-13-15-.06(8)(c) are given greater weight over others. After balancing 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. 3351315.06(8)(b). Therefore, more technically or mechanically complex and aggressive approaches may not be 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 2.4.4 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). Since the geologic conditions at each disposal Unit at the Site are the same, and constituents exceeding GWPSs are categorically similar, the following evaluations pertain to each of the five Units addressed by this report.

2.4.1 Permeation Grouting

Permeation grouting 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 Ash Pond. At the Ash Pond, permeation grouting would be performed using cement-based grout to fill void spaces and fractures in weathered and intact rock to greatly reduce permeability and resultant impacted groundwater flow. Permeation grouting, which is a fractured rock corollary to a conventional vertical barrier wall, impedes groundwater flow and helps prevent migration of COIs away from the source area and facility boundary. Slower groundwater travel times should aid MNA because slower travel times allow more time for attenuation mechanisms to operate.

Near the Ash Pond, permeation grouting is proposed for areas with higher concentrations of COIs and would be effective over the short and long terms. Based on the remedy selection considerations, permeation grouting is a viable and effective alternative for the Ash Pond.

At the Gypsum Pond (Figure 3), BALF (Figure 4), CCR Landfill, and Gypsum Landfill, a review of GWPS exceedances at these Units indicates that exceedances occur in isolated areas (or are naturally occurring as demonstrated by ASDs). A linear corrective action, such as a grout wall formed by permeation grouting, is not an effective means for addressing isolated areas. Therefore, permeation grouting is not proposed as a component of the groundwater corrective action for these units.

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 proposed to be part of the planned remedy for each Unit. Extensive geochemical and related studies demonstrate that MNA is a viable corrective action for groundwater impacts observed at each of the five Units at the Site. The preponderance of evidence indicates that Site conditions meet USEPA's evaluation criteria for the use of MNA, specifically the following:

- The area of impacts is stable or shrinking.
- Mechanisms for attenuation have been identified.
- The attenuating mechanisms will stabilize the COIs.
- There is sufficient aquifer capacity for attenuation.
- The time to achieve GWPSs is reasonable as compared to that of other corrective action alternatives.

The ACM identified alternative corrective measures, which is the last criterion should MNA not perform as expected. Permeation grouting is proposed in areas with higher concentrations of COIs in groundwater at the Ash Pond; 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 Geochemical Manipulation via Injection of Treatment Solutions

Geochemical manipulation via injections may be a viable remedial technology but is not currently selected because it has not been proven in field applications for effective treatment of inorganic constituents in fractured rock settings. Treatment solutions have been proven effective for arsenic in both laboratory treatability studies and field applications in sand aquifers, as well as for lithium and molybdenum in laboratory treatability studies (Anchor QEA 2017, 2018, 2019c, 2019d; EPRI 2021).

Injection treatments require that sufficient quantity of treatment solution be introduced into the aquifer and distributed adequately to capture the mass of COIs; implementation techniques have not yet been tested for treatment of inorganic constituents in fractured rock aquifers. Related to distribution, injection treatment for inorganic constituents relies on creating solid particles in situ that incorporate COIs in their mineral structures and capture COIs on their surfaces (sorption). The solids created from injection treatment may clog the relatively narrow fractures in rock such that distribution of treatment solution is not adequate. Geochemical manipulation via injections may be considered for further analysis if the selected technologies do not perform as expected (which is unlikely).

2.4.4 Hydraulic Containment (Pump-and-Treat)

Based on the remedy selection considerations, hydraulic containment is not recommended for the Site because the long- and short-term effectiveness and degree to which the approach would be successful are uncertain. Furthermore, compared to other alternatives, hydraulic containment would be very difficult to implement, operate, and maintain over the long term. In summary, hydraulic containment is not being considered for the Site for the following reasons (in no order of importance):

- Requires drilling a relatively high number of extraction wells relatively deep (up to 250 feet) in bedrock
- Uncertainty that the wells would intersect enough permeable (water-bearing) fractures to effectively capture and contain the impacts
- Inefficiency of the system extracting and treating high volumes of unimpacted water concurrent with impacted groundwater
- Difficult long-term operation and maintenance requirements
- Long time required to achieve GWPSs, likely beyond the post-closure period of 30 years
- Low sustainability (excessive use of resources)

One notable area with COIs in groundwater is north of the Ash Pond dam near the Mulberry Fork. An effective hydraulic containment (pump-and-treat) system in this area would likely pull water from the river into pumping wells and, ultimately, into the water treatment system. Treating large volumes of unimpacted groundwater would be inefficient and time-consuming and not contribute to achieving GWPSs.

Many pumping wells, extensive piping, and a water treatment system would be required to implement pump-and-treat at the Site. Depending upon fracture spacing and orientation, a high number of relatively deep wells (based on depths of COIs) would be required. For example, near-vertical fractures, as is typical for the area, would require close spacing of wells to intersect sufficient water-bearing fractures to extract impacted groundwater as compared to porous media, which has greater interconnectivity.

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 pump-and-treat systems. 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 three 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 require dewatering and proper disposal. Water treatment for lithium may require reverse osmosis (RO). RO produces a significant amount of reject water, where the COIs are concentrated. RO reject water will likely require treatment (such as evaporation) and may produce a solid waste that requires disposal. Water treatment systems usually require an operator.

Hydraulic containment (pump-and-treat) will likely not offer any time advantage to achieving GWPSs over permeation grouting and MNA due to the slow release of COIs from the aquifer solids such as iron oxides in weathered rock or fracture fillings. As described in Appendix D, COIs are adhered to relatively stable solids, such as iron oxides, in the aquifer. These attenuating solids will release COIs to the groundwater very slowly (if at all) through time. To remove even very small amounts of the COIs from the solids, many pore volumes (possibly hundreds) of water would need to be passed over the attenuating solids. Passing this number of pore volumes over the aquifer solids would take decades. The long time period and resultant small concentrations in pumped groundwater produce large volumes of water requiring treatment for very small amounts of 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 (SCS 1997; Geosyntec 2021), some with no end in sight.

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.

3 Selected Groundwater Remedy

Since submittal of the revised ACM in February 2020 (Anchor QEA 2020a), extensive investigations have been performed to select effective corrective measures for COIs in groundwater at the Site. Semiannual and annual status reports regarding investigation and evaluation have been submitted to ADEM and posted to the Site's CCR compliance webpage. Based on investigations and evaluation, the following combination of corrective measures are proposed to address GWPS exceedances at the Site:

- Source control
  - Ash Pond
    - Dewater and consolidate the Unit footprint by approximately 35%.
    - Install a low-permeability geosynthetic cover system over the consolidated footprint.
  - Gypsum Pond
    - Remove gypsum, liner, and underlying granular layer.
    - Modify embankments so the pond no longer impounds water.
  - BALF
    - Consolidated the footprint of the Unit by approximately 52%.
    - Installed a low-permeability geosynthetic cover over the consolidated footprint.
  - CCR Landfill and Gypsum Landfill
    - Designed and constructed with a composite liner system consisting of synthetic and soil liner materials
- Permeation grouting (Ash Pond)
  - Emplace in areas of relatively high COIs in groundwater, e.g., immediately north of the dam.
  - Create a cutoff wall to prevent migration of COIs from the facility boundary.
- MNA (Ash Pond, Gypsum Pond, BALF, CCR Landfill, and Gypsum Landfill)
  - Establish no-exceedance boundary monitoring.
  - Monitor concentration reduction and natural attenuation mechanisms.
- Adaptive site management (Ash Pond, Gypsum Pond, BALF, CCR Landfill, and Gypsum Landfill)
  - Routinely evaluate remedy system performance.
  - Measure performance against interim performance standards (adaptive triggers).
  - Systematically re-evaluate remedy system performance against adaptive triggers.

Table 1 provides a summary of the groundwater remedy components proposed for each Unit. Also included in Table 1 is a summary of the liner systems at the Gypsum Pond, CCR Landfill, and Gypsum Landfill, and a summary of outstanding ASDs.

The selected remedies meet the four 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 remedies.

3.1 Source Control

3.1.1 Ash Pond

Closure of the Ash Pond will be accomplished by dewatering, consolidating the footprint to a smaller area, and capping the CCR with a final cover system (APC 2020). The proposed corrective action strategy incorporates the closure of the Unit, which will effectively control the source of CCR constituents to groundwater by removing free liquid from the CCR, reducing the area of the Unit footprint, and capping the CCR in place to prevent further stormwater infiltration. Specifically, the design for the Unit closure calls for dewatering and consolidating the CCR material from the current footprint of approximately 420 acres to an area of approximately 274 acres. New containment structures will be constructed at the northern end of the capped area and incorporate a leachate control and collection system. A final cover system will be installed to limit the infiltration of surface runoff into the closed CCR footprint, and stormwater will be managed in a series of channels and spillways. Ash Pond closure activities began in 2019. Figures 5 and 6 are conceptual cross sections that show the planned closure strategy at the Ash Pond.

Excavating and subsequent placement of CCR could result in temporary releases of COIs due to physical disruption and, possibly, geochemical changes (e.g., temporary introduction of oxygen). Dewatering will also produce changes in groundwater flow. Therefore, geochemical and groundwater flow disequilibria are expected during and, likely, for a few years after closure. Until the new flow and geochemistry equilibria are established, temporary increases in COI concentrations may be observed in some wells.

3.1.1.1 Dewatering and Consolidation

As part of closure, the Ash Pond will be dewatered sufficiently to begin removal of the free liquids and provide a stable base for the construction of an ash containment structure for the consolidated footprint, ash outside the consolidated footprint will be removed, and the final cover system will be constructed. CCR will be dredged or excavated from the area outside the consolidated footprint, transported, and placed in the consolidated footprint to create a subgrade for the final cover system. Excavation will include removing all visible CCR and over excavating into the subgrade soils. Removing free liquids will reduce the volume of water available to migrate from the Ash Pond during and post closure, and will minimize hydraulic head within the pond, thereby reducing migration of COIs from the Ash Pond.

Consolidation of the horizontal footprint by approximately 35%, from 420 acres to approximately 274 acres, will reduce the CCR surface area potentially exposed to groundwater, thereby reducing the leaching potential of COIs to groundwater.

3.1.1.2 Containment Structures

The Ash Pond was originally formed by construction of a series of incremental raises to the cross-valley dam, which was originally constructed as a rockfill structure across Rattlesnake Creek in 1953 using local borrow and quarried materials. The closure design configuration removes CCR from the northern portions of the Unit adjacent to the existing containment dam and, as such, requires the design and construction of a new containment structure.

The closure design is based on the containment of CCR with the construction of a new containment structure at the northern end of the capped area. This containment structure will provide long-term stability to the ash stack and will be constructed of a combination of engineered earth and rock fills.

The closure also incorporates a leachate control and collection system consisting of a sump and conveyance system at the downgradient limit of the closure. Leachate within the closed CCR unit will be captured in the constructed leachate collection system above the low-lying backfill and upstream toe of the containment dam and conveyed to a treatment system via a sump and lift station, further decreasing the chance of COI migration into groundwater.

3.1.1.3 Final Cover System (Cap)

Once the final grades have been achieved, a cover system will be installed to limit the infiltration of surface runoff into the closed CCR unit, and stormwater will be managed in a series of channels and spillways. Managing water is a critical aspect of this closure due to the size of the watershed, magnitude of annual rainfall, and significant volumes and flow rates of water involved. Due to the general topography of the Unit, diverting stormwater from the contributing drainage areas away from the cap is not feasible and will have to be managed on the cap post closure. Once the final grades have been achieved, and the final cover is installed, stormwater will be managed in a series of channels and spillways.

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 final cover system is designed to prevent the future impoundment of water and includes measures to prevent infiltration and sloughing and minimize erosion from wind, water, settling, and subsidence. The final cover system is designed in accordance with 40 CFR § 257.102(d)(3)(i) and (ii) and ADEM Admin. Code r. 335-13-15-.07(3)(d)3.(ii) to minimize maintenance after closure of the CCR unit. Current design for the cover consists of a three-component system composed of an infiltration layer of a minimum of 18-inch-thick earthen material, an erosion-prevention layer providing a minimum of 6 inches of earthen fill and vegetation, and a polyethylene geomembrane liner with a minimum thickness of 40 mil. The geomembrane in the system provides an impermeable barrier. Final design will ensure the disruption of the integrity of the final cover system is minimized through a design that accommodates settlement and subsidence, in addition to providing an upper component for protection from wind or water erosion. The final cover system will have a permeability of 10^{-5} cm/sec or less (APC 2020).

3.1.1.4 Closure Schedule

Closure activities for the Ash Pond are outlined in the schedule presented in Figure 7. The Ash Pond is currently undergoing closure in accordance with ADEM Admin. Code r. 335-13-15-.07(3)(d) and 40 CFR § 257.102(d) and no longer receives CCR. Final capping and closure in place of the Ash Pond is expected to be completed in late 2030.

3.1.2 Gypsum Pond

Source control at the Gypsum Pond will be accomplished by complete removal of the CCR material from the Unit and regrading of the area as needed to facilitate stormwater management. Closure activities are planned to begin in 2022.

3.1.2.1 Bottom Liner

The Gypsum Pond is lined with a 60-mil HDPE geomembrane liner, which was installed after existing soils/mine spoils were graded, the subgrade proof rolled, and a granular fill placed beneath the liner. The liner is expected to continue reducing the potential for source contributions to groundwater during closure activities.

3.1.2.2 CCR Removal

The Gypsum Pond is being closed by removal of CCR in accordance with 40 CFR § 257.102(c) and ADEM Admin. Code r. 335-13-15-.07(3)(c) (APC 2019). The proposed corrective action strategy incorporates the closure of the Unit, which will effectively remove the potential source of CCR constituents to groundwater. Figure 8 presents a timeline of the planned closure.

The Gypsum Pond contains approximately 600,000 cubic yards of CCR with a current pond footprint of approximately 18 acres. After closure, the embankments will be modified so the pond no longer impounds water.

The closure consists of excavation of CCR from above the existing HDPE liner, followed by removal of the HDPE liner and underlying 12-inch layer of granular material that consists primarily of bottom ash. During closure, the Gypsum Pond will be progressively dewatered as required to facilitate closure by removal. Water from the Gypsum Pond will continue to be directed to the lower ponds. Water will be returned to the plant for treatment in the wastewater treatment facility. Once the Gypsum Pond is closed through the removal of the gypsum, liner, and underlying granular layer, decommissioning of the lower sedimentation pond, clear pool, and emergency storage pond will take place. This will involve removing any sediment and the HDPE liners. This area will then be regraded for management of stormwater runoff for the closed facility.

3.1.2.3 Closure Schedule

Closure activities for the Gypsum Pond are outlined in the schedule presented in Figure 8. The Gypsum Pond is currently undergoing closure in accordance with ADEM Admin. Code r. 335-13-15-.07(3)(c) and 40 CFR § 257.102(c). Final construction activities and site restoration are expected to be complete in 2023.

3.1.3 Bottom Ash Landfill

Source control measures at BALF were completed by the consolidation and closure of the Unit. The Notice of Closure Completion for BALF was submitted on December 3, 2020. BALF was closed by consolidation and capping the CCR in place to prevent stormwater infiltration. This facility is a landfill that contained dry stacked material; therefore, dewatering, as typically required at impoundments, was not needed to facilitate closure.

3.1.3.1 Consolidation

As part of closure, BALF was consolidated from an area of approximately 56 acres to an area of approximately 27 acres. The consolidated footprint occupies an area where dry stacking of ash had taken place for several years, so the area was dry and stable. The groundwater level is approximately 40 feet or more below the consolidated footprint.

3.1.3.2 Final Cover

The final cover system for BALF is composed of a composite cover system incorporating a 60-mil HDPE geomembrane overlain with a geocomposite, both covered with 18 inches of protective soil and 6 inches of topsoil. This cover system meets the requirements of 40 CFR § 257.102(d)(3)(i)(I) and (II) and ADEM Admin. Code r. 335-13-15-.07(3)(d)3.(i)(I) and (II). Infiltration of liquids is prevented by the presence of both an 18-inch infiltration/protective layer and the 60-mil HDPE geomembrane. A minimum 6-inch erosion layer of soil capable of sustaining native plant growth covers the infiltration layer and provides erosion protection for the final cover system. Sloping of the final cover system promotes drainage of runoff from the area and further minimizes potential for infiltration. The final cover system was installed over the consolidated area, eliminating direct exposure of CCR to the surrounding environment and limiting the likelihood of a release of CCR constituents to groundwater.

3.1.4 CCR Landfill and Gypsum Landfill

Source control at the CCR Landfill and Gypsum Landfill is accomplished by the construction of the liner systems and operation of the facilities as dry ash landfills. These Units are currently operating, and closure is not scheduled.

Each of these Units were designed and constructed with a composite liner system consisting of synthetic and soil liner materials. The liner systems consist of a 60-mil HDPE geomembrane overlying a geosynthetic clay liner having a maximum permeability on the order of 1×10^{-9} cm/sec. The geosynthetic clay liner is underlain by at least 12 inches of compacted clay having a maximum permeability of 1×10^{-5} cm/sec. The installation of the liner system was performed in accordance with the requirements of ADEM Admin. Code r. 335-13-4-.18. The facility has been designed and constructed to maintain a minimum of 5 feet of separation between the bottom of the liner system and the highest measured groundwater level (SCS 2018e). The liners reduce the potential for source contributions to groundwater.

3.2 Permeation Grouting

Permeation grouting is a selected remedy for the Ash Pond. The intent of permeation grouting is to create a virtually impermeable wall to stop the flow of impacted groundwater away from the Unit. The wall is created by filling fractures, bedding planes, and other void spaces in the rock with cement grout. Permeation grouting has been performed successfully at the Site for civil engineering purposes.

As shown in Figure 9, permeation grouting is proposed along the north side of the Ash Pond, just below the current dam. To determine the effectiveness and refine the implementation process of permeation grouting at the Ash Pond, a pilot test will be performed for approximately 150 feet in the vicinity of wells GS-AP-MW-7V, GS-AP-MW-6D, and GS-AP-MW-6S to a depth of approximately 200 feet bgs. A detailed pilot test plan will be prepared prior to implementation of the permeation grouting pilot test. However, the pilot test is expected to contain the components as described below or similar components. The horizontal and vertical extent of the full-scale permeation grouting program are dependent on further evaluation and the results of the pilot test.

The location and depth of the grouting pilot test was selected based on relatively high concentrations of COIs along flow paths such that a linear treatment would be effective and be protective of surface water.

The grouting pilot test that will be used at the Site is based on an ongoing proof-of-concept field demonstration at APC's Logan Martin Dam, which was approved by civil and geotechnical engineers at the Federal Energy Regulatory Commission. The proposed pilot study utilizes the most current techniques for permeation grouting developed by the team of experts emplacing a grout wall at the Logan Martin Dam site in Vincent, Alabama.

Grouting programs typically include the drilling and testing of primary grout holes, followed by the injection of cement-based grout. Primary grout holes are drilled on a prescribed spacing, then secondary holes are placed between the primary holes. One measure of success of the grouting program is the reduction in permeability (as measured by packer hydraulic conductivity tests) in the secondary holes, and resultant less grout injection into the secondary holes, as compared to the primary holes. In addition, a grout wall typically consists of more than one row of grout holes as shown in Figure 10.

Both low- and high-mobility grout will be utilized in the pilot test program to ensure adequate filling of spaces in the rock and a resulting wall that is as impermeable as possible. The reactive ingredient in both grouts is Portland cement. Low-mobility grout typically contains sand to increase its viscosity, limit its distance of travel, and fill larger spaces in the rock. High-mobility grout does not contain sand, can penetrate smaller spaces (e.g., smaller fractures) in the rock, and will travel greater distances from the grout hole. Other ingredients may be added to the grout to improve its properties and serve as fillers. Any additional additives used in the pilot test program will be determined to be environmentally acceptable based on their safety data sheets and other information.

Grouting programs are, by nature, adaptive, and this approach is consistent with the adaptive site management approach for corrective action at the Site. Though a 150-foot pilot test grout section is anticipated, cells within the section will be approximately 40 to 50 feet long. After emplacement of each cell, data will be analyzed, and specifications for the next cell will be adjusted accordingly.

The major measures of success of a grout wall include permeability reduction within the wall and a lower potentiometric surface on the downgradient side of the wall after grouting. Reduction in groundwater flow will also reduce or eliminate mass flux of COIs away from the closed pond. Slower groundwater travel times should aid MNA because slower travel times allow more time for attenuation mechanisms to operate. Most grout holes will be drilled using sonic drilling techniques. A select number of holes will be cored using wireline techniques to enable logging of rock and identification of permeable features.

All grout holes will be permeability tested using packer tests. Permeability tests may be repeated in the same hole after grouting adjacent holes to quantify the permeability reduction during the grouting program. In addition, piezometers will be installed upgradient, side-gradient, and downgradient of the grout cells to monitor water levels and potentiometric surfaces. Instruments (multiparameter sondes such as Aqua TROLLs) will be installed in select grout holes and piezometers to collect continuous water level and pH data. A rise in pH indicates grout influence in the vicinity of a grout hole or piezometer due to the influence of the higher pH of Portland cement. A pH rise from grouting is expected to be temporary and observed very locally, i.e., in adjacent holes near the grout hole during grouting. pH is expected to move back toward pre-grouting (ambient) values after the grouting is completed.

3.3 Monitored Natural Attenuation

MNA is a selected remedy for each Unit at the Site. 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.

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

As described in the guidance documents, attenuation mechanisms can be placed in the following two broad categories: 1) physical mechanisms; and 2) chemical mechanisms. Physical mechanisms include dilution, dispersion, flushing, and related processes. Chemical mechanisms include adsorption, precipitation, coprecipitation, and ion exchange. At any site, all constituents are subject to physical attenuation mechanisms, and those processes must 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 MNA demonstration report provided in Appendix D.

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 in several areas at the Site, even without source control. Concentration versus distance graphs along nine upgradient-to-downgradient well transects indicate that arsenic, lithium, and molybdenum concentrations are generally decreasing with distance from the respective Unit boundary. Concentration versus time trendline analyses indicate that lithium concentrations at the Ash Pond are either historically decreasing or are beginning to decrease within the last 2 years. Lithium concentrations at the Gypsum Pond (specifically monitoring well GS-GSA-MW-3) are stable. Arsenic concentrations have begun decreasing within the last year at GS-AP-MW-7.

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 molybdenum)
- Precipitation of arsenate and molybdate phases (arsenic and molybdenum, respectively)
- Cation exchange on clays (lithium)

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 Units at the Site.

Rates of attenuation were determined by extrapolating recent decreasing trends on the concentration versus time graphs to the GWPS for areas where decreasing trends were observed. Depending on the COI and well (area), MNA alone is estimated to achieve GWPSs within 24 years, not considering the benefits of closure and permeation grouting. This time frame is reasonable compared to other, more aggressive corrective action technologies, which are not expected to achieve GWPSs in less than 24 years. However, due to short-term perturbations in groundwater flow and geochemistry due to consolidation (moving CCR) and dewatering, temporary increases in COI concentrations may be observed in some wells.

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 arsenic, lithium, and molybdenum are attenuated by aquifer media (residual soils). The attenuation capacity of aquifer soils determined from column testing was scaled up to the entire volume of the aquifer downgradient of the Unit but within the property boundary. The extrapolation showed attenuating capacity of the aquifer greatly exceeds the mass of arsenic, lithium, and molybdenum requiring attenuation.

Selective sequential extraction (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. Several of the well solids (precipitates) extracts, particularly lithium, were below detection limits for the COIs. Based on available SSE data for well solids (precipitates), arsenic was primarily in the F4 (oxidizable) fraction, with some in the F2 (exchangeable) and F5 (residual) fractions; lithium was primarily in the F5 (residual) fraction; and molybdenum was primarily in the F4 (oxidizable) and F5 (residual) fractions, with some in the F1 (water soluble) and F2 (exchangeable) fractions. For SSE of the post-column soils, arsenic was primarily in the F2 (exchangeable) and F5 (residual) fractions, with some in the F3 (reducible) and F4 (oxidizable) fractions; all of the lithium was in the F5 (residual) fraction; and all of the molybdenum samples were below detection limits. Therefore, arsenic, lithium, and molybdenum are expected to remain immobile (not remobilize back into groundwater) because they are attenuated primarily in stable mineral phases.

Reactive transport modeling was performed along simulated fracture pathways in rock and demonstrated that the migration of arsenic, molybdenum, and lithium are significantly retarded (slower) as compared to a nonreactive constituent such as chloride. The attenuation of arsenic and molybdenum is dominated by geochemical reactions near the fracture, while attenuation of lithium is dominated by matrix diffusion and cation exchange on clay minerals in the rock matrix.

3.3.2 Site-Specific MNA Monitoring Program

Corrective action performance monitoring consists of the following two major components: 1) monitoring for sitewide corrective action, which would include MNA and the positive benefits of source control and permeation grouting at the Site scale; and 2) remedial effectiveness monitoring in the areas of grouting. 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 may need to be installed to monitor progress in critical areas. The site-specific MNA plan will be composed of the following:

- A network of sentinel or clean-line monitoring points beyond the extent of GWPS exceedances

- The 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
- Components of an adaptive site management 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 plan will be developed within 90 days of this report. A conceptual summary of the anticipated MNA monitoring network is shown in Figures 2 through 4.

MNA monitoring will primarily be accomplished by sampling MNA monitoring wells and analyzing 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, contingent upon regulatory review and approval of the monitoring plan. At least 1 year of groundwater monitoring data post closure is recommended to establish baseline conditions and trends. During closure, temporary variations in groundwater data are expected due to CCR disruption (excavation and placement within the consolidated footprint), dewatering, resultant changes in groundwater flow, and the time required for capping to reduce leaching from the CCR.

The following will be performed to implement the MNA monitoring plan:

- Begin MNA-specific sampling and analysis using existing monitoring locations.
- Install additional monitoring wells as needed.
- Provide the first MNA evaluation monitoring report, considering the changes in groundwater chemistry due to closure activities.

4 Corrective Action Monitoring Program

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 monitoring program must perform the following actions: 1) meet the assessment monitoring requirements of 40 CFR § 257.95 and ADEM Admin. Code r. 335-13-15-.06(6); 2) document the effectiveness of the remedy; and 3) demonstrate compliance with the GWPS. A corrective action groundwater monitoring program providing site-specific remedy monitoring details will be submitted within 90 days of this *Groundwater Remedy Selection Report*.

To meet the first requirement of the remedy monitoring program, 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 other two requirements are satisfied by developing a remedy-specific performance monitoring program. The corrective action groundwater monitoring program for the Site will include the following:

- Continued assessment monitoring of the certified CCR compliance groundwater monitoring network
- Groundwater monitoring to document remedy system effectiveness
  - Source control (dewatering, consolidation, and capping)
  - Permeation grouting performance
  - MNA
- Adaptive site management guidelines
- Sentinel and clean-line boundary monitoring
  - Verification of delineation boundaries
  - Potential receptor monitoring using risk-based screening levels

Within 90 days of selecting a remedy, a corrective action groundwater monitoring plan will be developed that describes the monitoring program and provides details regarding the following:

- Sample locations
- Sampling schedules
- Monitoring parameters
- Data analysis methods
- Adaptive site management evaluation guidelines
- Reporting and notification requirements

Following certification of the Site's groundwater monitoring network, several additional wells were installed to perform delineation of GWPS exceedances. These wells have been added to the semiannual monitoring program pursuant to 40 CFR § 257.95(g)(1) and ADEM Admin. Code

r. 335-13-15-.06(6)(g)2. Based on remedy-specific monitoring needs, certain delineation wells may not be included as part of the groundwater remedy monitoring program. If wells are proposed for exclusion from the corrective action monitoring plan, a justification for exclusion will be provided in the plan. A conceptual groundwater monitoring network for the Ash Pond, Gypsum Pond, and BALF are shown in Figures 9, 11, and 12, respectively.

As shown in Figure 9, 11, and 12, 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.

As discussed in Section 5, APC will incorporate adaptive site management 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. Adaptive triggers could include statistically increasing trends for multiple events after closure is complete and verifying GWPS exceedances at sentinel/clean-line boundary monitoring points.

During closure, the groundwater systems will be in a state of geochemical disequilibrium, leading to potential temporary increases in COI concentrations at some locations and decreases at other locations. Additionally, temporary increases could occur as the subsurface is disturbed by excavation, permeation grouting, and possible localized changes in groundwater flow direction. Closure-induced variability will need to be considered when evaluating remedy performance monitoring data and establishing triggers for the adaptive management component of the monitoring program. Due to the probable geochemical and groundwater flow disequilibria, adaptive triggers will not be implemented until the second year post closure, after 1 year of baseline data has been established. However, data generated between the implementation of corrective action and the post-closure period may be compared to risk-based screening levels to determine if immediate action is warranted.

5 Adaptive Site Management Plan

As applied here, adaptive site management is a component of the corrective action monitoring program, in which monitoring results are continually evaluated to determine if the system is making progress toward achieving remedy goals. Based on system performance—either achieving goals or not making expected progress—the remedy system may need to be adapted or changed. Adaptation of the system may include ceasing actions no longer necessary or changing the system because it is not performing as expected. The adaptive site management approach plans for changes at the Site and provides a process to make changes as necessary. Details regarding site-specific adaptive management metrics (adaptive triggers) and response will be included in the Site corrective action groundwater monitoring program.

Changes in groundwater geochemistry are expected as closure (excavation, dewatering, and capping) of the CCR unit proceeds. Expected changes include concentration variability and short-term increasing or decreasing trends. Therefore, although the remedy will be monitored and evaluated continually during the closure period, the adaptive site management plan will not be implemented completely until closure activities are complete or near the end of closure, and groundwater chemistry has stabilized. Interim adaptive site management will be implemented during the closure period to evaluate groundwater concentrations with respect to standards protective of potential human or ecologic receptors, and prompt action will be taken if those standards are at risk of potentially being exceeded.

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 remedies. As discussed above, the adaptive site management plan helps monitor compliance with these rules.

In summary, adaptive site management for the Site will include the following:

1. Establishing adaptive triggers; adaptive triggers are performance goals or standards that will be used to measure progress toward achieving the long-term remedy goal of reducing concentrations to below the GWPS. Adaptive triggers may change over time as more is learned about system performance and as Site conditions change. Adaptive triggers are synonymous with "short-term goals" and "interim performance standards."
2. Evaluating remedy system performance against adaptive triggers once geochemical and groundwater flow have been established post closure; monitoring data from each monitoring event will be evaluated against the adaptive triggers established to measure the performance of the remedy system over the short-term post closure.
3. Potentially adapting the system based on comparison to the adaptive triggers; if monitoring results hit an adaptive trigger, an evaluation process will be initiated. The process will include

re-evaluating the adaptive trigger to ascertain if it is suitable or should be adjusted. The process may conclude that the remedy system requires adaptation to meet remediation goals.

4. Updating the Site conceptual model and knowledge base as new data become available; as the remedy is implemented, more will be learned about how the hydrogeologic system responds to remedy activities. Additional data that enhances the Site conceptual model may also be collected. The remedy plan, Site conceptual model, and adaptive triggers will be updated and evaluated as more is learned.

Figure 13 presents the process that will be used to evaluate monitoring data, determine if performance objectives are met, and determine if adaptation of the groundwater remedy system is needed. Performance monitoring is an integral component of the adaptive site management plan.

5.1 Interim Performance Standards and Monitoring

The long-term performance standards for the groundwater remedy system 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 3 consecutive years based on semiannual monitoring.

5.1.1 Permeation Grouting

The interim, or short-term, performance goal of the permeation grouting system is to document the following two items: 1) reduced permeability (hydraulic conductivity) within the injection area; and 2) an increase in groundwater pH in the vicinity of the wall during grouting. A series of piezometers will be installed within the grouting zone and monitored to demonstrate the performance of the grouting system.

After verifying that a low-permeability zone has been established, the next interim performance goals will be to demonstrate that reduced groundwater levels (potentiometric surfaces) occur downgradient of the grout wall and that decreasing trends in COIs are observed downgradient. The performance monitoring system will account for potential variability created during ongoing closure activities such as dewatering, excavation, and capping.

As described in Section 2.4.1, effectiveness of permeation grouting will be determined primarily by reduction in groundwater levels downgradient of the grout wall and reductions in COIs in the existing monitoring wells. However, if determined to be useful, select piezometers installed to monitor grouting performance during grouting may be left in place for future groundwater level and chemistry monitoring. The possibility exists that nearby groundwater monitoring wells (e.g., GS-AP-MW-6S, GS-AP-MW-6D, and GS-AP-MW-7) may have greatly reduced water flow to them as a result of grouting such that sampling these wells would no longer be possible. If this happens, it is a clear indicator of success of the grouting program, and replacement wells (if needed) would be installed downgradient of the grout wall.

5.1.2 Monitored Natural Attenuation

The interim goal of MNA is to document that, in conjunction with source control and permeation grouting, natural attenuation of the constituents is occurring. As described by USEPA (2015), the four tiers of MNA can be summarized as:

- Tier 1: plume size and stability
- Tier 2: attenuation mechanisms and rates
- Tier 3: attenuation mechanism capacity and reversibility
- Tier 4: performance monitoring program and alternative remedies should MNA not perform as expected

The performance of MNA Tiers 1 through 3 will be monitored by evaluating the following:

- 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 (prior to completion of closure) 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 constituents detected at SSLs to occur within the plume area. The long-term performance objective is for statistically decreasing trends, continual reduction in the number of constituents detected at 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 GWPSs and reduction in COI mass.

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

5.2 Adaptive Trigger Evaluation and Corrective Action System Adaptation

If monitoring results hit an adaptive trigger (e.g., statistically significant trends are observed for longer than the prescribed years), the first step will be to re-evaluate the interim performance standard and determine if it is a suitable measure of performance or if it requires updating based on other factors. Similarly, the nature of the adaptive trigger hit will be evaluated to determine if it warrants further response. For example, confirmed statistically significant increases in concentration may warrant immediate response; in contrast, a gradual and slight increase in concentration may be addressed differently.

If it is determined that the adaptive trigger is appropriate and that the groundwater remedy system is not achieving the interim goals, then the system may be adapted, optimized, or changed. Within a reasonable time following the adaptive trigger hit, a work plan or implementation schedule for remedy system adaptation will be provided. A semiannual report describing the progress made adapting the groundwater remedy system will be completed and placed in the operating record following 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 releases to the environment.

Permeation grouting in areas with significantly elevated concentrations of constituents will reduce or eliminate mass flux of COIs away from the Site. Permeation grouting has been performed successfully at the Site for civil engineering purposes. Applications of permeation grouting will be evaluated in the context of decreasing trends from source control and natural attenuation.

Finally, as discussed in Section 3.3 and Appendix D, COIs are currently being attenuated, and concentrations are declining as a result of natural attenuation processes. In concert with closure, source control, permeation grouting, and MNA will continue until COI concentrations are below the GWPS. Closure activities and permeation grouting 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. 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 (area), MNA alone is estimated to achieve GWPSs within 24 years, not considering the benefits of closure and permeation grouting. This time frame is reasonable compared to durations of other corrective action technologies. 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 permeation grouting are expected to accelerate this time frame, particularly in areas where little attenuation is currently observed.

6.3 Control Sources of Releases

As discussed in Section 3.1, closures of the Ash Pond, Gypsum Pond, and BALF 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. Source control will be accomplished by:

- Ash Pond: dewatering, consolidating, and capping the CCR with a final cover system, which will reduce the footprint from approximately 420 acres to approximately 274 acres. As shown in Figure 7, dewatering and consolidation are anticipated to proceed into 2030.
- Gypsum Pond: removal of CCR, HDPE liner, and underlying 12-inch granular bottom ash with progressive dewatering as the work progresses. The planned completion of the construction of the final cover system is scheduled for 2032 (Figure 8).
- BALF: consolidation and capping of the CCR to prevent stormwater infiltration. The Notice of Closure Completion for BALF was submitted on December 3, 2020.

- CCR Landfill and Gypsum Landfill: Units were constructed with a composite liner system consisting of a 60-mil HDPE geomembrane overlying a geosynthetic clay liner having a maximum permeability of 1×10^{-9} cm/sec.

These 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 r. 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 grouting, 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)1through 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 Unit Closure and Source Control

Unit closure and source control activities at the Ash Pond and Gypsum Pond are currently being implemented and are expected to be completed as shown in the timelines provided in Figures 7 and 8. Anticipated project milestones are as follows:

- Ash Pond
  - Mid-2023: liner installation begins
  - Early 2029: CCR consolidation complete
  - Early 2029: liner installation complete
  - Late 2030: Unit closure certification complete
- Gypsum Pond
  - Mid-2022: closure activities begin
  - 2023: finalize construction activities and site restoration

7.2 Permeation Grouting

The anticipated permeation grouting pilot test implementation schedule is as follows:

- Design: 1 month
- Piezometer installation: 1 month
- Pilot test implementation: 8 months
- Data collection and analysis: 2 months

The schedule for additional permeation grouting, if needed, will be developed after completion of the pilot test and subsequent data analysis.

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 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:

- Coordinate MNA sampling with the first semiannual compliance sampling event after new well installation
- Collect and analyze baseline data: 1 year post closure
- Remedy complete: depending on area, within 24 years after Unit closure is complete

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Table

Table 1
Selected Groundwater Remedy by Unit

Unit	Groundwater Remedy				
	Source Control (Unit Closure)	Source Control (Liner)	Permeation Grouting	Monitored Natural Attenuation	Adaptive Site Management
Ash Pond	X		X	X	X
Gypsum Pond	X	X[1]		X	X
Bottom Ash Landfill[2]	X			X	X
CCR Landfill[3]		X[4]		X	X
Gypsum Landfill[3]		X[4]		X	X

Notes:

1. The Gypsum Pond is lined with an HDPE liner.
2. An ASD was prepared for arsenic at the BALF and submitted to ADEM in June 2019. This provided multiple lines of evidence that arsenic is naturally occurring and not related to the BALF. ADEM has not yet approved the ASD.
3. ASDs were prepared for lithium at the CCR Landfill and Gypsum Landfill and submitted to ADEM in 2018 and 2019, respectively. Each provided evidence that elevated lithium is a result of the presence of mine spoils and natural groundwater chemistry variability not accounted for by statistics. ADEM has not yet approved the ASDs.
4. The CCR Landfill and Gypsum Landfill are lined with a composite liner system consisting of a 60-mil HDPE geomembrane overlying a geosynthetic clay liner.

ADEM: Alabama Department of Environmental Management

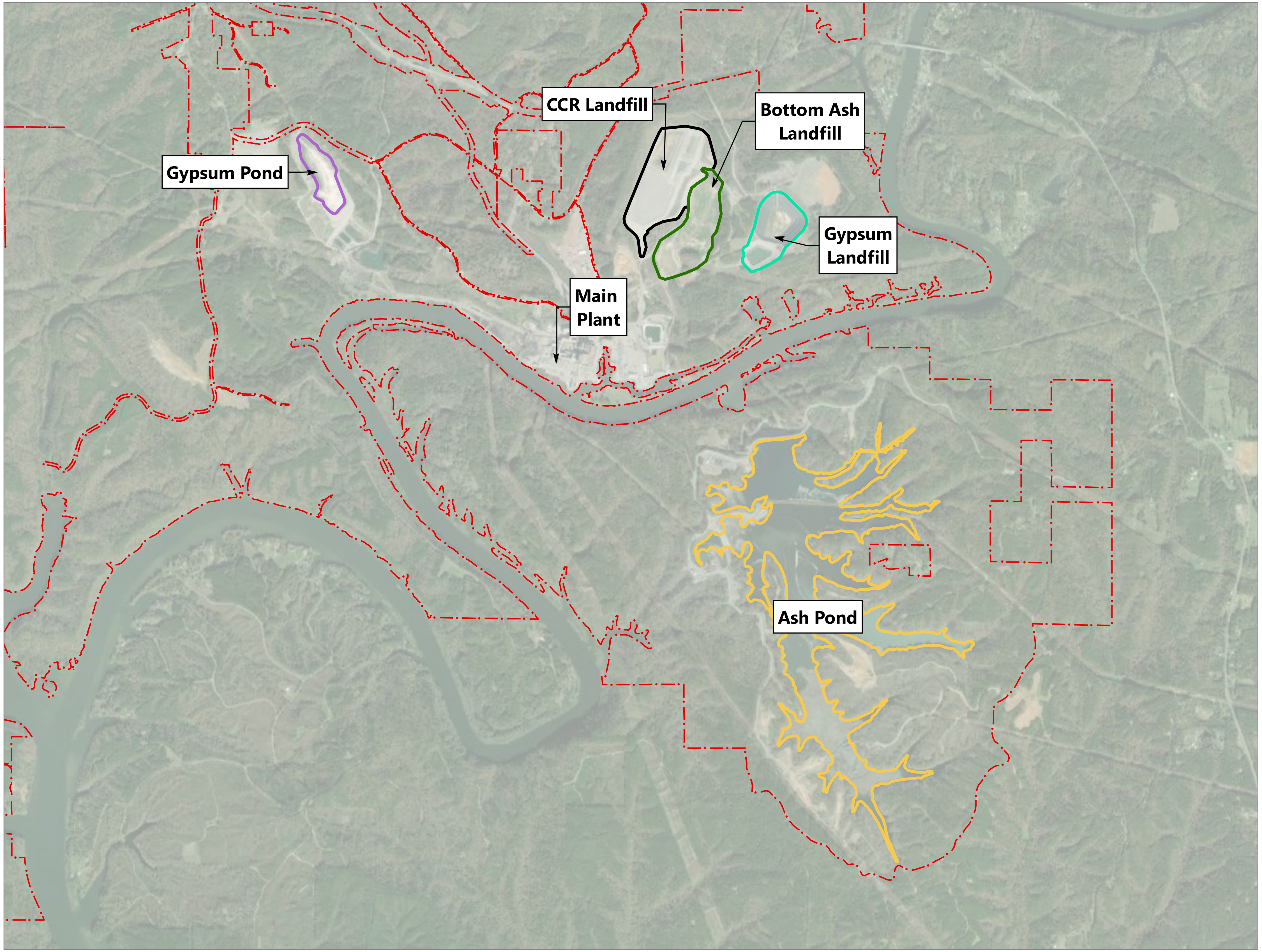
ASD: alternate source demonstration

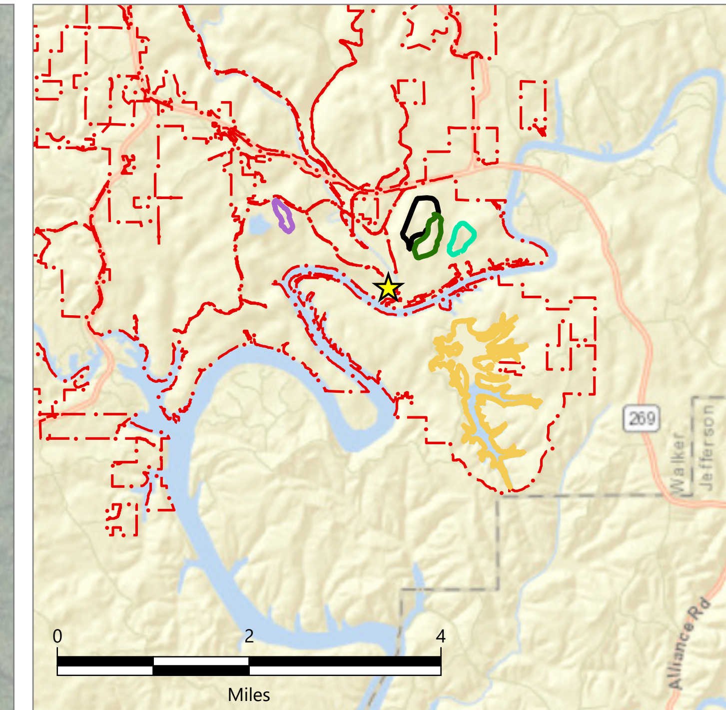
BALF: Bottom Ash Landfill

CCR: coal combustion residuals

HDPE: high-density polyethylene

Figures



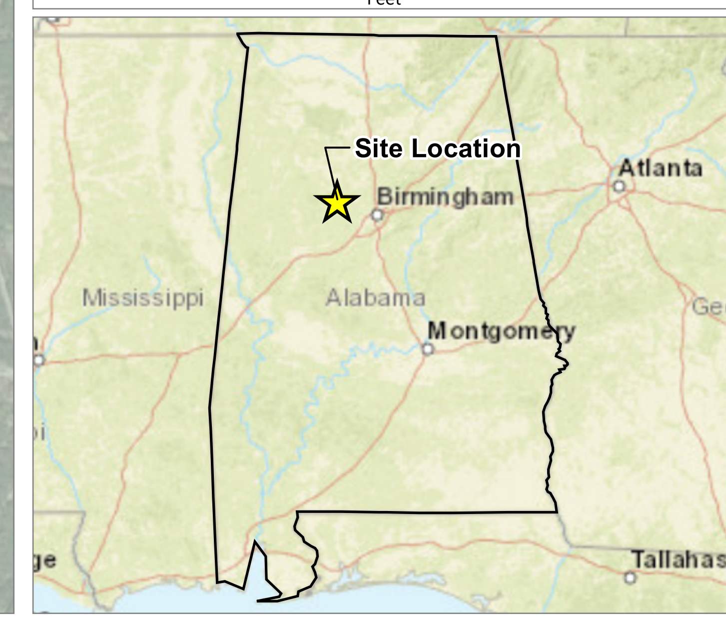


LEGEND:

- Property Boundary (Approximate)
- Ash Pond
- Gypsum Pond
- Bottom Ash Landfill
- CCR Landfill
- Gypsum Landfill

NOTE:
CCR: Coal Combustion Residuals

0 3,600
Feet



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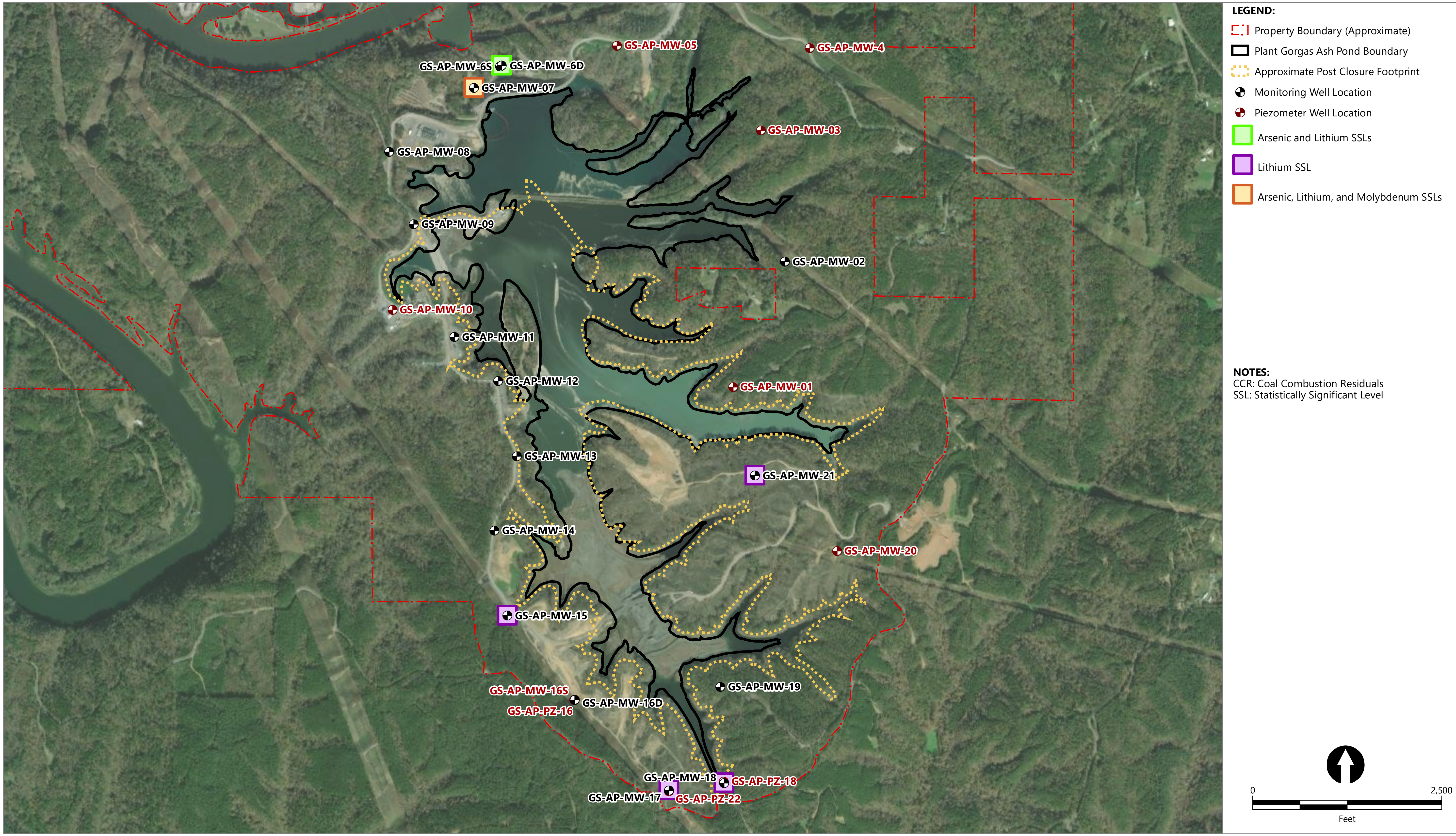
ANCHOR QEA

Figure 1
Site Location Map
Groundwater Remedy Selection Report
Plant Gorgas



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ANCHOR QEA

Figure 2
Ash Pond Site Layout
Groundwater Remedy Selection Report
Plant Gorgas

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Figure 3
Gypsum Pond Site Layout
Groundwater Remedy Selection Report
Plant Gorgas

LEGEND:

- Property Boundary (Approximate)
- Plant Gorgas Bottom Ash Landfill Boundary
- Other Landfill Boundary (Approximate)
- Approximate Closure Footprint
- Plant Gorgas Monitoring Well Location
- Arsenic SSL

NOTES:
CCR: Coal Combustion Residuals
SSL: Statistically Significant Level

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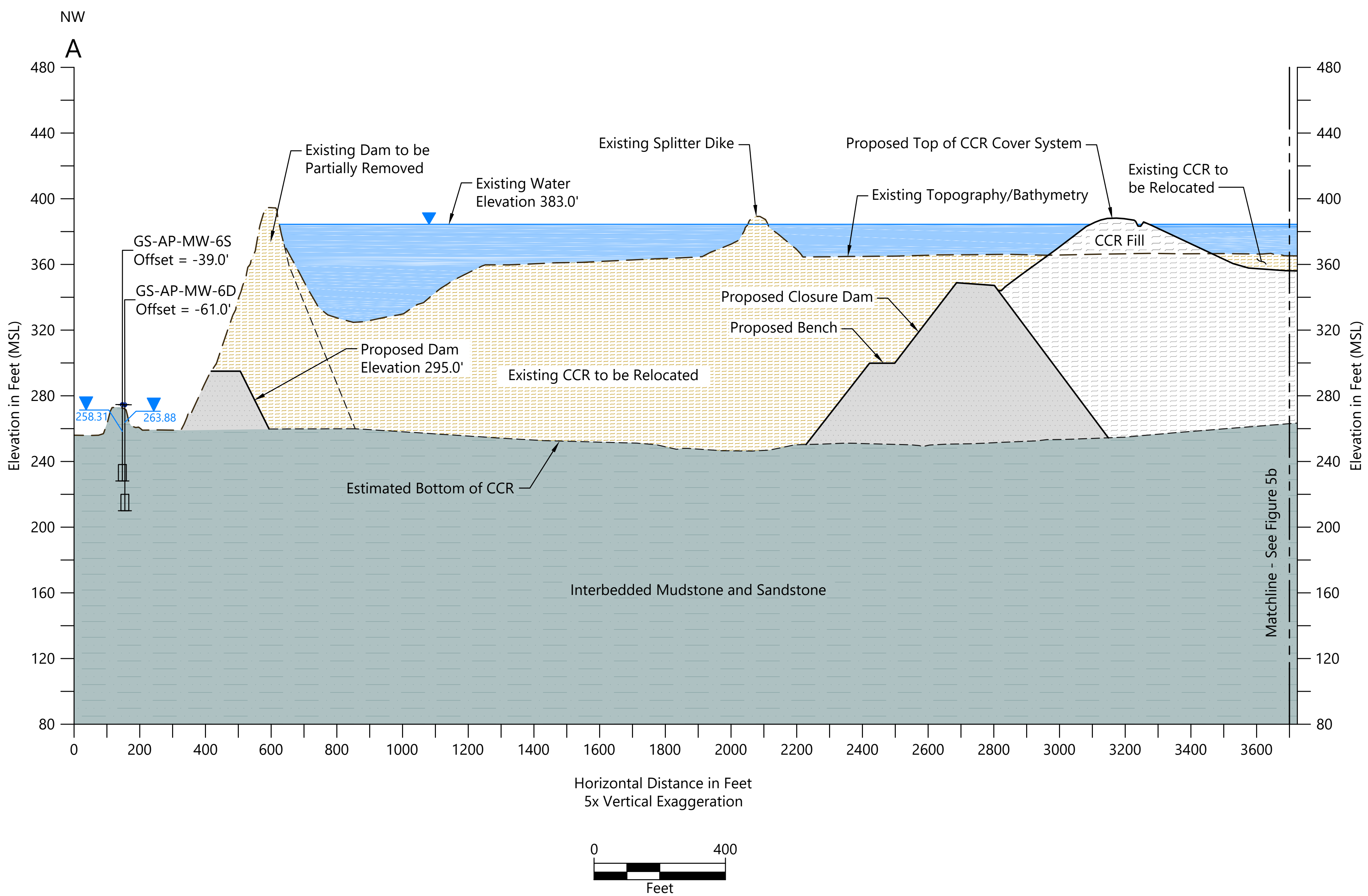
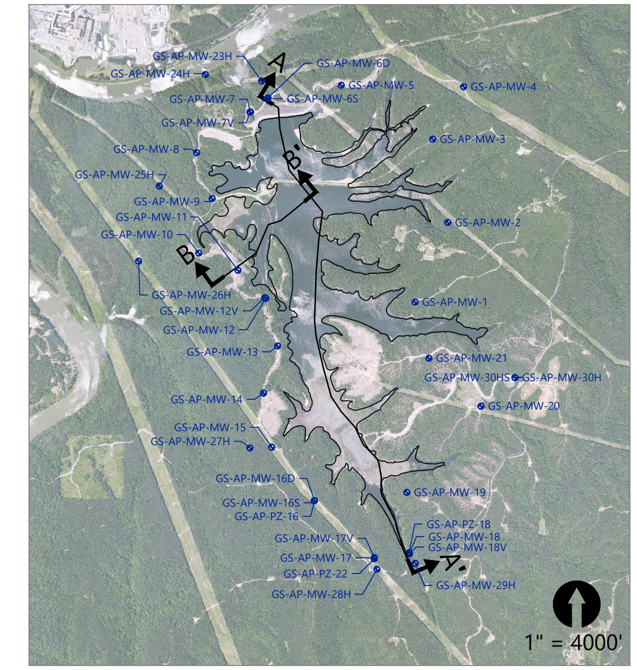
Figure 4
Bottom Ash Landfill Site Layout
Groundwater Remedy Selection Report
Plant Gorgas





LEGEND:

- Existing Topography/Bathymetry
- Proposed Ground Surface
- Geologic Contact
- Existing Monitoring Well
- Water Elevation (Collected September 14, 2020)
- Screened Interval

NOTES:

1. Water elevations were measured on September 14, 2020.
2. Existing ash pond water level and proposed features are based on Plant Gorgas CCR Pond Closure, Walker County, Alabama, Golder, February 2019.
3. CCR: Coal Combustion Residuals

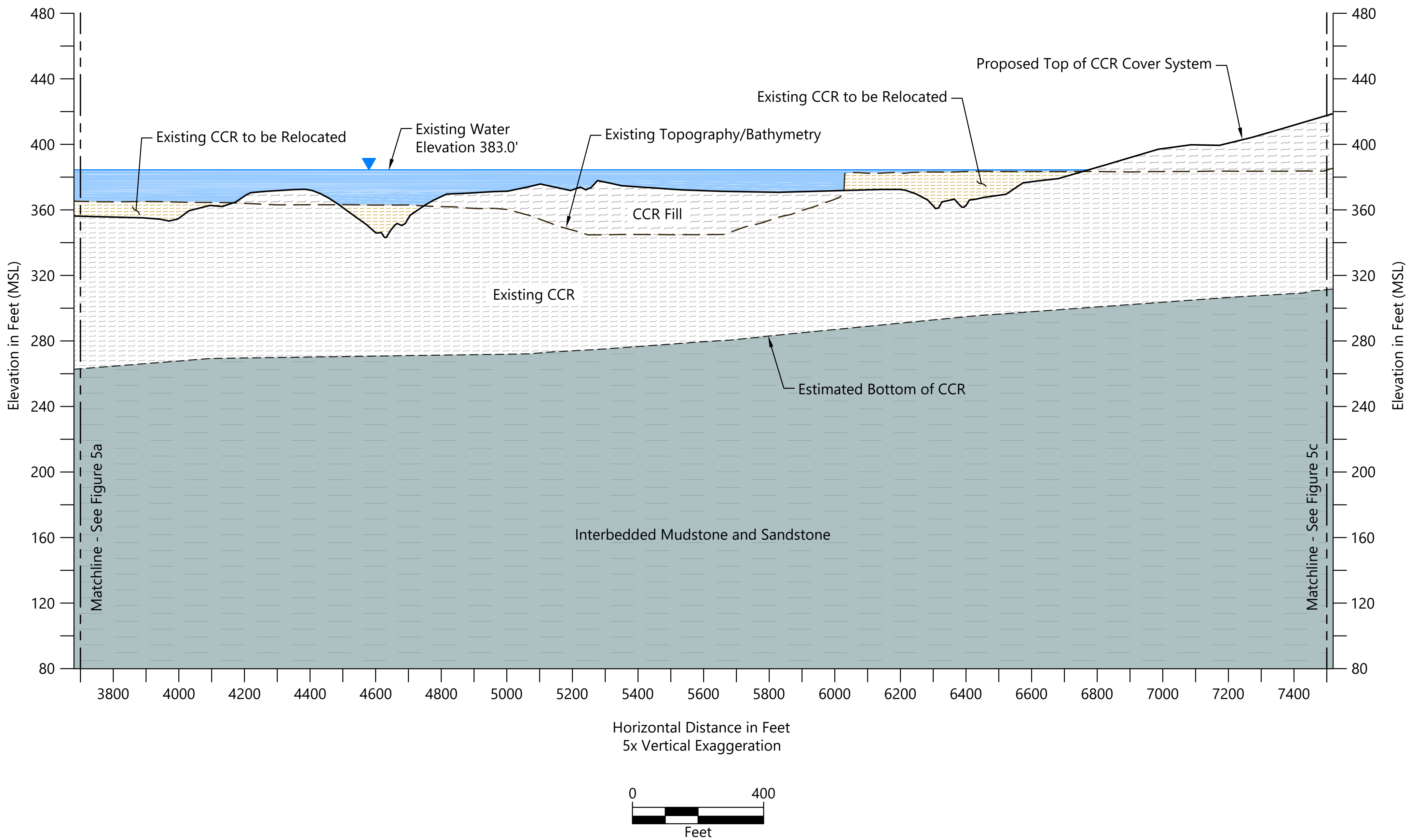
HORIZONTAL DATUM: Alabama State Plane West Zone, NAD83, U.S. Survey Feet
VERTICAL DATUM: MSL (Mean Sea Level)

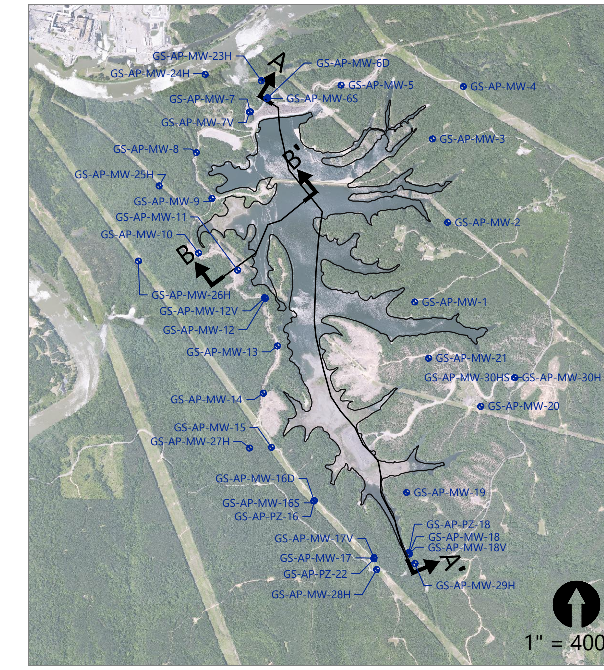
Publish Date: 2021/12/13 1:59 PM | User: hmerrick
Filepath: K:\Projects\1114-Southern Company\Gorgas\Groundwater Remedy Selection Report\1114-RP-001 (Gorgas Sections).dwg Figure 5a

ANCHOR QEA

Figure 5a
Conceptual Ash Pond Cross Section A-A'

Groundwater Remedy Selection Report
Plant Gorgas





LEGEND:

- Existing Topography/Bathymetry
- Proposed Ground Surface
- Geologic Contact
- Existing Monitoring Well
- Water Elevation (Collected September 14, 2020)
- Screened Interval

NOTES:

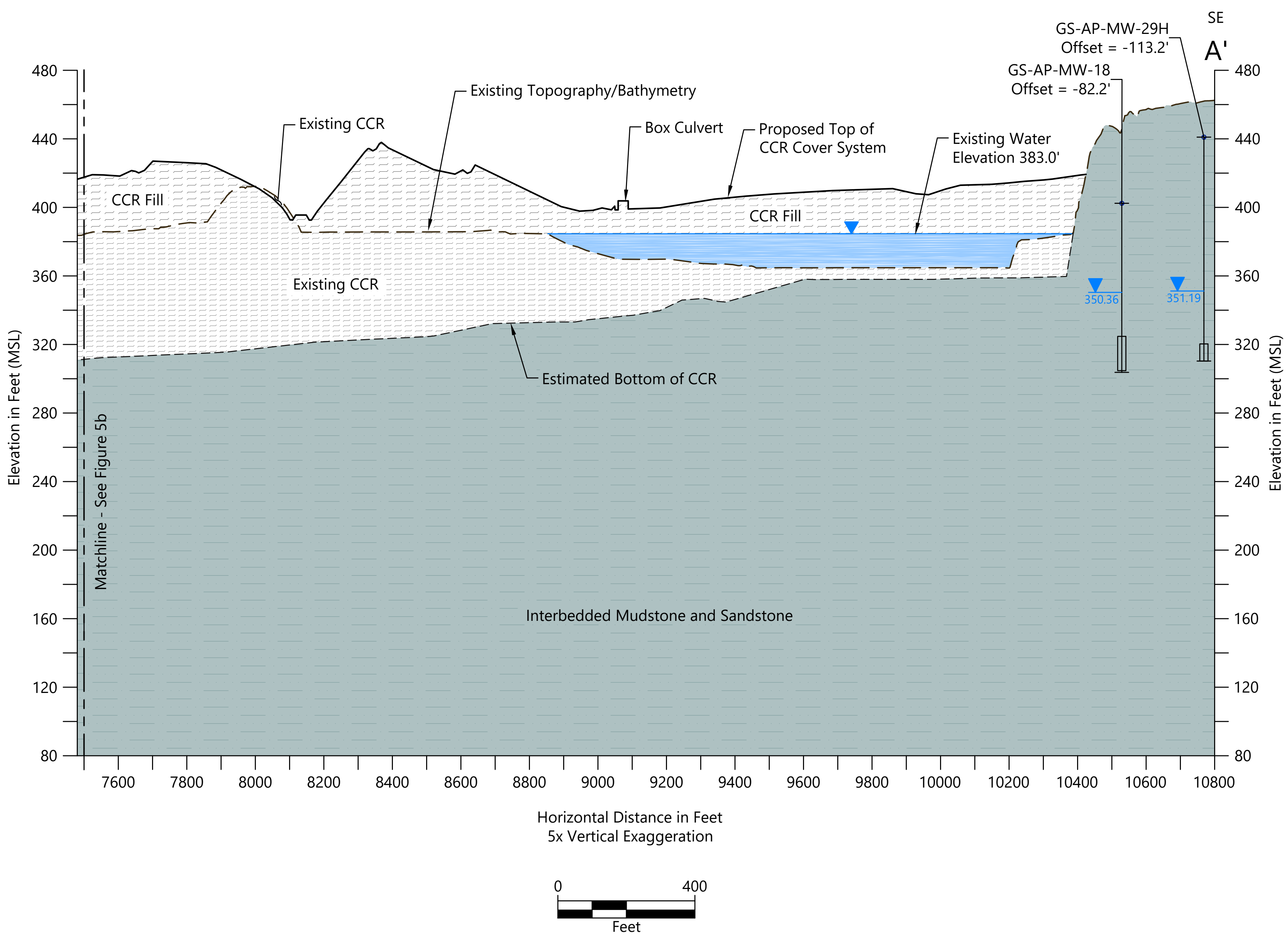
1. Water elevations were measured on September 14, 2020.
2. Existing ash pond water level and proposed features are based on Plant Gorgas CCR Pond Closure, Walker County, Alabama, Golder, February 2019.
3. CCR: Coal Combustion Residuals

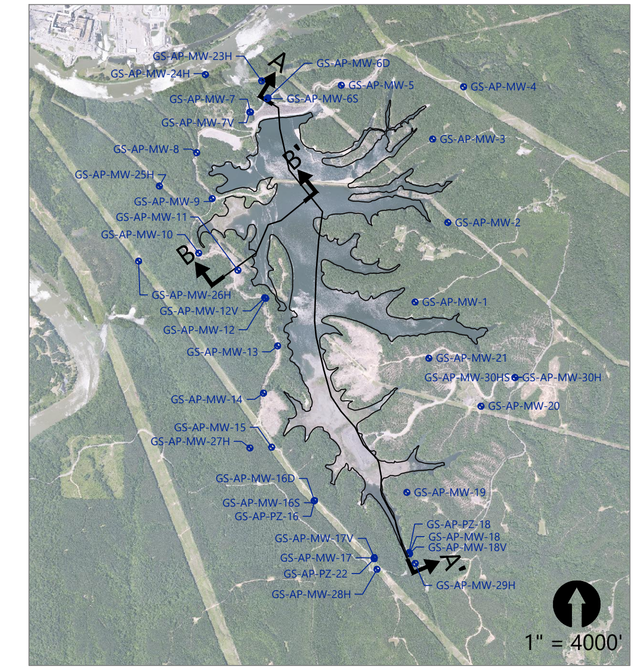
HORIZONTAL DATUM: Alabama State Plane West Zone, NAD83, U.S. Survey Feet
VERTICAL DATUM: MSL (Mean Sea Level)

ANCHOR QEA

Figure 5b
Conceptual Ash Pond Cross Section A-A'

Groundwater Remedy Selection Report
Plant Gorgas





LEGEND:

- Existing Topography/Bathymetry
- Proposed Ground Surface
- Geologic Contact
- Existing Monitoring Well
- Water Elevation (Collected September 14, 2020)
- Screened Interval

NOTES:

1. Water elevations were measured on September 14, 2020.
2. Existing ash pond water level and proposed features are based on Plant Gorgas CCR Pond Closure, Walker County, Alabama, Golder, February 2019.
3. CCR: Coal Combustion Residuals

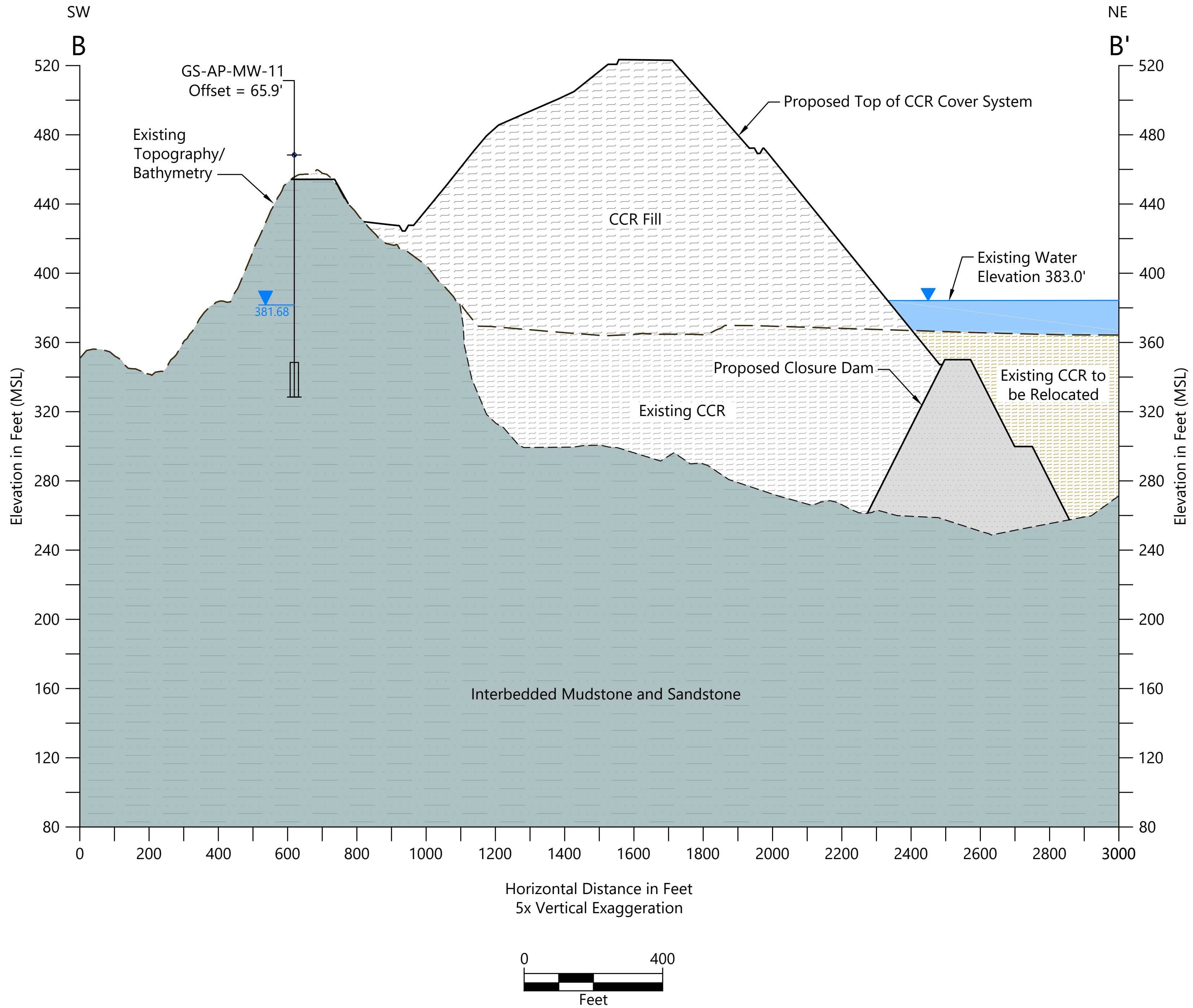
HORIZONTAL DATUM: Alabama State Plane West Zone, NAD83, U.S. Survey Feet
VERTICAL DATUM: MSL (Mean Sea Level)

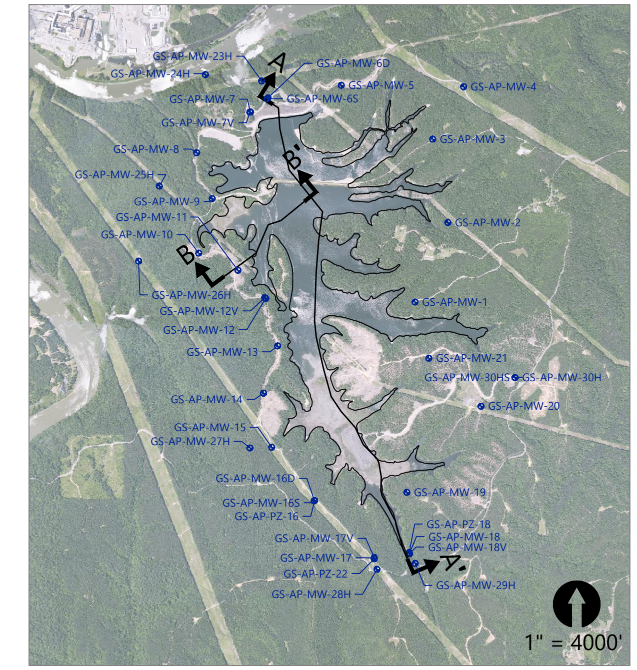
Publish Date: 2021/12/13 1:59 PM | User: hmerrick
Filepath: K:\Projects\1114-Southern Company\Gorgas\Groundwater Remedy Selection Report\1114-RP-001 (Gorgas Sections).dwg Figure 5c

ANCHOR QEA

Figure 5c
Conceptual Ash Pond Cross Section A-A'

Groundwater Remedy Selection Report
Plant Gorgas





LEGEND:

Existing Topography/Bathymetry

Proposed Ground Surface

Geologic Contact

Existing Monitoring Well

Water Elevation
(Collected April 15, 2019)

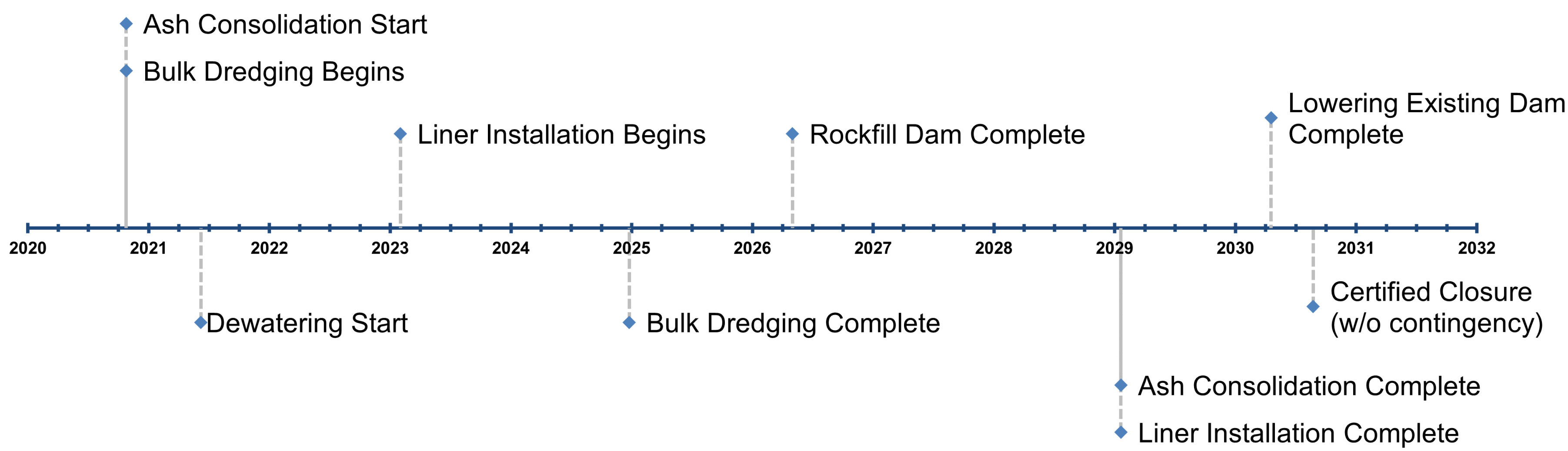
Screened Interval

NOTES:
1. Water elevations were measured on April 15, 2019.
2. Existing ash pond water level and proposed features are based on Plant Gorgas CCR Pond Closure, Walker County, Alabama, Golder, February 2019.
3. CCR: Coal Combustion Residuals

HORIZONTAL DATUM: Alabama State Plane West Zone, NAD83, U.S. Survey Feet
VERTICAL DATUM: MSL (Mean Sea Level)

ANCHOR QEA

Figure 6
Conceptual Ash Pond Cross Section B-B'
Groundwater Remedy Selection Report
Plant Gorgas

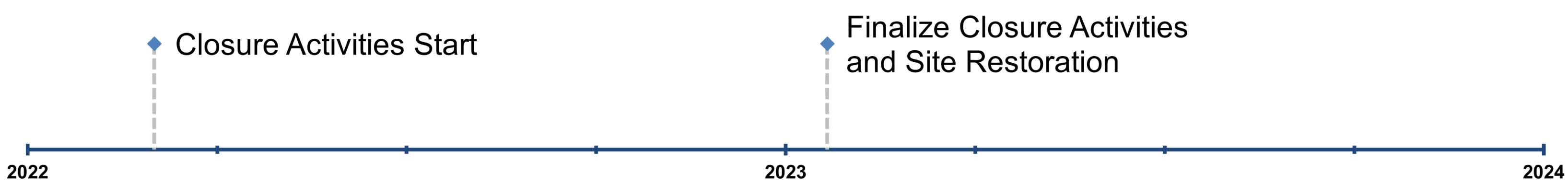


Note:
The liner is part of the final cover system (cap).

Filepath: \\Athena\Mobile\Projects\Southern Company\Alabama Power ACMs - PRIVILEGED & CONFIDENTIAL\Remedy Selection Reports\Gorgas\Figures\Figure 7 - Ash Pond Closure Timeline.docx

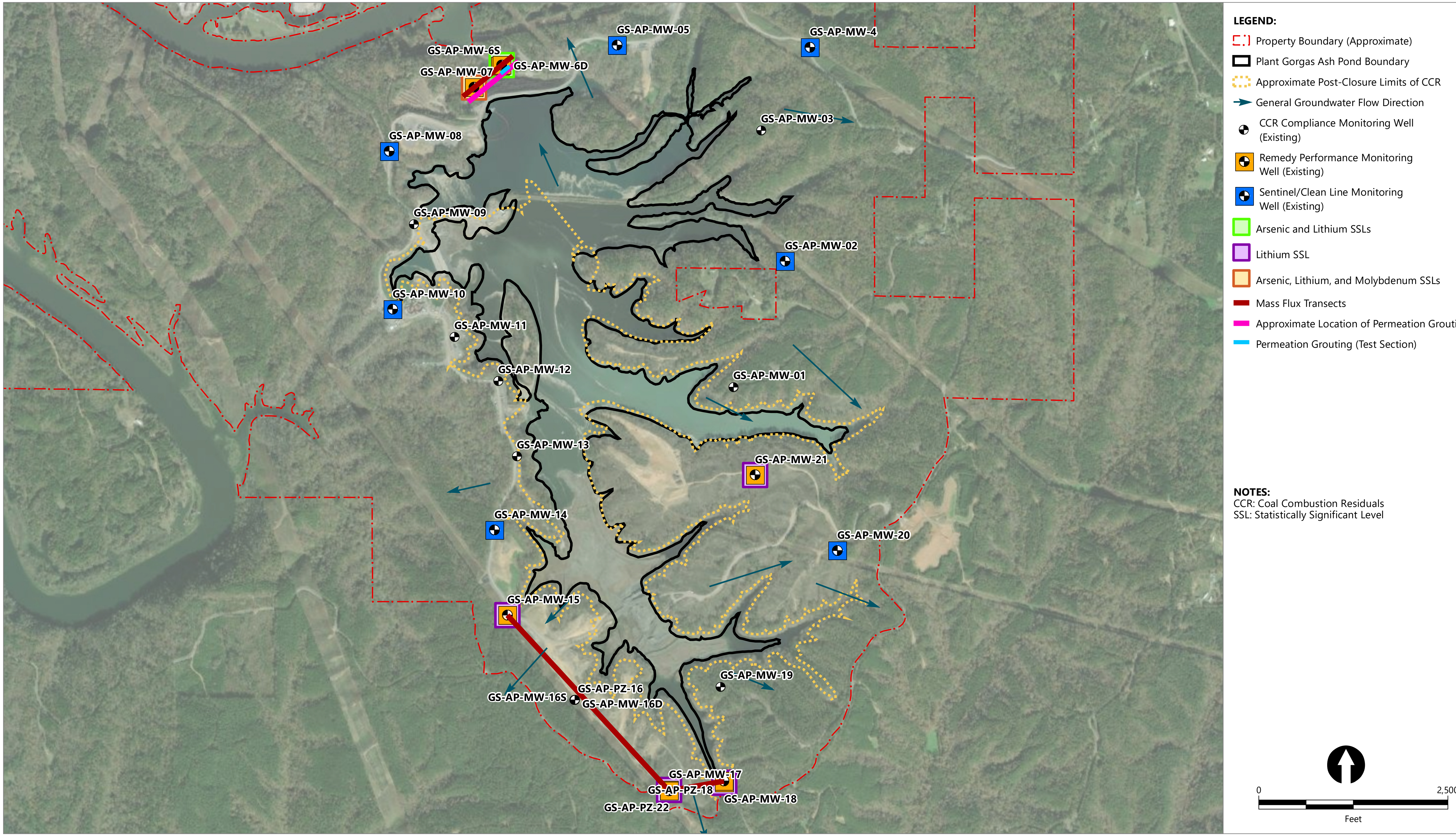
ANCHOR QEA

Figure 7
Proposed Ash Pond Closure Timeline
Groundwater Remedy Selection Report
Plant Gorgas



Notes:
1. The liner is part of the final cover system (cap).
2. Closure activities consist of excavation of coal combustion residuals from above the existing HDPE liner, followed by removal of the HDPE liner and underlying 12-inch layer of granular material. During closure, the Gypsum Pond will be progressively dewatered as required to facilitate closure by removal. Once the Gypsum Pond is closed through the removal of the gypsum, liner, and underlying granular layer, decommissioning of the lower sedimentation pond, clear pool, and emergency storage pond will take place. This will involve removing any sediment and the HDPE liners.
HDPE: high-density polyethylene

Figure 8
Proposed Gypsum Pond Closure Timeline
Groundwater Remedy Selection Report
Plant Gorgas



Publish Date: 2021/12/14, 2:59 PM | User: jquinley
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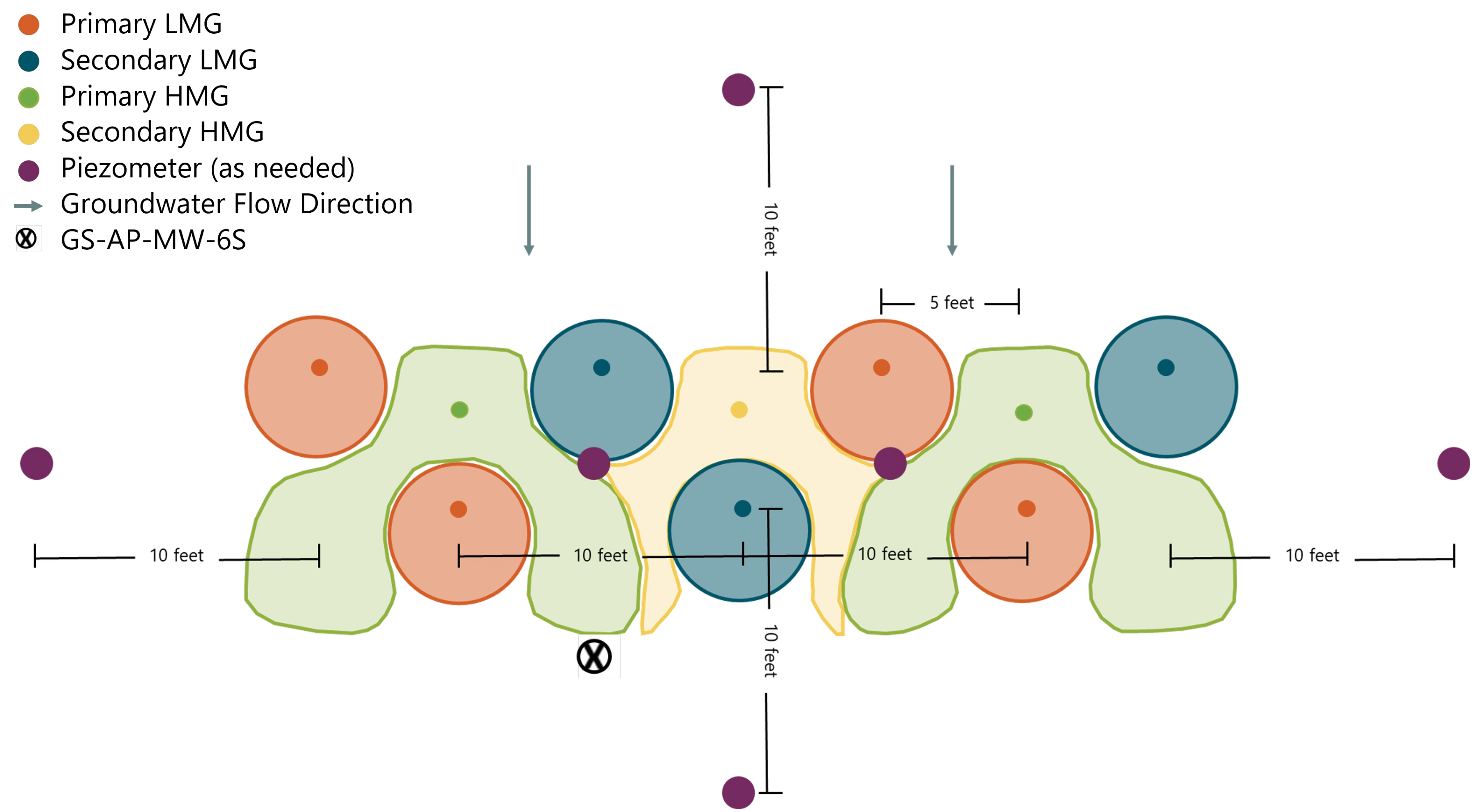
ANCHOR QEA

Figure 9
Ash Pond Conceptual Corrective Action Monitoring Plan
Groundwater Remedy Selection Report
Plant Gorgas



Notes:
HMG: high-mobility grout
LMG: low-mobility grout

Filepath: \\Athena\Mobile\Projects\Southern Company\Alabama Power ACMs - PRIVILEGED & CONFIDENTIAL\Remedy Selection Reports\Gorgas\Figures\Figure 10 - Pilot Plan Layout.docx

Figure 10
Typical Cell Layout, Pilot Grouting Program
Groundwater Remedy Selection Report
Plant Gorgas

Publish Date: 2021/12/02, 12:04 PM | User: jquinley
Filepath: \\orcas\GIS\Jobs\SouthernCompany_1114\PlantGorgas\Maps\2021_Groundwater_Remedy\AQ_PlantGorgas_Fig11_GypsumPond_ConceptualCorrectiveAction_MP.mxd

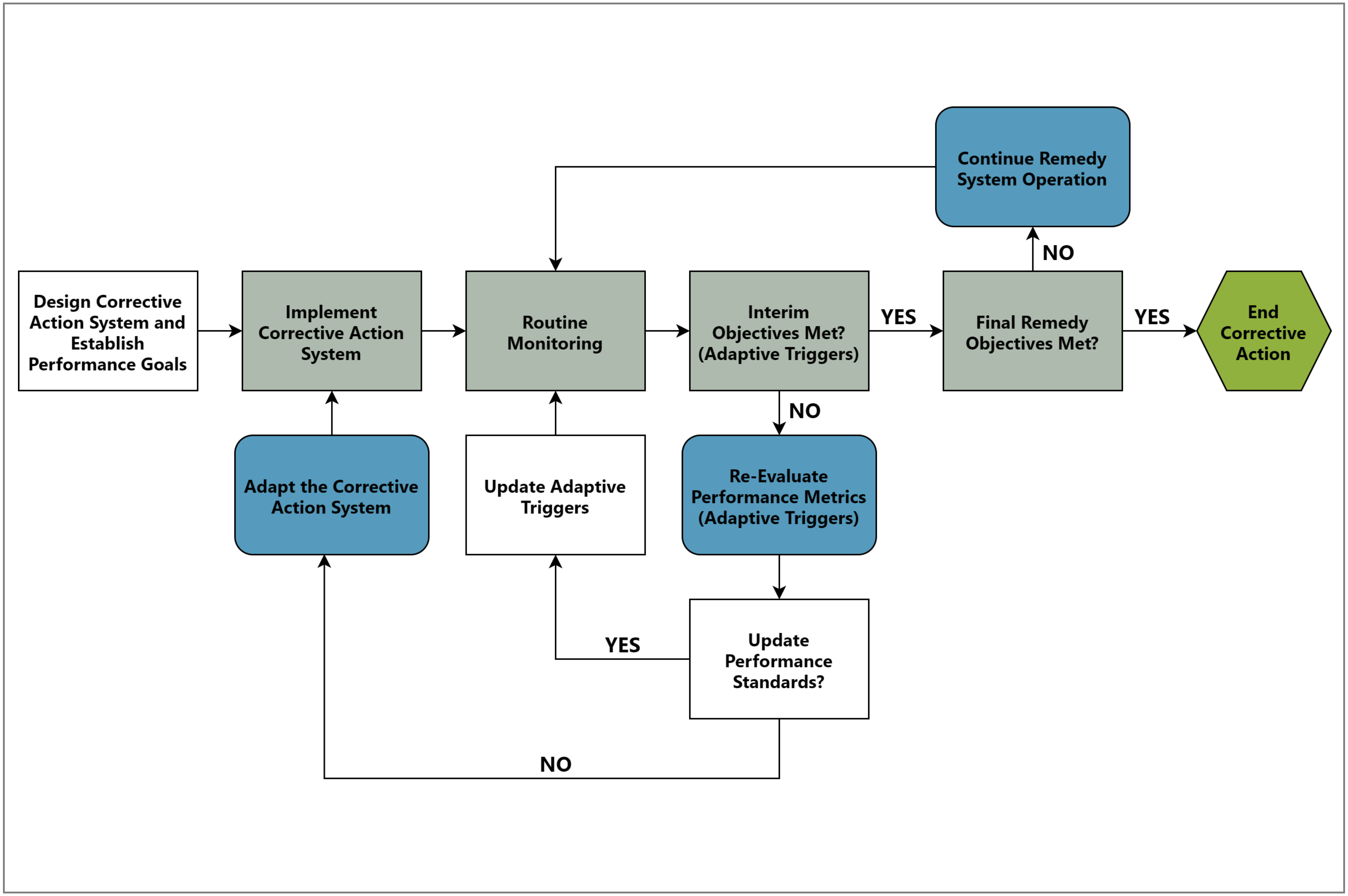
ANCHOR QEA

Figure 11
Gypsum Pond Conceptual Corrective Action Monitoring Plan
Groundwater Remedy Selection Report
Plant Gorgas

Publish Date: 2021/12/02, 12:04 PM | User: jquinley
Filepath: \\orcas\GIS\Jobs\SouthernCompany_1114\PlantGorgas\Maps\2021_Groundwater_Remedy\AQ_PlantGorgas_Fig12_BottomAsh_Landfill_ConceptualCorrectiveAction_MP.mxd

ANCHOR QEA

Figure 12
Bottom Ash Landfill Conceptual Corrective Action Monitoring Plan
Groundwater Remedy Selection Report
Plant Gorgas



Filepath: \\Athena\Mobile\Projects\Southern Company\Alabama Power ACMs - PRIVILEGED & CONFIDENTIAL\Remedy Selection Reports\Gorgas\Figures\Figure 13 - Site Management Framework.docx

ANCHOR QEA

Figure 13
Adaptive Site Management Framework
Groundwater Remedy Selection Report
Plant Gorgas

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.

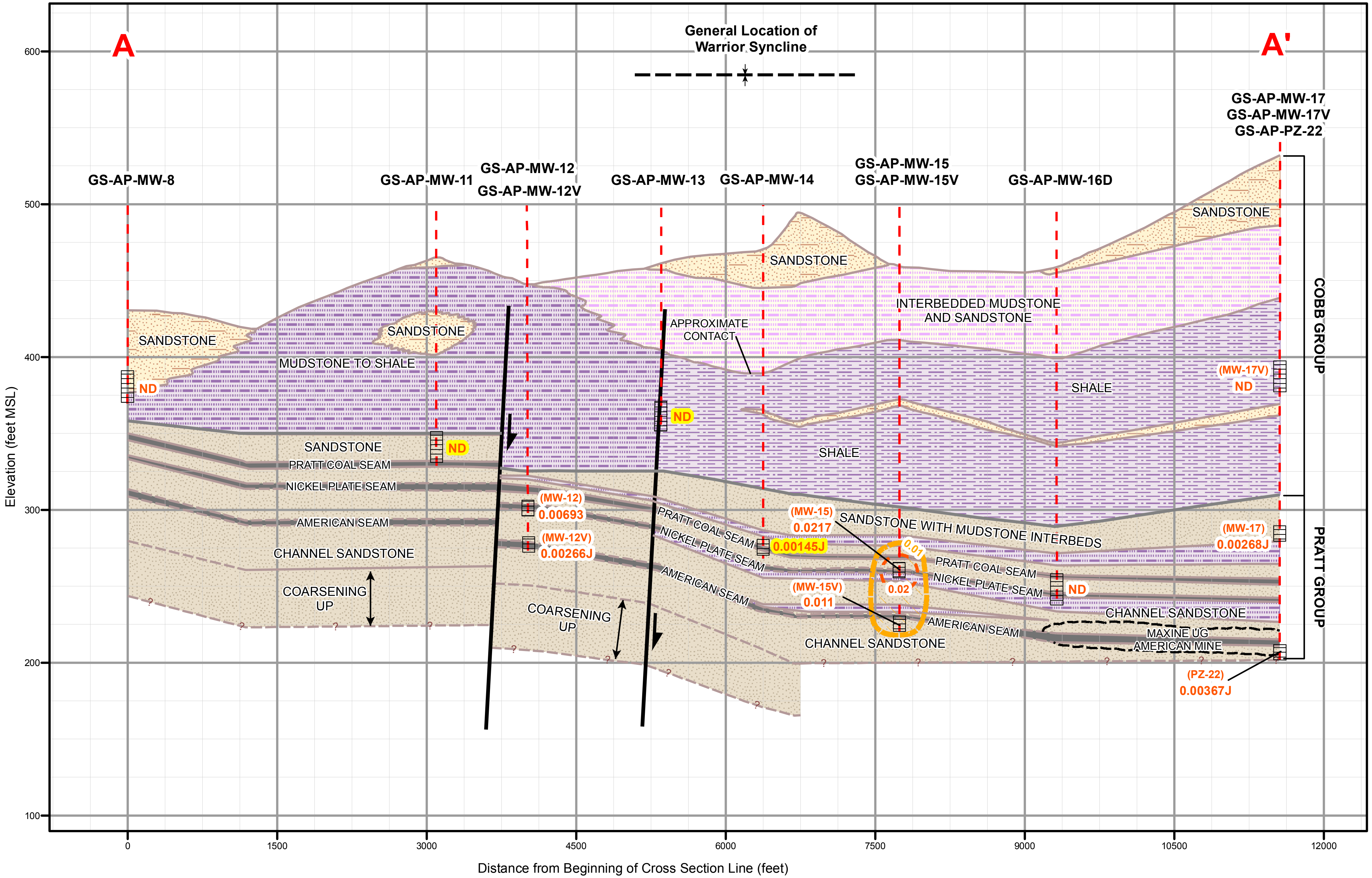
In Testimony whereof, witness the signature of the Executive Director under seal of the Board on November 02, 2020

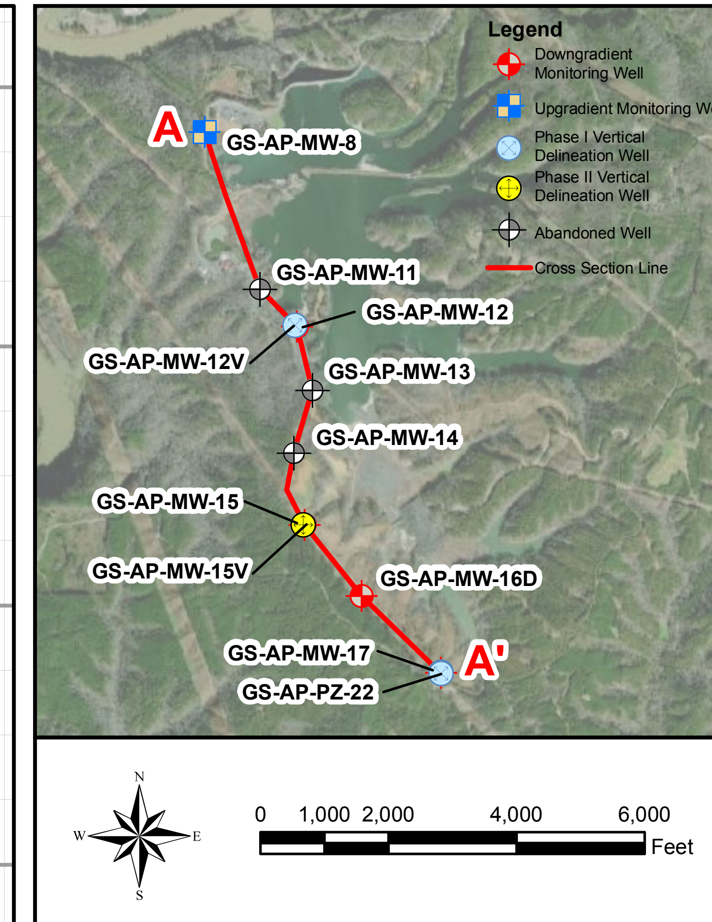
William R. Huett

Executive Director

RECEIPT NO.
20201102000023800

Appendix B
Geologic Cross Sections with Isoconcentration Lines





Notes:
1. Stratigraphic layers were correlated using a combination of boring data and gamma logs.
2. Elevation data are reported using feet above Mean Sea Level (MSL).
3. Water samples were collected between March 16 and March 25, 2020.
4. mg/L indicates milligrams per liter.
5. J indicates a laboratory estimated concentration between the analytical method detection limit and the laboratory reporting limit.
6. ND indicates not detected above the laboratory method detection limit.
7. GWPS indicates Groundwater Protection Standard.
8. Vertical exaggeration = 15x.
9. MW-11, MW-13, and MW-14 were abandoned, so the historical average arsenic concentration values are shown.
10. Concentrations are representative only of groundwater occupying discrete fractures or coal seams and are not to be utilized to characterize mass.

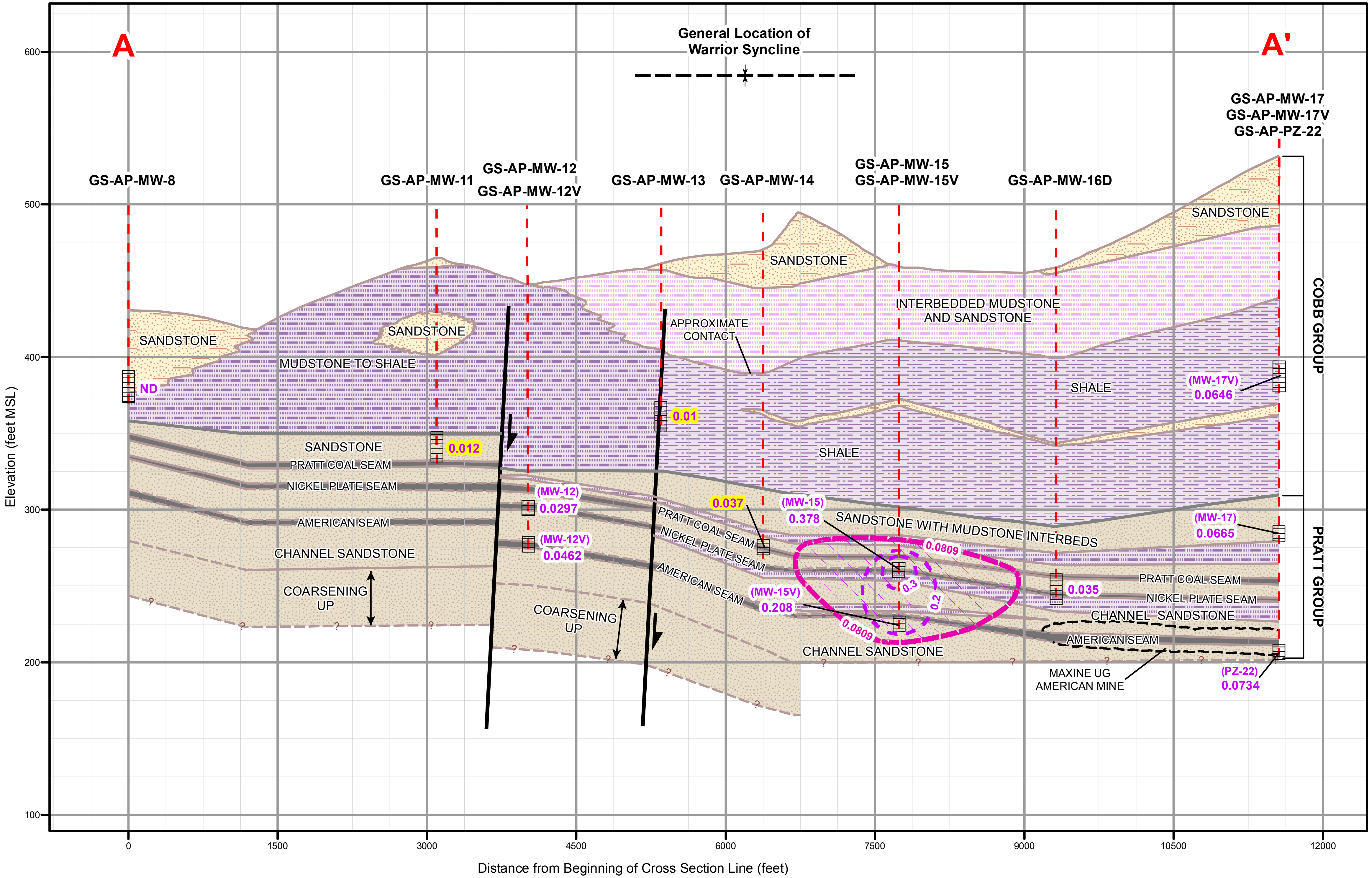
Legend

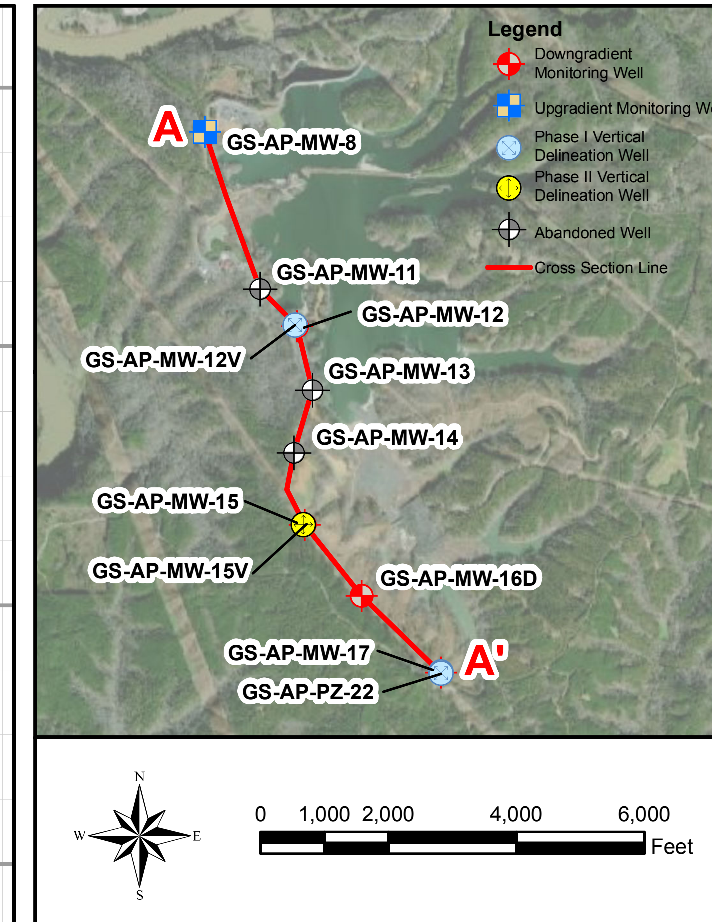
- Screen Interval
- Monitoring Well Location
- Arsenic Isoconcentration Contour
- Arsenic GWPS Isoconcentration Contour
- Area Exceeding GWPS for Arsenic
- 0.011 Arsenic concentration (mg/L)
- 0.00145J Average Arsenic concentration (mg/L)
- 0.01 Arsenic GWPS (mg/L)
- Group Boundary
- Strata Boundary
- Inferred Strata Boundary
- Fault
- Mine
- Syncline

Geologic Units

- Shale
- Mudstone to Shale
- Interbedded Mudstone and Sandstone
- Sandstone
- Channel Sandstone
- Coal

SCALE: As Shown	DRAWING TITLE: ARSENIC CONCENTRATIONS ALONG GEOLOGIC CROSS SECTION A - A' PLANT GORGAS ASH POND
DATE: 9/22/2020	
DRAWN BY: KWR	FIGURE NO: **FIGURE 9A**
CHECKED BY: GBD	Southern Company





Notes:
1. Stratigraphic layers were correlated using a combination of boring data and gamma logs.
2. Elevation data are reported using feet above Mean Sea Level (MSL).
3. Water samples were collected between March 16 and March 25, 2020.
4. mg/L indicates milligrams per liter.
5. ND indicates not detected above the laboratory method detection limit.
6. NS indicates abandoned well not sampled.
7. GWPS indicates Groundwater Protection Standard.
8. Vertical exaggeration = 15x.
9. MW-11, MW-13, and MW-14 were abandoned, so the historical average lithium concentration values are shown.
10. Concentrations are representative only of groundwater occupying discrete fractures or coal seams and are not to be utilized to characterize mass.
11. MW-17V is upgradient, as determined by groundwater elevations, and has a maximum concentration of 0.0809 mg/L which is the GWPS used for contouring.

Legend

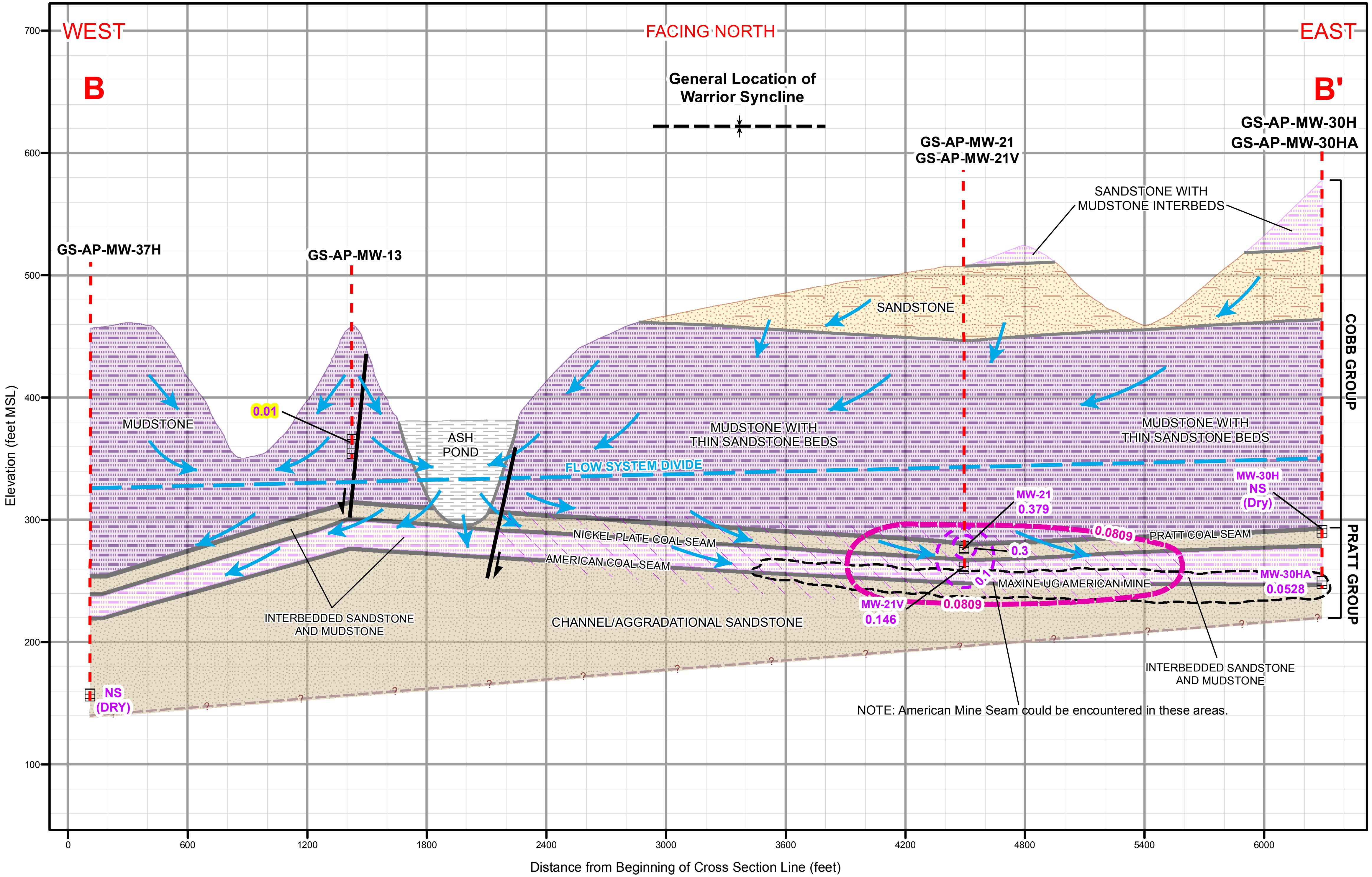
- Screen Interval
- Monitoring Well Location
- Lithium Isoconcentration Contour
- Lithium GWPS Isoconcentration Contour
- Area Exceeding GWPS for Arsenic
- 0.378 Lithium concentration (mg/L)
- 0.00145J Average Lithium concentration (mg/L)
- 0.0809 Lithium GWPS (mg/L)
- Group Boundary
- Strata Boundary
- Inferred Strata Boundary
- Fault
- Mine
- Syncline

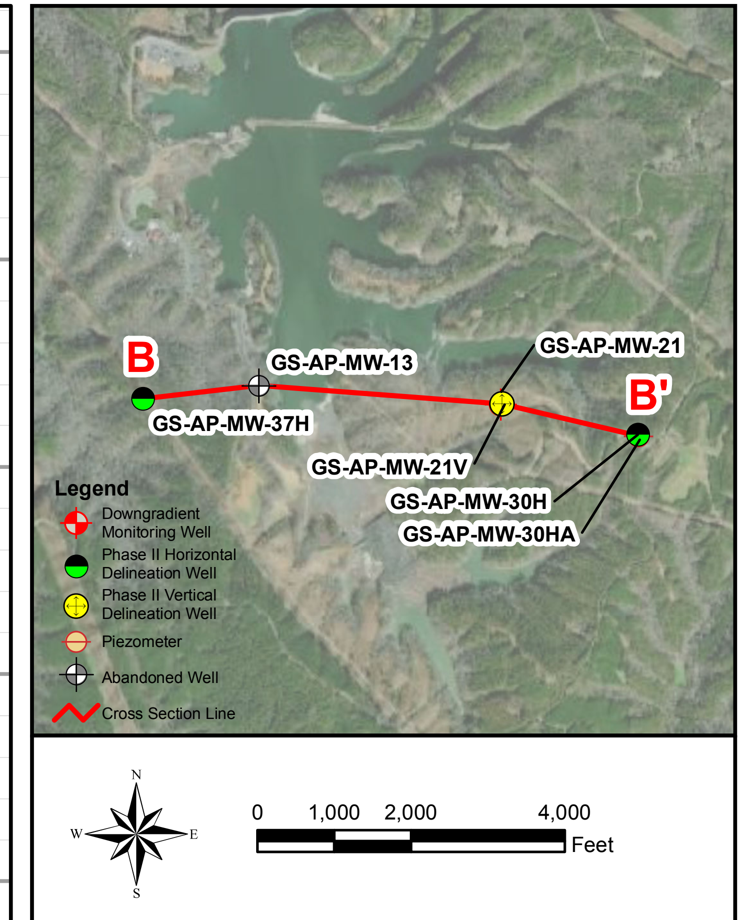
Geologic Units

- Shale
- Mudstone to Shale
- Interbedded Mudstone and Sandstone
- Sandstone
- Channel Sandstone
- Coal

SCALE	As Shown
DATE	9/22/2020
DRAWN BY	KWR
CHECKED BY	GBD
DRAWING TITLE	LITHIUM CONCENTRATIONS ALONG GEOLOGIC CROSS SECTION A - A' PLANT GORGAS ASH POND
FIGURE NO	FIGURE 9B

Southern Company





Notes:
1. Stratigraphic layers were correlated using a combination of boring data and gamma logs.
2. Dashed blue line represents approximate boundary between water-table flow system and deeper Pratt flow system.
3. Elevation data are reported using feet above Mean Sea Level (MSL).
4. Water samples were on March 18, 2020 (MW-21) and March 23, 2020 (MW-21V).
5. mg/L indicates milligrams per liter.
6. NS indicates well not sampled.
7. GWPS indicates Groundwater Protection Standard.
8. Vertical exaggeration = 6x.
9. MW-13 was abandoned, so the historical average lithium concentration value is shown.
10. Lithium exceedances at the MW-21/21V well pair are likely related to elevated pH in each well (greater than 10 SU).
11. Concentrations are representative only of groundwater occupying discrete fractures or coal seams and are not to be utilized to characterize mass.

Legend

- Cross Section Line
- Monitoring Well Location
- Screen Interval
- Lithium Isoconcentration Contour
- Lithium GWPS Isoconcentration Contour
- Area Exceeding GWPS for Lithium
- 0.146 Lithium concentration (mg/L)
- 0.01 AverageLithium concentration (mg/L)
- 0.0809 Lithium GWPS (mg/L)
- Groundwater Flow Direction
- Flow System Divide
- Group Boundary
- Strata Boundary
- Fault
- Mine
- Inferred Boundary
- Syncline

Geologic Units

- Ash Pond (Fill)
- Mudstone with Thin Sandstone Interbeds
- Sandstone with Mudstone Interbeds
- Sandstone
- Channel/Aggradational Sandstone
- Coal

SCALE	As Shown
DATE	9/29/2020
DRAWN BY	KWR
CHECKED BY	GBD

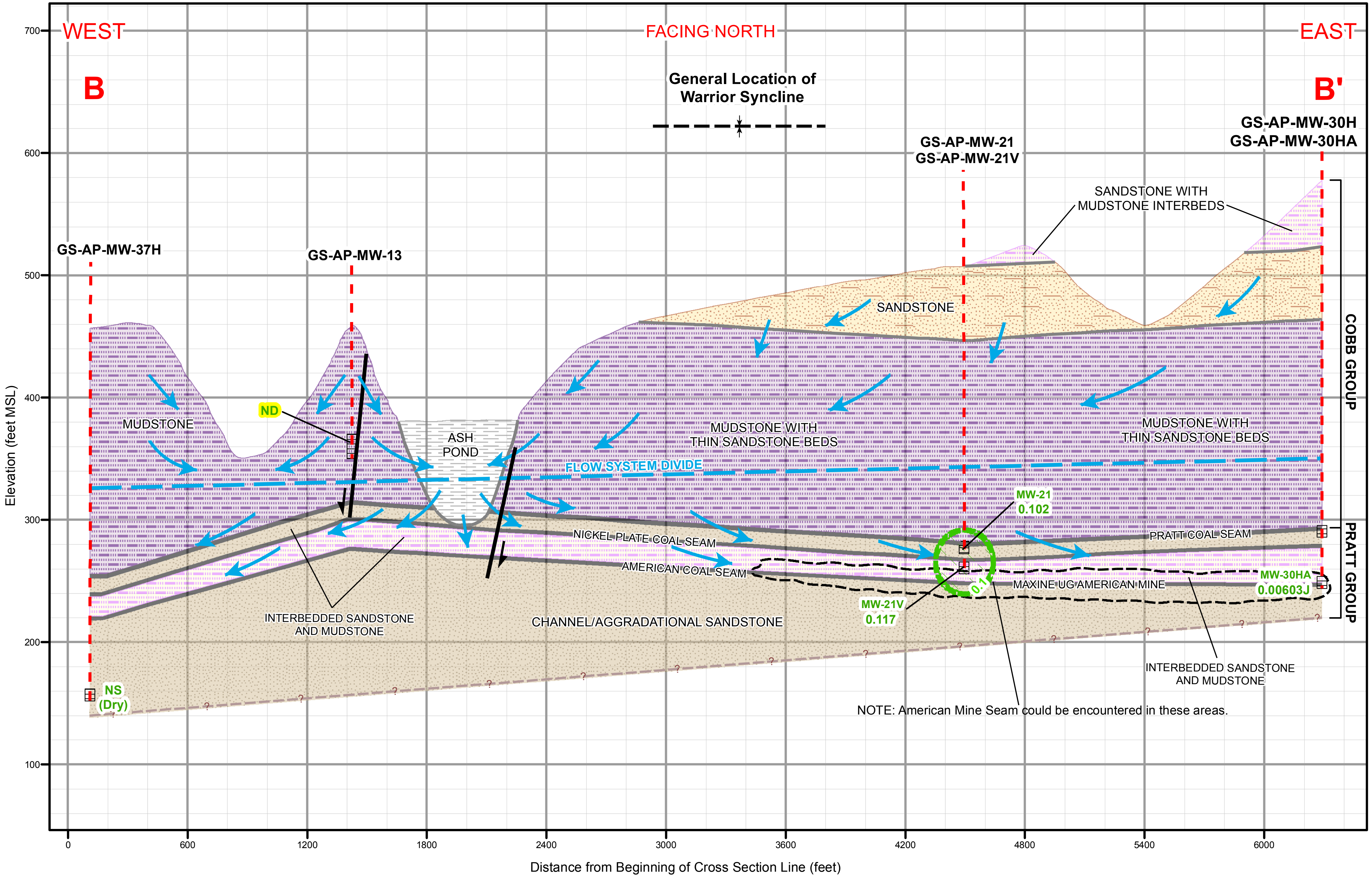
DRAWING TITLE

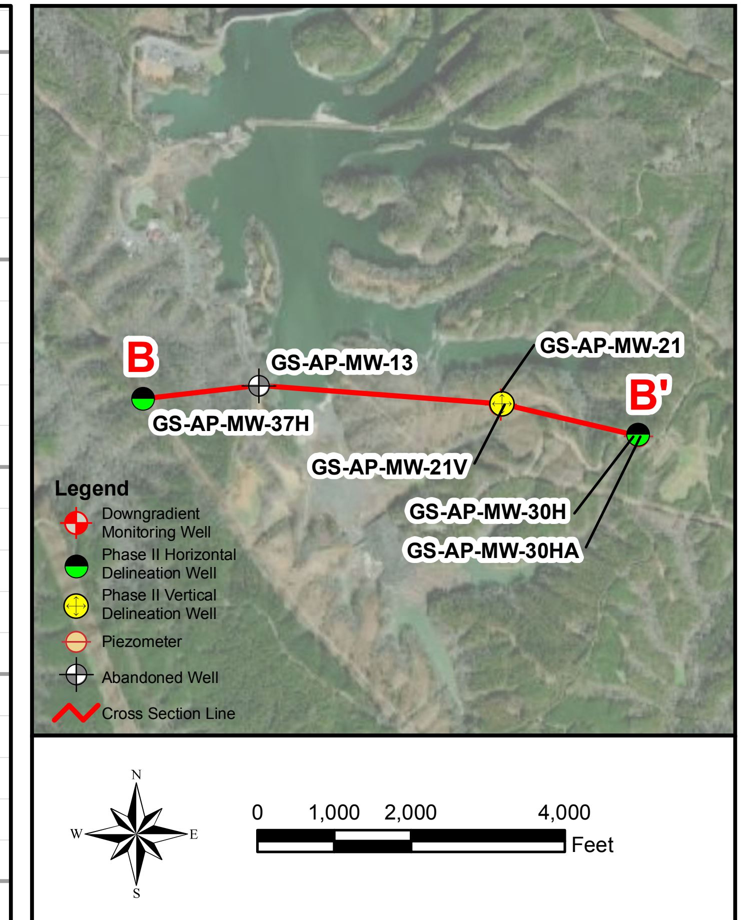
LITHIUM CONCENTRATIONS ALONG GEOLOGIC CROSS SECTION B - B' PLANT GORGAS ASH POND

FIGURE NO

FIGURE 10A

Southern Company





Notes:
1. Stratigraphic layers were correlated using a combination of boring data and gamma logs.
2. Dashed blue line represents approximate boundary between water-table flow system and deeper Pratt flow system.
3. Elevation data are reported using feet above Mean Sea Level (MSL).
4. Water samples were on March 18, 2020 (MW-21) and March 23, 2020 (MW-21V).
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 well not sampled.
9. GWPS indicates Groundwater Protection Standard.
10. Vertical exaggeration = 6x.
11. MW-13 was abandoned, so the historical average molybdenum concentration value is shown.
12. Concentrations are representative only of groundwater occupying discrete fractures or coal seams and are not to be utilized to characterize mass.

Legend

- Cross Section Line
- Monitoring Well Location
- Screen Interval
- Molybdenum GWPS Isoconcentration Contour
- Area Exceeding GWPS for Molybdenum
- 0.102 Molybdenum concentration (mg/L)
- ND Average Molybdenum concentration (mg/L)
- 0.1 Molybdenum GWPS (mg/L)
- Groundwater Flow Direction
- Flow System Divide
- Group Boundary
- Strata Boundary
- Fault
- Mine
- Inferred Boundary
- Syncline

Geologic Units

- Ash Pond (Fill)
- Mudstone with Thin Sandstone Interbeds
- Sandstone with Mudstone Interbeds
- Sandstone
- Channel/Aggradational Sandstone
- Coal

SCALE	As Shown
DATE	9/29/2020
DRAWN BY	KWR
CHECKED BY	GBD

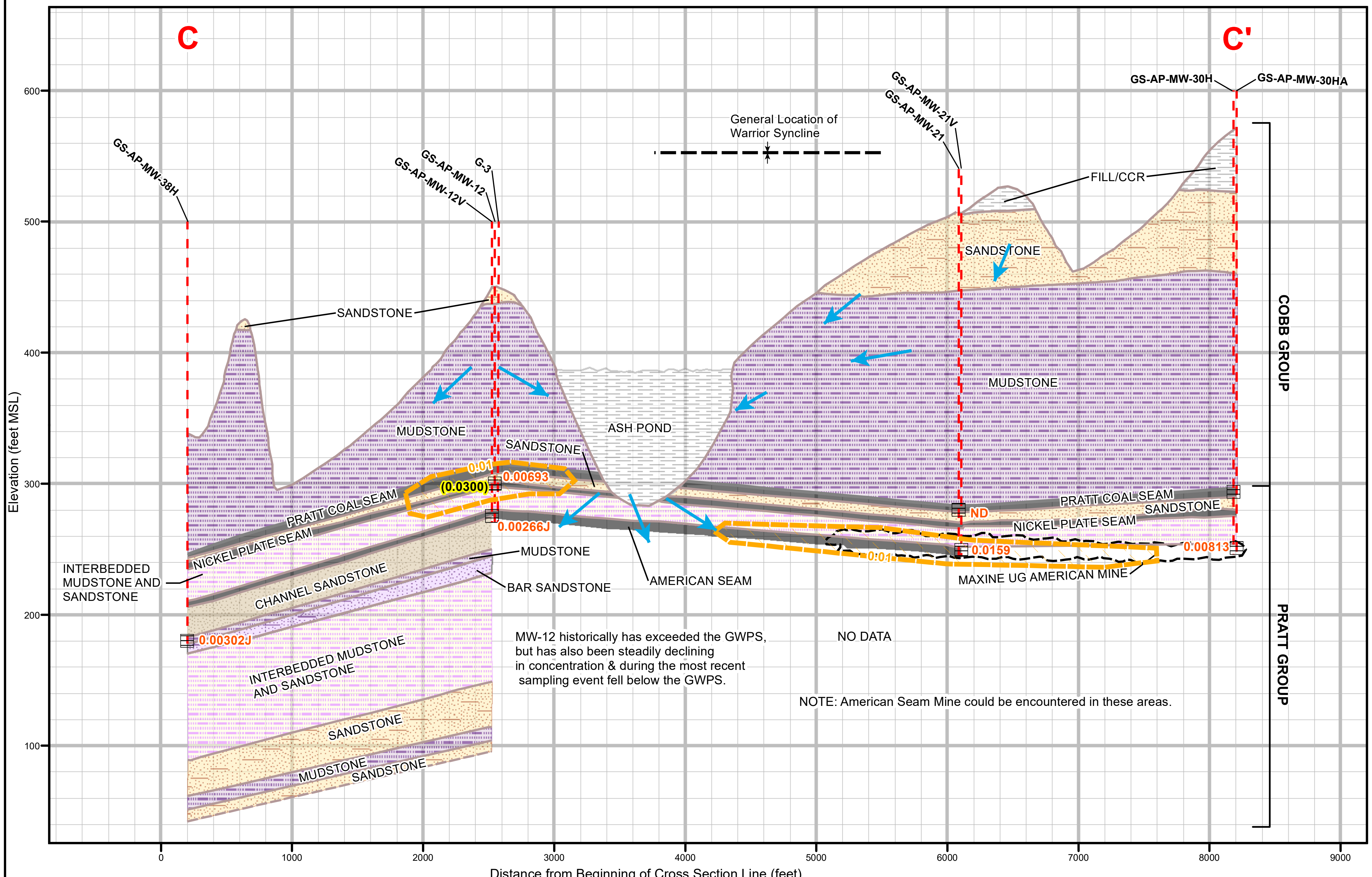
DRAWING TITLE

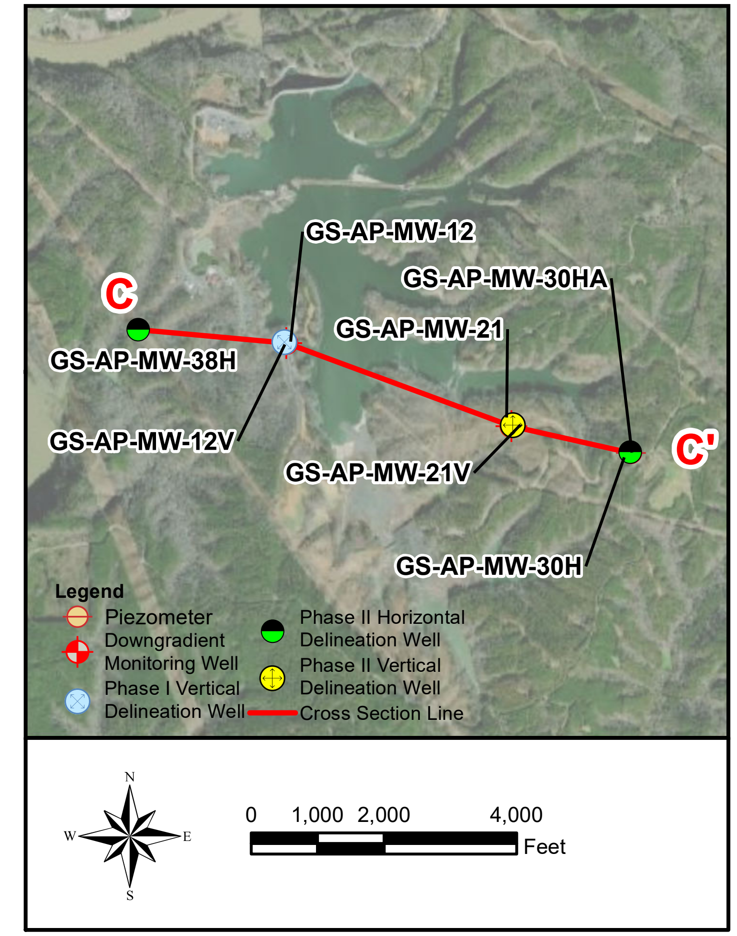
MOLYBDENUM CONCENTRATIONS ALONG GEOLOGIC CROSS SECTION B - B' PLANT GORGAS ASH POND

FIGURE NO

FIGURE 10B

Southern Company





Notes:

1. Stratigraphic layers were correlated using a combination of boring data and gamma logs.
2. Elevation data are reported using feet above Mean Sea Level (MSL).
3. Maxine Mine was not encountered at well GW-AP-MW-21v
4. Water samples were collected between March 18 and March 24, 2020
5. mg/L indicates milligrams per liter.
6. ND indicates not detected above the laboratory method detection limit.
7. Vertical exaggeration = 10x
8. GWPS indicates Groundwater Protection Standard.
9. J indicates a laboratory estimated concentration between the analytical method detection limit and the laboratory reporting limit.
10. Concentrations are representative only of groundwater occupying discrete fractures or coal seams and are not to be utilized to characterize mass.

Legend

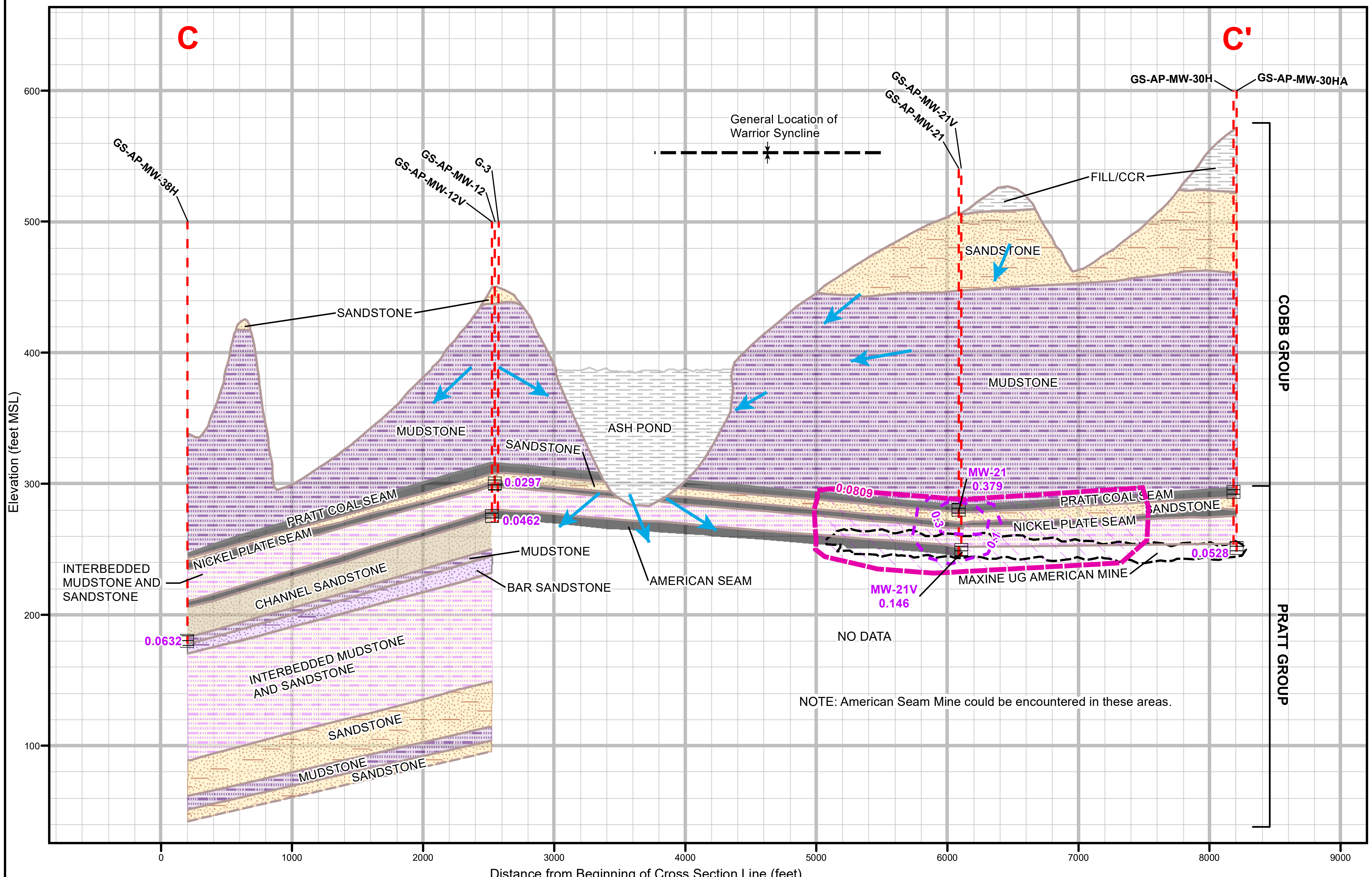
- Screen Interval
- Monitoring Well Location
- Groundwater Flow Direction
- Arsenic GWPS Isoconcentraion Contour
- Area Exceeding GWPS for Arsenic
- 0.01 Arsenic GWPS (mg/L)
- 0.002 Arsenic Concentration (mg/L)
- 0.0300 Average Arsenic Concentration (mg/L)
- Group Boundary
- Strata Boundary
- Inferred Strata Boundary
- Mine
- Syncline

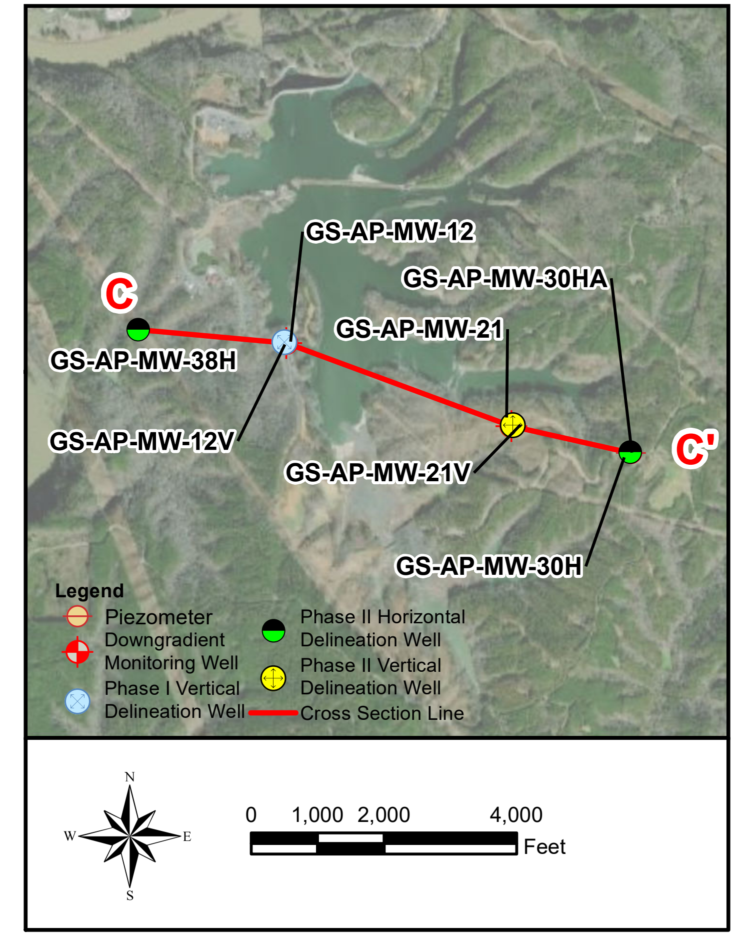
Geologic Units

- Fill/CCR
- Bar Sandstone
- Mudstone
- Interbedded Mudstone and Sandstone
- Sandstone
- Channel Sandstone
- Coal

SCALE As Shown	DRAWING TITLE
DATE 9/21/2020	ARSENIC CONCENTRATION ALONG GEOLOGIC CROSS SECTION C - C' PLANT GORGAS ASH POND
DRAWN BY MDM	
CHECKED BY GBD	FIGURE NO **FIGURE 11A**

Southern Company





Notes:
1. Stratigraphic layers were correlated using a combination of boring data and gamma logs.
2. Elevation data are reported using feet above Mean Sea Level (MSL).
3. Maxine Mine was not encountered at well GW-AP-MW-21v
4. Water samples were collected between March 18 and March 24, 2018
5. mg/L indicates milligrams per liter.
6. ND indicates not detected above the laboratory method detection limit.
7. Vertical exaggeration = 10x
8. GWPS indicates Groundwater Protection Standard.
9. Concentrations are representative only of groundwater occupying discrete fractures or coal seams and are not to be utilized to characterize mass.

Legend

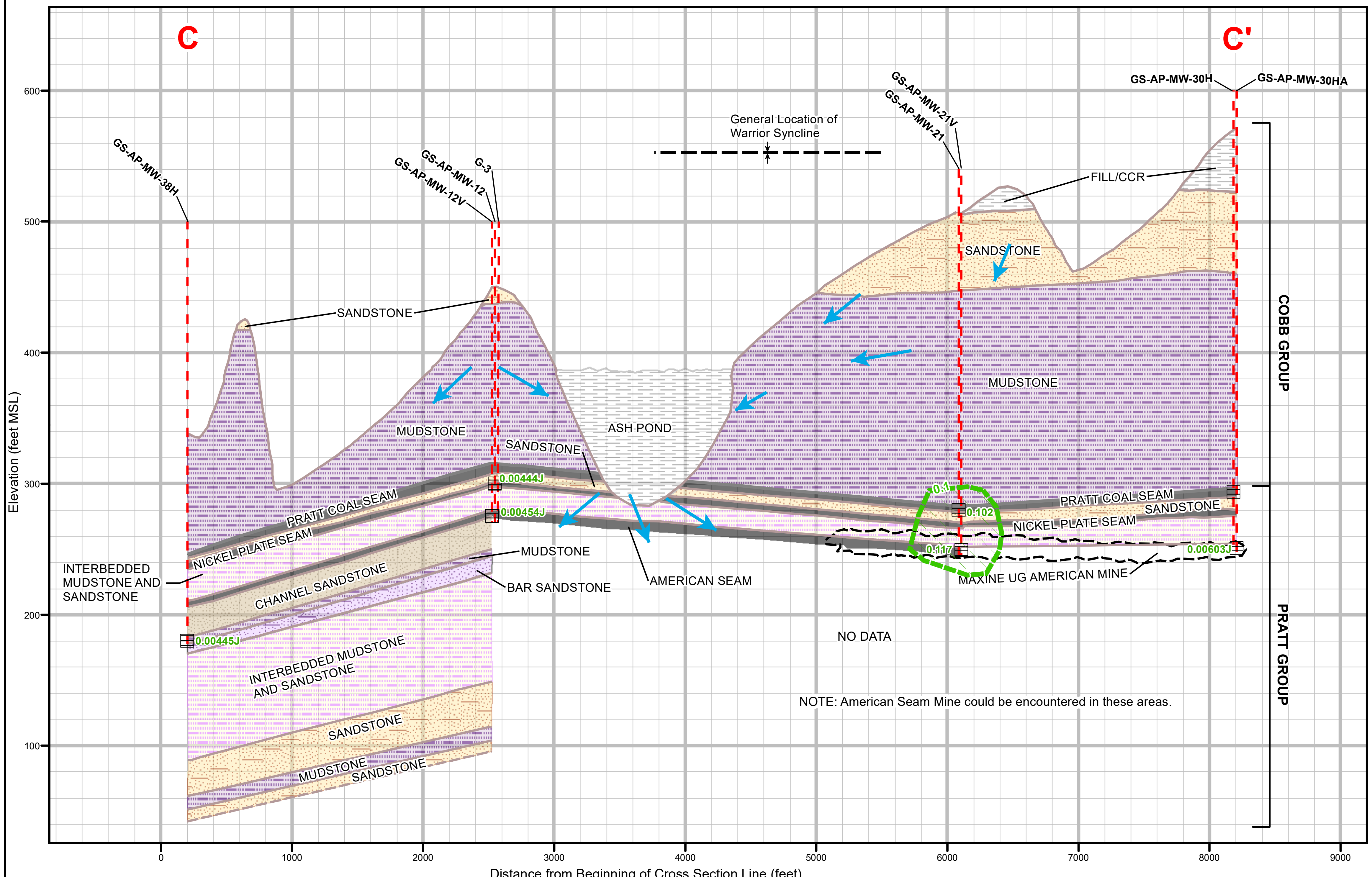
- Screen Interval
- Monitoring Well Location
- Groundwater Flow Direction
- Lithium GWPS Isoconcentration Contour
- Lithium Isoconcentration Contour
- Area Exceeding GWPS for Lithium
- 0.0809 Lithium GWPS (mg/L)
- 0.146 Lithium Concentration (mg/L)
- Group Boundary
- Strata Boundary
- Inferred Strata Boundary
- Mine
- Syncline

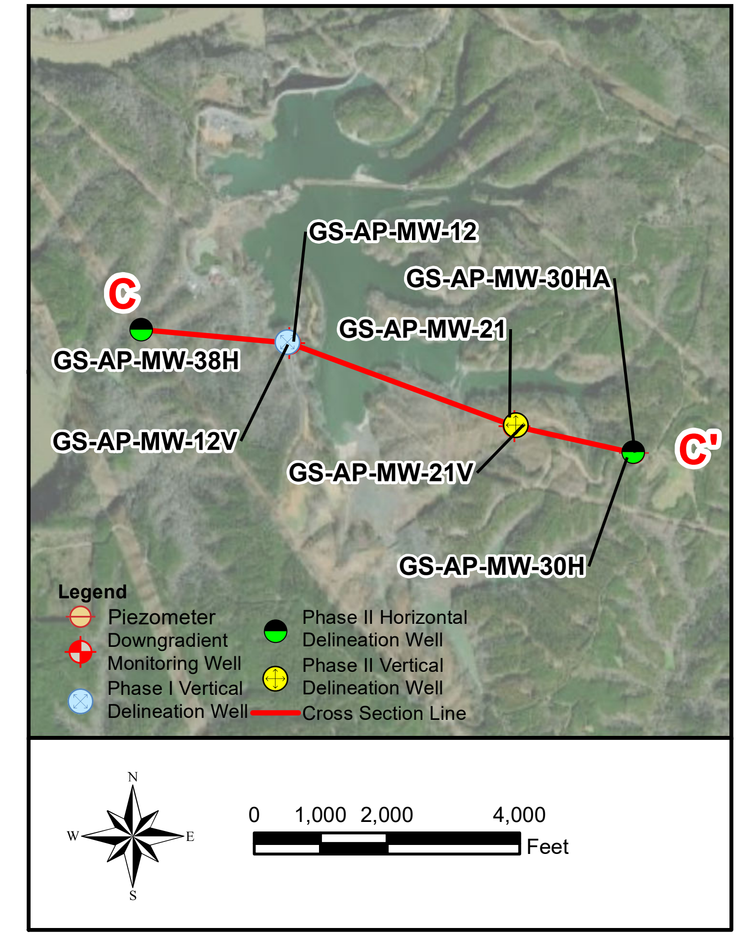
Geologic Units

- Fill/CCR
- Bar Sandstone
- Mudstone
- Interbedded Mudstone and Sandstone
- Sandstone
- Channel Sandstone
- Coal

SCALE As Shown	DRAWING TITLE LITHIUM CONCENTRATION ALONG GEOLOGIC CROSS SECTION C - C' PLANT GORGAS ASH POND
DATE 9/29/2020	
DRAWN BY MDM	
CHECKED BY GBD	FIGURE NO **FIGURE 11B**

Southern Company





Notes:

1. Stratigraphic layers were correlated using a combination of boring data and gamma logs.
2. Elevation data are reported using feet above Mean Sea Level (MSL).
3. Maxine Mine was not encountered at well GW-AP-MW-21v
4. Water samples were collected between March 18 and March 24, 2020
5. mg/L indicates milligrams per liter.
6. ND indicates not detected above the laboratory method detection limit.
7. Vertical exaggeration = 10x
8. GWPS indicates Groundwater Protection Standard.
9. J indicates a laboratory estimated concentration between the analytical method detection limit and the laboratory reporting limit.
10. Concentrations are representative only of groundwater occupying discrete fractures or coal seams and are not to be utilized to characterize mass.

Legend

- Screen Interval
- Monitoring Well Location
- Groundwater Flow Direction
- Molybdenum GWPS Isoconcentration Contour
- Area Exceeding GWPS for Molybdenum
- 0.1 Molybdenum GWPS (mg/L)
- 0.117 Molybdenum Concentration (mg/L)
- Group Boundary
- Strata Boundary
- Inferred Strata Boundary
- Mine
- Syncline

Geologic Units

- Fill/CCR
- Bar Sandstone
- Mudstone
- Interbedded Mudstone and Sandstone
- Sandstone
- Channel Sandstone
- Coal

SCALE	As Shown
DATE	9/21/2020
DRAWN BY	MDM
CHECKED BY	GBD

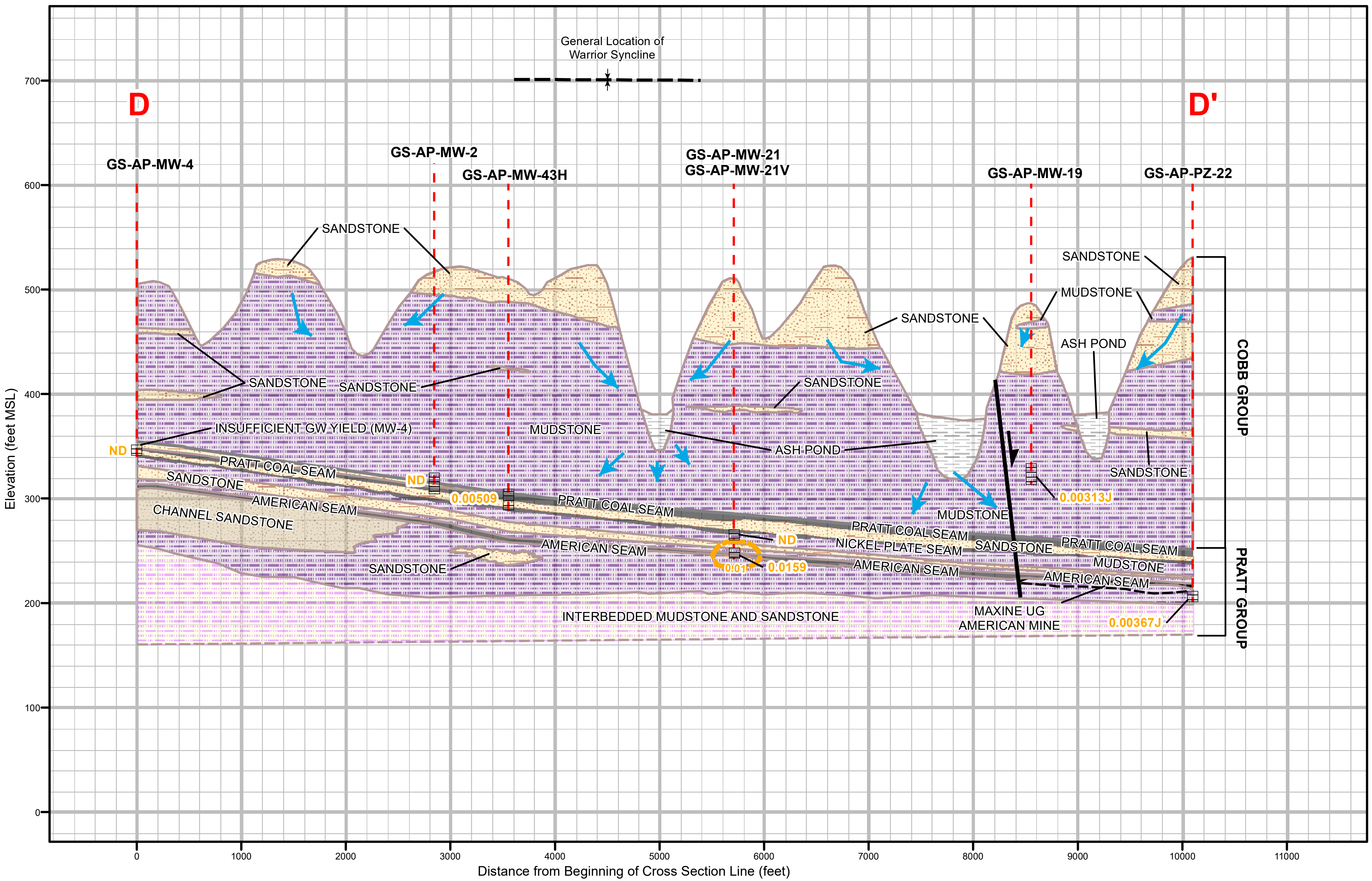
DRAWING TITLE

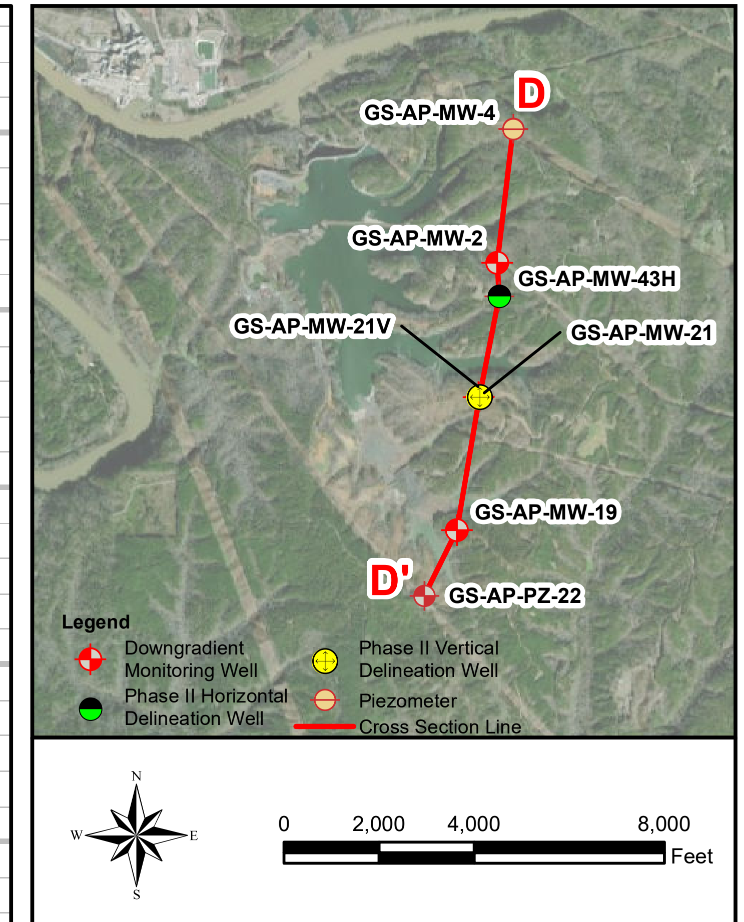
MOLYBDENUM CONCENTRATION ALONG GEOLOGIC CROSS SECTION C - C' PLANT GORGAS ASH POND

FIGURE NO

FIGURE 11C

Southern Company





Notes:
1. Stratagraphic layers were correlated using a combination of boring data and gamma logs.
2. Elevation data are reported using feet above Mean Sea Level (MSL).
3. Water samples were collected between March 18 and March 25, 2020.
4. mg/L indicates milligrams per liter.
5. J indicates a laboratory estimated concentration between the analytical method detection limit and the laboratory method detection limit.
6. ND indicates not detected above the laboratory method detection limit.
7. GWPS indicates Groundwater Protection Standard.
8. Vertical exaggeration = 10x.
9. Concentrations are representative only of groundwater occupying discrete fractures or coal seams and are not to be utilized to characterize mass.

Legend

- Monitoring Well Location
- Screen Interval
- Groundwater Flow Direction
- Group Boundary
- Strata Boundary
- Inferred Strata Boundary
- Mine
- Fault
- Syncline

Geologic Units

- Fill/CCR
- Mudstone
- Interbedded Mudstone and Sandstone
- Sandstone
- Channel Sandstone
- Coal
- Arsenic GWPS Isoconcentration Contour
- Area Exceeding GWPS for Arsenic
- 0.01 Arsenic GWPS (mg/L)

SCALE	As Shown
DATE	9/21/2020
DRAWN BY	JEM
CHECKED BY	GBD

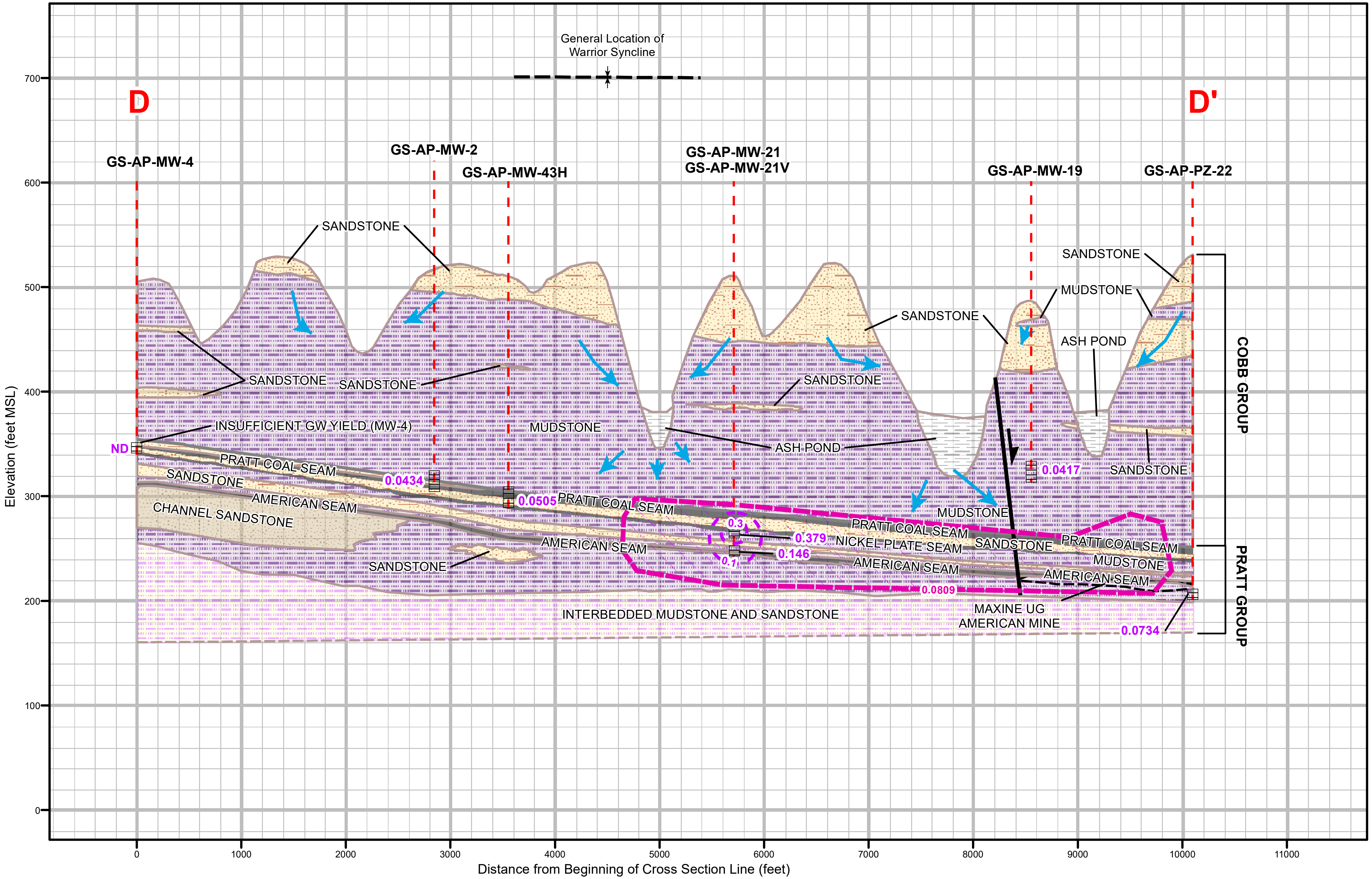
DRAWING TITLE

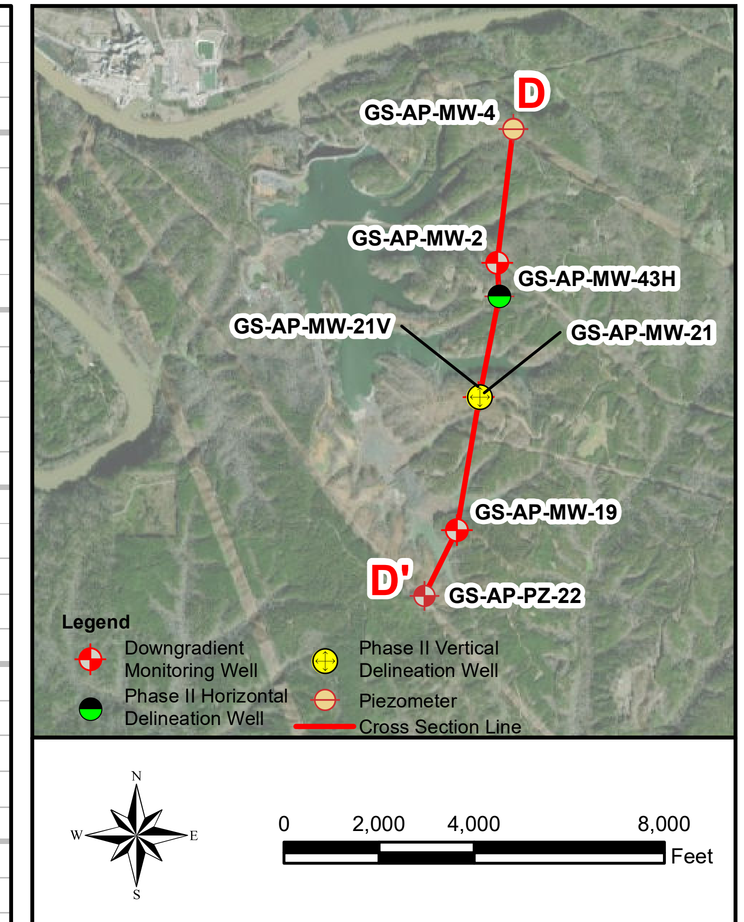
ARSENIC CONCENTRATIONS ALONG GEOLOGIC CROSS SECTION D – D' PLANT GORGAS ASH POND

FIGURE NO

FIGURE 12A

Southern Company





Notes:
1. Stratagraphic layers were correlated using a combination of boring data and gamma logs.
2. Elevation data are reported using feet above Mean Sea Level (MSL).
3. Water samples were collected between March 18 and March 25, 2020.
4. mg/L indicates milligrams per liter.
5. ND indicates not detected above the laboratory method detection limit.
6. GWPS indicates Groundwater Protection Standard.
7. Vertical exaggeration = 10x.
8. Lithium exceedances at MW-21/21V well pair likely related to elevated pH in each well (greater than 10 SU).
9. Concentrations are representative only of groundwater occupying discrete fractures or coal seams and are not to be utilized to characterize mass.

Legend

- Monitoring Well Location
- Screen Interval
- Groundwater Flow Direction
- Group Boundary
- Strata Boundary
- Inferred Strata Boundary
- Mine
- Fault
- Syncline

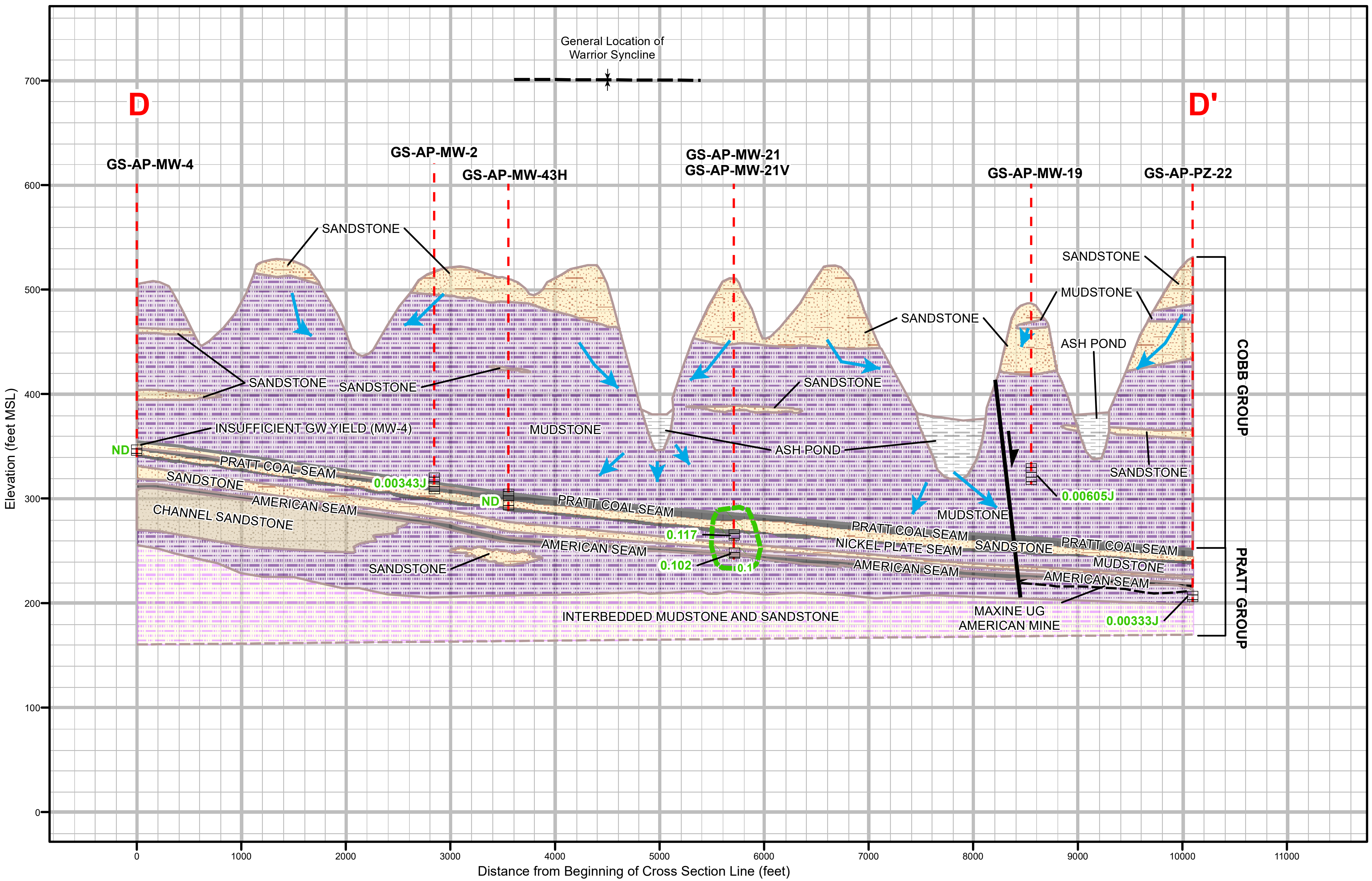
Geologic Units

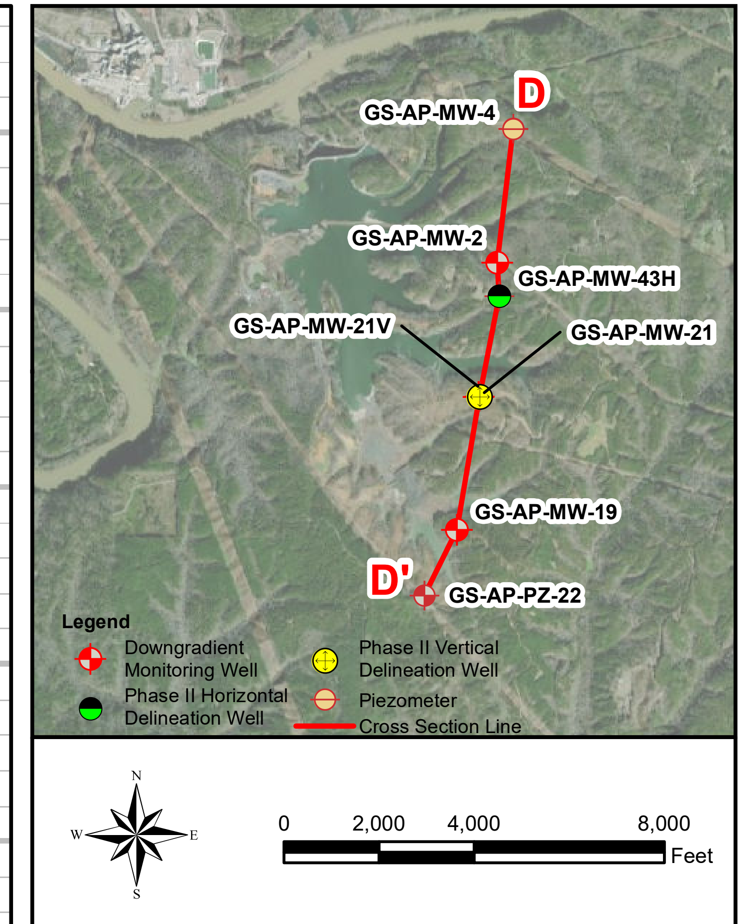
- Fill/CCR
- Mudstone
- Interbedded Mudstone and Sandstone
- Sandstone
- Channel Sandstone
- Coal

- Lithium Isoconcentration Contour
- Lithium GWPS Isoconcentration Contour
- Area Exceeding GWPS for Lithium
- 0.3 Lithium concentration (mg/L)
- 0.0809 Lithium GWPS (mg/L)

SCALE: As Shown	DRAWING TITLE: LITHIUM CONCENTRATIONS ALONG GEOLOGIC CROSS SECTION D – D' PLANT GORGAS ASH POND
DATE: 9/21/2020	
DRAWN BY: JEM	
CHECKED BY: GBD	FIGURE NO: FIGURE 12B

Southern Company





Notes:
1. Stratagraphic layers were correlated using a combination of boring data and gamma logs.
2. Elevation data are reported using feet above Mean Sea Level (MSL).
3. Water samples were collected between March 18 and March 25, 2020.
4. mg/L indicates milligrams per liter.
5. J indicates a laboratory estimated concentration between the analytical method detection limit and the laboratory method detection limit.
6. ND indicates not detected above the laboratory method detection limit.
7. GWPS indicates Groundwater Protection Standard.
8. Vertical exaggeration = 10x.
9. Concentrations are representative only of groundwater occupying discrete fractures or coal seams and are not to be utilized to characterize mass.

Legend

- Monitoring Well Location
- Screen Interval
- Groundwater Flow Direction
- Group Boundary
- Strata Boundary
- Inferred Strata Boundary
- Mine
- Fault
- Syncline

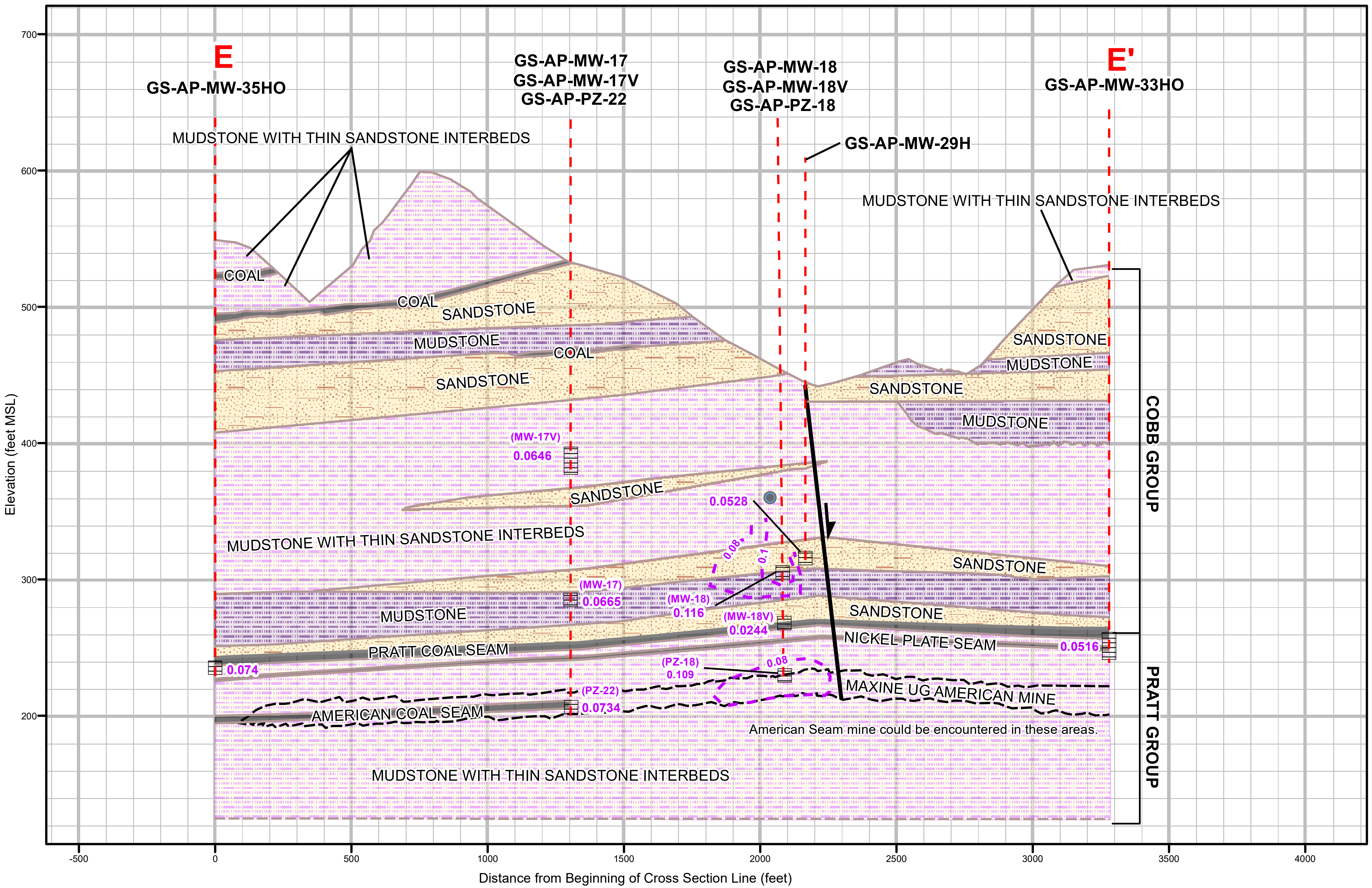
Geologic Units

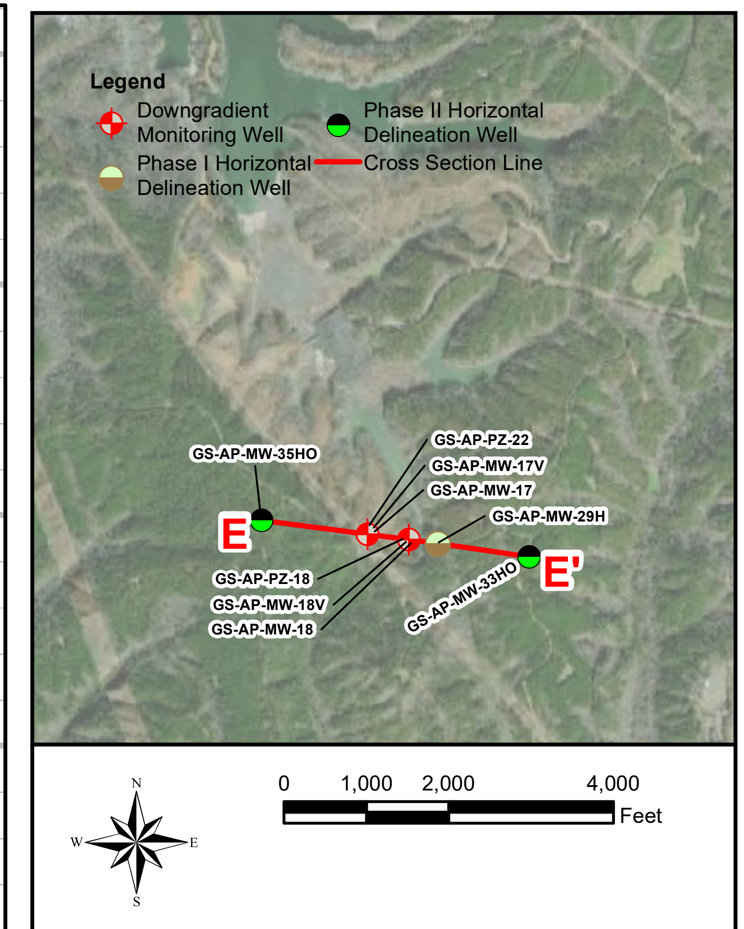
- Fill/CCR
- Mudstone
- Interbedded Mudstone and Sandstone
- Sandstone
- Channel Sandstone
- Coal

- Molybdenum GWPS Isoconcentration Contour
- Area Exceeding GWPS for Molybdenum
- 0.1 Molybdenum GWPS (mg/L)

SCALE	As Shown
DATE	9/21/2020
DRAWN BY	JEM
CHECKED BY	GBD
DRAWING TITLE	MOLYBDENUM CONCENTRATIONS ALONG GEOLOGIC CROSS SECTION D – D' PLANT GORGAS ASH POND
FIGURE NO	FIGURE 12C

Southern Company





Notes:
1. Stratagraphic layers were correlated using a combination of boring data and gamma logs.
2. Elevation data are reported using feet above Mean Sea Level (MSL).
3. Vertical exaggeration = 5x.
4. This well (17V) is upgradient of the ash pond and not factored into iso contour.
5. mg/L indicates milligrams per liter.
6. 17v is upgradient well w/ lithium concentrations ranging from 0.0646 to 0.0809 mg/L
7. Water samples were collected between March 16 and March 25, 2020.
8. Concentrations are representative only of groundwater occupying discrete fractures or coal seams and are not to be utilized to characterize mass.
9. Prescott Creek Outfall Tunnel (~355 ft MSL; 9' diameter) Plugged: 2007 Grouted: Spring-Early Summer 2019

Legend

- Monitoring Well Location
- Screen Interval
- Prescott Creek Outfall Tunnel
- Group Boundary
- Strata Boundary
- Inferred Strata Boundary
- Mine
- Fault

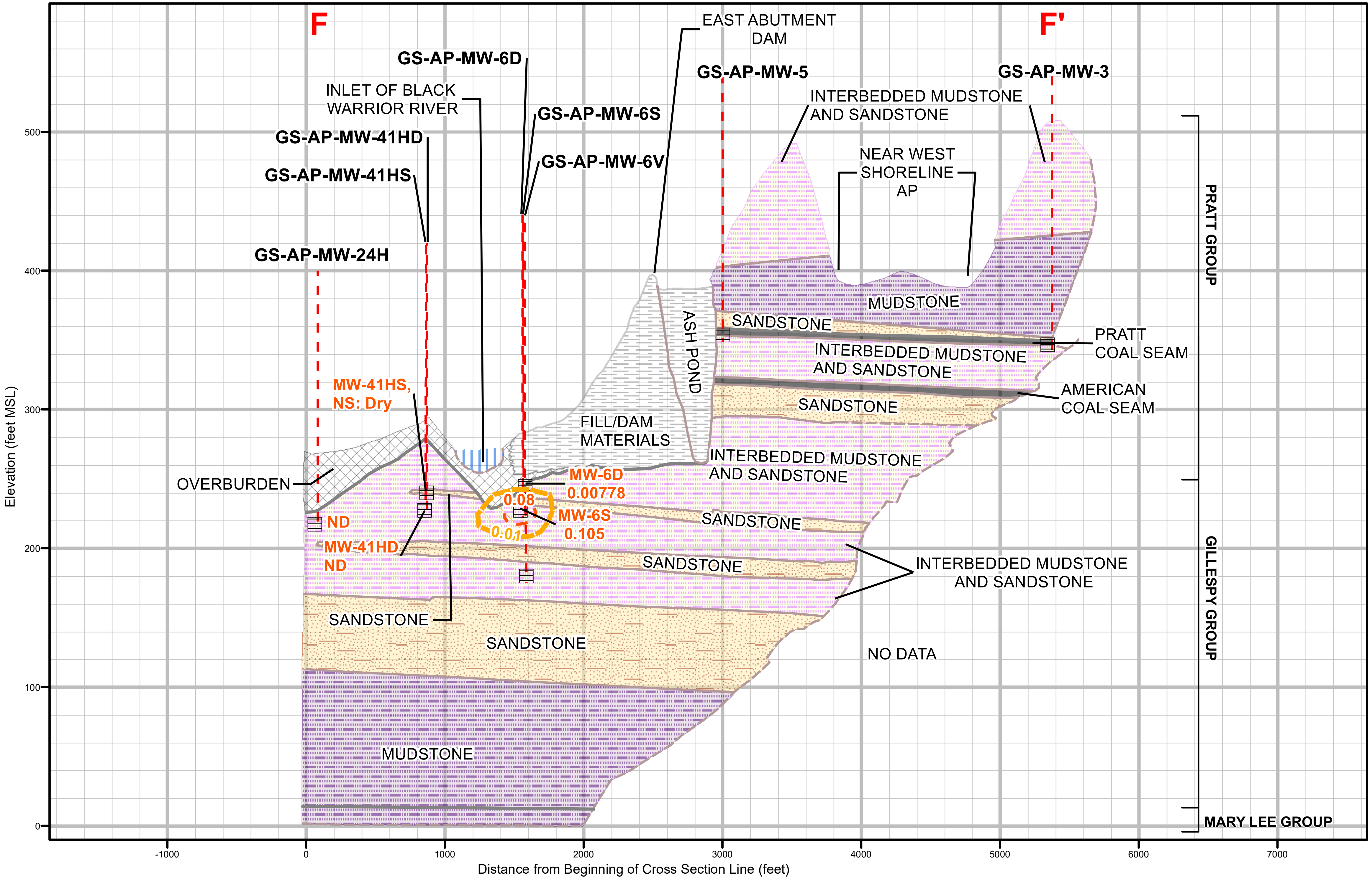
Geologic Units

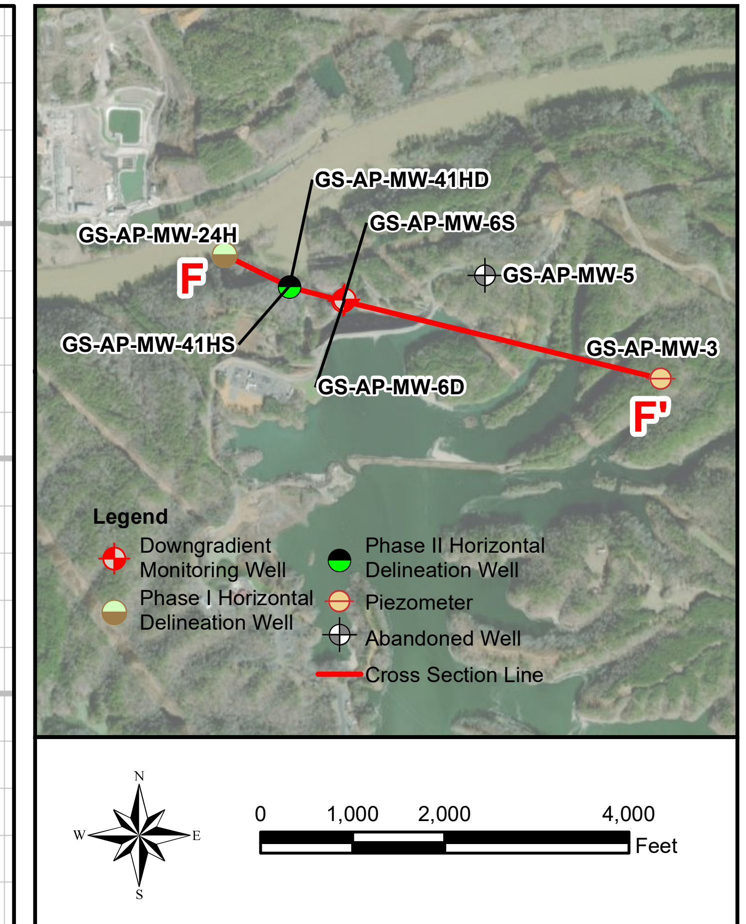
- Mudstone
- Mudstone with Thin Sandstone Interbeds
- Sandstone
- Coarse Sandstone
- Coal

- Lithium Isoconcentration Contour
- 0.1 Lithium concentration (mg/L)

SCALE: As Shown	DRAWING TITLE: LITHIUM CONCENTRATIONS ALONG GEOLOGIC CROSS SECTION E – E' PLANT GORGAS ASH POND
DATE: 9/21/2020	
DRAWN BY: JEM	
CHECKED BY: GBD	FIGURE NO: **FIGURE 4E**

Southern Company





Notes:

1. Stratigraphic layers were correlated using a combination of boring data and gamma logs.
2. Elevation data are reported using feet above Mean Sea Level (MSL).
3. Water samples were collected between March 17 and March 18, 2020
4. mg/L indicates milligrams per liter.
5. ND indicates not detected above the laboratory method detection limit.
6. Vertical exaggeration = 10x
7. GWPS indicates Groundwater Protection Standard.
8. Concentrations are representative only of groundwater occupying discrete fractures or coal seams and are not to be utilized to characterize mass.

Legend

- Screen Interval
- Monitoring Well Location
- Arsenic GWPS Isoconcentration Contour
- Arsenic Isoconcentration Contour
- Area Exceeding GWPS for Arsenic
- 0.01 Arsenic GWPS (mg/L)
- 0.08 Arsenic Concentration (mg/L)
- Group Boundary
- Strata Boundary
- Inferred Strata Boundary

Geologic Units

- Coal
- Fill/CCR
- Interbedded Mudstone and Shale
- Mudstone
- Overburden
- Sandstone
- Water

SCALE	As Shown
DATE	9/29/2020
DRAWN BY	MDM
CHECKED BY	GBD

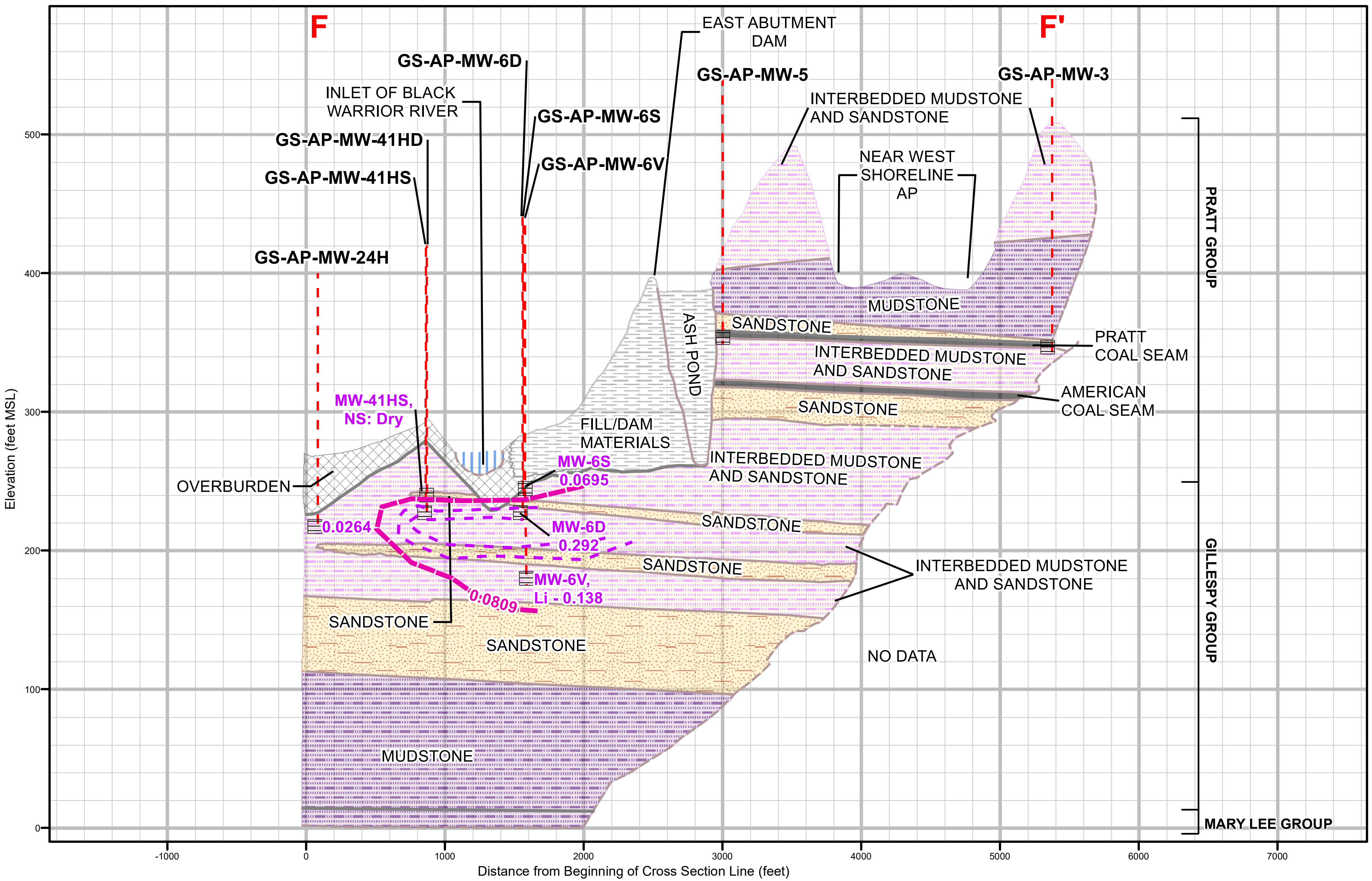
DRAWING TITLE

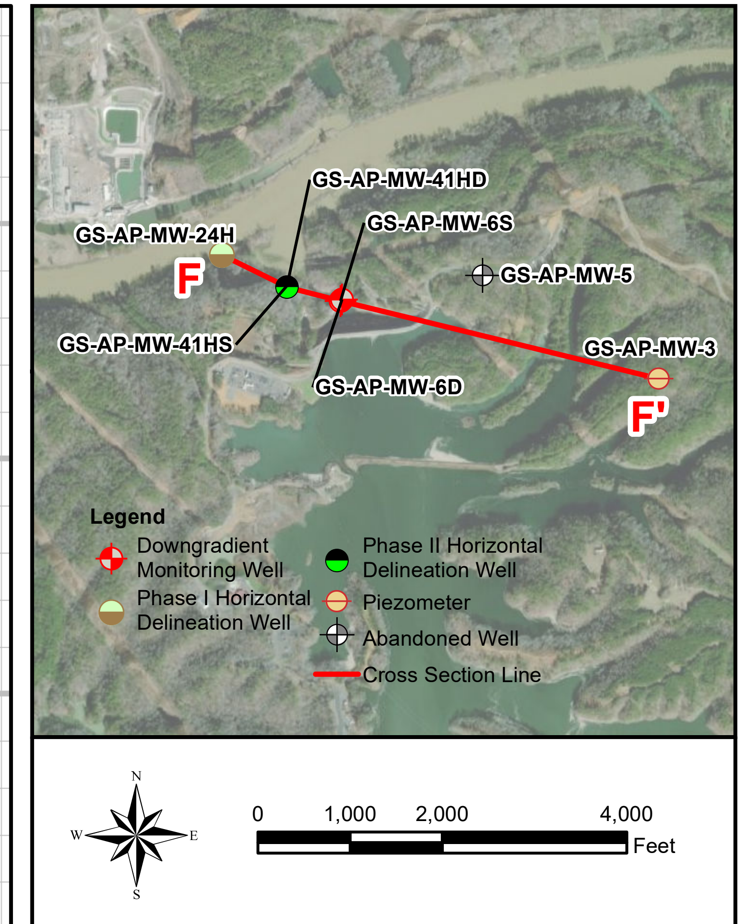
ARSENIC CONCENTRATIONS ALONG GEOLOGIC CROSS SECTION F - F' PLANT GORGAS ASH POND

FIGURE NO

FIGURE 14A

Southern Company





Notes:

1. Stratigraphic layers were correlated using a combination of boring data and gamma logs.
2. Elevation data are reported using feet above Mean Sea Level (MSL).
3. Water samples were collected between March 17 and March 18, 2020
4. mg/L indicates milligrams per liter.
5. ND indicates not detected above the laboratory method detection limit.
6. Vertical exaggeration = 10x
7. GWPS indicates Groundwater Protection Standard.
8. Increasing lithium concentration away from ash pond observed from 6S/6D to 41HD indicates a possibilty for natural source of lithium near 41HD.
9. Concentrations are representative only of groundwater occupying discrete fractures or coal seams and are not to be utilized to characterize mass.

Legend

- Screen Interval
- Monitoring Well Location
- Lithium Isoconcentration Contour
- Lithium GWPS Isoconcentration Contour
- Area Exceeding GWPS for Lithium
- 0.0809 Lithium GWPS (mg/L)
- 0.292 Lithium Concentration (mg/L)
- Group Boundary
- Strata Boundary
- Inferred Strata Boundary

Geologic Units

- Coal
- Fill/CCR
- Interbedded Mudstone and Shale
- Mudstone
- Overburden
- Sandstone
- Water

SCALE	As Shown
DATE	9/29/2020
DRAWN BY	MDM
CHECKED BY	GBD

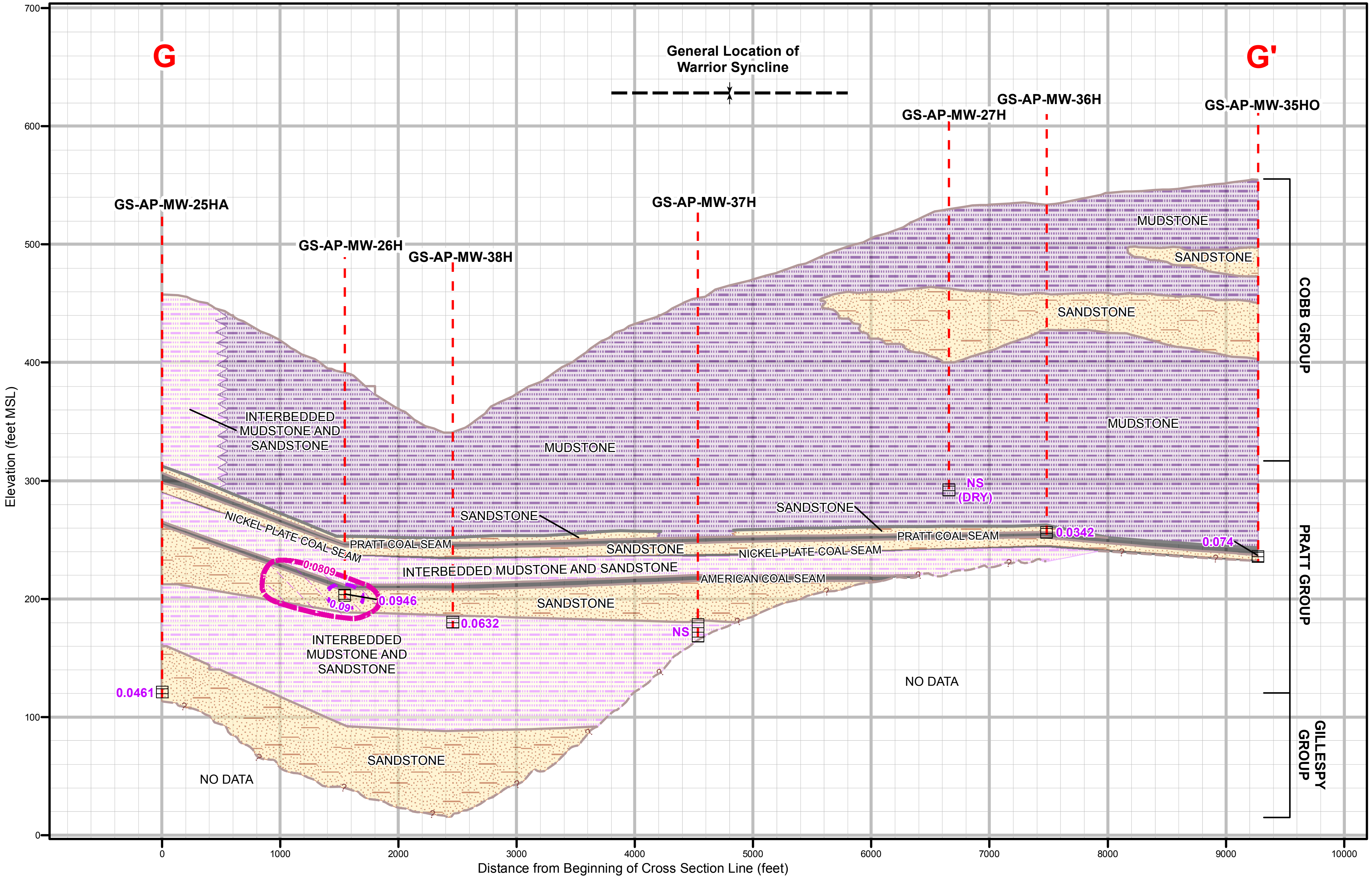
DRAWING TITLE

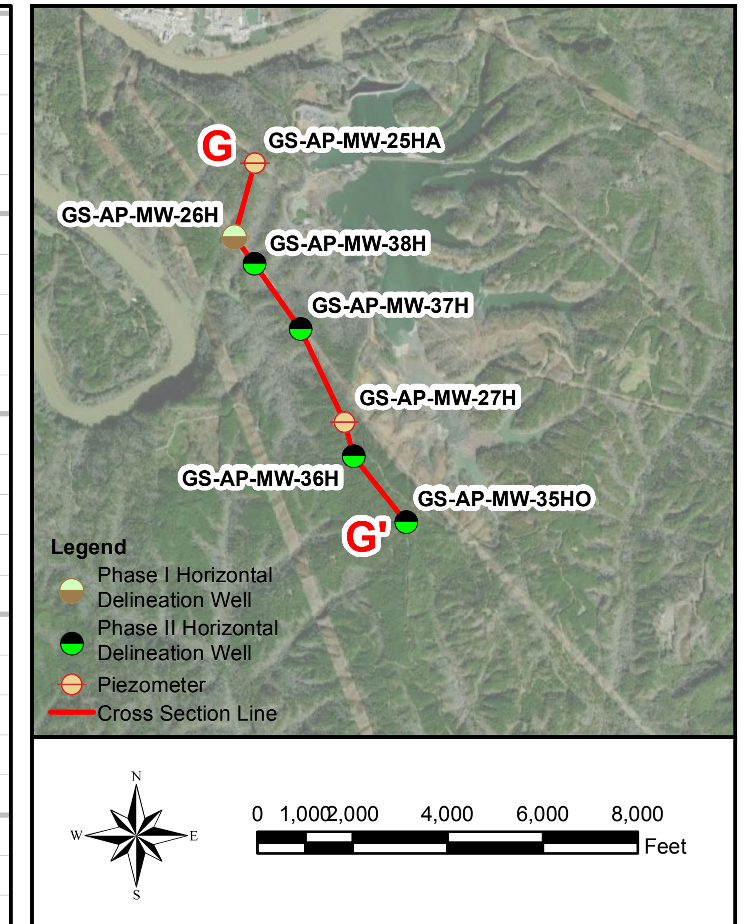
LITHIUM CONCENTRATIONS ALONG GEOLOGIC CROSS SECTION F - F'
PLANT GORGAS ASH POND

FIGURE NO

FIGURE 14B

Southern Company





Notes:
1. Stratigraphic layers were correlated using a combination of boring data and gamma logs.
2. Elevation data are reported using feet above Mean Sea Level (MSL).
3. Water samples were collected between March 17 and March 25, 2020.
4. mg/L indicates milligrams per liter.
5. NS indicates not sampled.
6. GWPS indicates Groundwater Protection Standard.
7. Vertical exaggeration = 10x.
8. Concentrations are representative only of groundwater occupying discrete fractures or coal seams and are not to be utilized to characterize mass.

Legend

- Screen Interval
- Monitoring Well Location
- Lithium Isoconcentration Contour
- Lithium GWPS Isoconcentration Contour
- Area Exceeding GWPS for Lithium
- 0.0946 Lithium concentration (mg/L)
- 0.0809 Lithium GWPS (mg/L)
- Group Boundary
- Strata Boundary
- Inferred Strata Boundary
- Syncline

Geologic Units

- Mudstone
- Interbedded Mudstone and Sandstone
- Sandstone
- Channel Sandstone
- Coal

SCALE	As Shown
DATE	9/22/2020
DRAWN BY	KWR
CHECKED BY	GBD

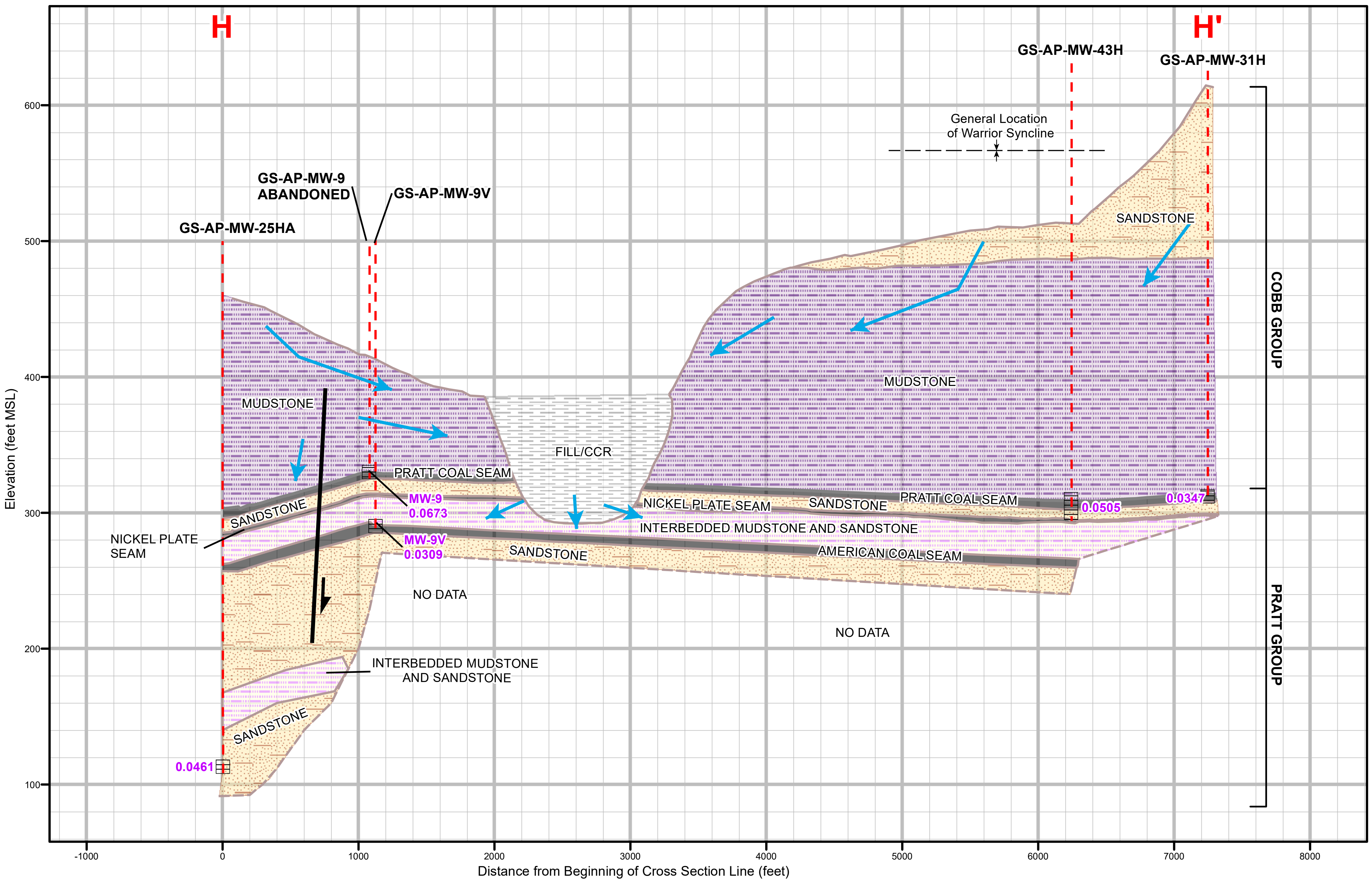
DRAWING TITLE

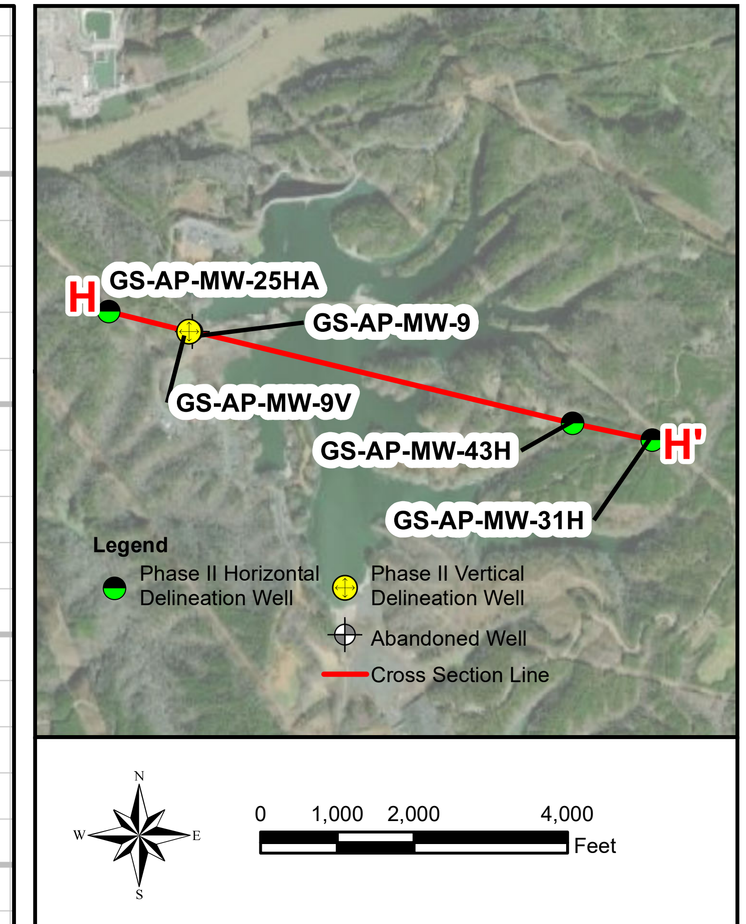
LITHIUM CONCENTRATIONS ALONG GEOLOGIC CROSS SECTION G - G' PLANT GORGAS ASH POND

FIGURE NO

FIGURE 15

Southern Company





Notes:
1. Stratigraphic layers were correlated using a combination of boring data and gamma logs.
2. Elevation data are reported using feet above Mean Sea Level (MSL).
3. Maxine Mine was not encountered at well GW-AP-MW-21v
4. Water samples were collected between March 18 and March 25, 2020. Sample from MW-9 was collected on April 16, 2019.
5. mg/L indicates milligrams per liter.
6. ND indicates not detected above the laboratory method detection limit.
7. Vertical exaggeration = 10x
8. GWPS indicates Groundwater Protection Standard.
9. Concentrations are representative only of groundwater occupying discrete fractures or coal seams and are not to be utilized to characterize mass.

Legend

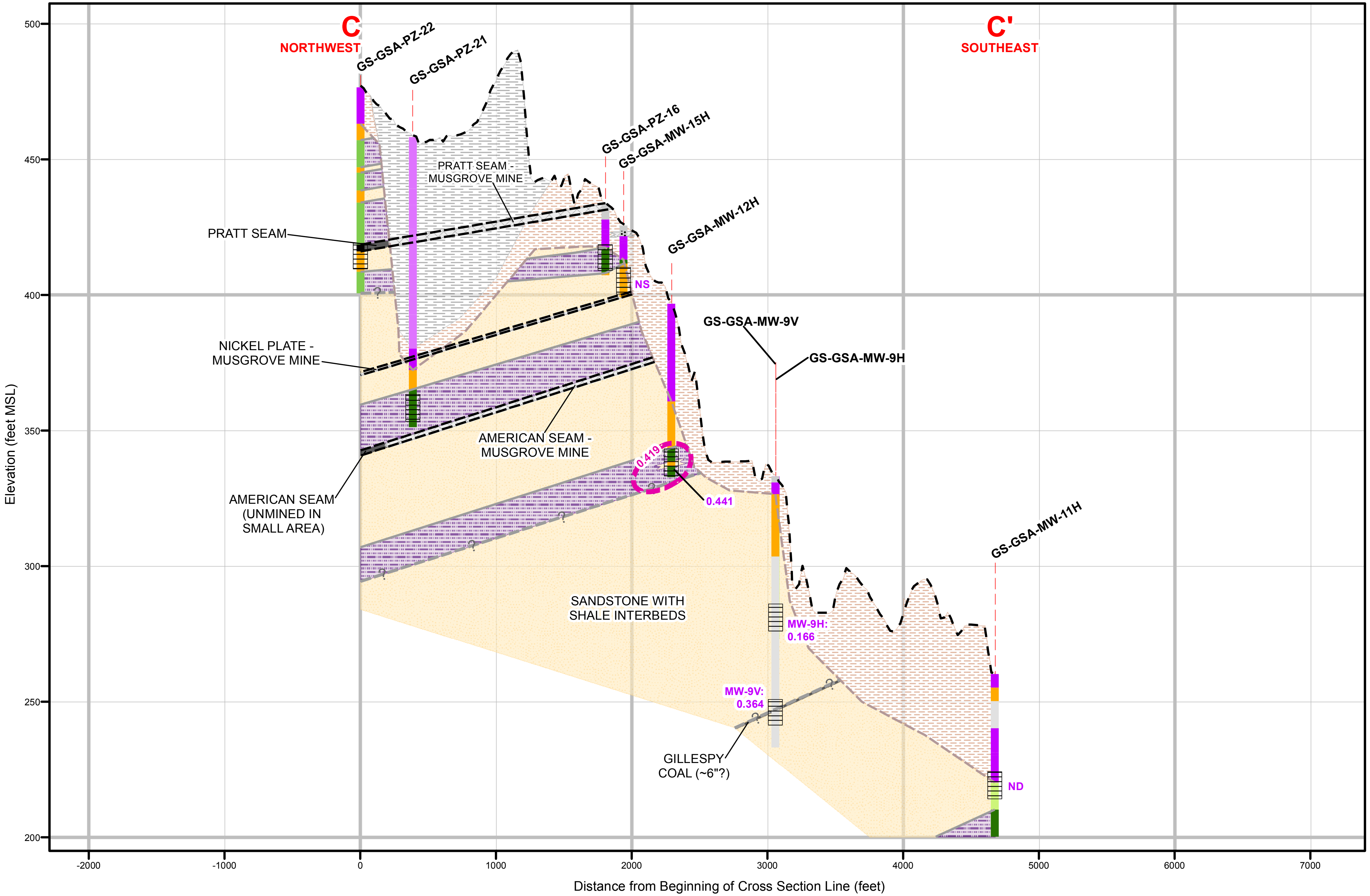
- Screen Interval
- Monitoring Well Location
- Groundwater Flow Direction
- 0.04 Lithium GWPS (mg/L)
- 0.146 Lithium Concentration (mg/L)
- Group Boundary
- Strata Boundary
- Inferred Strata Boundary
- Fault
- Syncline

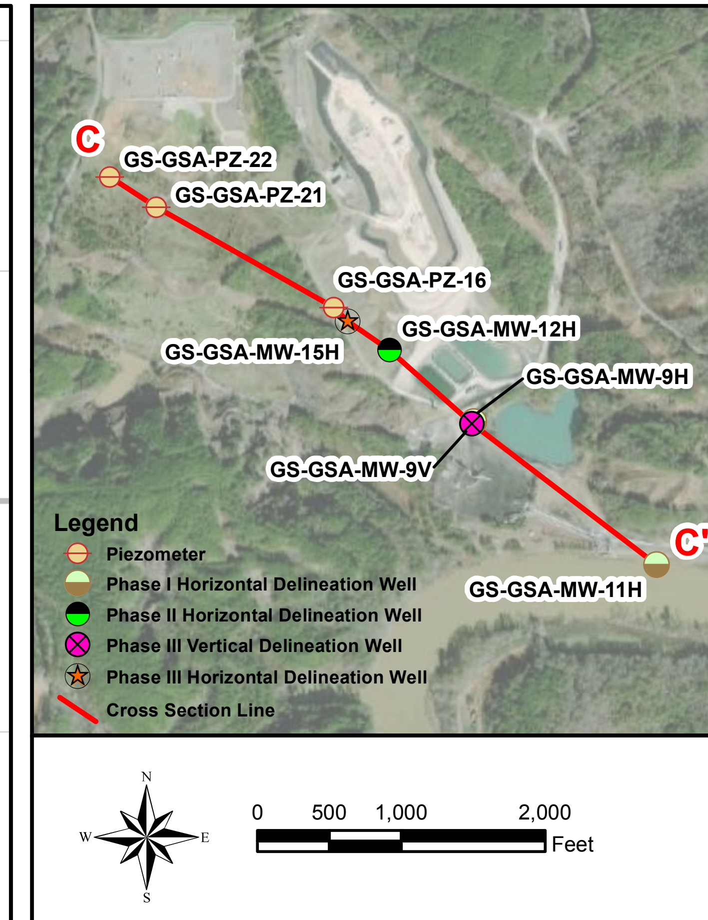
Geologic Units

- Coal
- Fill/CCR
- Interbedded Mudstone and Sandstone
- Mudstone
- Sandstone

SCALE: As Shown	DRAWING TITLE: LITHIUM CONCENTRATIONS ALONG GEOLOGIC CROSS SECTION H - H' PLANT GORGAS ASH POND
DATE: 9/21/2020	
DRAWN BY: MDM	
CHECKED BY: GBD	FIGURE NO: **FIGURE 16**

Southern Company





NOTES:
1. GS-GSA-MW-9H is projected onto the cross section line, so the ground surface deviates from the well surface elevation at this location.
2. Groundwater samples collected August 3 to 5, 2020.
3. Deeper strata projected from structural elevations of coal seams from Musgrove Mine records or from neighboring borings that extend deeper.
4. NS indicates not sampled due to lack of water sufficient for well development.
5. ND indicates not detected above laboratory method detection limit (MDL).
6. J indicates estimated concentration between laboratory method detection limit and reporting limit.
7. Vertical exaggeration = 5.

Legend

- Ground Surface Elevation
- GWPS Isoconcentration for Lithium (0.419 mg/L)
- Borehole Location
- Screened Interval
- 0.364 Lithium Concentration (mg/L)
- Top of Rock
- Strata Boundary
- Inferred Strata
- Mine

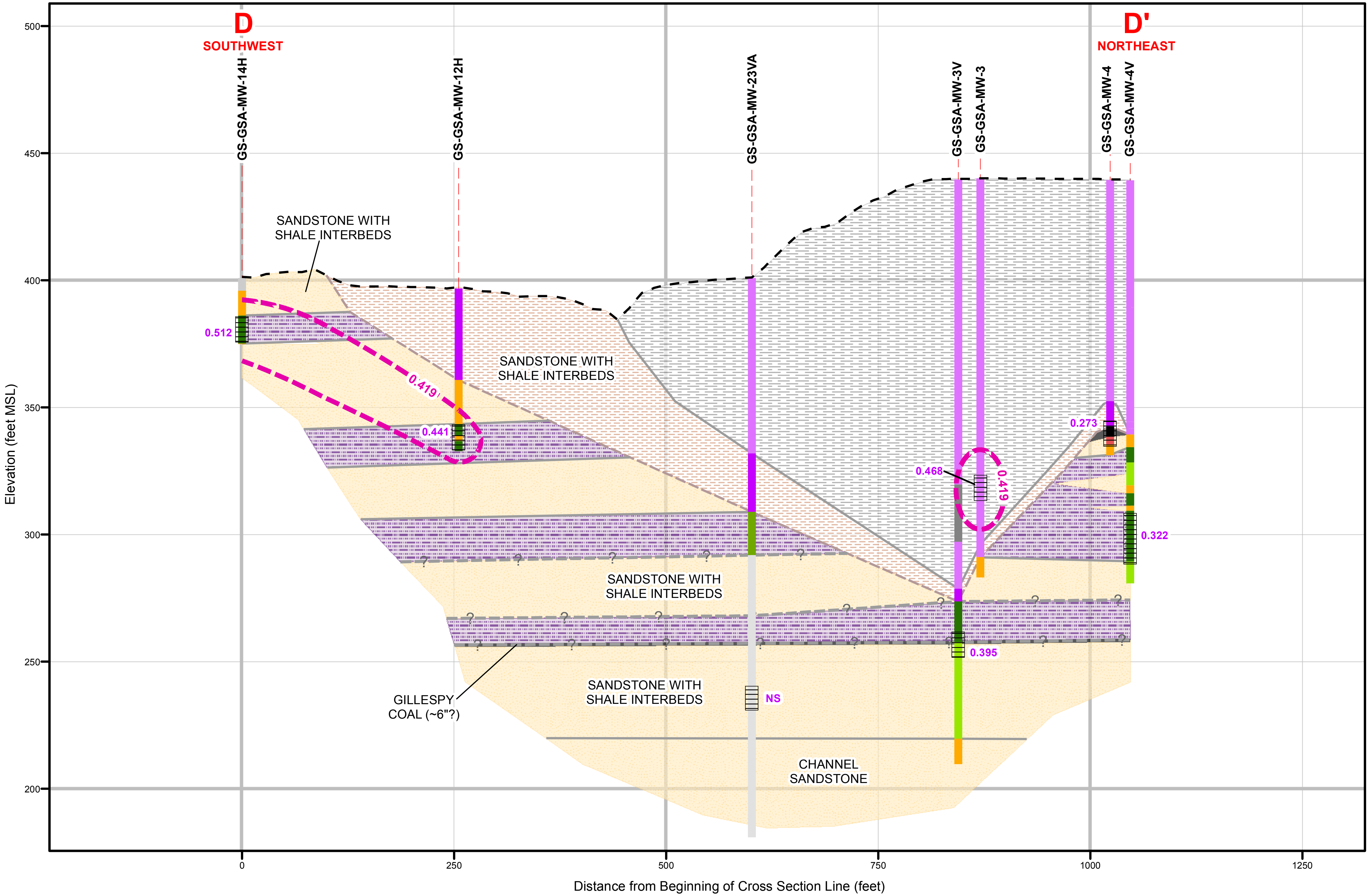
Borehole Description

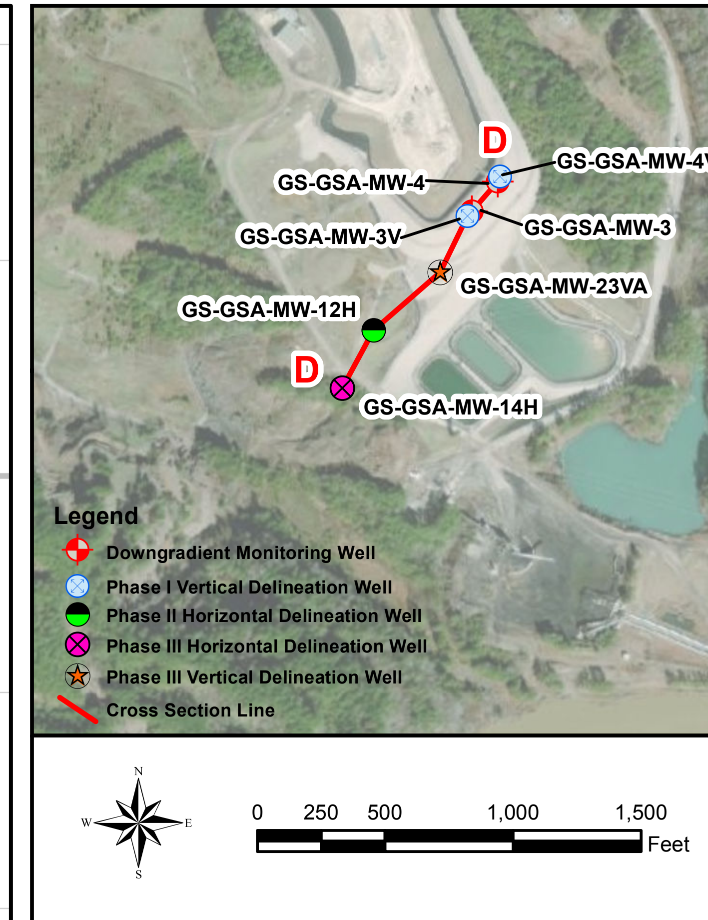
- CCR Fill
- Fill Materials
- Overburden
- MINESPOILS
- COAL
- Hydroexcavated
- No Recovery
- Sandstone
- Sandstone and Siltstone
- Siltstone
- Shale

Geologic Units

- Backfilled Mine Overburden
- Natural Overburden
- Mudstone/Shale
- Sandstone with Shale Interbeds
- Mine
- Coal

SCALE AS SHOWN	DRAWING TITLE LITHIUM CONCENTRATIONS ALONG GEOLOGIC CROSS SECTION C - C' PLANT GORGAS GYPSUM POND
DATE 9/29/2020	
DRAWN BY KAR	FIGURE NO **FIGURE 8A**
CHECKED BY GBD	Southern Company





NOTES:
1. Groundwater samples collected August 3 to 5, 2020.
2. Deeper strata projected from structural elevations of coal seams from Musgrove Mine records or from neighboring borings that extend deeper.
3. NS indicates not sampled due to lack of water sufficient for well development.
4. Vertical exaggeration = 5.

Legend

- Ground Surface Elevation
- GWPS Isoconcentration for Lithium (0.419 mg/L)
- Borehole Location
- Screened Interval
- 0.512 Lithium Concentration (mg/L)
- Top of Rock
- Strata Boundary
- Inferred Strata
- Mine

Borehole Description

- CCR Fill
- Fill Materials
- Overburden
- MINESPOILS
- COAL
- Hydroexcavated
- No Recovery
- Partially Weathered Rock
- Sandstone
- Sandstone and Siltstone
- Siltstone
- Shale

Geologic Units

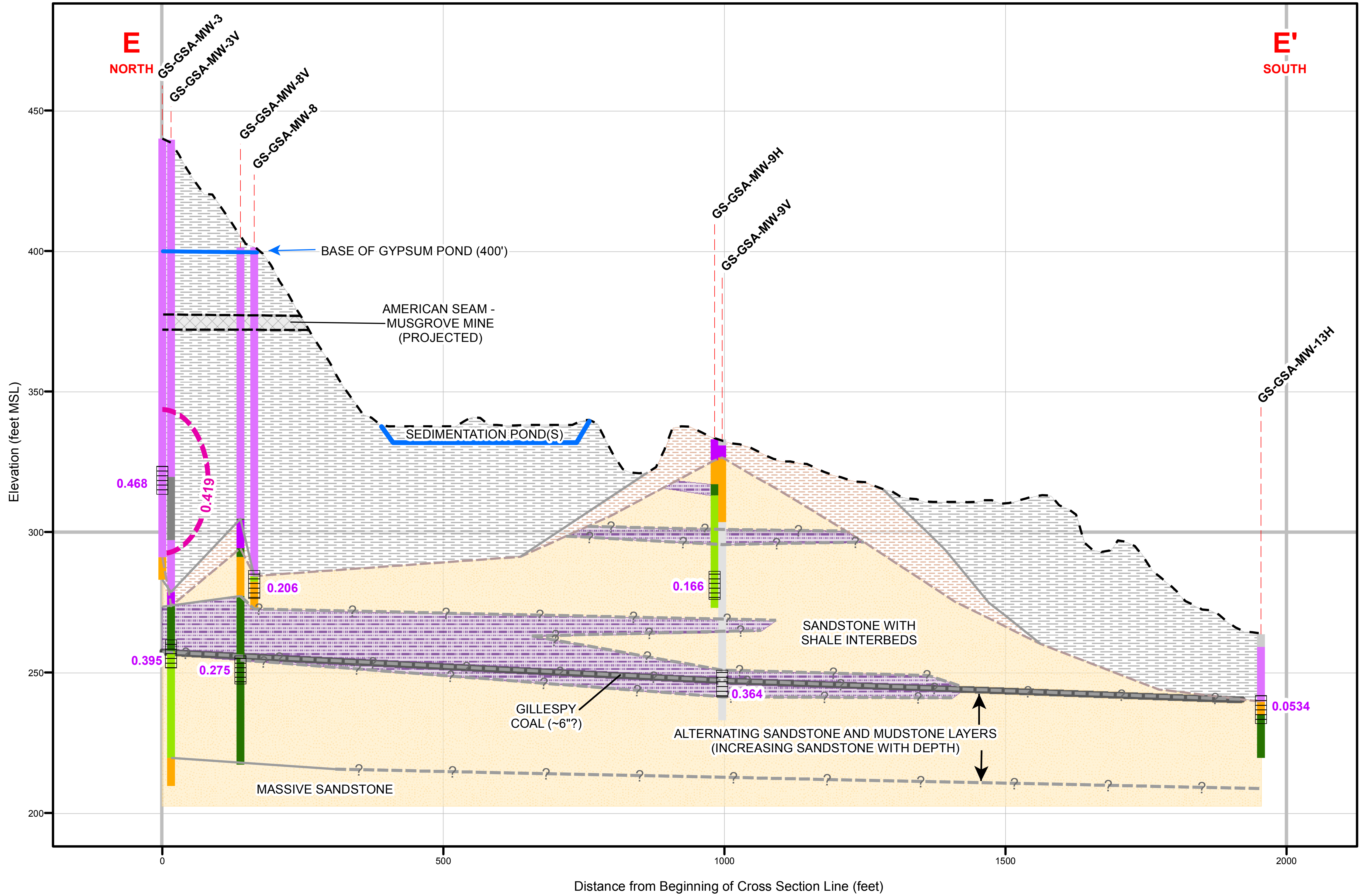
- Backfilled Mine Overburden
- Natural Overburden
- Mudstone/Shale
- Sandstone
- Mine
- Coal

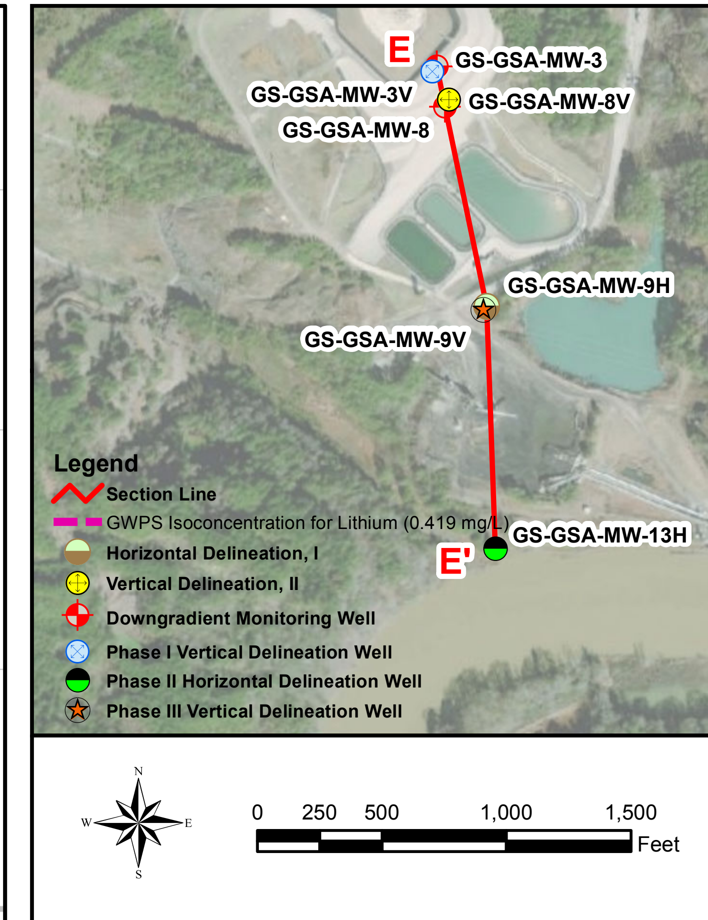
SCALE	AS SHOWN
DATE	9/25/2020
DRAWN BY	KAR
CHECKED BY	GBD

DRAWING TITLE
LITHIUM CONCENTRATIONS ALONG GEOLOGIC CROSS SECTION D - D' PLANT GORGAS GYPSUM POND

FIGURE NO
FIGURE 8B

Southern Company





NOTES:
1. GS-GSA-MW-3V, MW-8V, and MW-9V are projected onto the cross-section line, so the ground surface deviates from the well surface elevation at these locations.
2. Groundwater samples collected August 3 to 5, 2020.
3. Vertical exaggeration = 5.

Legend

- Ground Surface Elevation
- GWPS Isoconcentration for Lithium (0.419 mg/L)
- Screened Interval
- Borehole Location
- 0.275 Lithium Concentration (mg/L)
- Top of Rock
- Strata Boundary
- Inferred Strata
- Mine

Borehole Description

- CCR Fill
- Fill Materials
- Overburden
- Hydroexcavated
- No Recovery
- Sandstone
- Sandstone and Siltstone
- Shale

Geologic Units

- Backfilled Mine Overburden
- Natural Overburden
- Mudstone/Shale
- Sandstone
- Mine
- Coal

SCALE	AS SHOWN
DATE	9/25/2020
DRAWN BY	KAR
CHECKED BY	GBD

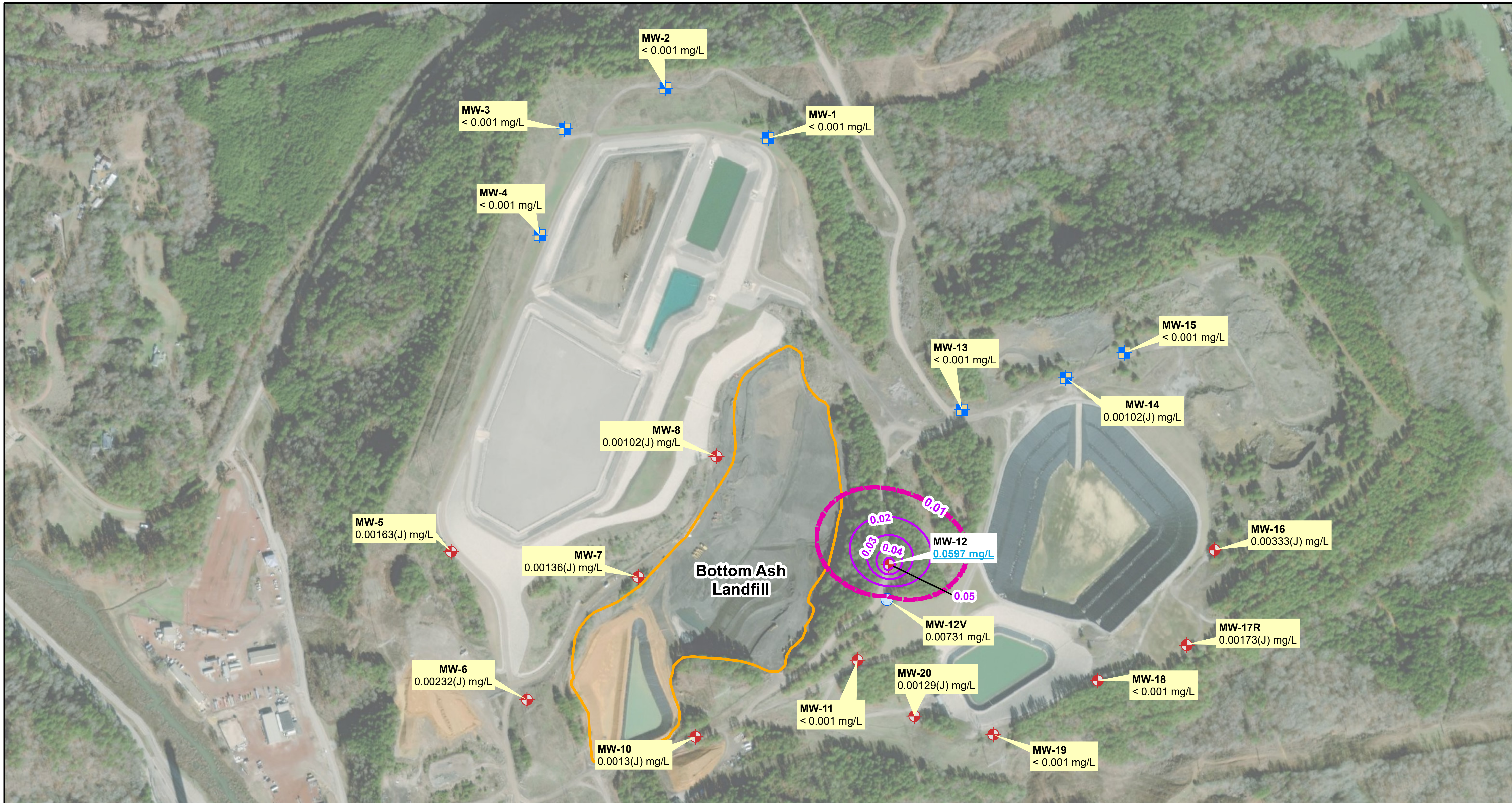
DRAWING TITLE

LITHIUM CONCENTRATIONS ALONG GEOLOGIC CROSS SECTION E - E' PLANT GORGAS GYPSUM POND

FIGURE NO

FIGURE 8C

Southern Company



Legend

- Arsenic GWPS Isoconcentration Contour (0.01 mg/L)
- Arsenic Isoconcentration Contour (mg/L)
- Bottom Ash Landfill Boundary
- Downgradient Monitoring Well
- Upgradient Monitoring Well
- Vertical Delineation Monitoring Well

N

0 250 500 1,000 1,500 Feet

NOTES:
1. Groundwater samples were collected from April 6 to 8, 2020.
2. < 0.001 mg/L indicates concentration not detected above laboratory Method Detection Limit (MDL).
3. Concentrations underlined in blue exceed the arsenic Groundwater Protection Standard of 0.01 mg/L.
4. J value indicates estimated concentration greater than or equal to the laboratory MDL and less than the laboratory Reporting Limit (RL).

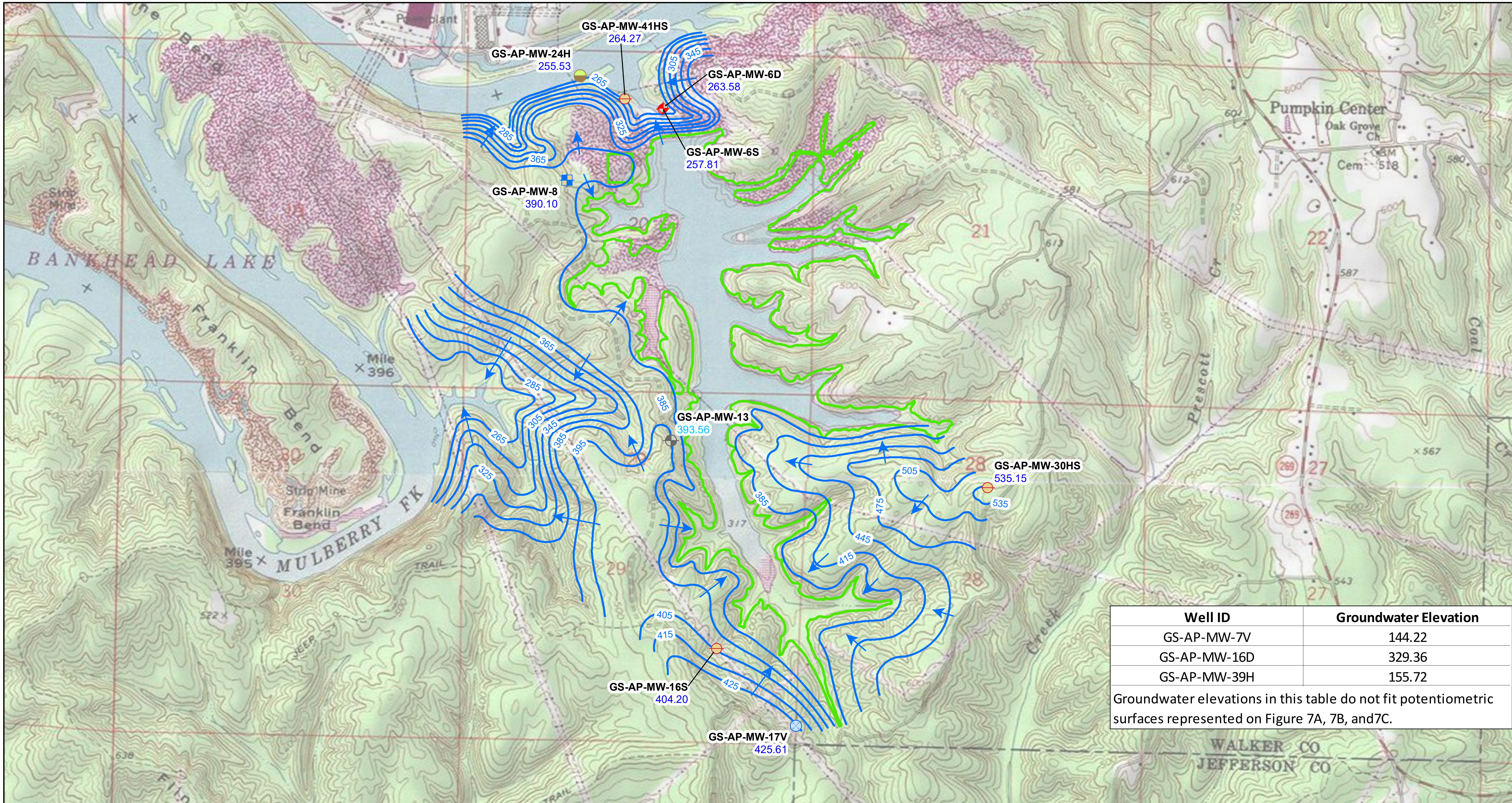
SCALE	1:6000
DATE	9/28/2020
DRAWN BY	KWR
CHECKED BY	GBD

DRAWING TITLE
ARSENIC CONCENTRATIONS MAP
PLANT GORGAS BOTTOM ASH LANDFILL

FIGURE NO
FIGURE 3

Southern Company

Appendix C
Potentiometric Surface Maps



Well ID	Groundwater Elevation
GS-AP-MW-7V	144.22
GS-AP-MW-16D	329.36
GS-AP-MW-39H	155.72

Groundwater elevations in this table do not fit potentiometric surfaces represented on Figure 7A, 7B, and7C.

Legend

- Downgradient Monitoring Well
- Upgradient Monitoring Well
- Vertical Delineation Well
- Horizontal Delineation Well
- Piezometer
- Abandoned Well
- Potentiometric Surface Contour (ft NAVD88)
- Approximate Groundwater Flow Direction
- Ash Pond Boundary

GS-AP-MW-8 Well ID
390.10 Groundwater Elevation
393.56 Average Groundwater Elevation

N

0 1,000 2,000 4,000 6,000 Feet

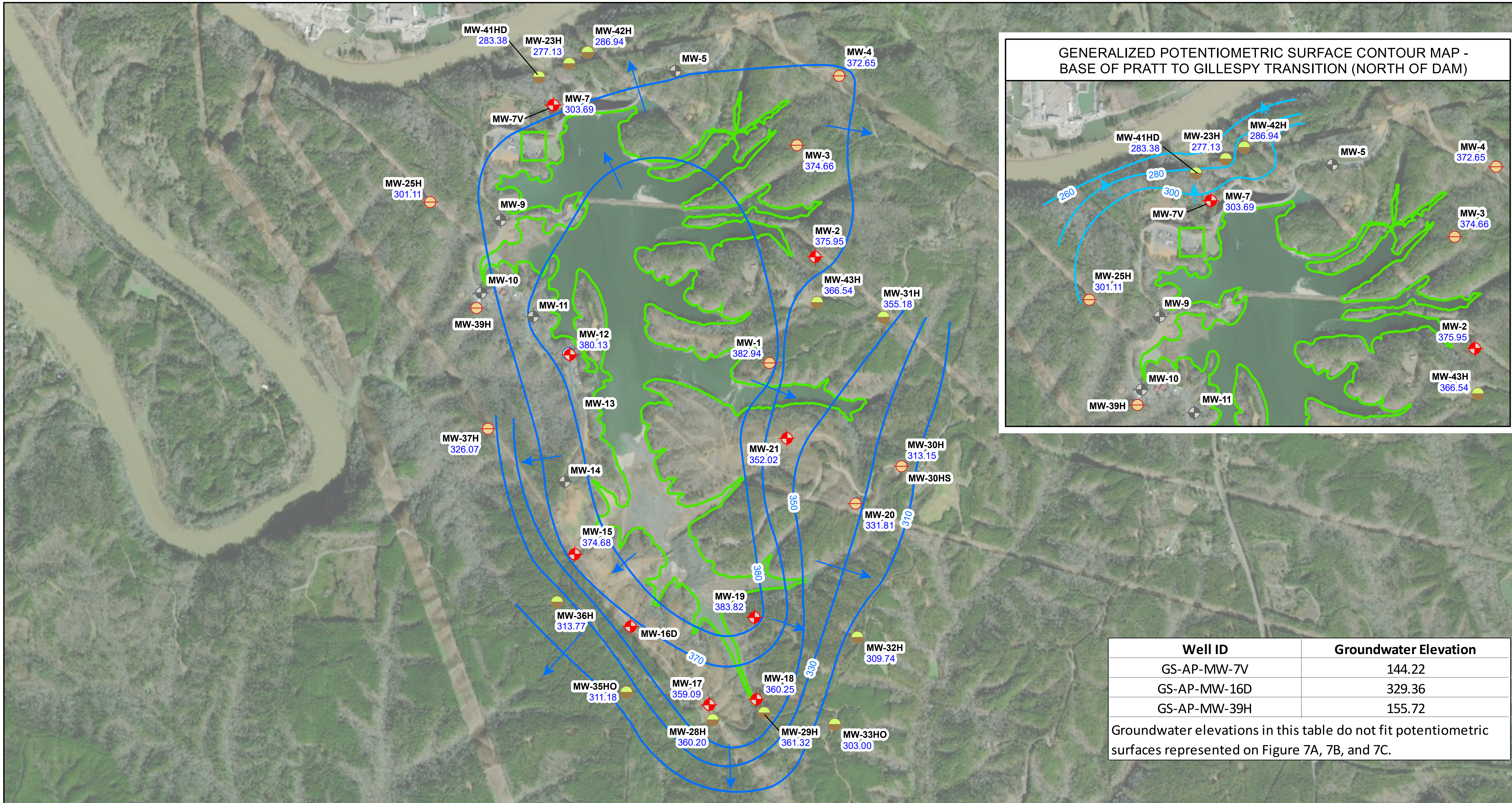
NOTE: 1. NAVD88 indicates North American Vertical Datum of 1988.
2. Generalized water table potentiometric surface map based upon groundwater elevations, surface water elevations, and topography.
3. Average groundwater elevation at GS-AP-MW-13 used to refine 390 ft NAVD88 contour.

SCALE	1:18000
DATE	9/23/2020
DRAWN BY	KAR
CHECKED BY	GBD

DRAWING TITLE
POTENTIOMETRIC SURFACE CONTOUR MAP
(UPPER) WATER TABLE AQUIFER
MARCH 16, 2020
PLANT GORGAS ASH POND

FIGURE NO
FIGURE 7A

Southern Company



Well ID	Groundwater Elevation
GS-AP-MW-7V	144.22
GS-AP-MW-16D	329.36
GS-AP-MW-39H	155.72

Groundwater elevations in this table do not fit potentiometric surfaces represented on Figure 7A, 7B, and 7C.

Legend

- Downgradient Monitoring Well
- Upgradient Monitoring Well
- Horizontal Delineation Well
- Vertical Delineation Well
- Piezometer
- Abandoned Well
- Potentiometric Surface Contour (ft NAVD88) (Pratt Aquifer)
- Approximate Groundwater Flow Direction (Pratt Aquifer)
- Potentiometric Surface Contour (ft NAVD88) (Base of Pratt to Gillespy Aquifer Transition)
- Approximate Groundwater Flow Direction (Base of Pratt to Gillespy Aquifer Transition)
- Ash Pond Boundary

GS-AP-MW-1 Well ID
382.94 Groundwater Elevation

N

0 1,000 2,000 4,000 6,000 Feet

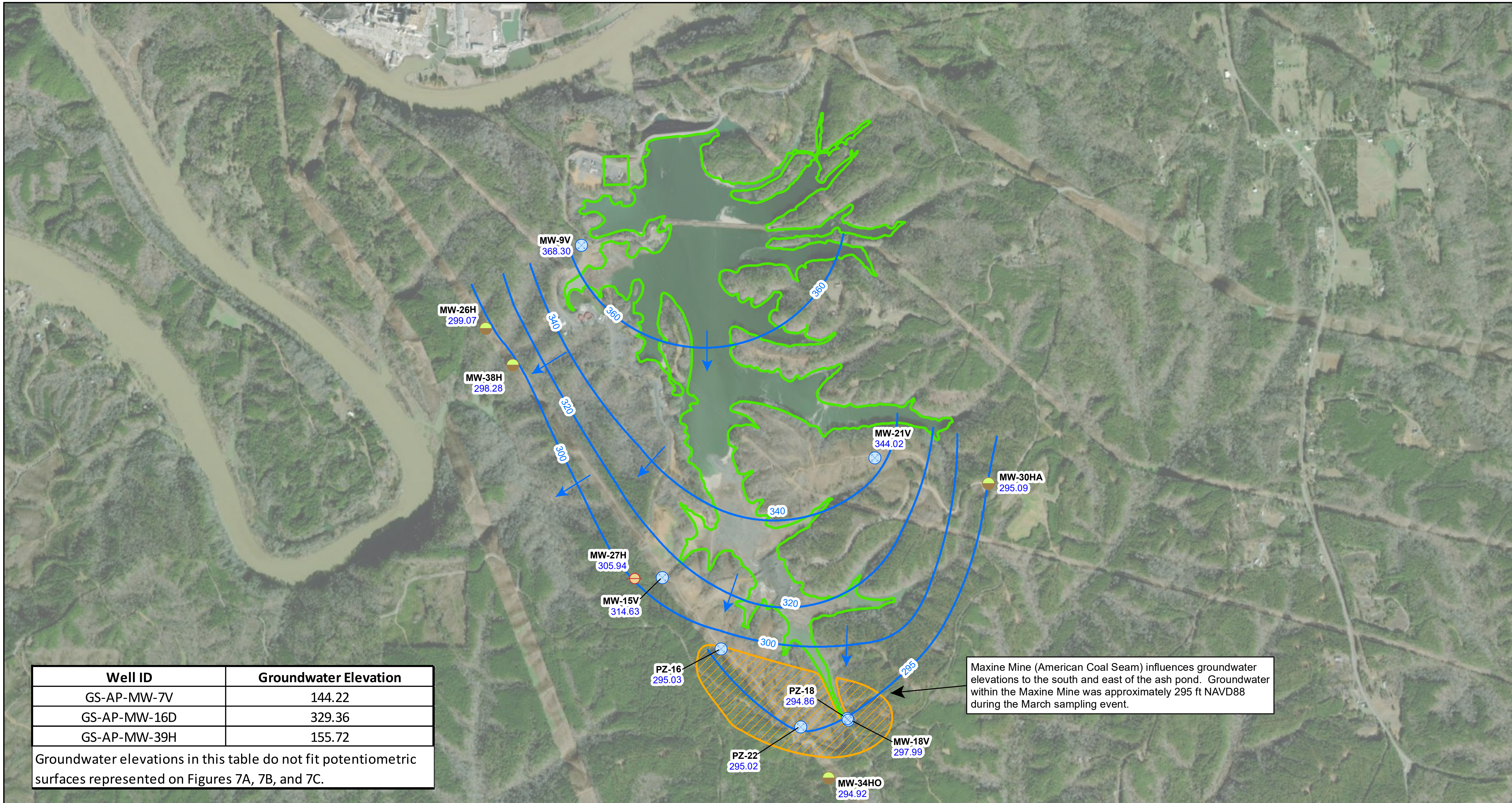
NOTES: 1. NAVD88 indicates North American Vertical Datum of 1988.
2. GS-AP-MW-5, GS-AP-MW-9, GS-AP-MW-10, GS-AP-MW-11, and GS-AP-MW-14 were abandoned prior to the March 2020 event.
3. Potentiometric contour lines were generalized for depiction and ease of reader.

SCALE	1:18000
DATE	9/23/2020
DRAWN BY	KWR
CHECKED BY	GBD

DRAWING TITLE
POTENTIOMETRIC SURFACE CONTOUR MAP
PRATT AQUIFER
MARCH 16, 2020
PLANT GORGAS ASH POND

FIGURE NO
FIGURE 7B

Southern Company



Well ID	Groundwater Elevation
GS-AP-MW-7V	144.22
GS-AP-MW-16D	329.36
GS-AP-MW-39H	155.72

Groundwater elevations in this table do not fit potentiometric surfaces represented on Figures 7A, 7B, and 7C.

Legend

- Horizontal Delineation Well
- Vertical Delineation Well
- Piezometer
- Potentiometric Surface Contour (ft NAVD88)
- Approximate Groundwater Flow Direction
- Maxine Mine
- Ash Pond Boundary

GS-AP-MW-9V Well ID
368.30 Groundwater Elevation

N

0 1,000 2,000 4,000 6,000 Feet

NOTES: 1. NAVD88 indicates North American Vertical Datum of 1988.
2. GS-AP-PZ-16, -18, and -22 monitor water levels in the Maxine Mine.
3. Potentiometric contour lines were generalized for depiction and ease of reader.

SCALE	1:18000
DATE	9/29/2020
DRAWN BY	KWR
CHECKED BY	GBD

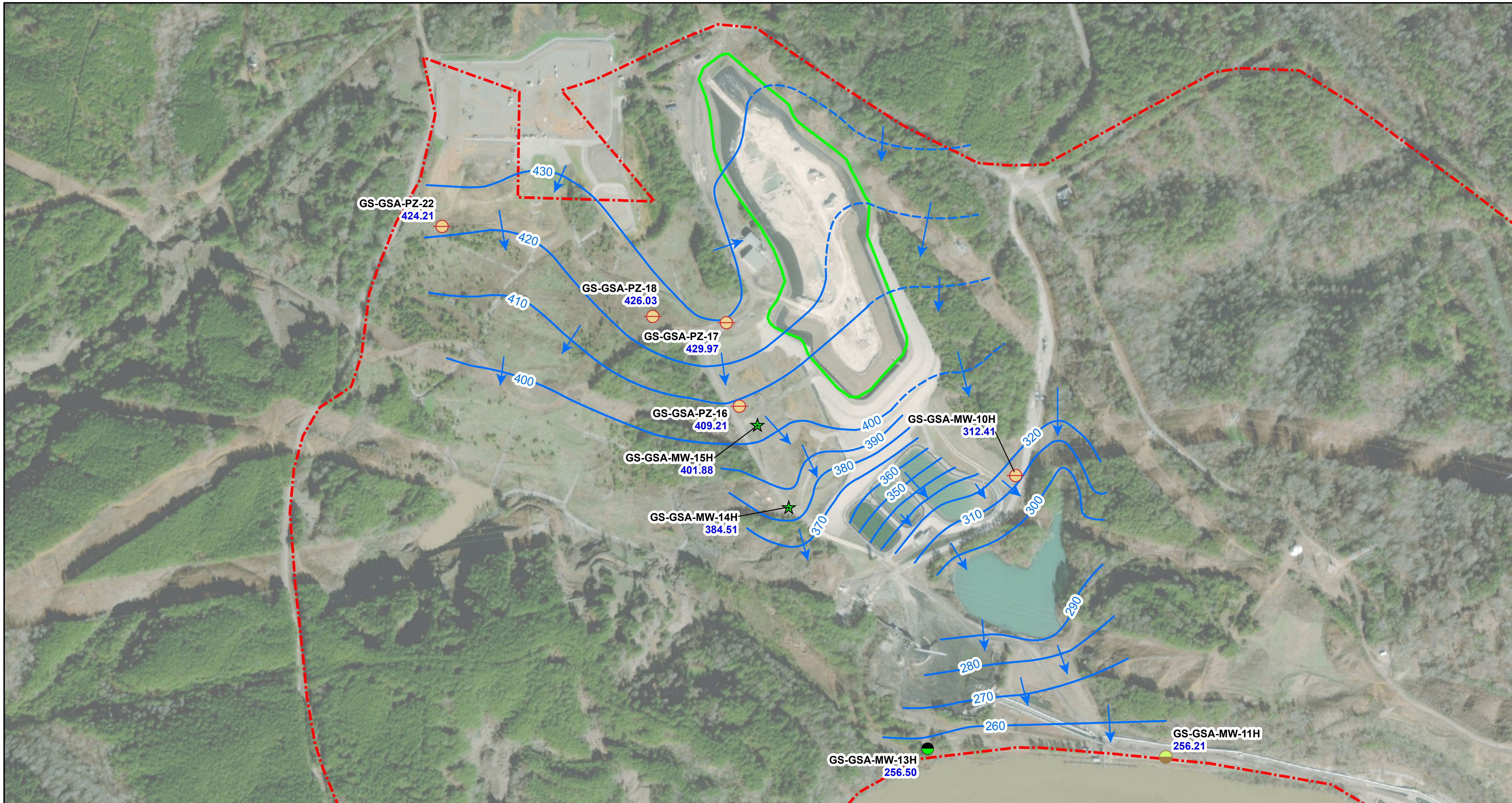
DRAWING TITLE

POTENTIOMETRIC SURFACE CONTOUR MAP
AMERICAN AQUIFER
MARCH 16, 2020
PLANT GORGAS ASH POND

FIGURE NO

FIGURE 7C

Southern Company



Legend

- Piezometer
- Phase I Horizontal Delineation Well
- Phase II Horizontal Delineation Well
- Phase III Horizontal Delineation Well

GS-GSA-PZ-22 Well ID
424.21 Groundwater Elevation

- Property Boundary (Approximate)
- Gypsum Pond Boundary
- Inferred Potentiometric Surface Contour (ft NAVD 88)
- Potentiometric Surface Contour (ft NAVD88)
- Approximate Groundwater Flow Direction

N

0 250 500 1,000 1,500 Feet

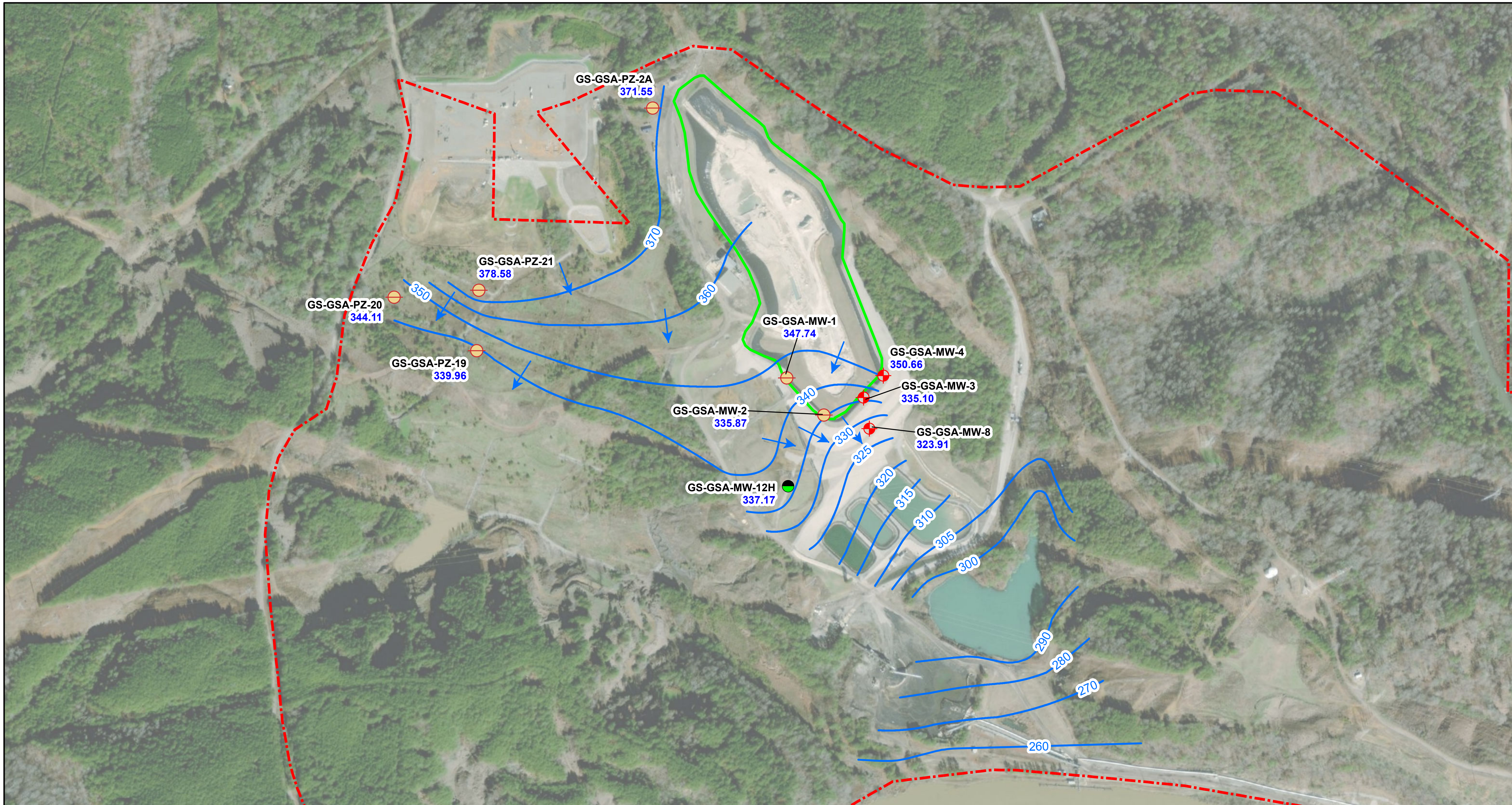
NOTES:
1. ft NAVD88 indicates feet above North American Vertical Datum of 1988.
2. Vertical delineation wells were not factored into potentiometric surface contouring.
3. GS-GSA-MW-1 and GS-GSA-MW-2 are shown as piezometers, since they are not included in the monitoring well network for this site.

SCALE	1:6,000
DATE	9/23/2020
DRAWN BY	MDM
CHECKED BY	GBD

DRAWING TITLE
POTENTIOMETRIC SURFACE CONTOUR MAP
WATER TABLE
AUGUST 3, 2020
PLANT GORGAS GYPSUM POND

FIGURE NO
FIGURE 6A

Southern Company



Legend

- Downgradient Monitoring Well
- Piezometer
- Phase II Horizontal Delineation Well
- Potentiometric Surface Contour (ft NAVD88)
- Approximate Groundwater Flow Direction
- Property Boundary (Approximiate)
- Gypsum Pond Boundary

GS-GSA-MW-2 Well ID
335.87 Groundwater Elevation

N

0 250 500 1,000 1,500 Feet

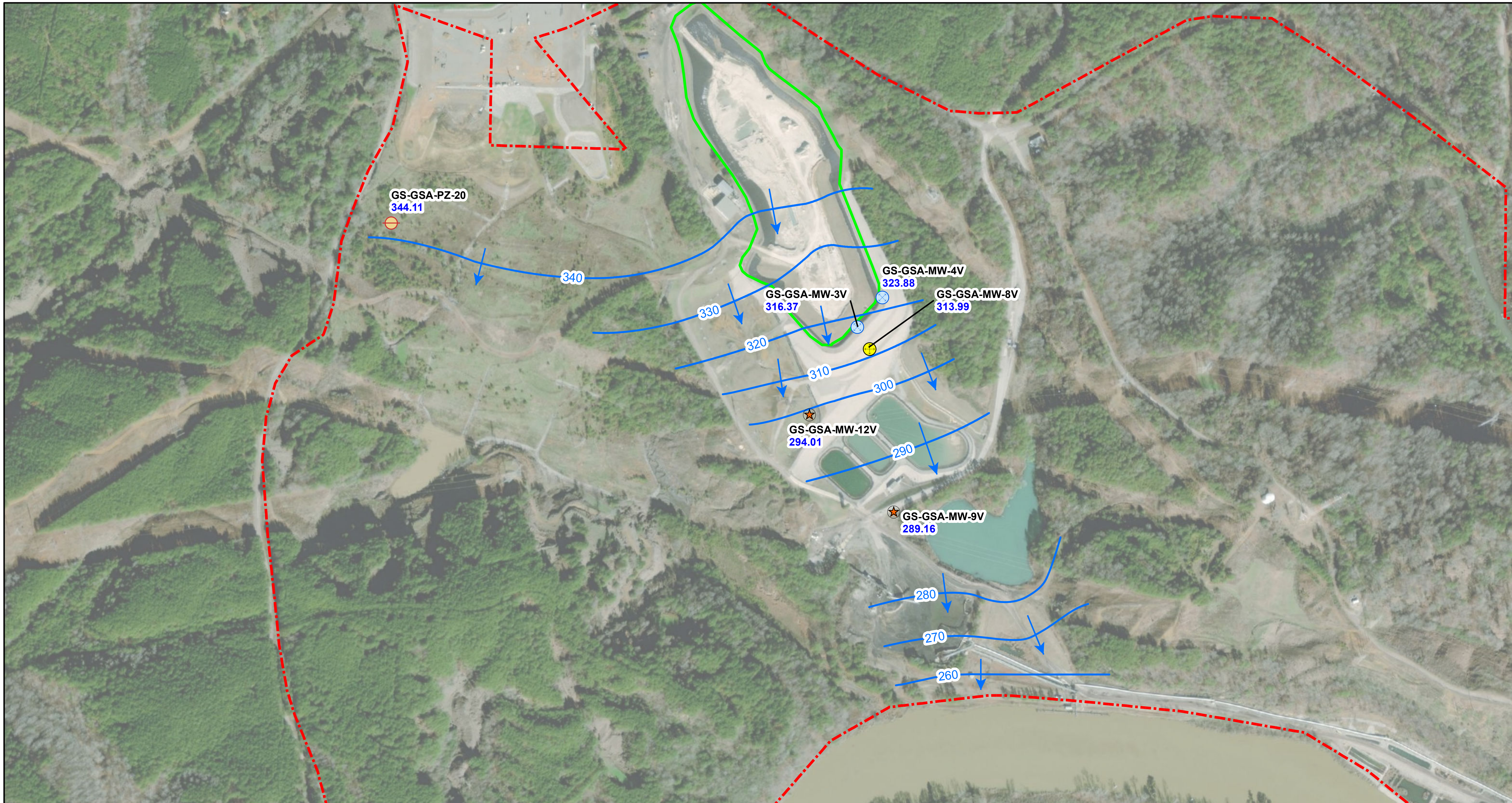
NOTES:
1. ft NAVD88 indicates feet above North American Vertical Datum of 1988.
2. Vertical delineation wells were not factored into potentiometric surface contouring.
3. GS-GSA-MW-1 and GS-GSA-MW-2 are shown as piezometers, since they are not included in the monitoring well network for this site.

SCALE	1:6,000
DATE	9/23/2020
DRAWN BY	MDM
CHECKED BY	GBD

DRAWING TITLE
POTENTIOMETRIC SURFACE CONTOUR MAP
MIDDLE ROCK
AUGUST 3, 2020
PLANT GORGAS GYPSUM POND

FIGURE NO
FIGURE 6B

Southern Company



Legend

- Piezometer
- Phase I Vertical Delineation Well
- Phase II Vertical Delineation Well
- Phase III Vertical Delineation Well
- Potentiometric Surface Contour (ft NAVD88)
- Approximate Groundwater Flow Direction
- Property Boundary (Approximiate)
- Gypsum Pond Boundary

GS-GSA-MW-3V Well ID
316.37 Groundwater Elevation

N

0 250 500 1,000 1,500 Feet

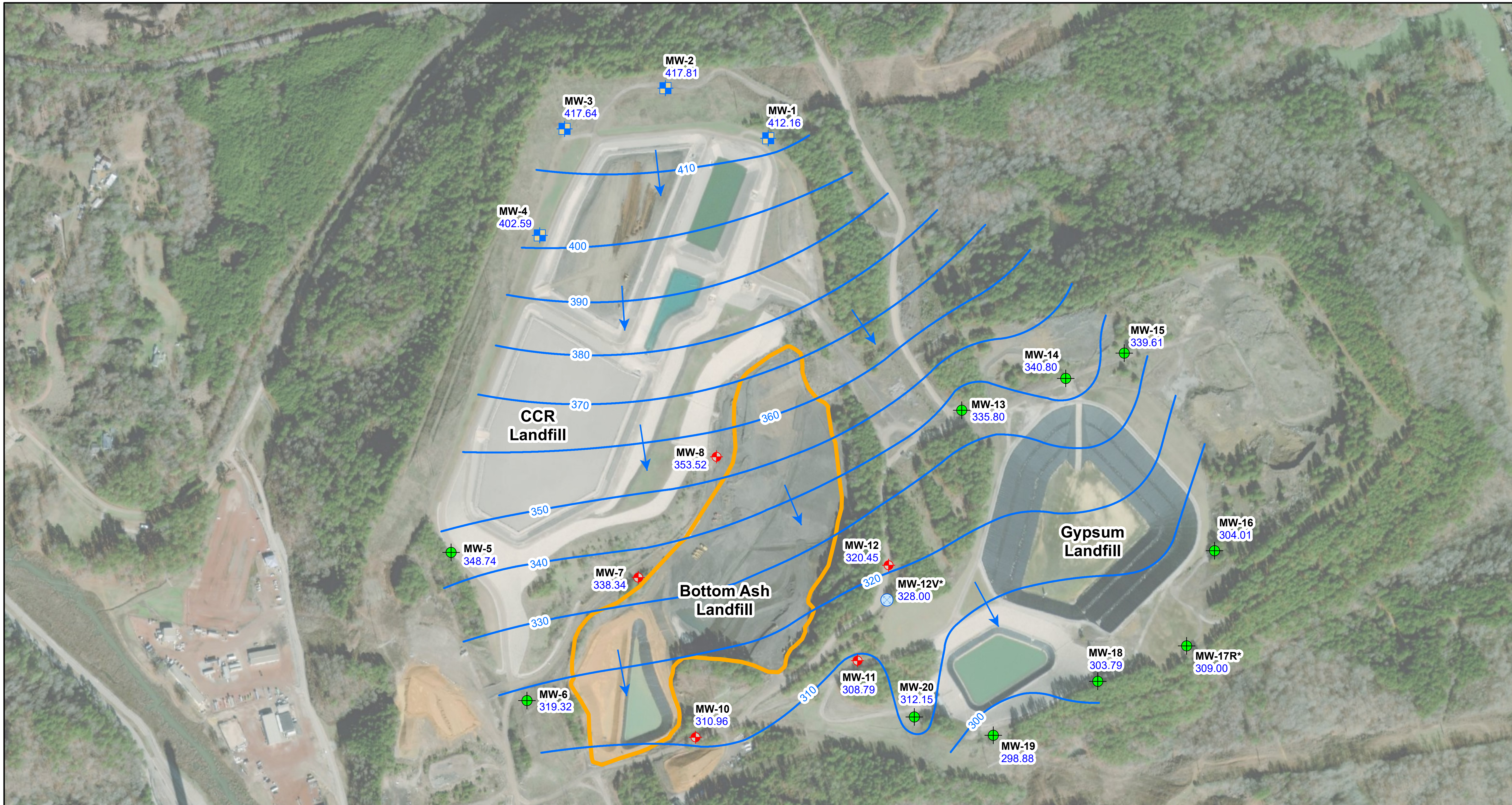
NOTES:
1. ft NAVD88 indicates feet above North American Vertical Datum of 1988.
2. Vertical delineation wells were not factored into potentiometric surface contouring.
3. GS-GSA-MW-1 and GS-GSA-MW-2 are shown as piezometers, since they are not included in the monitoring well network for this site.

SCALE	1:6,000
DATE	9/23/2020
DRAWN BY	MDM
CHECKED BY	GBD

DRAWING TITLE
POTENTIOMETRIC SURFACE CONTOUR MAP
DEEP ROCK
AUGUST 3, 2020
PLANT GORGAS GYPSUM POND

FIGURE NO
FIGURE 6C

Southern Company



Legend

- Downgradient Monitoring Well
- Upgradient Monitoring Well
- Vertical Delineation Well
- Monitoring Well
- MW-1 Well ID
- 412.16 Groundwater Elevation
- Potentiometric Surface Contour (ft NAVD88)
- Approximate Groundwater Flow Direction
- Bottom Ash Landfill Boundary (Approximate)

N

0 250 500 1,000 1,500 2,000 Feet

NOTES: 1. NAVD88 indicates North American Vertical Datum of 1988.
2. MW-10, screened across American Coal Seam, was factored into contouring.
3. *MW-12V and MW-17R are screened entirely in rock and were not factored into contouring.

SCALE	1:6000
DATE	9/29/2020
DRAWN BY	KAR
CHECKED BY	GBD

DRAWING TITLE

POTENTIOMETRIC SURFACE CONTOUR MAP
APRIL 6, 2020
PLANT GORGAS BOTTOM ASH LANDFILL

FIGURE NO

FIGURE 2

Southern Company

Appendix D
Monitored Natural Attenuation Demonstration

December 2021
Plant Gorgas

Monitored Natural Attenuation Demonstration

Prepared for Alabama Power Company

December 2021
Plant Gorgas

Monitored Natural Attenuation Demonstration

Prepared for
Alabama Power Company
600 18th Street North
Birmingham, Alabama 35203

Prepared by
Anchor QEA, LLC
9797 Timber Circle, Suite B
Daphne, Alabama 36527

Project Number: 201114-01.01
https://anchorqea-my.sharepoint.com/personal/aaccardi_anchorqea_com/Documents/PRIVILEGED & CONFIDENTIAL_ACMs/MNA Demonstration Reports/Gorgas/Gorgas MNA Demonstration Report_121320.docx

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ABBREVIATIONS

µg/L	microgram per liter
CCR	coal combustion residuals
CEC	cation exchange capacity
CFR	Code of Federal Regulations
cm	centimeter
COI	constituent of interest
EGL	Anchor QEA Environmental Geochemistry Laboratory
GWPS	groundwater protection standard
mg/kg	milligram per kilogram
MNA	monitored natural attenuation
PV	pore volume
SEM	scanning electron microscopy
Site	William Crawford Gorgas Electric Generating Plant
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 William Crawford Gorgas Electric Generating Plant (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. MNA will be implemented in conjunction with two other corrective measures: source control and permeation grouting in areas of relatively high concentrations of arsenic, lithium, and molybdenum (constituents of interest [COIs]).

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 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 indicated that arsenic and lithium concentrations are generally stable or decreasing in several areas, even without source control. Molybdenum is of concern at only one well, but it is not currently decreasing with time. The concentration versus distance graphs along downgradient transects indicate that arsenic, lithium, and molybdenum are decreasing with distance from the Site.

Based on the geochemical investigations, multiple lines of evidence support at least four attenuating mechanisms, depending upon the COI. The major attenuating mechanisms include sorption on iron oxides (arsenic and molybdenum), precipitation of arsenate phases (for arsenic), and cation exchange on clays (lithium). All COIs are subject to physical attenuating mechanisms such as dispersion and flushing, which will decrease concentrations with time and distance from the Site.

Column studies were performed to assess the ability of the residual aquifer media (soil) to remove COIs from groundwater and that available attenuation capacity is significant. The attenuation capacity of aquifer soils from column studies was scaled up to the entire volume of the aquifer downgradient of the Site but within the property boundary. The extrapolation showed that the attenuation capacity of the residual soil aquifer is far greater than the mass of COIs requiring attenuation (300 times greater or more).

SSE was performed on attenuating solids from wells and soils used in the column studies (after studies were complete) to assess the stability of the COIs and their host minerals. Due to almost no COIs in the water-soluble fraction and the sum of the mass of COIs in the more stable fractions (strong acid oxidizable, reducible, and residual), attenuated COIs are not expected to remobilize back into groundwater.

Reactive transport modeling was performed along simulated fracture pathways in rock and demonstrated that the migration of arsenic, molybdenum, and lithium are significantly retarded (slower) as compared to a nonreactive constituent such as chloride. The attenuation of arsenic and molybdenum is dominated by geochemical reactions near the fracture, while attenuation of lithium is predominately by matrix diffusion and cation exchange on clay minerals in the rock matrix.

Slopes of trend lines through recent data on concentration versus time graphs 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 2 to 24 years. This range is reasonable compared to durations of other corrective-action technologies and is compatible with the closure and post-closure period. Site closure (source control) and permeation grouting are expected to reduce the time to achieve GWPS as compared to MNA alone.

1 Introduction

The William Crawford Gorgas Electric Generating Plant (Site), located in Walker County, Alabama, is owned and operated by the Alabama Power Company. Alabama Power Company has been monitoring groundwater at the Site in accordance with the U.S. Environmental Protection Agency (USEPA) coal combustion residuals (CCR) rule (40 Code of Federal Regulations [CFR] Part 257.97) and the Alabama Department of Environmental Management's Administrative Code r. 335-13-15-.06 since 2016. Constituents of interest (COIs) for the Site include arsenic, lithium, and molybdenum. 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 the plume areas are stable or shrinking.
2. Determine the mechanisms and rates of attenuation (time to achieve groundwater protection standards [GWPSs]).
3. Determine the capacity of the aquifer is sufficient to attenuate the mass of constituents in groundwater and 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 assess natural attenuation occurrence and rates (SCS 2021a). COIs were plotted on the y-axis. For the concentration versus time plots, the time between sampling events (from 2016 through 2021) was plotted on the x-axis (Figure 1). For the concentration versus distance graphs (Figure 2), the distance between the pond boundary and monitoring well was plotted on the x-axis. Concentration versus distance graphs were made for COIs with statistically significant levels (SSLs) along upgradient-downgradient flow paths. Specifically, concentration versus distance graphs were made for the following wells:

- GS-AP-MW-6D to GS-AP-MW-23H (arsenic and lithium)
- GS-AP-MW-7 to GS-AP-MW-41HD (arsenic, lithium, and molybdenum)
- GS-AP-MW-15 to GS-AP-MW-36H (lithium)
- GS-AP-MW-17 to GS-AP-MW-28H (lithium)
- GS-AP-MW-18 to GS-AP-MW-29H (lithium)
- GS-AP-MW-21 to GS-AP-MW-30HA (lithium)

The trends observed in recent spatial and temporal data provide evidence that natural attenuation is occurring at the Site. A selection of concentration versus time graphs is included in Figure 1. Recent arsenic concentrations at monitoring well GS-AP-MW-7 suggest a decrease in COI concentration with time at the Ash Pond. SSLs of lithium are decreasing based on historical and recent concentration versus time trends (within the most recent 1 to 2 years). All concentration versus time graphs are included in Appendix A.

Concentration versus distance graphs suggest COI concentrations are decreasing with distance from the Site, indicating spatial attenuation (Figure 2). Although molybdenum was not observed to be decreasing with time at GS-AP-MW-7 (representing the only well with a molybdenum SSL), molybdenum is attenuating with distance from the Ash Pond boundary. Decreasing and stabilizing trends are expected in other wells after closure, as closure activities cut off the source of COIs to groundwater.

3 Groundwater Sampling and Analysis

Groundwater sampling and analyses were conducted to perform geochemical modeling to help determine attenuating mechanisms. Groundwater samples were collected by RDH Environmental in February 2020 and submitted to the Alabama Power General Test Laboratory. Groundwater samples were collected from monitoring wells, as listed in Table 2. The samples were analyzed for major cations and anions and geochemical parameters influencing the chemical behavior of the COIs. 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 USEPA CCR Rule 40 CFR § 257.93(a) and Alabama Department of Environmental Management Administrative 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, lithium, and molybdenum, as well as the behavior of other species (such as iron, manganese, and aluminum) that influence the behavior of the COIs.

The Geochemist's Workbench software (Bethke and Yeakel 2013) was used to construct Pourbaix (EhpH) diagrams for iron, arsenic, manganese, and molybdenum based on Site groundwater chemistry and to assess the geochemical stability of phases potentially controlling COI concentrations under Site conditions (Figures 3 to 9). 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+}] (Figures 3 and 4). Amorphous iron oxides are strong sorbents for many metals and metalloids, including arsenic and molybdenum.
- 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 (Figures 5 and 6).
- Lithium is often associated with manganese oxides, and the mineral lithiophorite [$(Li,Al)Mn_2O_2(OH)_2$] is an example of a lithium-bearing manganese oxide. The thermodynamic properties of lithiophorite and other lithium-bearing manganese oxides are not well known, and its stability field shown in Figures 7 and 8 is approximate.
- Molybdenum concentrations associated with the Ash Pond do not appear to be controlled by any molybdenum minerals under Site conditions (Figure 9).

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 data for lithiophorite [Parc et al. 1989] and molybdenum 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. The solubility of these phases 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 with detectable iron is slightly supersaturated 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 in the Ash Pond area with detectable arsenic is supersaturated with respect to a barium arsenate mineral phase.
- Groundwater with both detectable aluminum and manganese is supersaturated with respect to lithiophorite (lithium aluminum manganese oxide), suggesting lithiophorite as a potential attenuating phase for lithium at the Site. However, groundwater samples are undersaturated with respect to other manganese oxides.
- No molybdate mineral phases are close to saturation in groundwater with detectable molybdenum in the Ash Pond area.

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) are forming and incorporating COIs, then natural attenuation is occurring.

5.1 Sample Collection

To evaluate these mechanisms (precipitation and coprecipitation), solid particles (if present) were collected from the bottom of monitoring wells and analyzed (summarized in Table 2). The well solids (precipitates) 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 insights into aquifer geochemistry and mineralogy and may be attenuation mechanisms for COIs.

Well solids (precipitates) samples were collected as follows:

- Well solids were pumped from the bottom of the well via polyethylene tubing.
- Groundwater and well solids 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 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, LLC, Environmental Geochemistry Laboratory (EGL) in Portland, Oregon, for analysis.

Aquifer solids (soil) samples and unconsolidated residual materials were selected from core boxes in a core storage area and analyzed to determine capacity, rates, and stability of MNA. Soil and rock samples were collected from GS-AP-MW-15, GS-AP-MW-7, GS-AP-MW-7V, GS-AP-MW-17V, and GS-AP-MW-23H between April 5 and April 9, 2021, from the boring locations shown in Figure 10. Samples were collected from areas with greater impacts and where a sufficient sample in the core boxes was available for collection. Representative samples were collected from horizons where excess material was available for collection. The samples were sealed in zip-top bags, labeled, packed in coolers, and shipped to EGL. Preservation of these samples was not required. Rock samples were analyzed to provide information on mineralogy and lithology to inform attenuation mechanisms in fractured rock and for use in modeling (Section 7). As described in Section 8, soil samples were also used in column studies to determine attenuation capacity and stability of the attenuated COIs and their host minerals in residual soils.

5.2 Sample Analysis

Upon arrival at 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 were recovered from the filters in a glove box under a nitrogen 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 a nitrogen 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 in well solids (soil was not examined by SEM)

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 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 in order of decreasing solubility and mobility from F1 to F5. 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 (reducible), F4 (strong acid oxidizable), and F5 (residual) fractions represent COIs associated with relatively stable (permanent) attenuating mechanisms, provided Site geochemical conditions do not change drastically in the future (which is not expected).

Cation exchange on clays can be an important attenuation mechanism for some COIs, such as lithium. 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 lithium.

Select well solids (precipitates) samples, including point microanalysis and elemental mapping, were also submitted for examination by SEM 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

In solid samples collected from 15 monitoring wells, the XRF chemical analysis of the well solids (Table 6) showed a relationship with at least one COI and elements associated with natural attenuation (iron, calcium, and/or manganese). The relationship of arsenic and iron and the relationship of molybdenum and iron are shown in Figures 11 and 12, respectively. Upgradient data (GS-AP-MW-8) and the lower COI to iron ratios were used to define geogenic (naturally occurring) arsenic and molybdenum. Arsenic (Figure 11) and molybdenum (Figure 12) values above the line represent arsenic and molybdenum enrichment in iron compounds, which supports natural attenuation for these COIs in downgradient wells. The XRF chemical analysis of the well solids (precipitates) (Table 6) also showed relatively high concentrations of aluminum in samples from most wells, specifically from 3,030 milligrams per kilogram (mg/kg) with most samples being over

12,500 mg/kg, which suggests the presence of clay minerals and supports lithium attenuation by cation exchange on clay minerals.

XRD identified multiple attenuating species for the COI (Table 7), including ferrihydrite (an iron oxide), illite, montmorillonite and vermiculite (clay minerals), and zeolite (a clay-like mineral).

Four samples with suspected clay content were submitted for CEC testing. CEC was variable for these samples, ranging between 33 to 487 milliequivalents per kilogram and mostly due to calcium (Table 8), which likely reflects clay mineralogy. Exchangeable lithium was detected in solids from three of the wells, supporting ion exchange on clays as an attenuating mechanism for lithium.

SEM and associated elemental mapping were conducted on select samples to confirm mineral phases and attenuating mechanisms. SEM results indicate the solids collected from GS-AP-MW-6D are predominantly silica (quartz) interspersed with very small aluminum-rich and iron-rich grains. Very little alteration, with very thin coatings of aluminum-rich and iron-rich material, was observed.

SEM results indicated the solids collected from MW-13 are fine-grained quartz and feldspar grains, often coated with aluminum-rich and iron-rich material. Coatings contained a significant fraction of platy, clay-like grains that may represent clay minerals formed in place. Analysis also showed that iron nodules were in two forms: 1) spherical assemblages of sulfide nanoparticles; and 2) irregular, often roughly cylindrical assemblages of oxide nanoparticles. The oxide nanoparticles themselves were often needle-like or formed by linear assemblages of nanospheres. Arsenic was not detected in the iron oxide nanoparticles. SEM images indicate framboidal pyrite (an iron sulfide mineral) is present (Figure 13). Spectral analysis confirmed the pyrite composition, which was sequestering up to 0.3 weight percent arsenic. This is thought to be pyrite formed in place but could possibly be detrital pyrite weathering from the rock. The framboids in MW-13 appear to include both iron oxide and sulfide clusters in the sample, and arsenic is detectable (0.1 to 0.3 weight percent) in the sulfides, suggesting that natural attenuation and enhanced attenuation via sulfide sequestration would be viable under Site conditions.

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

Figures 14 and 15 show the results of SSE for four well solids (precipitate) samples from the Site. Interpretation by COI includes the following:

- **Arsenic:** Bound primarily in the F4 (strong acid oxidizable) and F5 (residual) fractions, though some samples also show an association with the F2 (exchangeable) fraction. Arsenic associated with the F4 (strong acid oxidizable) fraction is consistent with the identification of iron sulfide minerals (framboidal pyrite) from the SEM analysis.

- **Lithium:** Most of the lithium data are below detection limits, which provides little information. The SSE detection limits for lithium are somewhat elevated due to small sample masses. Of the detectable lithium, all is bound in the F5 (residual) fraction.
- **Molybdenum:** For the Ash Pond area, molybdenum is bound primarily in the F3 (reducible, poorly crystalline metal oxides) and F5 (residual) fractions, though some molybdenum is associated with the F2 (exchangeable) fraction. For the gypsum pond and landfill areas, molybdenum is bound primarily in the F4 (strong acid oxidizable) and F5 (residual) fractions, though some molybdenum is also associated with the F1 (water soluble) and F2 (exchangeable, clay mineral) fractions.

5.4 Aquifer Solids (Soil) Results

XRF analysis of monitoring well aquifer samples from GS-AP-MW-7V shows high total iron content at 44,732 mg/kg, which provides substantial attenuating capacity (Table 9).

The mineralogy of the soil samples (as determined by XRD) consists predominantly of quartz (average 52%) with abundant muscovite-illite and clay minerals (mainly kaolinite and vermiculite), and lesser amounts of feldspar (Table 10). Although muscovite was identified by XRD, it is likely a mixture of muscovite and illite, which is a clay mineral weathering product of muscovite that possesses a similar XRD pattern.

CEC for the soil samples ranges from 28 to 74.7 milliequivalents per kilogram (Table 11) and reflects the nature and abundance of clay minerals in the aquifer soil samples. These values, while significantly lower than the CEC reported for the well solids (precipitates) samples, are more consistent with the expected CEC of the clay minerals identified and are, therefore, likely more representative of the cation exchange properties of the aquifer.

Extractable iron, manganese, and aluminum oxides in aquifer soil samples and simultaneously extractable arsenic, lithium, and molybdenum are presented in Table 12. The data indicate that aquifer soils contain a mixture of mainly iron and aluminum oxides; however, manganese was detected in all four samples. These are likely present as both discrete iron-rich grains, as well as coatings on mineral particles, as indicated by SEM. Groundwater geochemical modeling results (Eh-pH diagrams) indicate that iron oxides are stable at the Site. The aluminum oxides may also reflect the presence of clay minerals. Arsenic was detected in the oxide extracts of all aquifer soil samples, and molybdenum was detected in half of the samples, indicating arsenic and molybdenum are being attenuated by sorption and incorporation in iron oxides.

Analytical results are included in Appendix B.

6 Mechanisms for Natural Attenuation

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

- Performed groundwater geochemical modeling using The Geochemist's Workbench software and PHREEQC to assess the geochemical stability of phases potentially controlling COI concentrations under Site conditions, including saturation index calculations
- Analyzed samples by XRF, XRD, SEM, and CEC to identify attenuating mechanisms for COIs
- Performed SSE to determine the association of COIs with attenuating phases, and relative strength and stability of attenuation mechanisms

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 13). The major attenuating mechanisms include sorption on iron oxides (arsenic and molybdenum), precipitation of arsenate phases (for arsenic), and cation exchange on clays (lithium).

XRF detected at least one COI and elements associated with natural attenuation (iron, calcium, manganese, and/or potassium). The relationship of arsenic and iron and the relationship of molybdenum and iron are shown in Figures 11 and 12, respectively. The XRF bulk chemical analysis showed sufficient concentrations of iron for attenuation, ranging between 219 and 44,732 mg/kg. Aluminum concentrations from the XRF analysis suggest clay minerals are present.

XRD identified at least one of five potentially attenuating clay minerals: muscovite-illite, kaolinite, montmorillonite, vermiculite, and/or zeolite in 11 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 to high CEC, which ranges from 33 to 487 milliequivalents per kilogram. Exchangeable lithium was detected in downgradient well solids, indicating attenuation of lithium by cation exchange on clay minerals (Figure 15).

SEM identified widespread occurrence of iron and aluminum oxide coatings on aquifer solids, which supports the other lines of evidence that indicate that iron oxides are important attenuating phases for arsenic (Figure 13).

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 F4 (strong acid oxidizable) and F5 (residual) fractions, though some samples also show an association with the F2 (exchangeable) fraction. Arsenic associated with the F4 (strong acid oxidizable) fraction is consistent with the identification of iron sulfide minerals (framboidal pyrite) from the other investigations.

- **Molybdenum:** For the Ash Pond area, molybdenum is bound primarily in the F3 (reducible) and F5 (residual) fractions, though some molybdenum is associated with the F2 (exchangeable) fraction. For the gypsum pond and landfill areas, molybdenum is bound primarily in the F4 (strong acid oxidizable) and F5 (residual) fractions, though some molybdenum is also associated with the F1 (water soluble) and F2 (exchangeable, clay mineral) fractions.
- **Lithium:** Most of the lithium data are below detection limits, which provides little information. The SSE detection limits for lithium are somewhat elevated due to small sample masses. Of the detectable lithium, all is bound in the F5 (residual) fraction.

In summary, arsenic and molybdenum are bound primarily in the F3 (reducible, poorly crystalline metal oxides), F4 (strong acid oxidizable), and F5 (residual) fractions, which represent stable to very stable attenuation mechanisms associated with iron oxides. Both arsenic and molybdenum have slight association with the F2 (exchangeable) fraction, and molybdenum is bound to the F1 (water soluble) fraction in some areas. Lithium SSE results were inconclusive; however, the detectable lithium is bound in the F5 (residual) fraction. 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 fate and transport of COIs along two representative groundwater flow paths at the Ash Pond under current conditions. The objective of the modeling was to understand the potential role of natural attenuation processes occurring in the fractured rock system based on site-specific hydrogeological and geochemical data supporting remedy selection and future remedial design.

2D transects oriented along representative groundwater flow paths (i.e., perpendicular to the interpreted potentiometric contours) from an upgradient monitoring well, either MW-7 for Transect 1 or MW-15 for Transect 2, to a downgradient well, either MW-41HD for Transect 1 or MW-36H for Transect 2 (Figure 10) were modeled using the U.S. Geological Survey modular finite-difference flow model MODFLOW-2005 (Harbaugh 2005) and the multicomponent reactive transport model PHT3D (Prommer and Post 2010), which incorporates the 3D multispecies transport model MT3DMS (Zheng and Wang 1999) and geochemical modeling code PHREEQC (Parkhurst and Appelo 2013). The model includes a single idealized discrete bedrock fracture pathway with an aperture value consistent with site-specific and literature-based data. The fracture pathway is represented as a single model layer. The unfractured rock matrix adjacent to the fracture is included in the model domain and represented by multiple layers to explicitly simulate COI diffusive interaction between the fracture pathway and rock matrix. The model domain extends from the midpoint of the fracture outward to a distance representing half of the average fracture spacing based on site-specific low flow sampling data (SCS 2021b). The upgradient and downgradient extents of the model domain are represented by constant head boundaries defined by measured hydraulic head values at MW-7 to MW-41HD (for Transect 1) and from MW-15 to MW-36H (for Transect 2), respectively. A graphic depicting the 2D model grid for each transect is provided as Figures 16 and 17. Hydraulic and transport input parameters to the model (including hydraulic conductivity, hydraulic gradient, porosity, molecular diffusion [effective diffusion coefficient], and dispersivity) were defined based on site-specific data and the literature (Table 14). Where applicable, specific data from wells MW-7 and MW-41HD were applied for Transect 1 (Table 14a) and MW-15 to MW-36H for Transect 2 (Table 14b). If unavailable, Ash Pond average data were applied. A summary of hydraulic and transport parameter inputs is provided in Table 14. Specific model domain and grid details for the 2D models are listed as follows:

- Transect 1: MW-7 to MW-41HD
  - Model length in the direction of groundwater flow: 500 feet
    - Number of columns: 100
    - Column width: 5 feet
  - Model height (i.e., half the average fracture spacing) perpendicular to the simulated fracture pathway: 2.8 feet

        - Number of layers: 66
        - Layer thickness: variable, ranging from 0.000295 foot (90 microns) for the layer representing half of the fracture aperture to 0.5 feet for the outer-most model layer
    - Model width: 0.5 feet
        - Number of rows: 1
        - Row thickness: 0.5 feet, equal to the maximum layer thickness
- Transect 2: MW-15 to MW-36H
    - Model length in the direction of groundwater flow: 785 feet
        - Number of columns: 157
        - Column width: 5 feet
    - Model height (i.e., half the average fracture spacing) perpendicular to the simulated fracture pathway: 5 feet
        - Number of layers: 29
        - Layer thickness: variable, ranging from 0.000082 foot (25 microns) for the layer representing half of the fracture aperture to 0.409 feet for the outer-most model layer
    - Model width: 0.409 feet
        - Number of rows: 1
        - Row thickness: 0.409 feet, equal to the maximum layer thickness

Each transect was also modeled as a single-column 1D model using MODFLOW-2005 and PHT3D, using the same chemistry inputs as the 2D model. The 1D model simulation times for both transects were 10 years and are intended to illustrate diffusion and effects of long-term attenuation in the rock matrix.

As groundwater and solutes migrate downgradient through bedrock fractures, COI concentrations are attenuated by reactions with mineral coatings such as iron oxides and clay minerals on the fracture walls and by diffusion into and reaction with minerals in the rock matrix. Diffusive forces alone are known to provide substantial attenuation relative to the rate of groundwater flow. Lipson et al. (2005) demonstrated that the rate of attenuation increases with time and travel distance, eventually reaching an asymptotic level or a maximum retardation rate, β. Using Equation 1 (from Lipson et al. 2005), β for this model is estimated at 165 (dimensionless) for Transect 1 and 321 (dimensionless) for Transect 2, meaning that, following the advance of the plume to a sufficient distance, even a nonreactive solute near the leading edge of the plume would migrate at a rate 165 or 321 times slower than the rate of groundwater flow in the fractures simulated in Transect 1 or Transect 2, respectively.

Equation 1

$$\beta = R'\left(\frac{\varphi_m}{\varphi_f}\right)$$

where:

β	=	plume attenuation factor
R′	=	matrix retardation factor representing sorption of solute to grain surfaces within the matrix (for non-sorbing solutes such as chloride, R′ is assumed to equal 1)
φ_m	=	matrix porosity
φ_f	=	fracture porosity, $\frac{e}{S}$
e	=	fracture aperture
S	=	fracture spacing

Reactions with mineral coatings on the fracture walls and in the rock matrix also attenuate solutes migrating through a bedrock fracture network (Lipson et al. 2005). Specific attenuating mechanisms for the three COIs simulated in the model include the following:

- Lithium (Transects 1 and 2): Cation exchange on clay minerals within the rock fractures and matrix
- Arsenic (Transect 1): Sorption to iron oxide binding sites within the rock fractures and matrix and precipitation of a barium arsenate mineral phase
- Molybdenum (Transect 1): Sorption to iron oxide binding sites within the rock fractures and matrix

Inclusion of these attenuation mechanisms in the transport model was based on analysis of trends in groundwater monitoring data, geochemical modeling, and laboratory analyses described previously, as well as thin-section petrography and SEM data on fractured rock samples collected in the vicinity of the model transects (Appendix B).

Sorption reactions of COIs and other species on iron oxides were modeled using the surface complexation model of Dzombak and Morel (1990). Transect-specific data (as described in the subsequent paragraphs), including groundwater chemistry, as well as estimated CEC and iron oxide concentration data for the rock fractures and matrix, were used to define initial groundwater and matrix geochemistry.

Initial groundwater chemistry along the transect is based on data for samples collected in September 2020 for which complete chemical analyses (major and minor constituents, including

COIs) were available. Initial chemistry is defined by average background[1] groundwater chemistry data from downgradient wells MW-23H, MW-24H, and MW-41HD for Transect 1 and MW-36H for Transect 2. The chemistry of groundwater entering the upgradient boundary is defined by average data from upgradient wells MW-6D and MW-7 for Transect 1 and MW-15 for Transect 2, with COI concentrations at SSLs. The groundwater chemistry data used in the model are presented in Table 15.

Average CEC and iron oxide data estimated from petrographic and SEM analyses for rock samples collected at the Ash Pond and an adjacent quarry (Appendix B) were used to assign cation exchange and sorption capacity (concentrations of iron binding sites) parameters in the model (Table 16). Parameter estimates are based on elemental and mineral analyses of the rock samples, which generally show copious amounts of iron oxide coatings in fractures and approximately 1% iron minerals and 2% iron-rich clays (i.e., closely related to illite) in the rock matrix. Illite was assumed as the representative clay, which is a conservative assumption because illite has lower exchange capacity than other clays such as montmorillonite (Ugwu and Igbokwe 2019). For modeling purposes, for estimation of iron oxide concentration in the fracture, it was assumed the effective thickness of iron oxide mineral coatings within the fracture is equal to the fracture thickness, which is a conservative assumption.

Model simulations were run for different simulation times, ranging from 8 days to 10 years, to assess the relative importance of the different natural attenuation processes (e.g., sorption on iron oxides, cation exchange on clay minerals, and diffusion) within the fracture and rock matrix on the migration of different COIs. The groundwater flow velocity in the representative fracture pathway is calculated at 263 feet per day for Transect 1 and 93 feet per day for Transect 2, based on estimates of bulk hydraulic conductivity, fracture spacing, fracture aperture, and hydraulic gradient (Snow 1968). For Transect 1, which has a domain length of 500 feet, it would take 1.9 days for groundwater within the fracture pathway to reach MW-41HD at the end of the transect or, in other words, to achieve one fracture pathway pore volume (PV) flush. Similarly, for Transect 2, which has a domain length of 785 feet, a single PV flush is equal to approximately 8.5 days. The 2D models have a simulation time of four PV flushes, which is sufficient to assess attenuation within the fracture. However, a longer simulation time is required to evaluate attenuation associated with matrix diffusion since it occurs over a longer timescale; thus, the 1D model was also run for a total time of 10 years for both Transects 1 and 2. To keep model execution times reasonable for this longer simulation, the model domain length was reduced to 5 feet, with only a single column.

The reactive transport model results presented here demonstrate that attenuation of arsenic and molybdenum occurs predominantly within the fracture but also to some extent within the rock matrix. Figures 18 and 19 show normalized concentrations (i.e., final simulated concentrations

[1] "Background" here refers to groundwater chemical composition.

divided by influent concentrations) along the fracture pathway for Transects 1 and 2, respectively. Figure 18a shows it only takes a few (e.g., 3) days for chloride (which, for all practical purposes, is considered a conservative, nonreactive constituent) to reach the downgradient end of the modeled Transect 1, whereas, at 8 days, lithium (Figure 18b) has traveled 300 feet and has maximum concentration approximately 20% of the initial concentration. Arsenic (Figure 18c) and molybdenum (Figure 18d) are rapidly attenuated in the fracture via sorption to iron oxide and precipitation of barium arsenate and, as such, are not shown to migrate downgradient. For Transect 2, Figure 19 shows that lithium has traveled approximately 50 feet in 34 days and has maximum concentration less than 10% of the initial concentration. These results demonstrate that migration of arsenic, molybdenum, and lithium along the fracture is significantly retarded compared to that of chloride and the COIs are attenuated.

Diffusion into the rock matrix is also occurring and contributes to the attenuation of arsenic, molybdenum, and lithium at the Ash Pond. Figures 20 and 21 show vertical profiles of chloride, lithium, arsenic, and molybdenum for Transect 1 and lithium for Transect 2, respectively. These figures demonstrate the effect of diffusion into the rock matrix on attenuation. As shown, after 10 years, chloride (Figure 20a) has diffused more than 2 feet into the matrix, while lithium (Figures 20b and 21), arsenic (Figure 20c), and molybdenum (Figure 20d) have diffused only inches into the rock matrix. The diffusion of chloride into the rock matrix demonstrates attenuation via diffusion is occurring. The differences in the concentration profiles between chloride and the COIs over time demonstrates that COIs are attenuated within the matrix. The attenuation of arsenic and molybdenum is dominated by geochemical reactions near the fracture, while attenuation of lithium is predominately by matrix diffusion and cation exchange on clay minerals in the rock matrix.

The modeling results indicate that both geochemical reactions and matrix diffusion contribute to natural attenuation of COIs at the Ash Pond.

8 Column Studies

8.1 Methodology (Setup)

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

Two groundwater samples for column testing were collected during the week of June 7, 2021, from monitoring wells GS-AP-MW-6D and GS-AP-MW-7. These wells were selected for column testing, based on COI concentrations, to provide high COI mass loading to the Site soils. Upon receipt at EGL, groundwater samples were submitted to ALS Environmental in Kelso, Washington, for chemical analysis prior to beginning the column testing. Analytical results are summarized in Table 17 and included in Appendix B. Six column tests were prepared with combinations of the two groundwater samples and three Site soils (GS-AP-MW-23H 3.5'-5.0', GS-AP-MW-7V 4.0’-5.0’, and GS-AP-MW-7V 18.0'-19.0'; Table 18). The laboratory column setup is shown in Figure 22, and a detailed schematic is provided in Figure 23.

Column tests were carried out in 12.8-centimeter (cm)-long, 2.6 cm diameter polypropylene columns. Because the Site soils are fine-grained, preferential flow paths would form in columns packed only with Site soils. To avoid preferential flow paths, the dried Site soils were mixed with clean quartz sand (Accusand) in a 50:50 mass ratio. The Site soil/sand mixtures 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 approximately 14 days using a peristatic pump with a multichannel pump head. Flow rates were regularly checked and adjusted as needed to maintain a constant flow rate. The influent reservoirs were purged with nitrogen and kept in sealed Mylar bags with oxygen-absorbing packets during the column tests. Table 19 provides a summary of the column test operating conditions.

The initial COI concentrations in the two groundwater samples were close to historical data. Therefore, initial COI concentrations were not adjusted (spiked) for the column testing. The initial arsenic concentrations in GS-AP-MW-6D and GS-AP-MW-7 were 118 and 254 micrograms per liter (µg/L), respectively. The initial lithium concentrations in GS-AP-MW-6D and GS-AP-MW-7 were 335 and 186 µg/L, respectively. The initial molybdenum concentrations in GS-AP-MW-6D and GS-AP-MW-7 were 5.72 and 218 µg/L, respectively (molybdenum is an SSL at GS-AP-MW-7 only).

Column influents and effluents were sampled periodically over the duration of the test, and pH was measured at the time of sampling. The samples were filtered using 0.45-micron nylon membrane 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 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 generally range from 10.1 to 95.7 cm per day (SCS 2018). 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 because the shorter residence time in the column provides less time for attenuation and less mass of COI being attenuated as compared to field conditions.

8.2 Column Test Results

Column test results for arsenic, lithium, and molybdenum are shown in Figures 24 through 35. Results are plotted as the concentration ratio of effluent to influent as a function of PVs of groundwater passed through each column, as well as cumulative COI mass uptake by soil versus COI mass loading. Arsenic, lithium, and molybdenum concentrations in the influent reservoirs were stable throughout the column testing. Analytical summary reports are included in Appendix B.

The attenuation capacity of arsenic in soil from GS-AP-MW-7V and GS-AP-MW-23H was significant (Figures 24, 25, 26, and 27); excess capacity for attenuation remained after 300 PV. For all columns (i.e., columns using either GS-AP-MW-6D and GS-AP-MW-7 as influent), arsenic concentrations in the effluent from the GS-AP-MW-23H 3.5'-5.0' columns were less than 5 µg/L until 70 PV. The shallower soil from GS-AP-MW-7V 4.0'-5.0' showed a higher capacity for arsenic attenuation than the deeper soil from GS-AP-MW-7V 18.0'-19.0'.

The attenuation capacity of lithium in soil from GS-AP-MW-23H was reached after approximately 150 PV for all columns while some attenuation capacity in soil from GS-AP-MW-7V remained after approximately 325 PV. Generally, shallower soils showed more capacity for lithium attenuation than deeper soils (Figures 28, 29, 30, and 31).

The attenuation capacity of molybdenum in soils from GS-AP-MW-23 was reach after approximately 150 PV in all columns. The attenuation capacity of molybdenum in soil from GS-AP-MW-7V was reached after approximately 100 PV when using groundwater from GS-AP-MW-6D as influent and after approximately 150 PV when using GS-AP-MW-7 as influent. For soil from GS-AP-MW-7V, both shallow and deep soils showed similar attenuation capacity (Figures 32, 33, 34, and 35).

Overall, Site soils attenuated COIs. Excess capacity for attenuating arsenic remained after more than 300 PV. Depending on soil and groundwater, the capacity for attenuating lithium was reached at approximately 150 PV to excess capacity remaining after approximately 325 PV. The capacity for attenuating molybdenum was reached between 100 and 150 PV.

9 Aquifer Capacity for Attenuation

Geospatial methods were used to calculate the estimated saturated volume of the residual aquifer (soil) overlying rock 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 2021a) 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)
- Site-wide 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 2.

Equation 2

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

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 µg or mg to kg
p	=	porosity

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.

To calculate the 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 36. 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, lithium, and molybdenum requiring attenuation. Specifically, the aquifer has an attenuating capacity of more than 300 times the mass of arsenic, lithium, and molybdenum in groundwater. Aquifer capacity for attenuation results is summarized in Table 20.

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

The slope of trend lines through recent monitoring data (last 2 years) on concentration versus time graphs 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 2 to 24 years, not considering source control. This range is reasonable compared to durations of other corrective-action technologies and is compatible with the closure and post-closure period. Source control and permeation grouting (as applicable) are expected to reduce the time to achieve GWPSs as compared to MNA alone. Figure 1 shows typical concentration versus time graphs that served as the basis for the rate analysis, and Appendix A contains all concentration versus time 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:

- Water soluble
- Exchangeable (e.g., clay minerals)
- Reducible (e.g., poorly crystalline metal oxides such as iron oxides)
- Strong acid oxidizable (e.g., crystalline oxide and crystalline sulfide minerals)
- Residual (e.g., silicate phases)

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. SSE results are summarized in Table 21. Iron, which is commonly associated with arsenic and molybdenum attenuation, is present in the reducible and oxidizable fractions for well solids (Figures 14 and 15) and in the reducible, oxidizable, and residual fractions in the post-column soil samples (Figure 37). The residual fraction, however, may represent crystalline mineral phases (grains) that are a part of the aquifer matrix that filtered in through the well screen, rather than mineral phases formed in situ. Where detected in well precipitates, arsenic was primarily in the oxidizable and residual fractions, with some in the exchangeable fraction. In the post-column soils, arsenic occurs primarily in the exchangeable fraction, with some in the oxidizable, reducible, and residual fractions. In both well solids (precipitate) and post-column aquifer solids (soil) samples, lithium was associated with the residual fraction only due to the small sample size and associated detection limits for the well precipitates. Molybdenum was associated primarily with the oxidizable and residual fractions in the well precipitates, though some was associated with the water soluble and exchangeable fractions. Molybdenum was below detection limits in the post-column aquifer solids (soil) extracts. Manganese, which is associated with lithium attenuation, was associated primarily with the oxidizable and residual fractions in the well precipitates, though some was associated with the water soluble and exchangeable fractions. Manganese in the aquifer solids (soil) samples was near equally distributed among all fractions except the water soluble fraction where it was absent. Due to almost no COIs in the water soluble fraction and the sum of the mass of COIs in the more stable fractions (oxidizable, reducible, and residual), attenuated COIs are not expected to remobilize back into groundwater.

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, permeation grouting in areas of relatively high concentrations of COIs (at the Ash Pond), 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 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 and lithium in groundwater through time (particularly in the past 1 to 2 years) in several areas, even without source control. Specifically, arsenic and lithium are either decreasing or generally stable at the following wells:

- Arsenic at monitoring well GS-AP-MW-7
- Lithium at monitoring wells GS-AP-MW-17, GS-AP-MW-18, and GS-AP-MW-21

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

- GS-AP-MW-6D to GS-AP-MW-23H (arsenic and lithium)
- GS-AP-MW-7 to GS-AP-MW-41HD (arsenic and molybdenum)
- GS-AP-MW-15 to GS-AP-MW-36H (lithium)
- GS-AP-MW-18 to GS-AP-MW-29H (lithium)
- GS-AP-MW-21 to GS-AP-MW-30HA (lithium)

Results from existing groundwater data analysis, geochemical modeling, and well solids (precipitates) and soil 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 iron oxides (for arsenic and molybdenum)
- Precipitation of arsenate phases (for arsenic)
- Cation exchange on clays (for lithium)

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, lithium, and molybdenum than the mass of the COIs currently in groundwater. Specifically, the aquifer has an attenuating capacity of more than 300 times the mass of each COI 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 COIs are bound in the exchangeable, reducible, strong acid oxidizable, and residual fractions. Due to almost no COIs in the water soluble fraction and the sum of the mass of COIs in the more stable fractions (reducible, oxidizable, and residual), attenuated COIs are not expected to remobilize back into groundwater.

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 2 to 24 years, not considering source control. These time frames are reasonable to achieve GWPSs by MNA and are compatible with the closure and post-closure periods. Site closure and permeation grouting are expected to accelerate time to achieve GWPSs.

12 References

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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 column tests; geochemical modeling	Satisfied
Tier 3a: Determine System (Aquifer) Capacity for Attenuation	Batch and 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; adaptive 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			
Ash Pond	**Gypsum Pond**	**Landfills**	
GS-AP-MW-6D	GS-GSA-MW-3	MW-1	MW-12
GS-AP-MW-7	GS-GSA-MW-4	MW-2	MW-13
GS-AP-MW-8		MW-3	MW-14
GS-AP-MW-12		MW-4	MW-15
GS-AP-MW-18		MW-6	MW-20

Well Solids Sampling Locations			
Ash Pond	**Gypsum Pond**	**Landfills**	
GS-AP-MW-7	GS-GSA-MW-3	MW-1	MW-12
GS-AP-MW-8	GS-GSA-MW-4	MW-2	MW-13
GS-AP-MW-8D		MW-3	MW-14
GS-AP-MW-12		MW-4	MW-15
GS-AP-MW-18		MW-6	MW-20

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
Antimony (dissolved)	EPA 200.8	Lead (total)	EPA 200.8
Antimony (total)	EPA 200.8	Lithium (total)	EPA 200.7
Arsenic (dissolved)	EPA 200.8	Magnesium (total)	EPA 200.7
Arsenic (total)	EPA 200.8	Manganese (dissolved)	EPA 200.8
Barium (total)	EPA 200.8	Manganese (total)	EPA 200.8
Beryllium (dissolved)	EPA 200.8	Molybdenum (dissolved)	EPA 200.8
Beryllium (total)	EPA 200.8	Molybdenum (total)	EPA 200.8
Bicarbonate alkalinity (calculated)	SM 4500CO2 D	Nitrogen nitrate (calculated)	EPA 353.2
Boron (total)	EPA 200.7	Nitrogen nitrate/nitrite	EPA 353.2
Cadmium (dissolved)	EPA 200.8	Nitrogen nitrite	EPA 353.2
Cadmium (total)	EPA 200.8	Ortho phosphate	SM 4500PF-OP
Calcium (total)	EPA 200.7	Potassium (total)	EPA 200.8
Carbonate alkalinity (calculated)	SM 4500CO2 D	Selenium (dissolved)	EPA 200.8
Chloride	SM 4500Cl E	Selenium (total)	EPA 200.8
Chromium (dissolved)	EPA 200.8	Silica (total; calculated)	EPA 200.7
Chromium (total)	EPA 200.8	Silicon (total)	EPA 200.7
Cobalt (dissolved)	EPA 200.8	Sodium (total)	EPA 200.7
Cobalt (total)	EPA 200.8	Sulfate	SM 4500SO4 E
Fluoride	SM 4500F G 2017	Thallium (dissolved)	EPA 200.8
Iron (dissolved)	EPA 200.7	Thallium (total)	EPA 200.8
Iron (total)	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 Location	Gibbsite	$Fe(OH)_3(a)$	Goethite	Hematite	Magnetite	Siderite	$Ba_3(AsO_4)_2$	BaMoO4	$CaMoO_4$	$FeMoO_4$	Pyrolusite	Bixbyite	Birnessite	Hausmannite	Manganite	Pyrochroite	Lithiophorite	Rhodochrosite
GS-GSA-MW-3	Gypsum Pond	**0.16**	**0.19**	**5.85**	**13.7**	**14.4**	**0.64**	-3.39	--	--	--	-15.3	-16.4	-16.5	-19.5	-7.80	-7.17	**17.8**	**0.19**
GS-GSA-MW-4	Gypsum Pond	-1.49	-3.75	**1.93**	**5.84**	**1.47**	--	-10.5	--	--	--	-17.4	-22.9	-18.7	-30.4	-11.1	-11.6	**1.27**	--
GS-CCB-MW-1	Landfill	-0.21	--	--	--	--	--	--	--	--	--	-15.6	-18.6	-16.8	-23.8	-8.95	-9.22	**12.1**	-1.87
GS-CCB-MW-2	Landfill	--	-0.48	**5.18**	**12.3**	**11.4**	-0.86	--	--	--	--	-14.1	-15.7	-15.3	-19.4	-7.43	-7.71	--	-0.28
GS-CCB-MW-3	Landfill	**1.06**	--	--	--	--	--	--	--	--	--	-13.1	-15.6	-14.1	-20.4	-7.30	-8.65	**17.8**	-1.49
GS-CCB-MW-4	Landfill	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GS-CCB-MW-6	Landfill	**0.52**	**0.33**	**6.05**	**14.1**	**13.8**	-0.29	-2.26	--	--	--	-13.2	-14.6	-14.6	-18.0	-7.02	-7.57	**18.6**	-0.08
GS-CCB-MW-12	Landfill	--	-0.21	**5.58**	**13.1**	**13.6**	**0.71**	-0.57	--	--	--	-15.6	-17.1	-17.3	-20.5	-8.46	-7.71	--	**0.07**
GS-CCB-MW-13	Landfill	--	-0.06	**5.64**	**13.3**	**12.2**	-1.70	--	--	--	--	-11.8	-12.6	-13.2	-15.4	-6.00	-6.94	--	-0.09
GS-CCB-MW-14	Landfill	--	-0.11	**5.55**	**13.1**	**12.6**	-0.69	--	--	--	--	-14.0	-15.3	-15.2	-18.8	-7.28	-7.52	--	-0.32
GS-CCB-MW-15	Landfill	--	-0.07	**5.60**	**13.2**	**13.2**	-0.11	--	--	--	--	-14.6	-15.7	-15.8	-18.8	-7.47	-7.21	--	**0.03**
GS-CCB-MW-20	Landfill	--	**1.68**	**7.30**	**16.6**	**17.1**	**0.17**	--	--	--	--	-12.5	-13.7	-13.5	-17.2	-6.37	-7.38	--	-0.38
GS-AP-MW-6D	Ash Pond	--	**0.77**	**6.34**	**14.6**	**13.8**	-1.71	**11.7**	-5.94	-2.62	-4.23	-11.5	-12.3	-12.3	-15.4	-5.55	-6.93	--	-0.56
GS-AP-MW-7	Ash Pond	**1.94**	**1.82**	**7.40**	**16.8**	**19.1**	**0.35**	**11.4**	-5.35	-1.66	-1.02	-14.7	-14.5	-15.5	-16.5	-6.66	-5.92	**26.1**	-0.64
GS-AP-MW-8	Ash Pond	--	--	--	--	--	--	--	--	--	--	-17.1	-20.3	-18.0	-25.7	-9.58	-9.28	--	-2.30
GS-AP-MW-12	Ash Pond	--	**1.03**	**6.68**	**15.3**	**17.0**	**0.21**	**9.34**	--	--	--	-14.9	-15.1	-16.1	-17.4	-7.12	-6.31	--	-0.42
GS-AP-MW-18	Ash Pond	--	**1.52**	**7.09**	**16.2**	**17.0**	**0.11**	**5.58**	-7.03	-2.30	-2.40	-13.0	-13.5	-13.8	-16.3	-6.16	-6.62	--	-0.09

Notes:

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

SIs are for Plant Gorgas groundwater samples collected in February 2020.

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

SI: saturation index

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 constituents of interest.	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 constituents of interest. (Lithium is too light to be detected by XRF.)	Relationships are determined among elements in attenuating phases (e.g., iron and manganese) and constituents of interest. 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

Unit	Well ID	Arsenic	Molybdenum	Iron	Manganese	Aluminum	Calcium	Magnesium	Potassium	Silicon	Phosphorus	Sulfur
Ash pond	GS-AP-MW-8	133	1	3,690	ND	3,030	1,190	ND	393	26,700	8,420	295
	GS-AP-MW-6D	23	15	351	ND	22,000	1,750	ND	194	221,000	4,460	2,570
	GS-AP-MW-7	11	2	212	ND	4,570	8,630	ND	79	231,000	3,080	996
	GS-AP-MW-12	10	10	219	ND	5,220	214,000	12,900	128	95,500	1,860	584
	GS-AP-MW-18	27	25	438	ND	26,100	65,200	10,100	326	150,000	3,430	4,000
Gypsum pond	GS-GSA-MW-3	30	6	417	ND	34,400	3,940	ND	388	139,000	3,620	3,750
	GS-GSA-MW-4	31	12	362	ND	28,200	1,810	ND	347	148,000	3,270	2,200
Landfills	MW-1	15	25	298	3,640	12,500	954	ND	194	192,000	3,120	611
	MW-2	7	10	263	ND	12,800	1,340	ND	161	216,000	6,790	880
	MW-3	15	11	255	ND	19,600	1,070	ND	209	178,000	3,360	4,170
	MW-4	16	11	425	ND	27,200	1,420	5,440	354	159,000	3,230	445
	MW-13	19	13	317	ND	20,800	1,150	ND	249	180,000	3,140	5,620
	MW-14	19	17	292	ND	20,600	1,260	ND	240	166,000	2,990	7,550
	MW-6	27	17	353	ND	22,100	1,690	ND	297	221,000	3,960	2,430
	MW-12	69	60	347	ND	17,300	1,460	ND	231	201,000	3,280	2,030

Notes:

Direct analysis of lithium is not possible with portable XRF due to X-ray physics limitations.

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]

Unit	Well ID	Quartz	Feldspar	Zeolite	Mica	Clay Minerals			Carbonate	Oxide	Phosphate
			Albite		Muscovite-Illite	Kaolinite	Montmorillonite	Vermiculite	Calcite	Ferrihydrite	Iron Phosphate
Ash pond	GS-AP-MW-8	--	--	--	--	--	--	--	--	27.0	73.0
	GS-AP-MW-6D	99.6	--	0.3	--	--	0.1	--	--	--	--
	GS-AP-MW-7	98.8	--	0.1	--	--	0.1	--	0.9	--	--
Gypsum pond	GS-GSA-MW-4	36.8	--	2.0	61.0	--	--	0.2	--	--	--
Landfills	MW-2	33	5.0	--	45.3	16	--	0.8	--	--	--
	MW-3	27.2	--	--	52.9	19.7	--	0.2	--	--	--
	MW-4	42.6	3.9	--	48.6	4.7	--	0.2	--	--	--
	MW-13	46.3	--	--	37.0	16.5	--	0.2	--	--	--
	MW-12	57.8	--	--	28.3	13.9	--	--	--	--	--

Notes:

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

--: not detected

XRD: X-ray diffraction

Table 8
Cation Exchange Capacity of Well Solids Samples

Unit	Well ID	Calcium	Magnesium	Potassium	Sodium	Lithium	Sum
Ash pond	GS-AP-MW-6D	21	7.2	2.6	2.7	0.098	34
	GS-AP-MW-7	230	5.4	1.2	2.1	0.094	239
Gypsum pond	GS-GSA-MW-3	310	150	8.4	19	0.21	488
Landfills	MW-13	120	150	7.4	3.9	<0.1	282

Notes:

Units are in milliequivalents per kilogram.

<: indicates the compound was analyzed for but not detected

Table 9
Bulk Chemistry of Aquifer Solids Samples by XRF

Sample ID	Depth Interval (ft bgs)	Units	Arsenic	Molybdenum	Iron	Aluminum	Barium	Calcium	Magnesium	Manganese	Potassium	Silicon
GS-AP-MW-7V	4-5	ppm	10	<LOD	42,019	29,922	550	1,530	1,329	484	21,653	159,802
GS-AP-MW-7V	18–19	ppm	9	<LOD	44,732	51,166	450	627	<LOD	242	19,211	238,854
GS-AP-MW-23H	3.5-5	ppm	<LOD	<LOD	24,146	26,744	370	1,790	<LOD	135	15,661	161,741

Notes:

Direct analysis of lithium is not possible with portable XRF due to X-ray physics limitations.

Samples were analyzed on July 16, 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	Depth Interval (ft bgs)	Clay Minerals		Mica	Feldspar		Quartz
		Kaolinite	Vermiculite	Muscovite/Illite	Albite	K-Feldspar	
GS-AP-MW-7V 4-5	4–5	9.9	0.3	37.4		7.6	44.8
GS-AP-MW-7V 18-19	18–19	8.6	0.1	34.1	1.0		56.2
GS-AP-MW-23H 3.5-5	3.5–5	18.3		24.3		1.4	56.0

Notes:

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

ft bgs: feet below ground surface

XRD: X-ray diffraction

Table 11
Cation Exchange Capacity and Exchangeable Cations in Aquifer Soils

Monitoring Well Location	Depth Interval (ft bgs)	Exchangeable Cations (meq/kg soil)						CEC (meq/kg soil)
		Aluminum	Calcium	Magnesium	Potassium	Sodium	Lithium	
MW-23H	3.5–5	0.0694 U	**26.9**	**9.58**	**1.19**	**0.306**	0.009 U	**38.0**
MW-7V	4–5	0.0694 U	**30.9**	**38.8**	**4.15**	**0.89**	0.00899 U	**74.7**
MW-7V	18–19	0.0695 U	**24.3**	**26.2**	**6.84**	**0.841**	0.009 U	**58.2**
MW-7V[1]	18–19	0.0695 U	**26.2**	**26.9**	**6.66**	**0.857**	0.00901 U	**60.6**

Notes:

Bold indicates detected values.

1. Duplicate

CEC: cation exchange capacity

ft bgs: feet below ground surface

meq/kg: milliequivalents per kilogram

U: compound analyzed for but not detected above detection limit

Table 12
Extractable Aluminum, Manganese and Iron Oxides in Aquifer Soils

Well Location	Depth Interval (ft bgs)	Extractable Oxides (mg/kg soil)			Simultaneously Extractable Metals (mg/kg)		
		Aluminum	Iron	Manganese	Arsenic	Lithium	Molybdenum
GS-AP-MW-23H	3.5-5	**354**	**577**	**29.4**	**0.292 J**	0.735 U	0.147 U
GS-AP-MW-7V	4-5	**579**	**2050**	**244**	**1.49**	0.746 U	**0.345**
GS-AP-MW-7V	18-19	**758**	**1170**	**28.4**	**0.578**	0.758 U	**0.195 J**
GS-AP-MW-7V[1]	18-19	**729**	**1080**	**27.5**	**0.569**	0.735 U	0.147 U

Notes:

Bold indicates detected values.

Extractable oxides were determined by acid ammonium oxalate method.

1. Duplicate

ft bgs: feet below ground surface

J: estimated value

mg/kg: milligrams per kilogram

U: compound analyzed for but not detected above detection limit

Table 13

Geochemical Evidence for Attenuation Mechanisms for Arsenic, Lithium, and Molybdenum

Mechanism	Geochemical Modeling	XRF	XRD	SSE	CEC
Sorption on iron oxides (arsenic and molybdenum)	X	X	X	X	
Precipitation of arsenate phases (arsenic)	X				
Cation exchange on clays (lithium)			X		X

Notes:

X: indicates attenuation for arsenic, lithium, and/or molybdenum

CEC: cation exchange capacity

SSE: selective sequential extraction

XRD: X-ray diffraction

XRF: X-ray fluorescence

Table 14a
Hydraulic and Transport Parameters for Model Transect 1

Parameter	Units	Range of Values	Base Case Parameters	Notes
Linear distance, D_L	feet	500	500	Represents the linear distance between wells MW-7 and MW-41HD
Upgradient head, H1	feet NAVD88	304	304	Average groundwater elevation measured at MW-7 on 9/23/2019, 3/13/2020, and 9/14/2020
Downgradient head, H2	feet NAVD88	283	283	Average groundwater elevation measured at MW-41HD on 3/13/2020 and 9/14/2020
Hydraulic gradient, i	feet/feet	0.042	0.042	Equals $(H_1 - H_2)/D_L$
Bulk hydraulic conductivity, K_b	feet/day	0.39 - 0.93	0.68	Estimated from low-flow sampling data using the steady-state Thiem equation
Matrix porosity, nm	Dimensionless	0.0215	0.022	Total porosity reported by CoreLabs
Matrix hydraulic conductivity, Km	feet/day	1.86E-10	1.86E-10	Reported by CoreLabs
Matrix tortuosity, τ_m	Dimensionless	0.1–0.4	0.20	Base case value from Lipson (2005)
Mean fracture spacing, S	feet	1.67 - 10	5.6	Estimated from the MW-7 boring log and data from Snow (1968)
Representative mean fracture aperture, e	microns	100 - 250	180	Calculated from K_b and S following the method developed by Snow (1968)
Mean fracture porosity, n_f	Dimensionless	8.3E-05 - 2.0E-04	1.3E-04	Calculated following the method by Snow (1968)
Mean fracture hydraulic conductivity, Kf	feet/day	2,000 - 11,000	6,300	Calculated from $K_{b,}$ S, and e following the method developed by Snow (1968)
Molecular diffusion coefficient (entire model domain)	ft^2/day	5.0E-05–5.0E-04	1.86E-04	Equals the free-water diffusion coefficient of 1.0E-09 m^2/s X τ_m and converted to ft^2/day
Longitudinal dispersivity (entire model domain)	feet	--	1.87E-10	Assumed values
Ratio of transverse/longitudinal dispersion (entire model domain)	Dimensionless	--	0.10	Assumed values
Ratio of vertical/longitudinal dispersion (entire model domain)	Dimensionless	--	0.05	Assumed values

Notes:

Lipson, D.S., B.H. Kueper, and M.J. Gefell, 2005. "Matrix Diffusion-Derived Plume Attenuation in Fractured Bedrock." *Groundwater* 43(1):30−39.

Snow, D.T., 1968. "Rock Fracture Spacings, Openings, and Porosities." *Journal of the Soil Mechanics and Foundations Division* 94(1):73–91, 416–421, and 880–883.

--: not applicable

ft^2/day: square feet per day

m^2/s: square meters per second

NAVD88: North American Vertical Datum of 1988

Table 14b
Hydraulic and Transport Parameters for Model Transect 2

Parameter	Units	Range of Values	Base Case Parameters	Notes
Linear distance, D_L	feet	785	785	Represents the linear distance between wells MW-15 and MW-36H
Upgradient head, H1	feet NAVD88	373	373	Average groundwater elevation measured at MW-15 on 9/14/2020, 3/13/2020, 9/23/2019, and 4/15/2019
Downgradient head, H2	feet NAVD88	307	307	Average groundwater elevation measured at MW-36H on 9/14/2020 and 3/13/2020
Hydraulic gradient, i	feet/feet	0.084	0.084	Equals $(H_1 - H_2)/D_L$
Bulk hydraulic conductivity, K_b	feet/day	0.03-0.13	0.05	Estimated from low-flow sampling data using the steady-state Thiem equation
Matrix porosity, nm	Dimensionless	0.0215	0.022	Total porosity reported by CoreLabs
Matrix hydraulic conductivity, Km	feet/day	1.65E-10	1.65E-10	Reported by CoreLabs
Matrix tortuosity, τ_m	Dimensionless	0.1–0.4	0.20	Base case value from Lipson (2005)
Mean fracture spacing, S	feet	10	10.0	Calculated S data from Snow (1968)
Representative mean fracture aperture, e	microns	50	50	Calculated from K_b and S following the method developed by Snow (1968)
Mean fracture porosity, n_f	Dimensionless	2.6E-05–1.3E-04	6.7E-05	Calculated following the method by Snow (1968)
Mean fracture hydraulic conductivity, Kf	feet/day	1050-1150	1,100	Calculated from $K_{b,}$ S, and e following the method developed by Snow (1968)
Molecular diffusion coefficient (entire model domain)	ft^2/day	5.0E-05–5.0E-04	1.86E-04	Equals the free-water diffusion coefficient of 1.0E-09 m^2/s X τ_m and converted to ft^2/day
Longitudinal dispersivity (entire model domain)	feet	--	1.87E-10	Assumed values
Ratio of transverse/longitudinal dispersion (entire model domain)	Dimensionless	--	0.10	Assumed values
Ratio of vertical/longitudinal dispersion (entire model domain)	Dimensionless	--	0.05	Assumed values

Notes:

Lipson, D.S., B.H. Kueper, and M.J. Gefell, 2005. "Matrix Diffusion-Derived Plume Attenuation in Fractured Bedrock." *Groundwater* 43(1):30–39.

Snow, D.T., 1968. "Rock Fracture Spacings, Openings, and Porosities." *Journal of the Soil Mechanics and Foundations Division* 94(1):73–91, 416–421, and 880–883.

--: not applicable

ft^2/day: square feet per day

m^2/s: square meters per second

NAVD88: North American Vertical Datum of 1988

Table 15
Groundwater Chemistry Data Used in the Reactive Transport Models

		Model Transect 1[a,b]					Model Transect 2	
Sample Location ID:		GS-AP-MW-6D	GS-AP-MW-7	GS-AP-MW-23H	GS-AP-MW-24H	GS-AP-MW-41HD	GS-AP-MW-15	GS-AP-MW-36H
Analyte	Units	Upgradient	Upgradient	Downgradient	Downgradient	Downgradient	Upgradient	Downgradient
Eh	V	0.068	0.064	0.200	0.126	0.193	-0.038	0.046
pe	SUs	1.16	1.10	3.46	2.18	3.33	-0.65	0.78
pH	SUs	7.41	7.74	5.74	7.02	7.22	11.9	8.18
Alkalinity	mg/L	187	119	91.8	219	135	575	202
Arsenic	mg/L	0.093	0.282	0.058	0.005 U	0.002	0.017	0.001
Barium	mg/L	0.378	0.124	0.015	0.988	0.041	0.119	0.038
Boron	mg/L	1.22	1.54	0.064	0.069	1.42	0.054	0.035
Calcium	mg/L	61.5	12.2	87.2	45.5	61.1	3.83	4.12
Chloride	mg/L	10.5	6.17	1.92	3.19	6.63	6.00	38.5
Iron	mg/L	0.028	7.20	49.3	1.99	0.046	0.077	0.044
Lithium	mg/L	0.299	0.160	0.033	0.024	0.341	0.414	0.035
Magnesium	mg/L	15.9	5.16	36.7	13.6	18.1	0.372	0.896
Manganese	mg/L	0.163	0.110	1.61	0.097	0.459	0.001	0.007
Molybdenum	mg/L	0.009	0.215	0.01 U	0.01 U	0.026	0.074	0.011
Potassium	mg/L	2.27	1.53	1.52	1.54	1.61	10.4	7.43
Sodium	mg/L	28.3	105	17.5	29.7	17.3	255	127
Sulfate	mg/L	65.1	131	361	6.70	105	13.2	50.2

Notes:

a. Average of MW-6D and MW-7 data used for Transect 1 upgradient chemistry, except for the constituents of interest, which used the maximum concentration of the two wells.

b. Average of MW-23H, MW-24H, and MW-41HD data used for Transect 1 downgradient chemistry.

Groundwater chemistry data from September 2020.

mg/L: milligrams per liter

SU: standard unit

U: compound analyzed for but not detected above detection limit

V: volts

Table 16
Cation Exchange and Sorption Capacity for the Model Transects

Constituent	Units[1]	Fracture	Rock Matrix
Cation exchange capacity (X)	mol/L	0.13	0.13
Iron oxides	mol/L	11	0.24
≡FeOH (weak)	mol/L	2.2	0.048

Notes:

1. Units are mol/L-water for the fracture (porosity = 100%) and mol/L-bulk for the rock matrix (porosity = 2.2%).

X: ion exchange site

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

mol/L: moles per liter

Table 17
Initial Groundwater Characterization Results

Parameter	Result		Units
	MW-6D	MW-7	
Alkalinity	182	104	mg/L as $CaCO_3$
Ammonia as N	0.567	0.406	mg/L
Total organic carbon	0.90	0.46 J	mg/L
Chloride	8.06	5.88	mg/L
Fluoride	0.01 U	0.01 U	mg/L
Nitrate as N[1]	0.007 U	0.007 U	mg/L
Nitrite as N	0.003 U	0.003 U	mg/L
Orthophosphate	0.187	0.199	mg/L
Sulfate	68.0	140	mg/L
Aluminum, dissolved	5 J	6 J	µg/L
Aluminum, total	5 J	6 J	µg/L
Antimony, dissolved	0.10 U	0.10 U	µg/L
Arsenic, dissolved	118	254	µg/L
Barium, dissolved	537	57.4	µg/L
Beryllium	0.03 U	0.03 U	µg/L
Boron, dissolved	1,510	1,790	µg/L
Cadmium, dissolved	0.04 U	0.04 U	µg/L
Calcium, dissolved	57.8	11.6	mg/L
Chromium, dissolved	0.2 U	0.2 U	µg/L
Cobalt, dissolved	0.05 U	0.05 U	µg/L
Iron, dissolved	17	11	µg/L
Iron, total	22	172	µg/L
Lead, dissolved	0.03 U	0.03 U	µg/L
Lithium, dissolved	335	186	µg/L
Magnesium, dissolved	15.4	3.88	mg/L
Manganese, dissolved	191	36.0	µg/L
Manganese, total	182	35.6	µg/L
Molybdenum, dissolved	5.72	218	µg/L
Nickel, dissolved	0.2 U	0.2 U	µg/L
Potassium, dissolved	2.25	1.18	mg/L
Selenium, dissolved	1.0 U	1.0 U	µg/L
Silicon, dissolved	6.85	5.37	mg/L
Silver, dissolved	0.05 U	0.05 U	µg/L
Sodium, dissolved	26.2	910	mg/L
Thallium, dissolved	0.05 U	0.05 U	µg/L
Zinc, dissolved	3 J	3 J	µg/L
pH	7.31	7.45	--

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 the result is an estimated value

mg/L: milligrams per liter

N: nitrogen

U: indicates the compound was analyzed for but not detected

Table 18
Site Soils and Groundwater Used in Column Tests

Column Number	Soil ID	Groundwater ID	Constituents of Interest in Groundwater
1	GS-AP-MW-23H 3.5'-5.0'	MW-6D	Arsenic, lithium, and molybdenum
2	GS-AP-MW-23H 3.5'-5.0'	MW-7	Arsenic, lithium, and molybdenum
3	GS-AP-MW-7V 4.0'-5.0'	MW-6D	Arsenic, lithium, and molybdenum
4	GS-AP-MW-7V 4.0'-5.0'	MW-7	Arsenic, lithium, and molybdenum
5	GS-AP-MW-7V 18.0'-19.0'	MW-6D	Arsenic, lithium, and molybdenum
6	GS-AP-MW-7V 18.0'-19.0'	MW-7	Arsenic, lithium, and molybdenum

Table 19
Column Test Operating Conditions

Parameter	Value	Unit
Soil/sand mixture depth	12.8	cm
Column inside diameter	2.68	cm
Flow rate	0.40	mL per minute
Empty bed contact time	3.01	hours
Porosity	30–35	%
Dry mass of soil in column	55.0–62.5	grams
Mass of clean sand in column	55.0–62.5	grams
Hydraulic residence time	0.90–1.05	hours
Darcy flux	30.6–35.7	cm per day
Linear velocity	102	cm per day
Column test duration	14	days

Notes:
cm: centimeter
mL: milliliter

Table 20
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	12	>4,800	>400 times
Lithium	45	>18,000	>400 times
Molybdenum	13	3,900	300 times

Notes:
>: significantly greater than
COI: constituent of interest
kg: kilogram

Table 21
Post-Column Test Soil SSE Results

Boring Location	Depth Interval (ft bgs)	Groundwater	Arsenic (mg/kg)					Iron (mg/kg)					Lithium (mg/kg)					Manganese (mg/kg)					Molybdenum (mg/kg)				
			F1	F2	F3	F4	F5	F1	F2	F3	F4	F5	F1	F2	F3	F4	F5	F1	F2	F3	F4	F5	F1	F2	F3	F4	F5
GS-AP-MW-23H	3.5–5	MW-6D	1.97 U	**4.25**	**0.249 J**	**0.474**	**0.639 J**	--	98.4 U	**38.4**	**383**	**2,140**	9.84 U	9.84 U	0.984 U	0.984 U	2.73 U	--	**3.83 J**	**3.57**	**2.75**	**1.41**	1.97 U	1.97 U	0.197 U	0.197 U	0.546 U
GS-AP-MW-23H	3.5–5	MW-7	2.1 U	**8.57**	**0.403 J**	**0.627**	**1.84**	--	105 U	**60.8**	**409**	**4,070**	10.5 U	10.5 U	1.05 U	1.05 U	2.66 U	--	**3.49 J**	**5.5**	**2.67**	**2.73**	2.1 U	2.1 U	0.21 U	0.21 U	0.532 U
GS-AP-MW-7V	4–5	MW-6D	1.97 U	**2.67 J**	**0.22 J**	**0.737**	**1.85**	--	98.4 U	**191**	**1,910**	**6,840**	9.84 U	9.84 U	0.984 U	0.984 U	**3.51 J**	--	**24.1**	**54.1**	**42.2**	**21.1**	1.97 U	1.97 U	0.197 U	0.197 U	0.515 U
GS-AP-MW-7V	4–5	MW-7	1.94 U	**4.77**	**0.369 J**	**1.07**	**2.63**	--	96.9 U	**197**	**2,160**	**7,980**	9.69 U	9.69 U	0.969 U	0.969 U	**3.56 J**	--	**22.6**	**40.7**	**53.5**	**22.2**	1.94 U	1.94 U	0.194 U	0.194 U	0.536 U
GS-AP-MW-7V	18–19	MW-6D	1.94 U	**2.69 J**	**0.202 J**	**0.467**	**2.26**	--	96.9 U	**71.6**	**740**	**12,500**	9.69 U	9.69 U	0.969 U	0.969 U	**5.09**	--	**2.43 J**	**4.46**	**7.98**	**32.2**	1.94 U	1.94 U	0.194 U	0.194 U	0.508 U
GS-AP-MW-7V	18–19	MW-7	2.5 U	**2.8 J**	**0.272 J**	**0.486 J**	**1.51**	--	125 U	**86.3**	**915**	**6,670**	12.5 U	12.5 U	1.25 U	1.25 U	**5.47 J**	--	2.5 U	**6.78**	**10.4**	**25.9**	2.5 U	2.5 U	0.25 U	0.25 U	0.549 U
GS-AP-MW-7V[1]	18–19	MW-7	2.5 U	**3.19 J**	**0.291 J**	**0.599**	**3.46**	--	125 U	**63.2**	**1,050**	**10,400**	12.5 U	12.5 U	1.25 U	1.25 U	**8.72**	--	2.5 U	**7.96**	**14.8**	**62.7**	2.5 U	2.5 U	0.25 U	0.25 U	0.542 U

Notes:

Bold indicates detected values.

1. Duplicate

--: not measured

F1: water soluble

F2: exchangeable

F3: reducible (iron/manganese oxide bound)

F4: strong acid oxidizable (sulfide/organic/crystalline oxide bound)

F5: residual

ft bgs: feet below ground surface

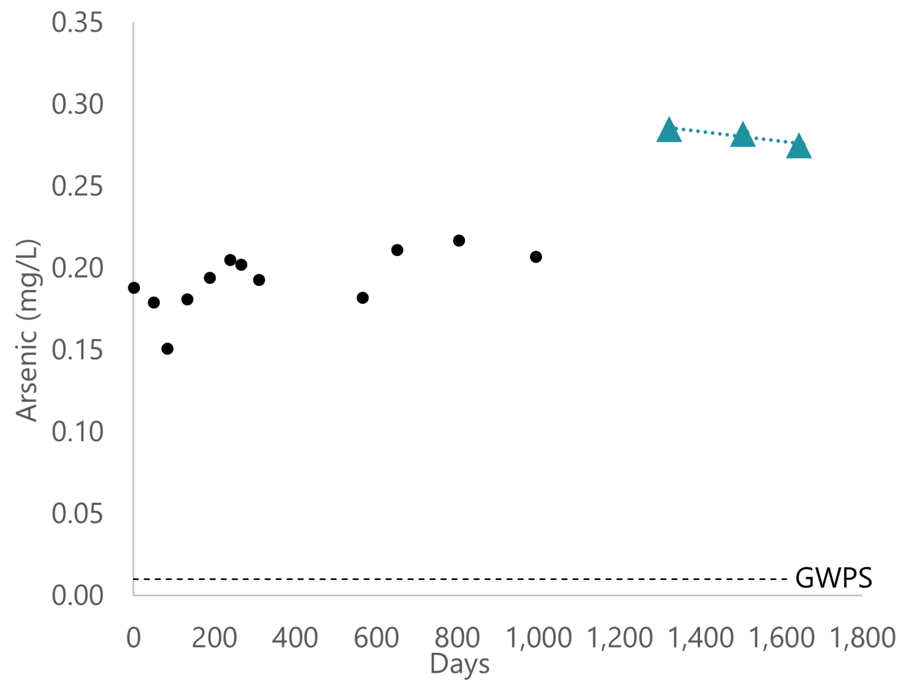
J: estimated value

mg/kg: milligrams per kilogram

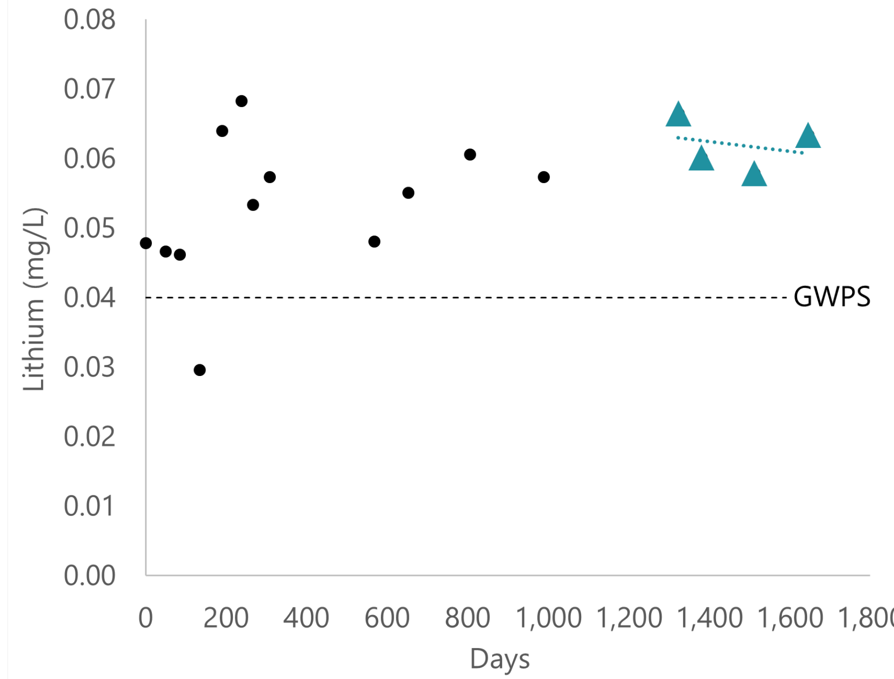
SSE: selective sequential extraction

U: compound analyzed for but not detected above detection limit

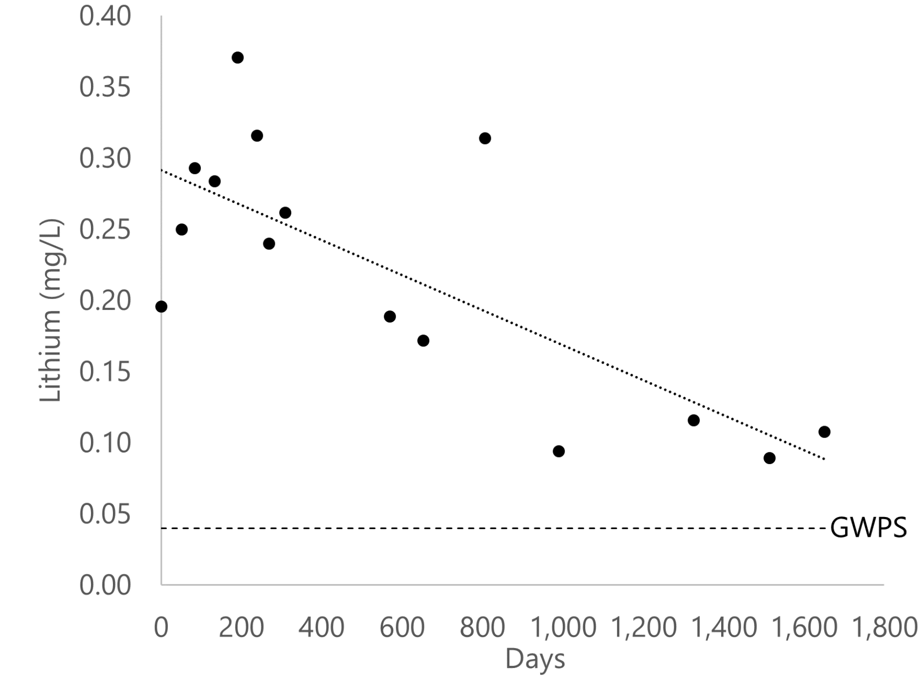
Figures



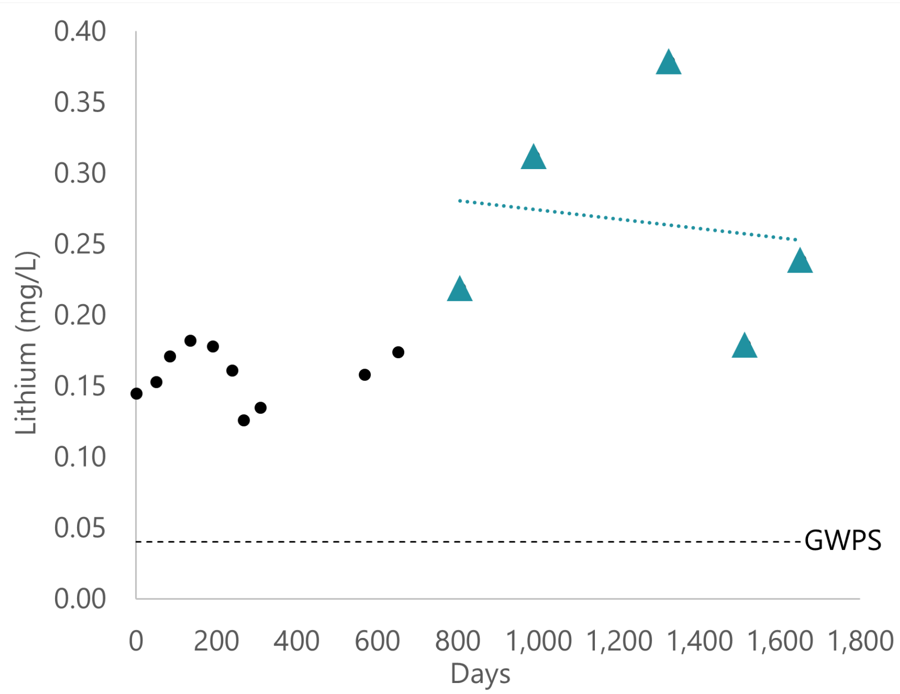
Arsenic at GS-AP-MW-7 (Ash Pond)[1]



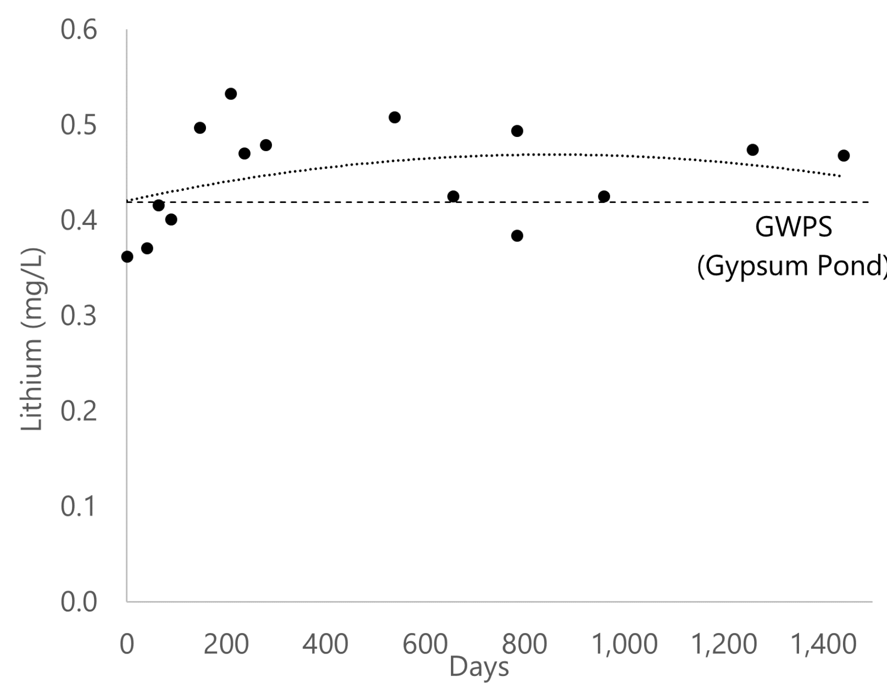
Lithium at GS-AP-MW-17 (Ash Pond)[1]



Lithium at GS-AP-MW-18 (Ash Pond)

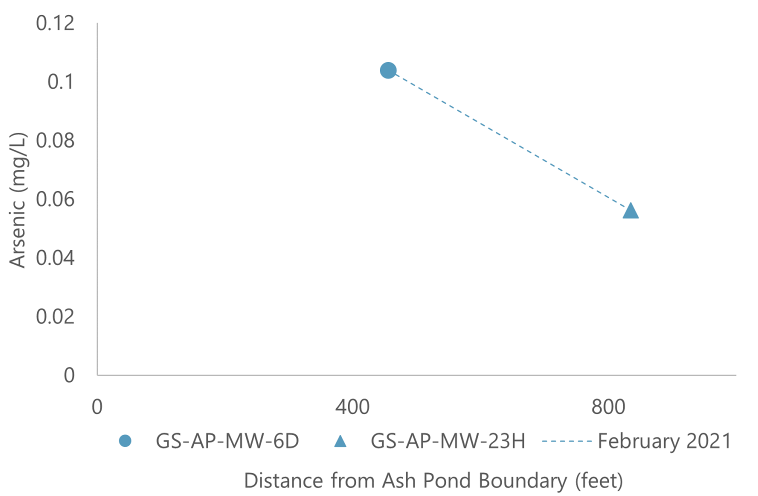


Lithium at GS-AP-MW-21 (Ash Pond)[1]

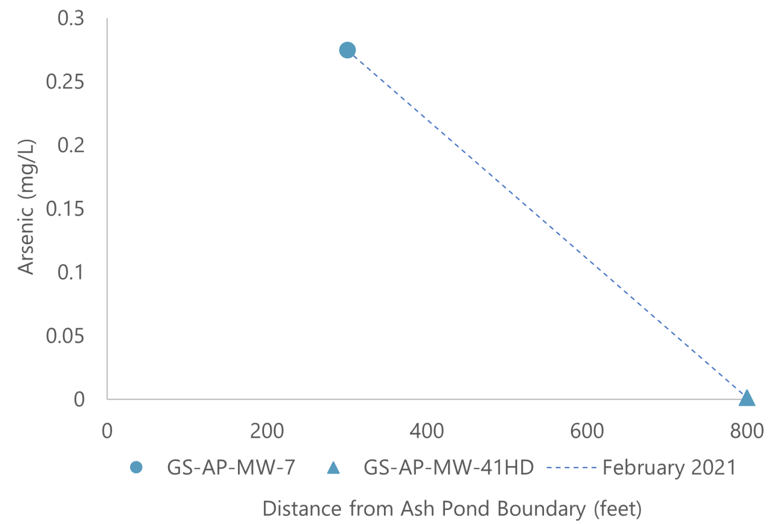


Lithium at GS-GSA-MW-3 (Gypsum Pond)

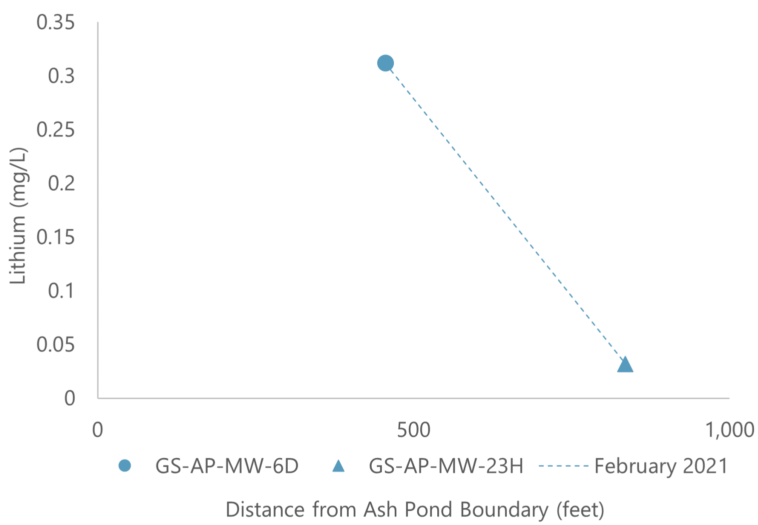
Notes:
1: Denotes recent data was used to determine time to achieve GWPS
Arsenic GWPS at Ash Pond: 0.01 mg/kg
Lithium GWPS at Ash Pond: 0.04 mg/kg
Lithium GWPS at the Gypsum Pond: 0.419 mg/kg
GWPS: groundwater protection standard
mg/L: milligrams per liter



GS-AP-MW-6D to GS-AP-MW-23H (arsenic)

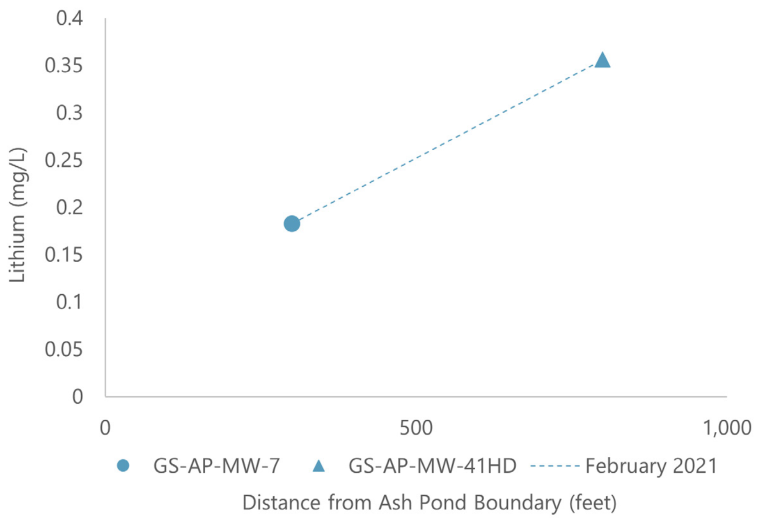


GS-AP-MW-7 to GS-AP-MW-41HD (arsenic)

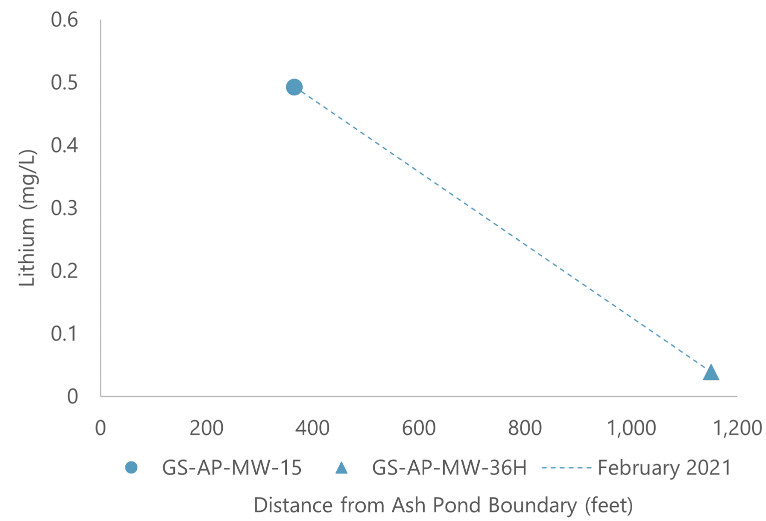


GS-AP-MW-6D to GS-AP-MW-23H (lithium)

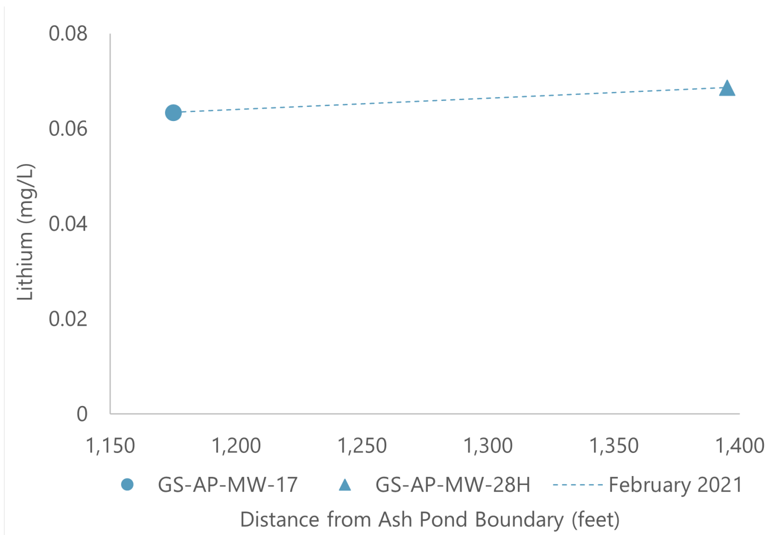
Notes:
Transect selection criteria assume radial flow path from the Site.
mg/L: milligrams per liter



GS-AP-MW-7 to GS-AP-MW-41HD (lithium)

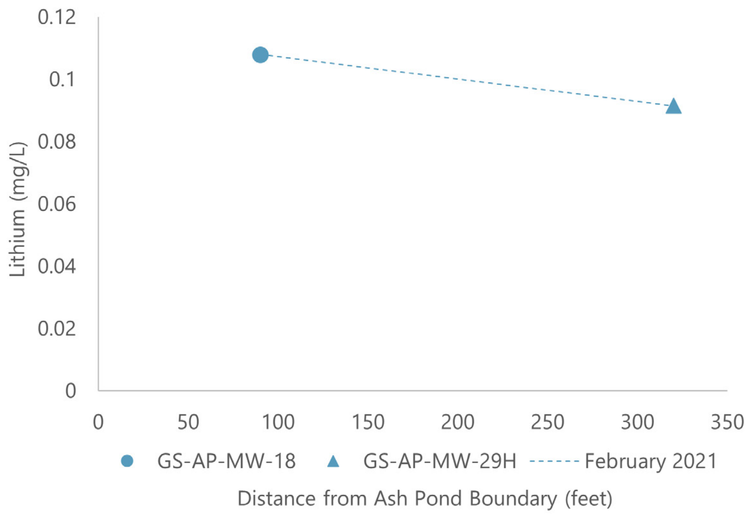


GS-AP-MW-15 to GS-AP-MW-36H (lithium)

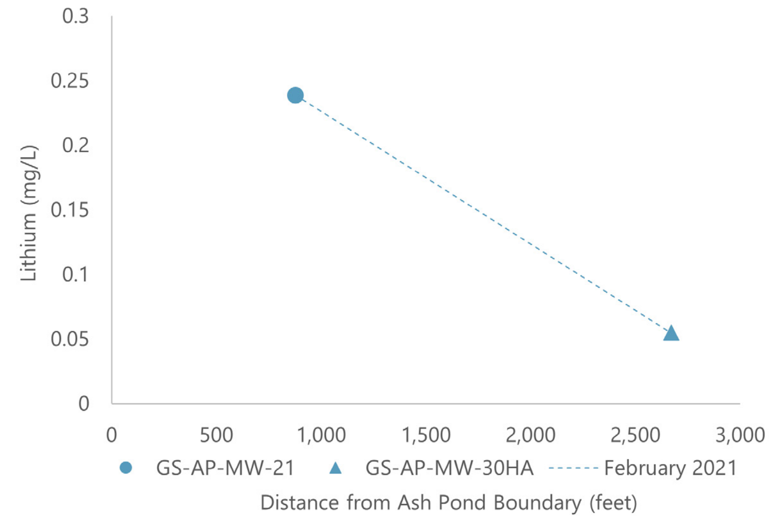


GS-AP-MW-17 to GS-AP-MW-28H (lithium)

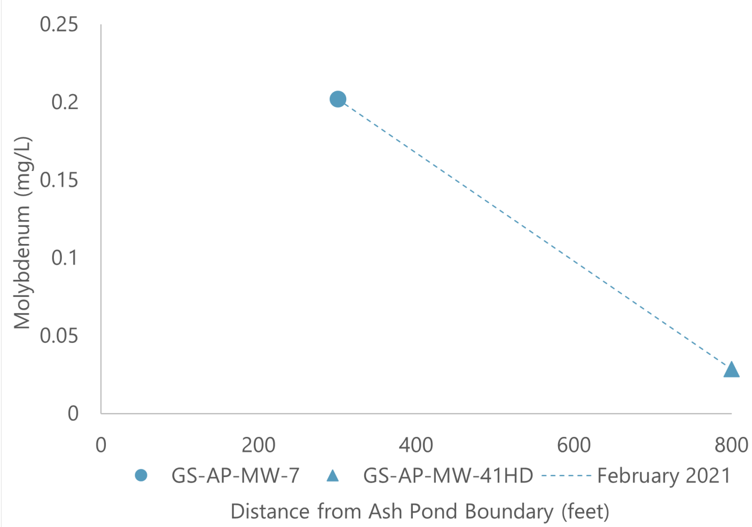
Notes:
Transect selection criteria assume radial flow path from the Site.
mg/L: milligrams per liter



GS-AP-MW-18 to GS-AP-MW-29H (lithium)



GS-AP-MW-21 to GS-AP-MW-30HA (lithium)

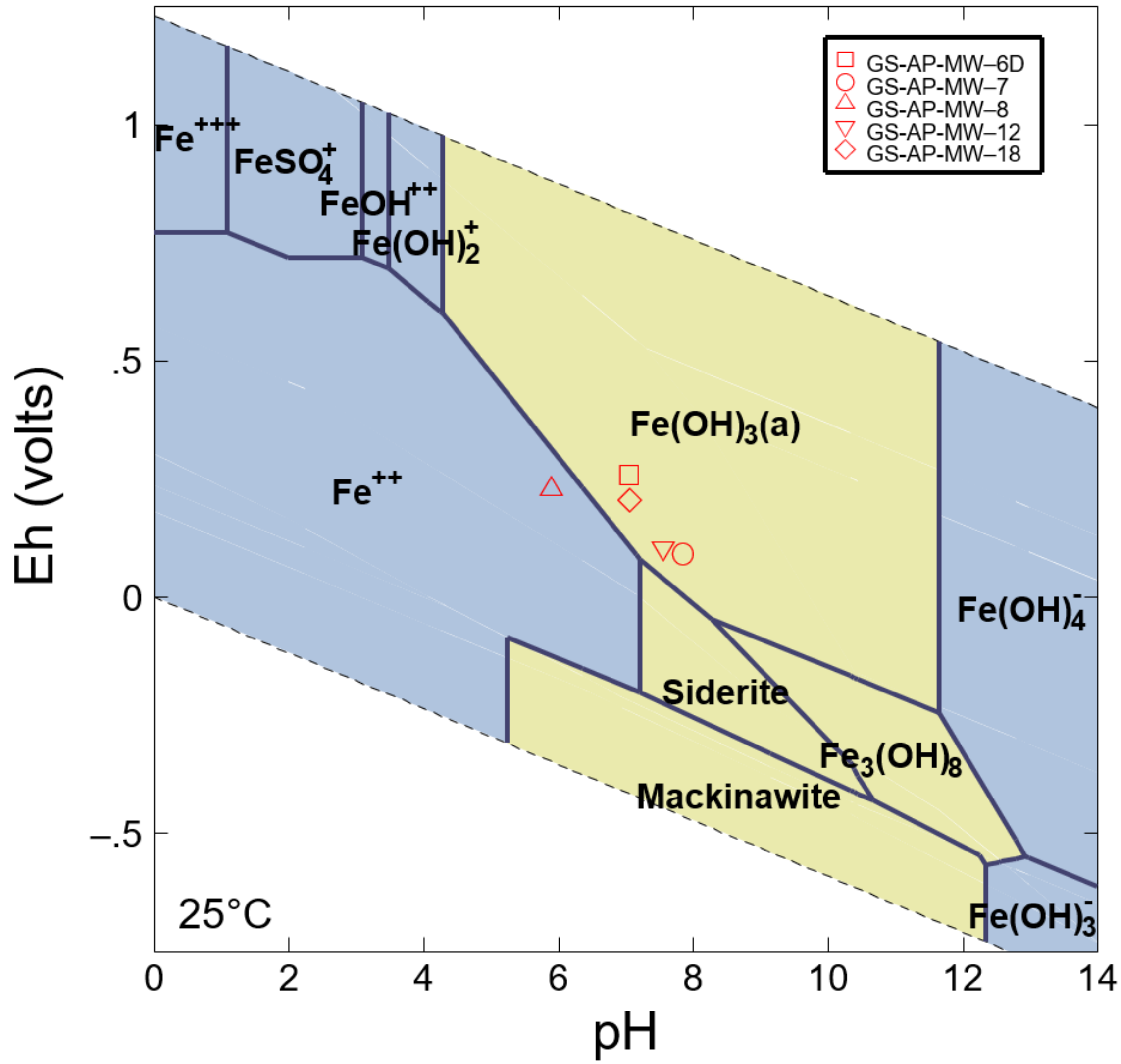


GS-AP-MW-7 to GS-AP-MW-41HD (molybdenum)

Notes:
Transect selection criteria assume radial flow path from the Site.
mg/L: milligrams per liter

ANCHOR QEA

Figure 2c
Concentration Versus Distance Graphs
Monitored Natural Attenuation Demonstration
Plant Gorgas



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

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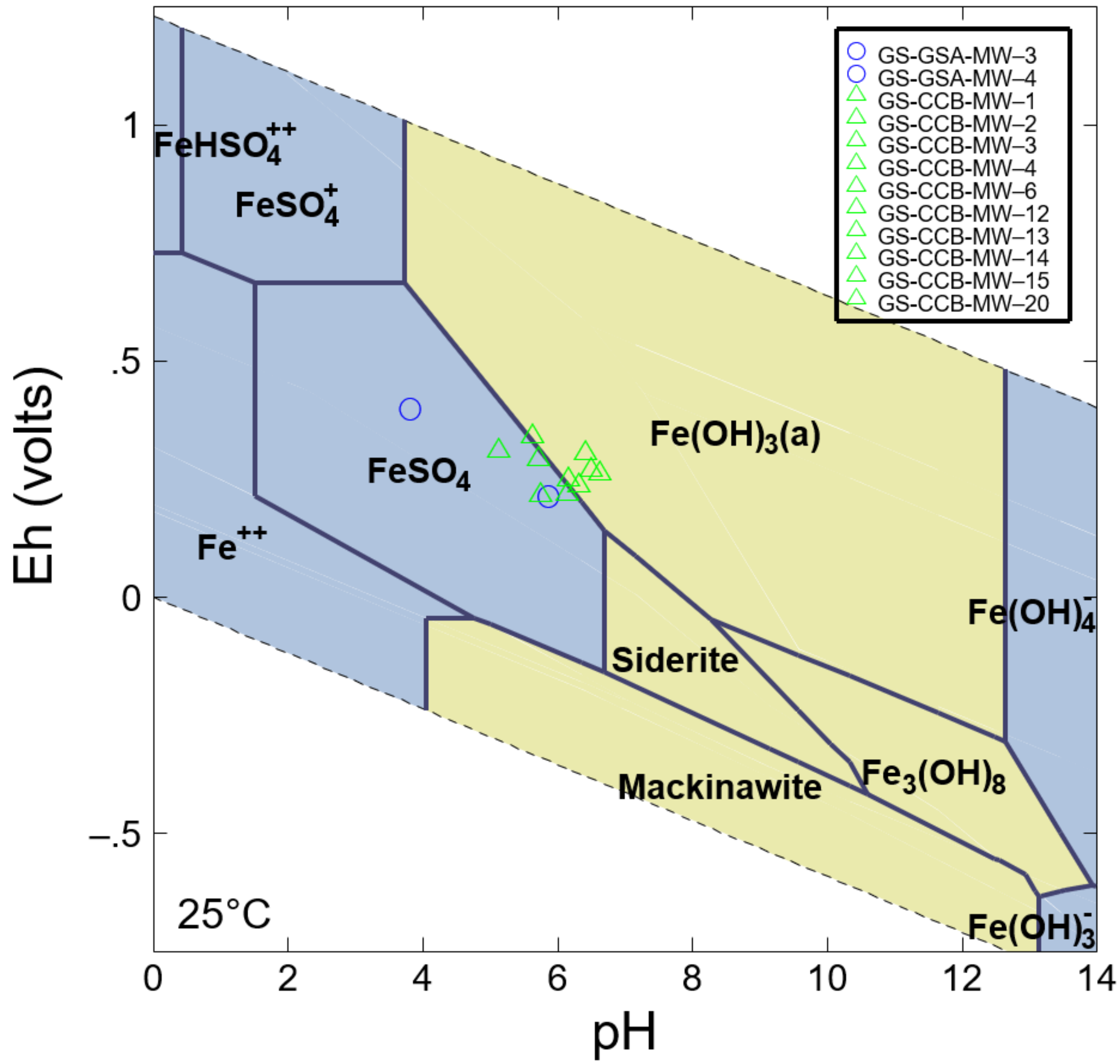
Figure 3
Eh-pH Stability Diagram for Dissolved and Solid Iron Phases: Ash Pond
Monitored Natural Attenuation Demonstration
Plant Gorgas



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

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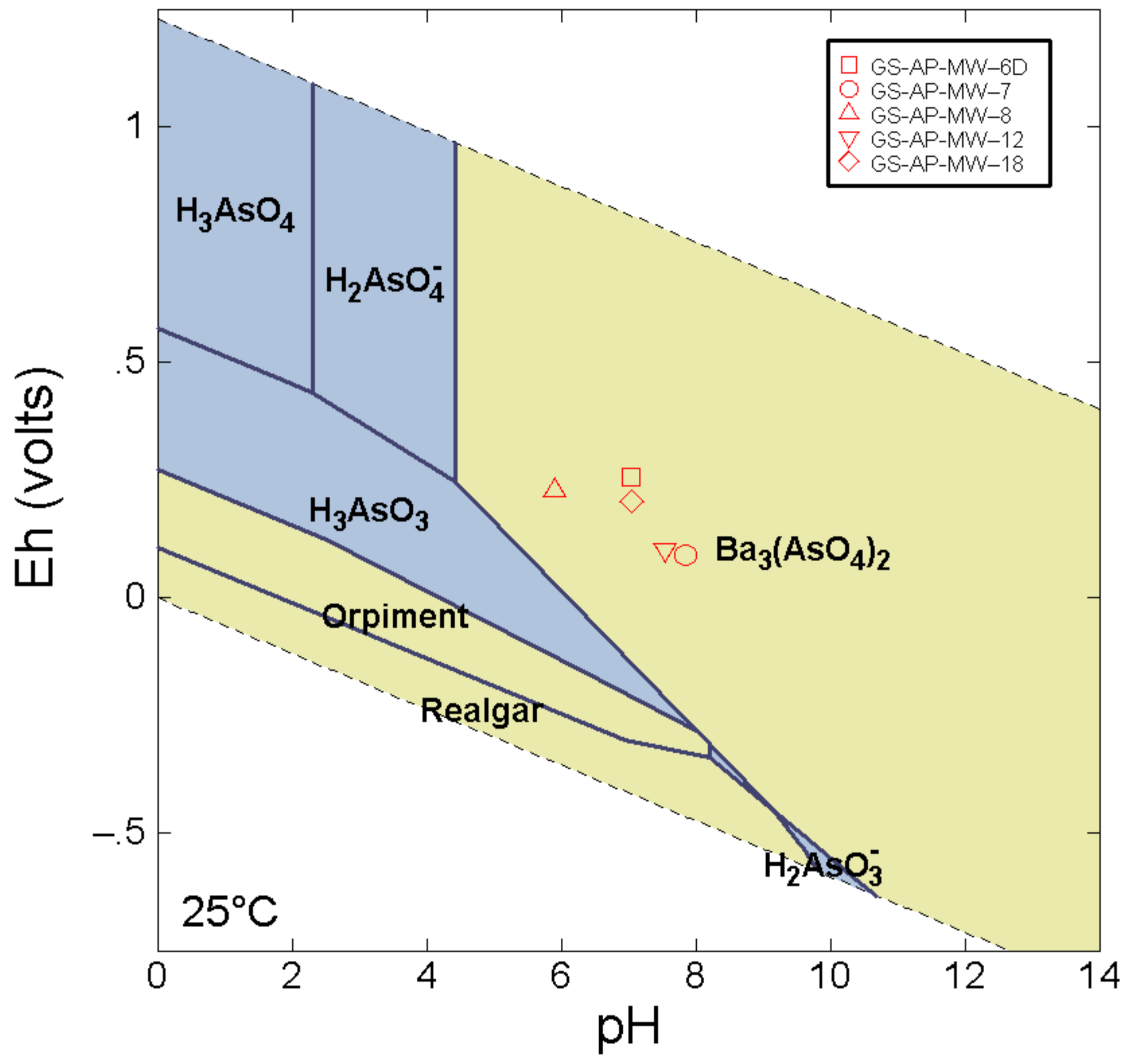
Figure 4
Eh-pH Stability Diagram for Dissolved and Solid Iron Phases: Gypsum Pond and Landfills
Monitored Natural Attenuation Demonstration
Plant Gorgas



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

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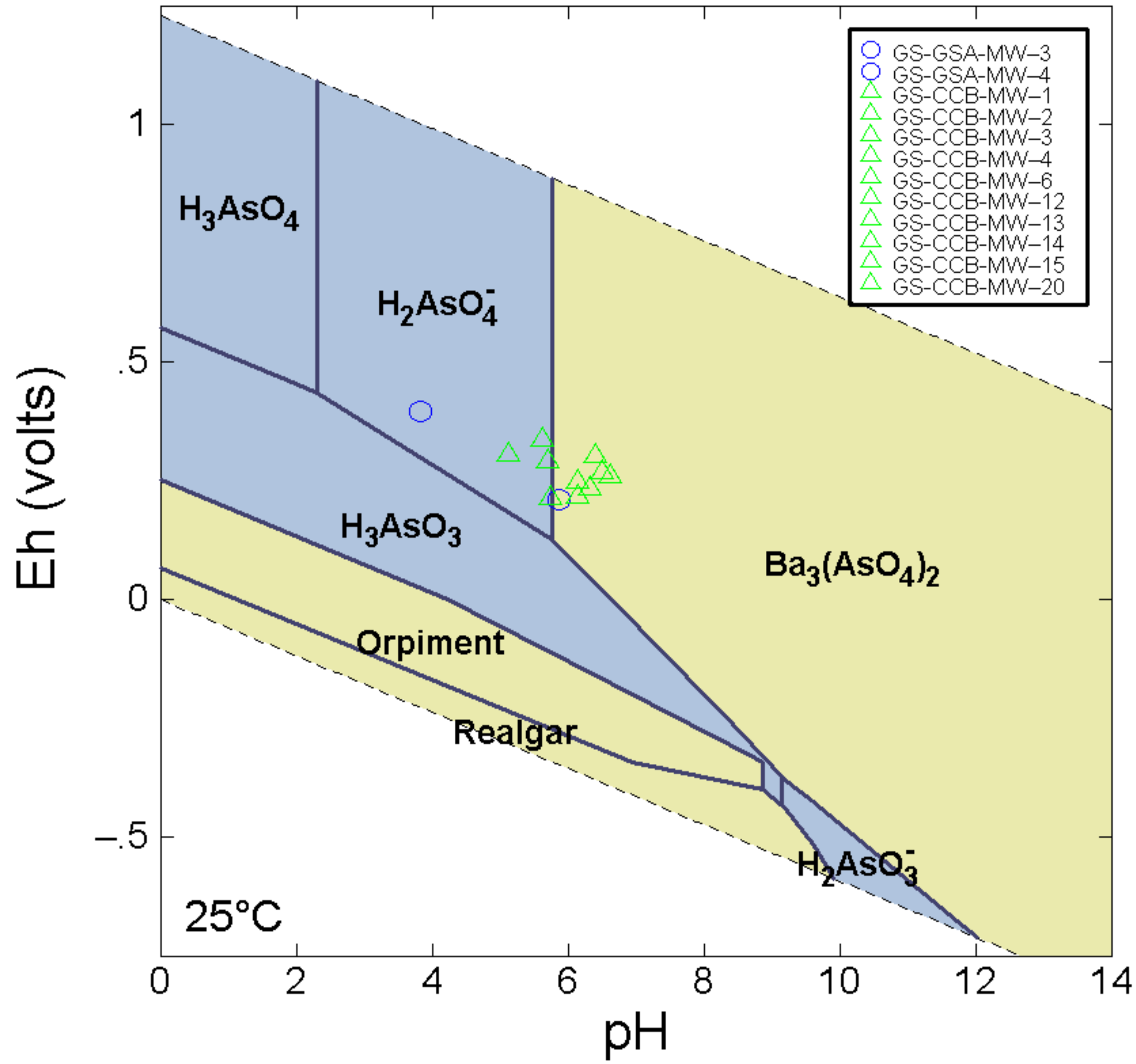
Figure 5
Eh-pH Stability Diagram for Dissolved and Solid Arsenic Phases: Ash Pond
Monitored Natural Attenuation Demonstration
Plant Gorgas



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

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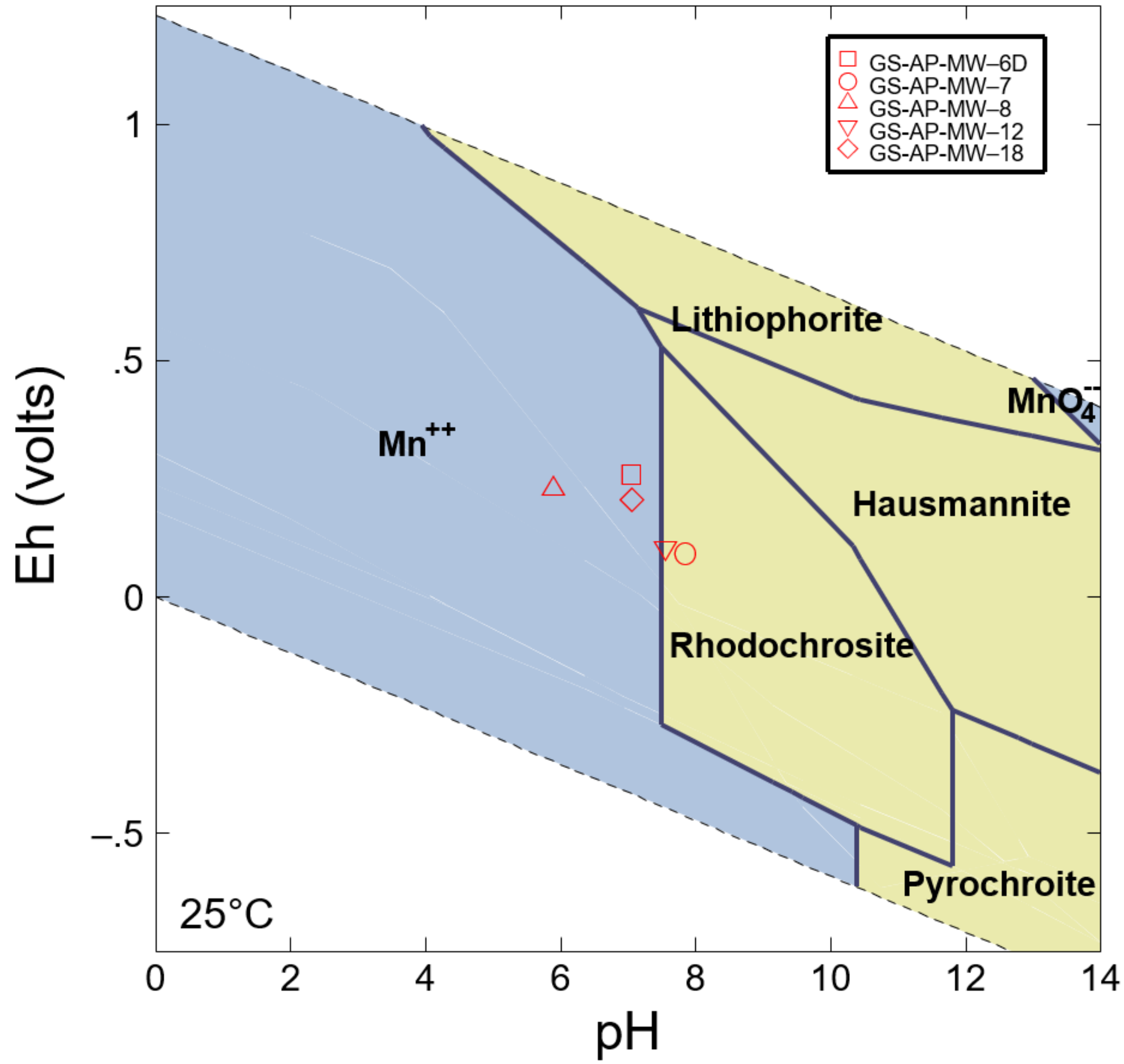
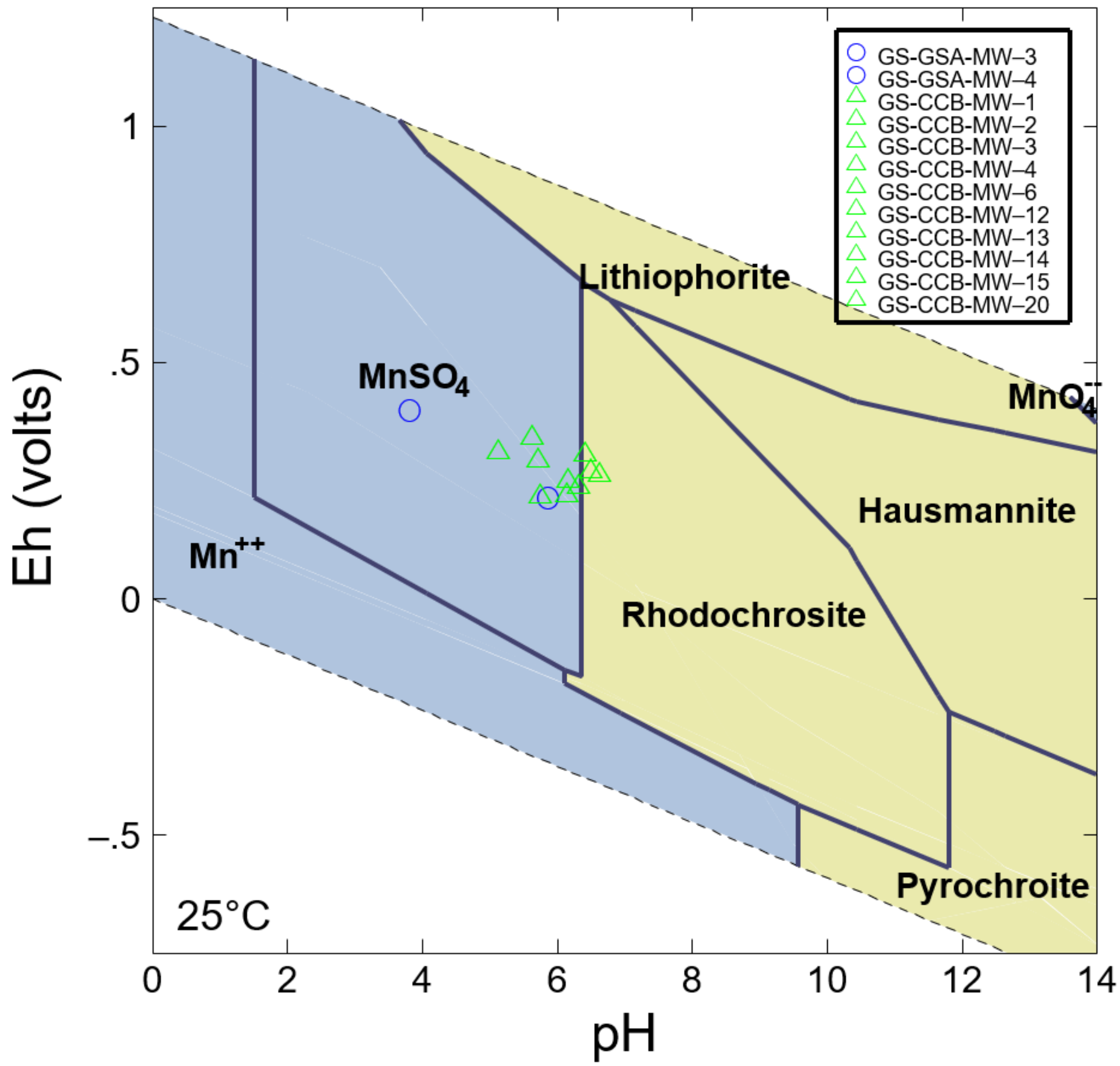
Figure 6
Eh-pH Stability Diagram for Dissolved and Solid Arsenic Phases: Gypsum Pond and Landfills
Monitored Natural Attenuation Demonstration
Plant Gorgas



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

Figure 7
Eh-pH Stability Diagram for Dissolved and Solid Manganese Phases: Ash Pond
Monitored Natural Attenuation Demonstration
Plant Gorgas



Note:

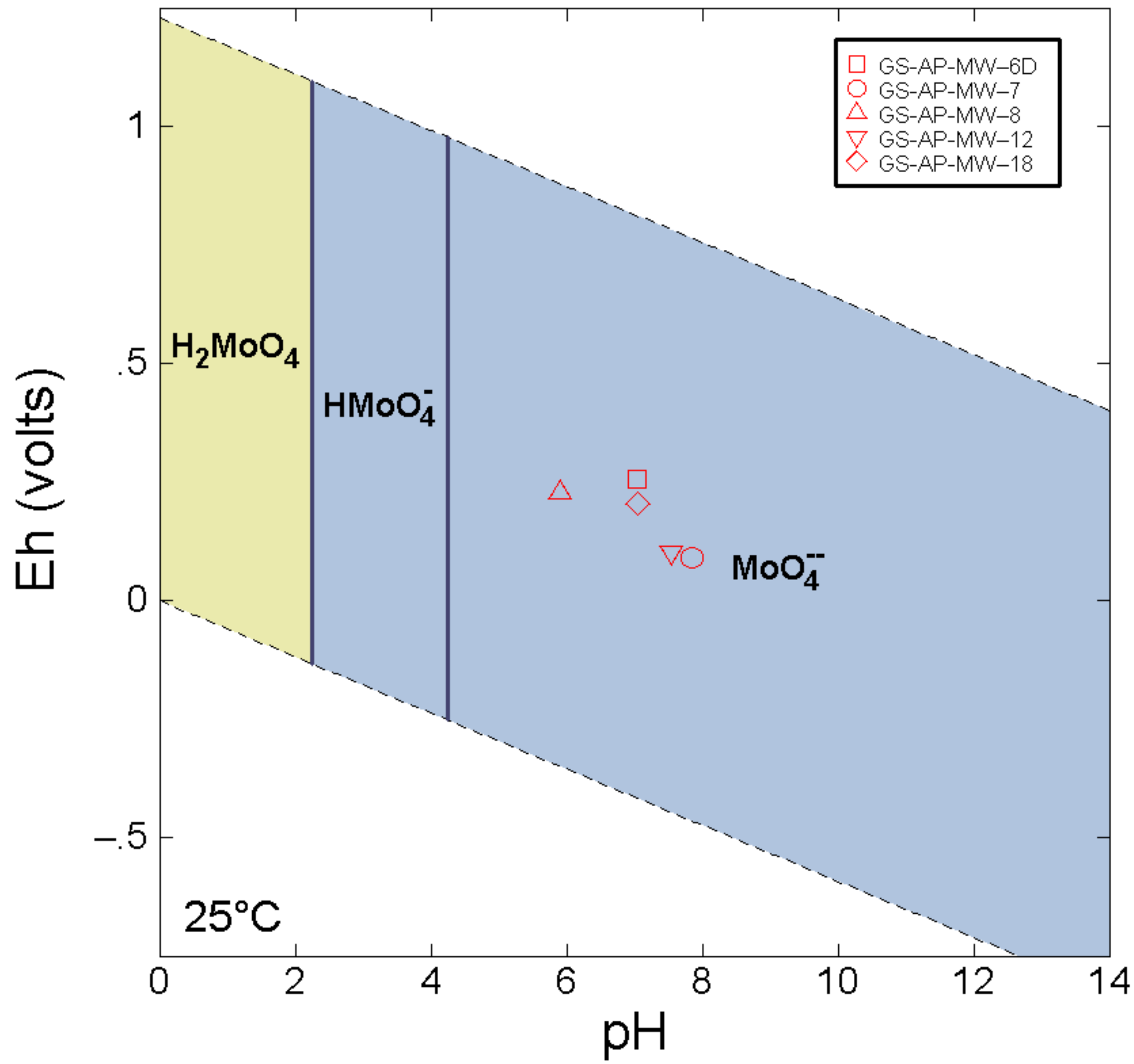
Blue fields indicate dissolved/mobile species. Yellow fields indicate solid/attenuated species.

Figure 8

Eh-pH Stability Diagram for Dissolved and Solid Manganese Phases: Gypsum Pond and Landfills

Monitored Natural Attenuation Demonstration

Plant Gorgas



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

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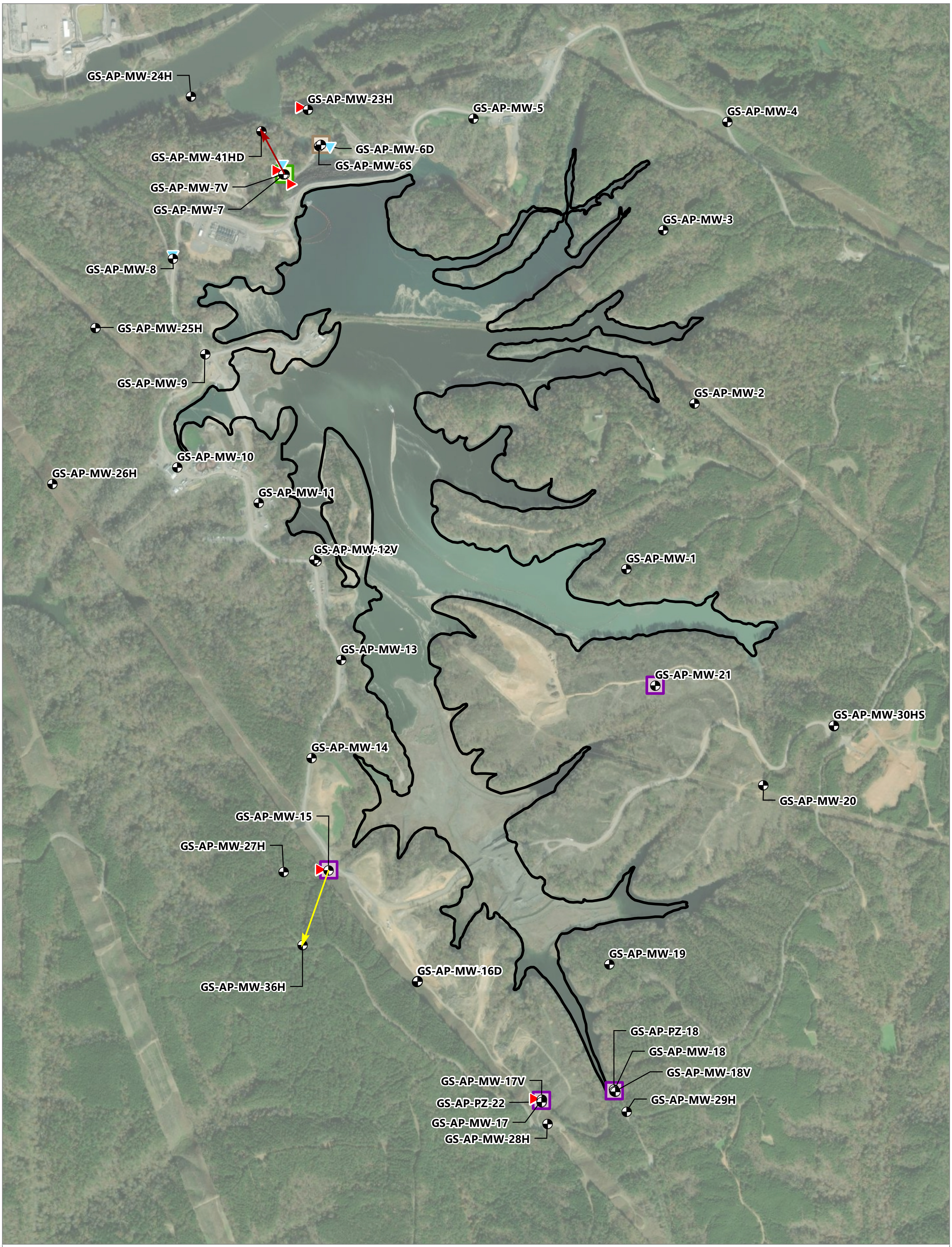
Figure 9
Eh-pH Stability Diagram for Dissolved and Solid Molybdenum Phases: Ash Pond
Monitored Natural Attenuation Demonstration
Plant Gorgas



LEGEND:

- Ash Pond Boundary
- Gorgas Well
- Soil/Rock Sample
- Groundwater Sample
- Lithium SSL
- Arsenic and Lithium SSLs
- Arsenic, Lithium, and Molybdenum SSLs
- Transect 1
- Transect 2

NOTE:
SSL: Statistically significant level

Groundwater Samples:
- GS-AP-MW-6D
- GS-AP-MW-7
- GS-AP-MW-8

Soil/Rock Samples:
- GS-AP-MW-7
- GS-AP-MW-7V
- GS-AP-MW-15
- GS-AP-MW-17V
- GS-AP-MW-23H

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Feet

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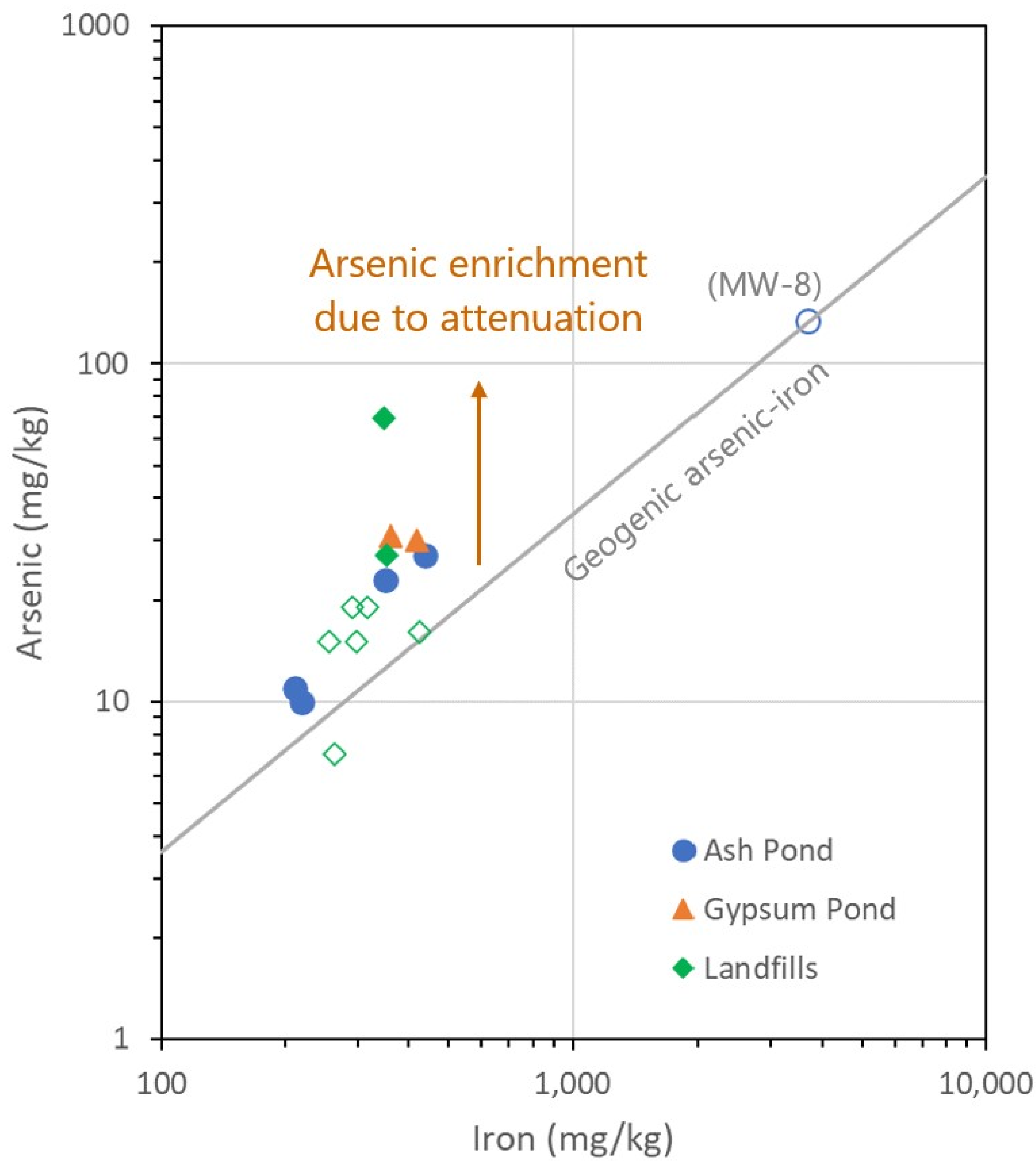
Figure 10
Transport Model Transect and Sampling Locations
Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes:
Open markers indicate upgradient wells.
mg/kg: milligrams per kilogram

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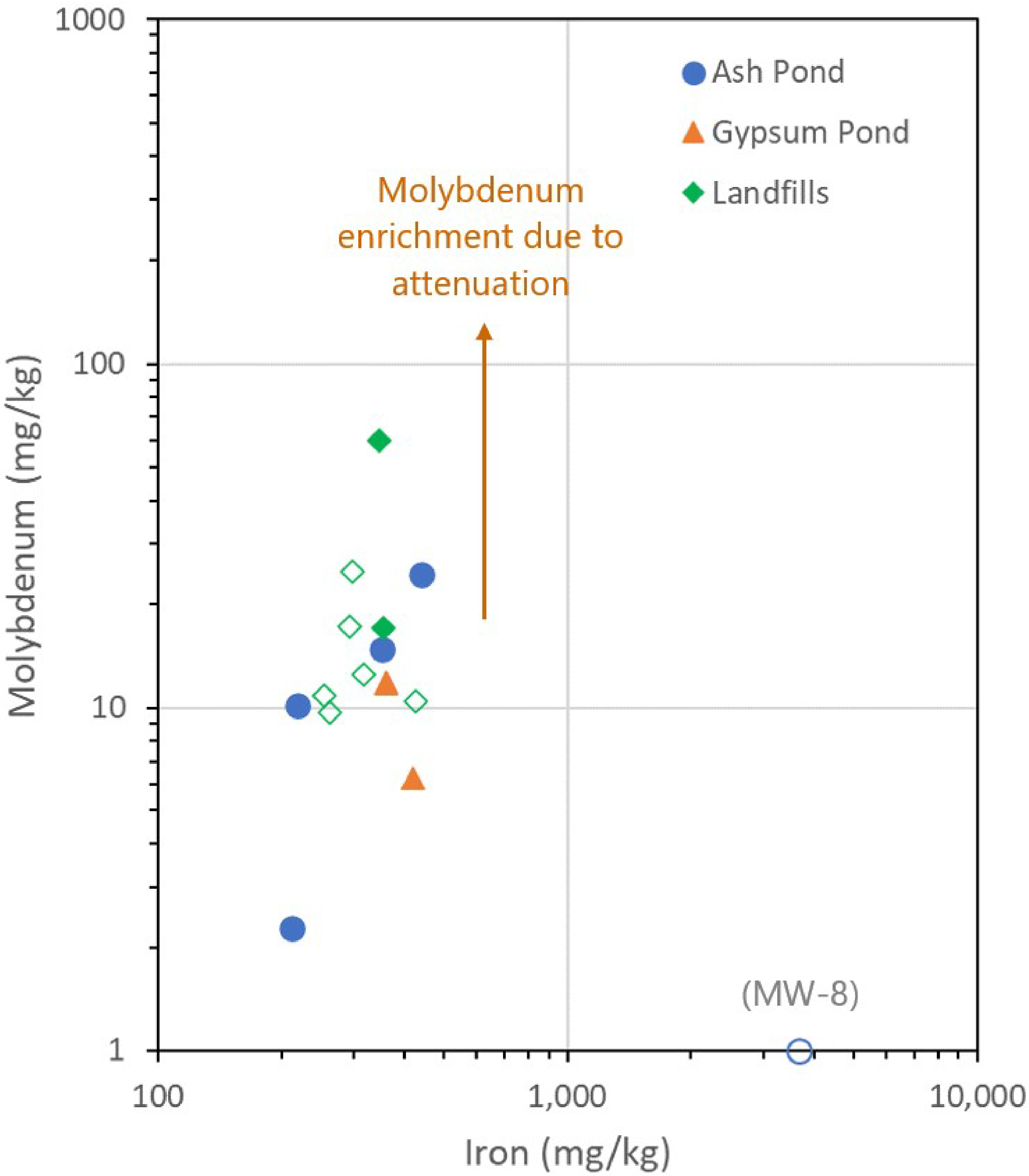
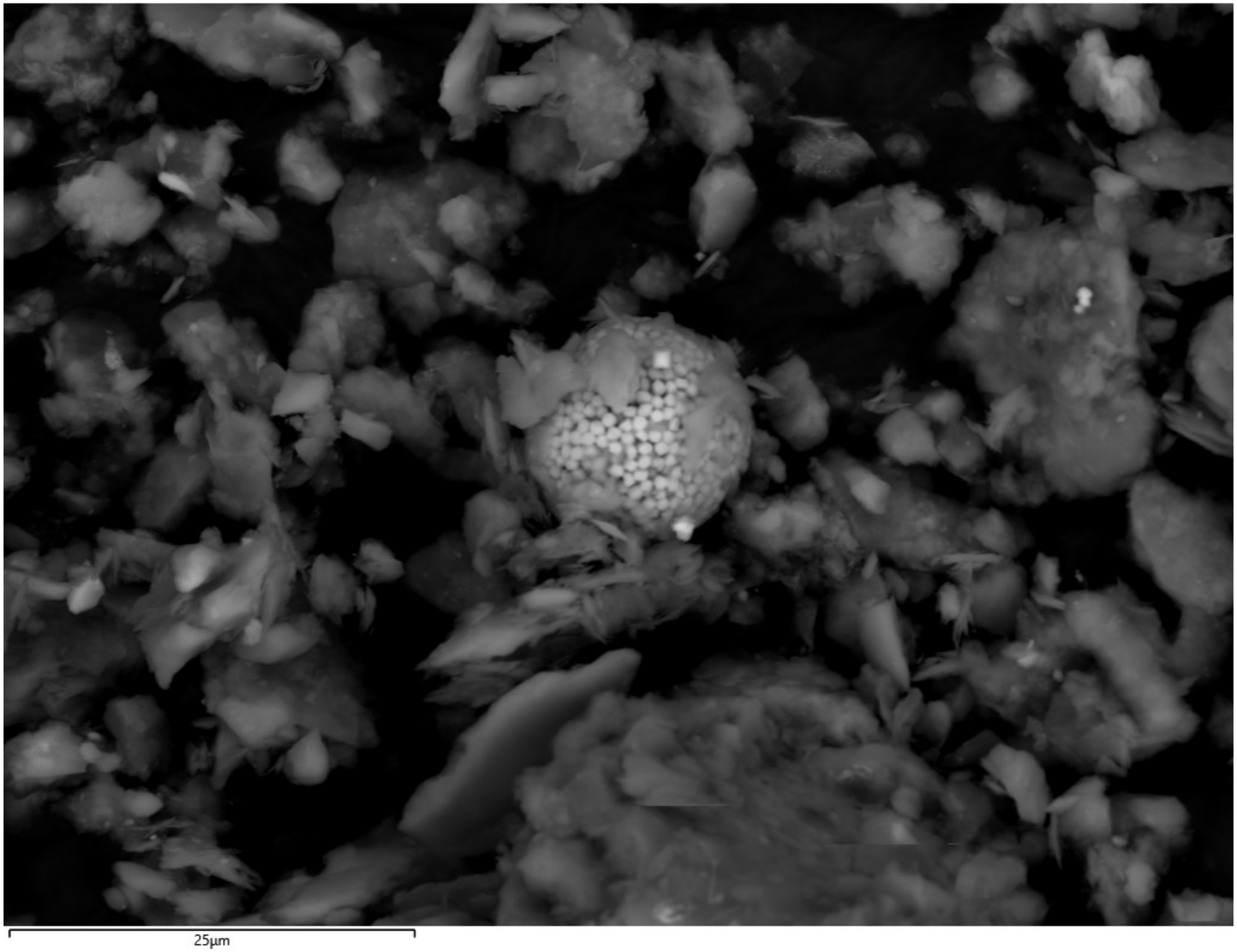
Figure 11
Bulk Chemistry Relationship Between Arsenic and Iron
Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes:
Open markers indicate upgradient wells.
mg/kg: milligrams per kilogram

Filepath: \\Athena\Mobile\Projects\Southern Company\Alabama Power ACMs - PRIVILEGED & CONFIDENTIAL\MNA Demonstration Reports\Gorgas\Figures\Figure 12 - Bulk Chemistry Molybdenum and Iron.docx

Figure 12
Bulk Chemistry Relationship Between Molybdenum and Iron
Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes:
µm: micron
SEM: scanning electron microscopy

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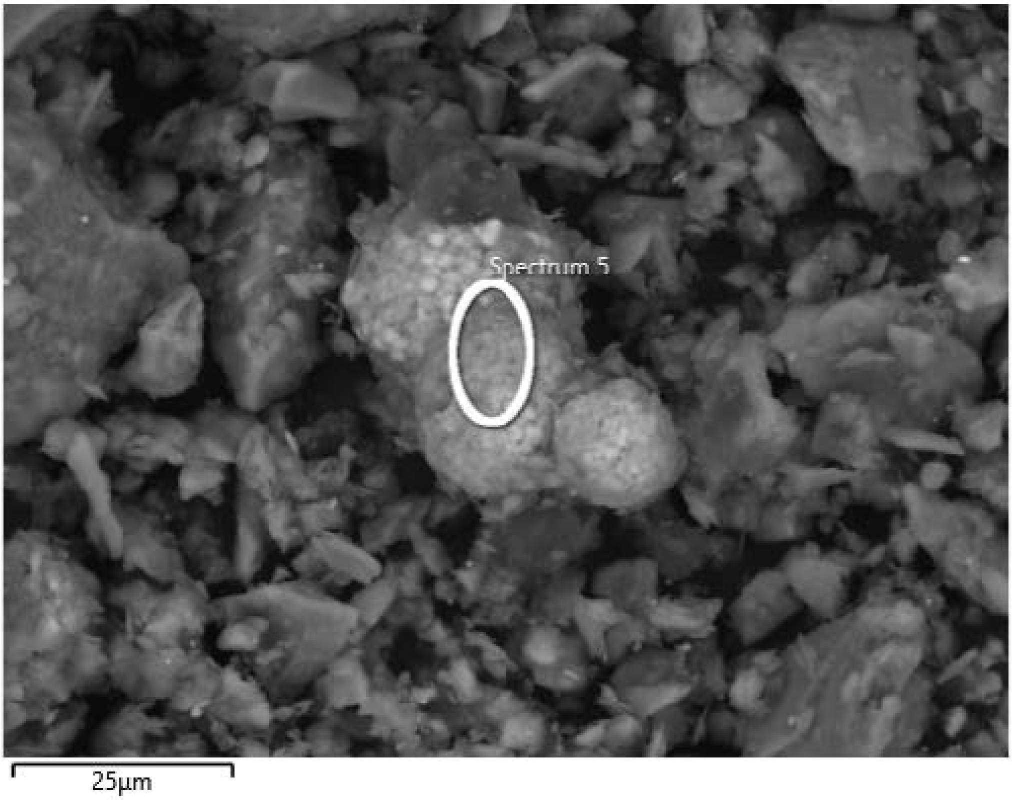
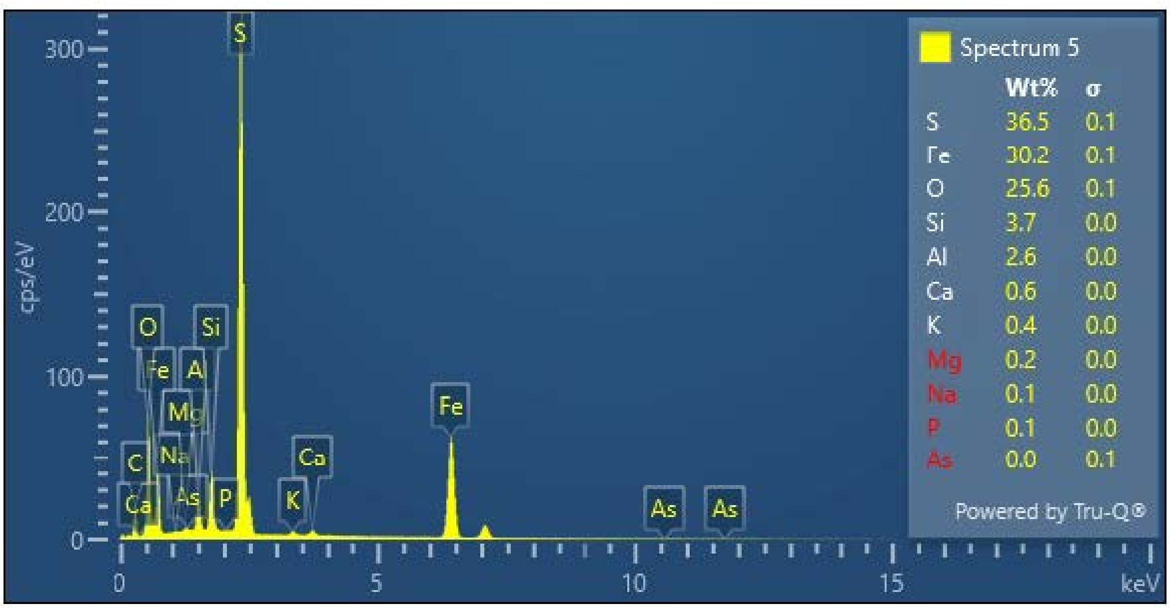
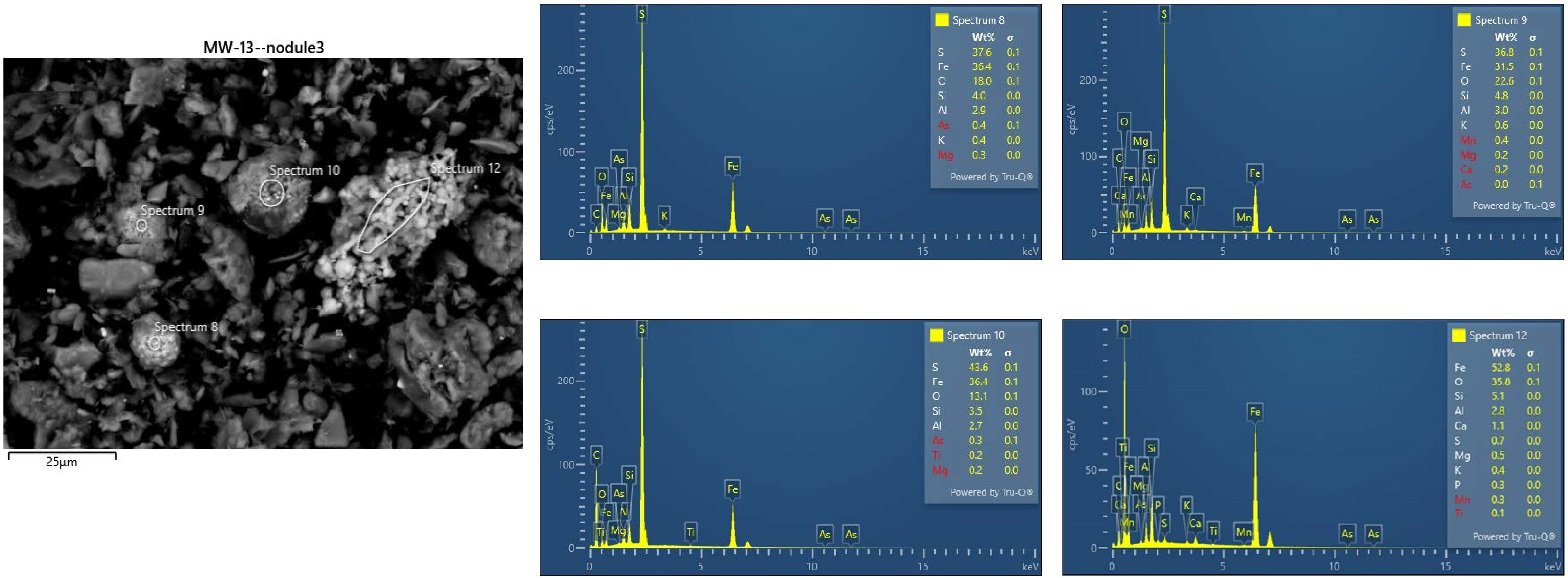
Figure 13a
SEM Results for MW-13 (Area 1)
Monitored Natural Attenuation Demonstration
Plant Gorgas





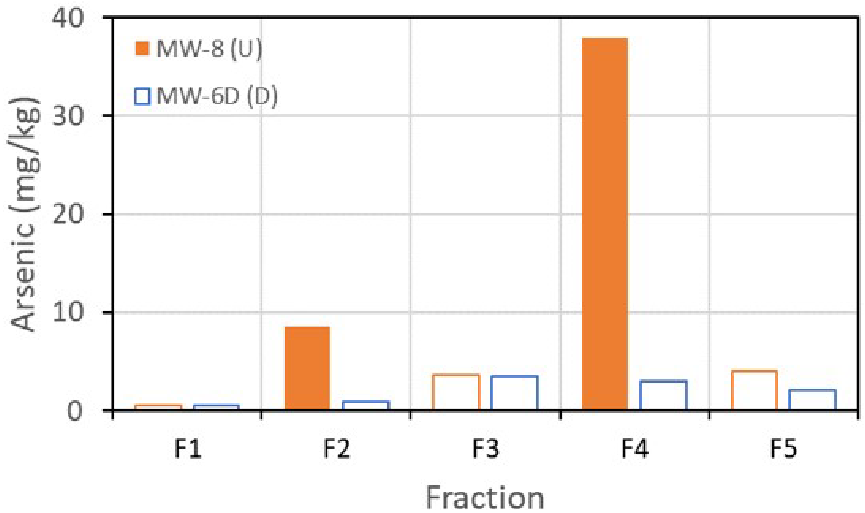
Notes:
μm: micron
cps/eV: counts per second per electron-volt
SEM: scanning electron microscopy

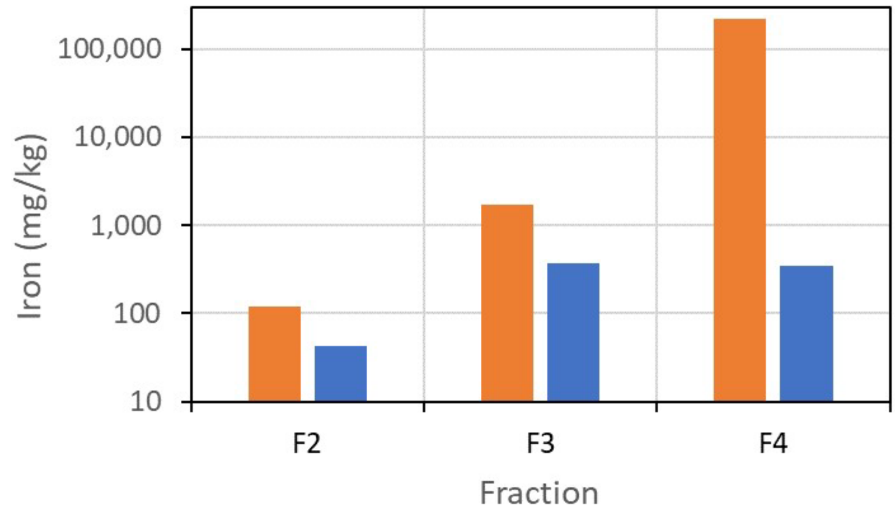
Figure 13b
SEM Results and Associated Spectrum for MW-13 (Area 2)
Monitored Natural Attenuation Demonstration
Plant Gorgas

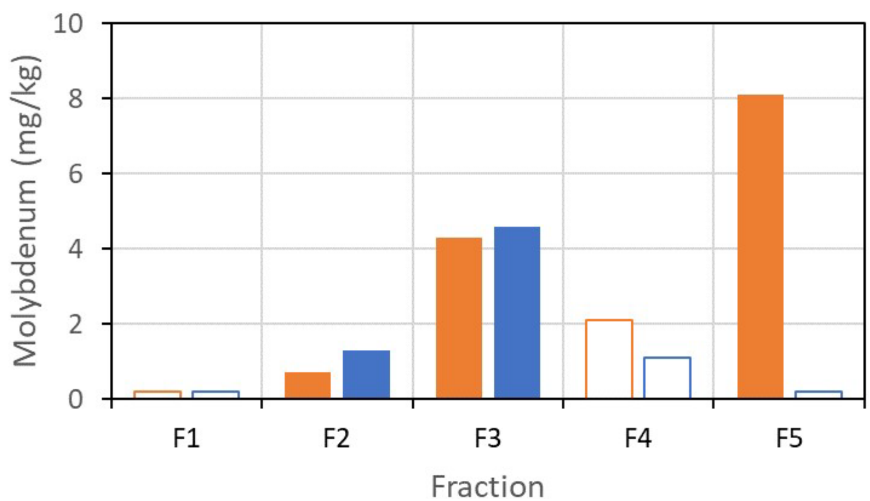


Notes:
μm: micron
cps/eV: counts per second per electron-volt
SEM: scanning electron microscopy

Figure 13c
SEM Results and Associated Spectra for MW-13 (Area 3)
Monitored Natural Attenuation Demonstration
Plant Gorgas

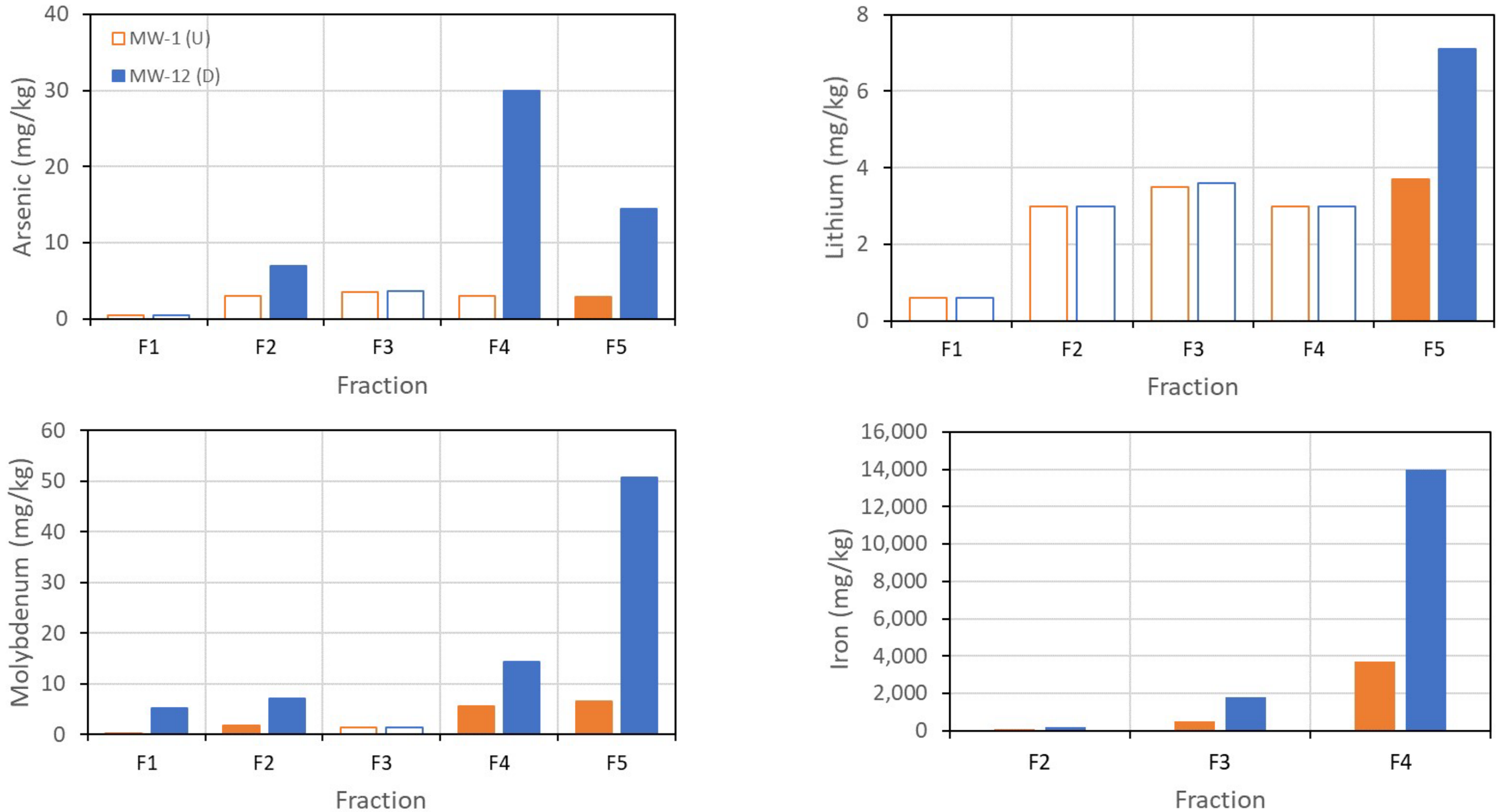






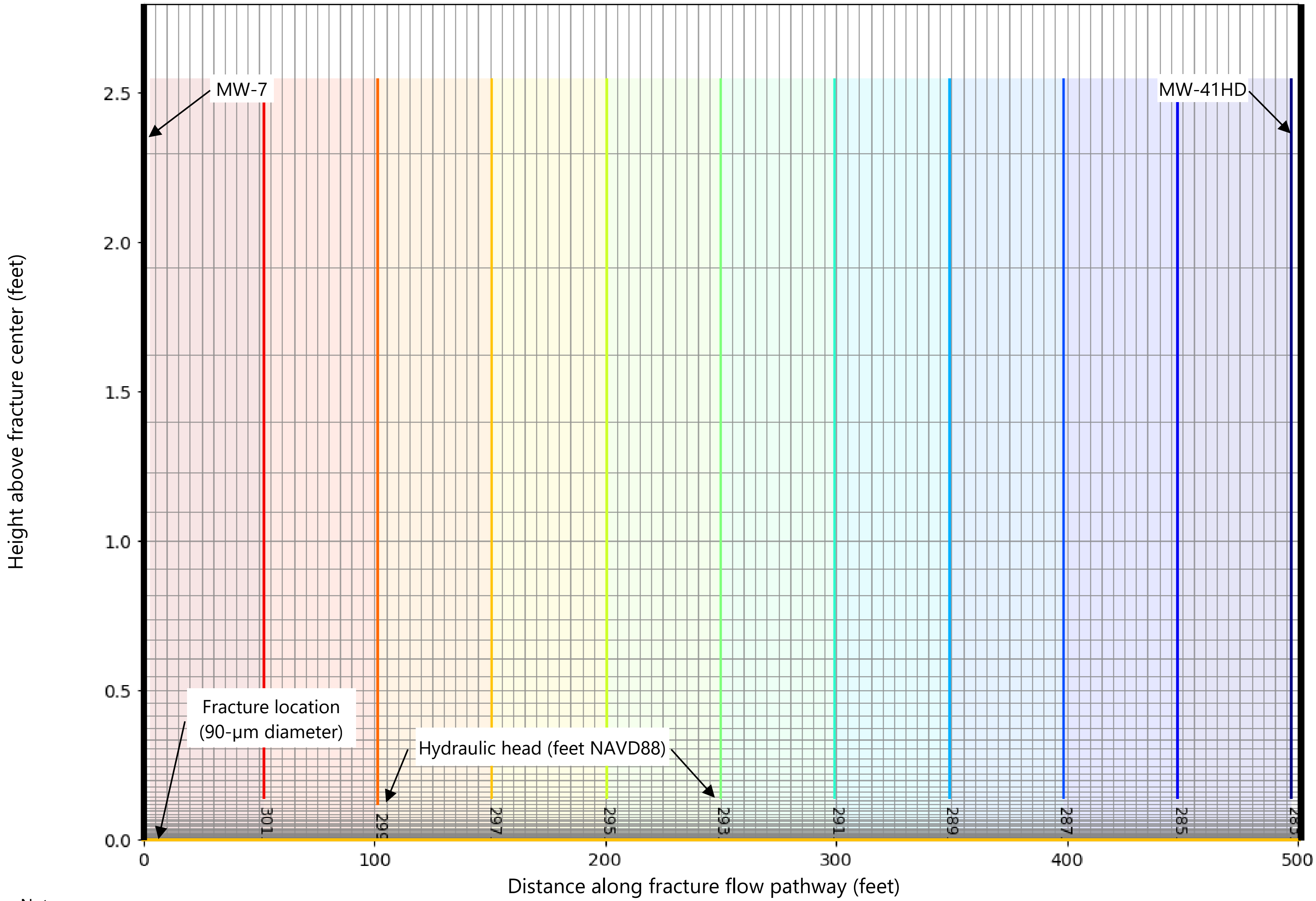
Notes:
Non-detect results are shown as unfilled bars plotted at the detection limit.
F1: water soluble
F2: exchangeable (e.g., clay minerals)
F3: reducible (e.g., poorly crystalline metal oxides such as iron oxides)
F4: oxidizable (e.g., crystalline oxide and crystalline sulfide minerals)
F5: residual (e.g., silicate phases)
mg/kg: milligrams per kilogram
SSE: selective sequential extraction

Figure 14
SSE Results for Well Solids: Ash Pond
Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes:
Non-detect results are shown as unfilled bars plotted at the detection limit.
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)
mg/kg: milligrams per kilogram
SSE: selective sequential extraction

Figure 15
SSE Results for Well Solids: Gypsum Pond and Landfills
Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes:
µm: micrometers
NAVD88: North American Vertical Datum of 1988

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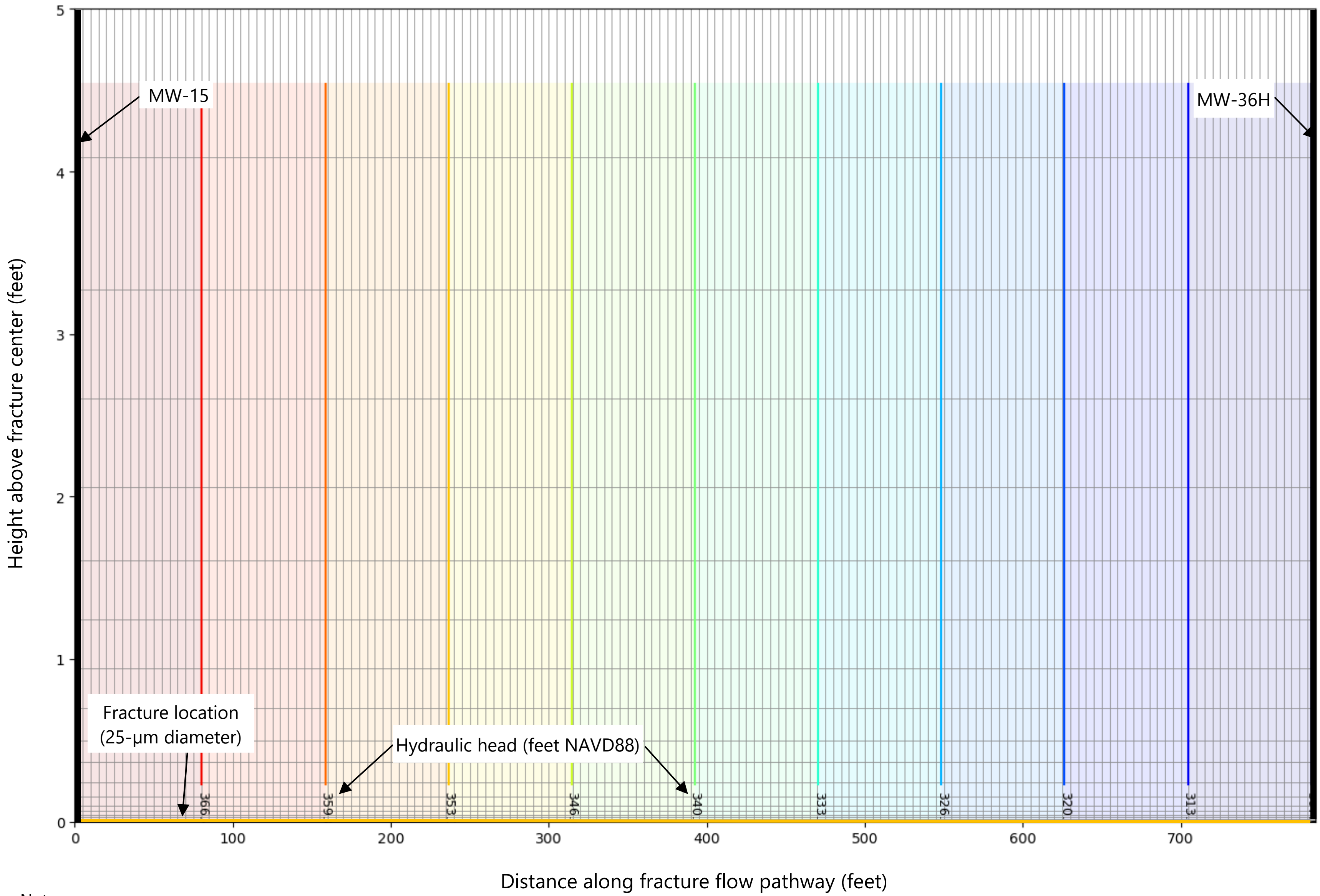
Figure 16
Model Grid (Transect 1: MW-7 to MW-41HD)
Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes:
µm: micrometers
NAVD88: North American Vertical Datum of 1988

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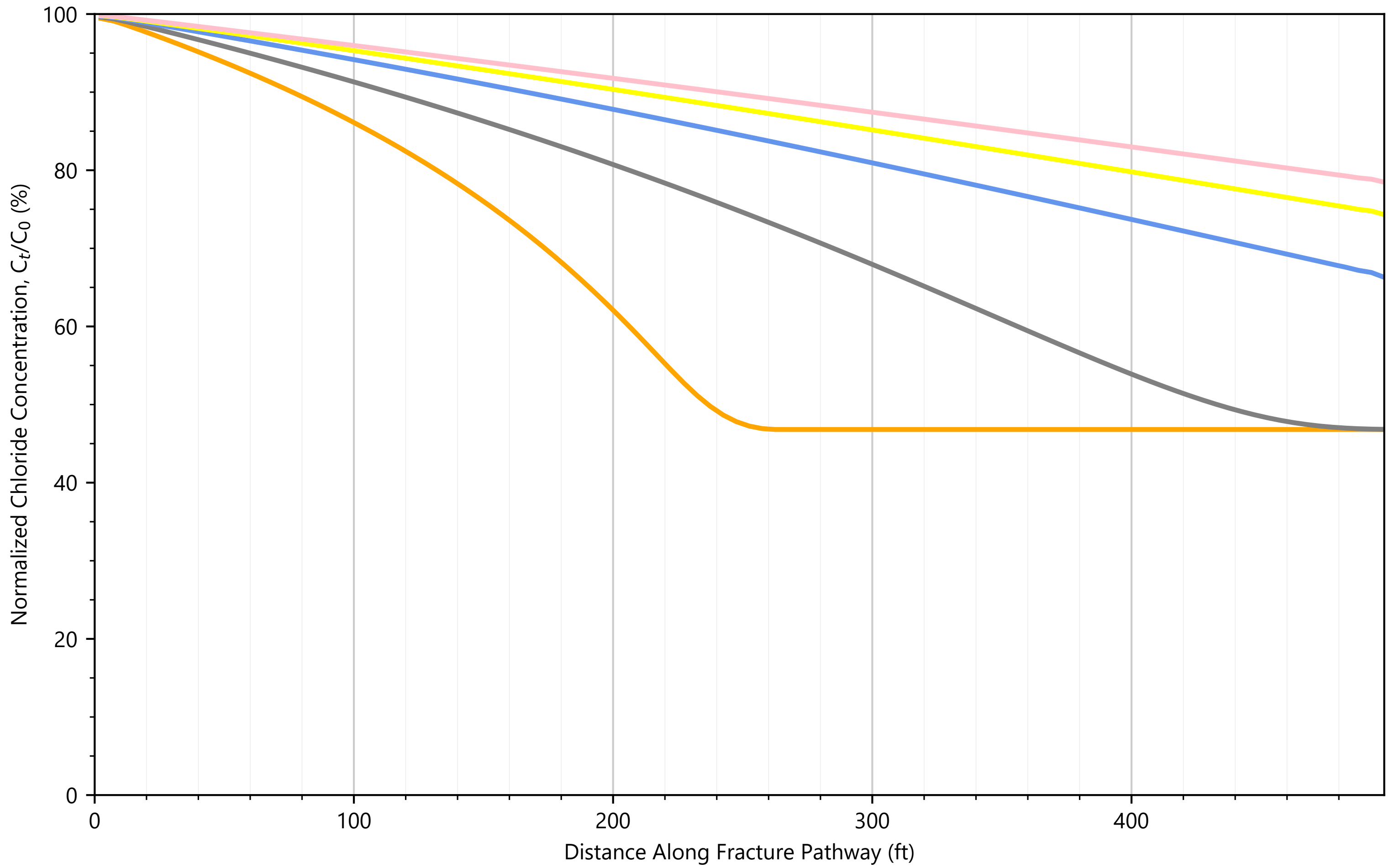
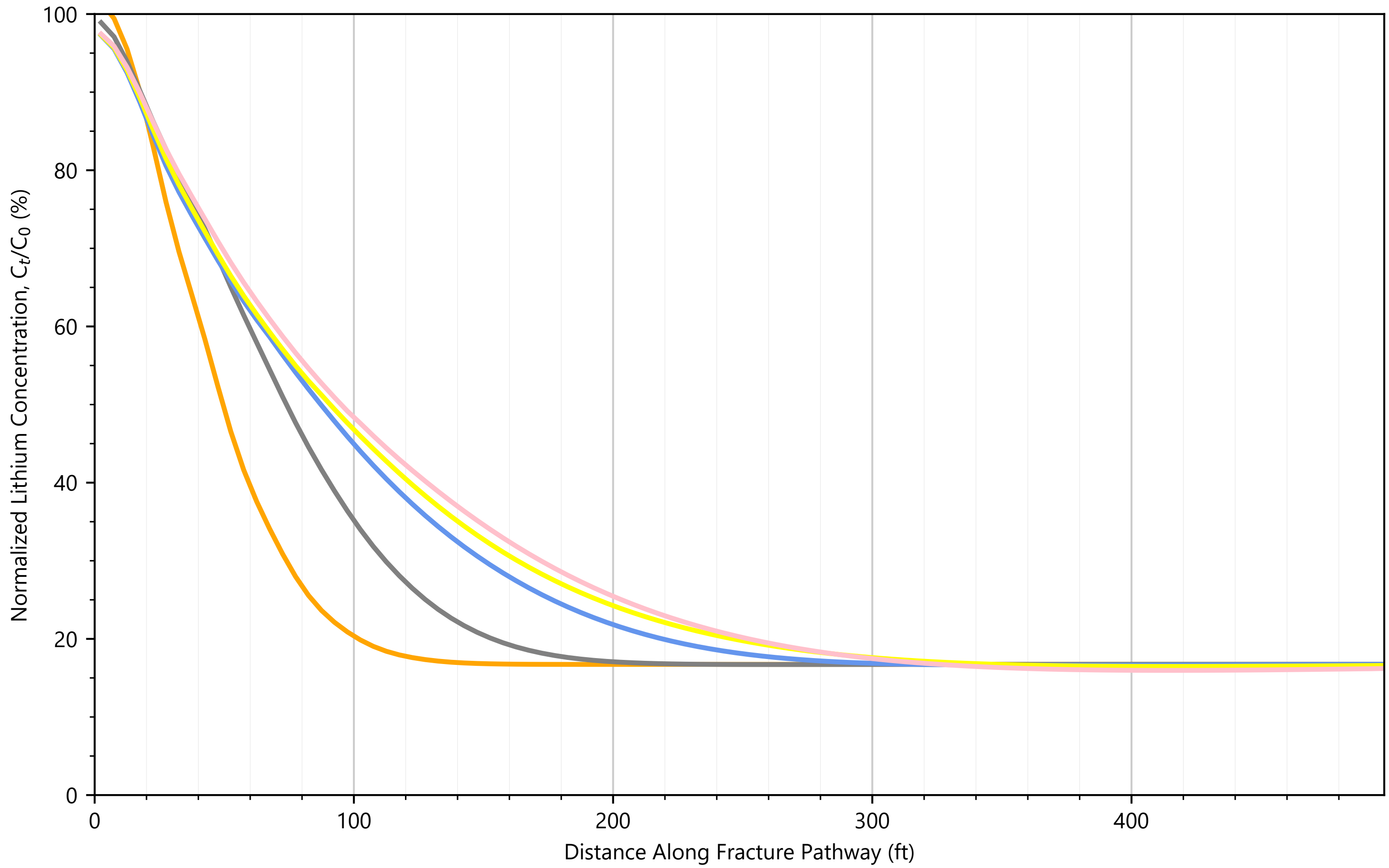
Figure 17
Model Grid (Transect 2: MW-15 to MW-36H)
Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes
C_t/C_0 equals the simulated concentration, C_t, at any time, t, divided by the initial concentration, C_0.
The initial concentration for Chloride is 0.000235 moles per liter.

Figure 18a
Normalized Chloride Concentration (C_t/C_0) Along Simulated Transect 1 Fracture Pathway
Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes
C_t/C_0 equals the simulated concentration, C_t, at any time, t, divided by the initial concentration, C_0.
The initial concentration for Lithium is 4.31e-05 moles per liter.

Legend:
1-days
2-days
4-days
6-days
8-days

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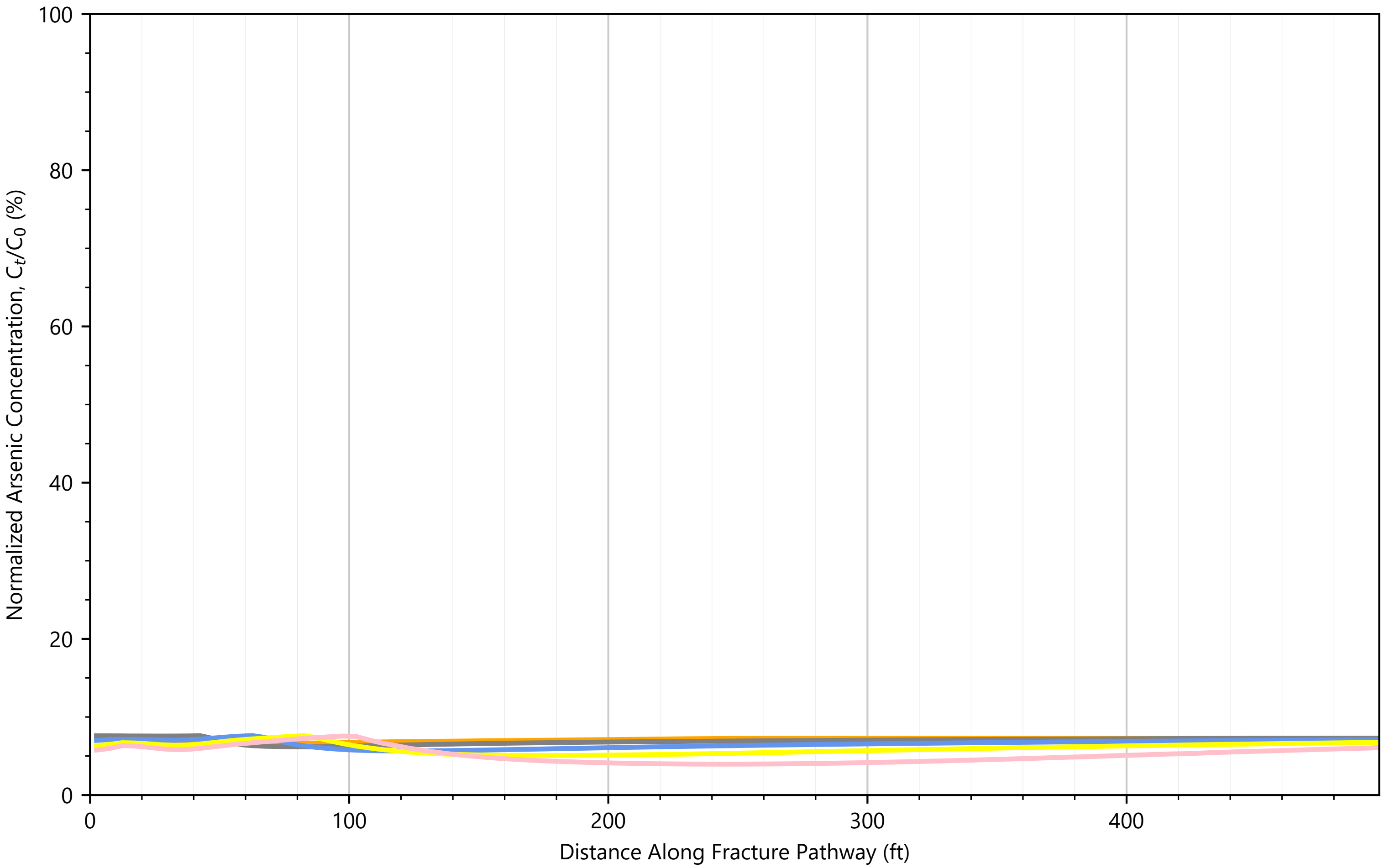
Figure 18b
Normalized Lithium Concentration (C_t/C_0) Along Simulated Transect 1 Fracture Pathway
Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes
C_t/C_0 equals the simulated concentration, C_t, at any time, t, divided by the initial concentration, C_0.
The initial concentration for Arsenic is 4.09e-10 (As(+3)) and 3.76e-06 (As(+5)) moles per liter.

Legend:
- 1-days
- 2-days
- 4-days
- 6-days
- 8-days

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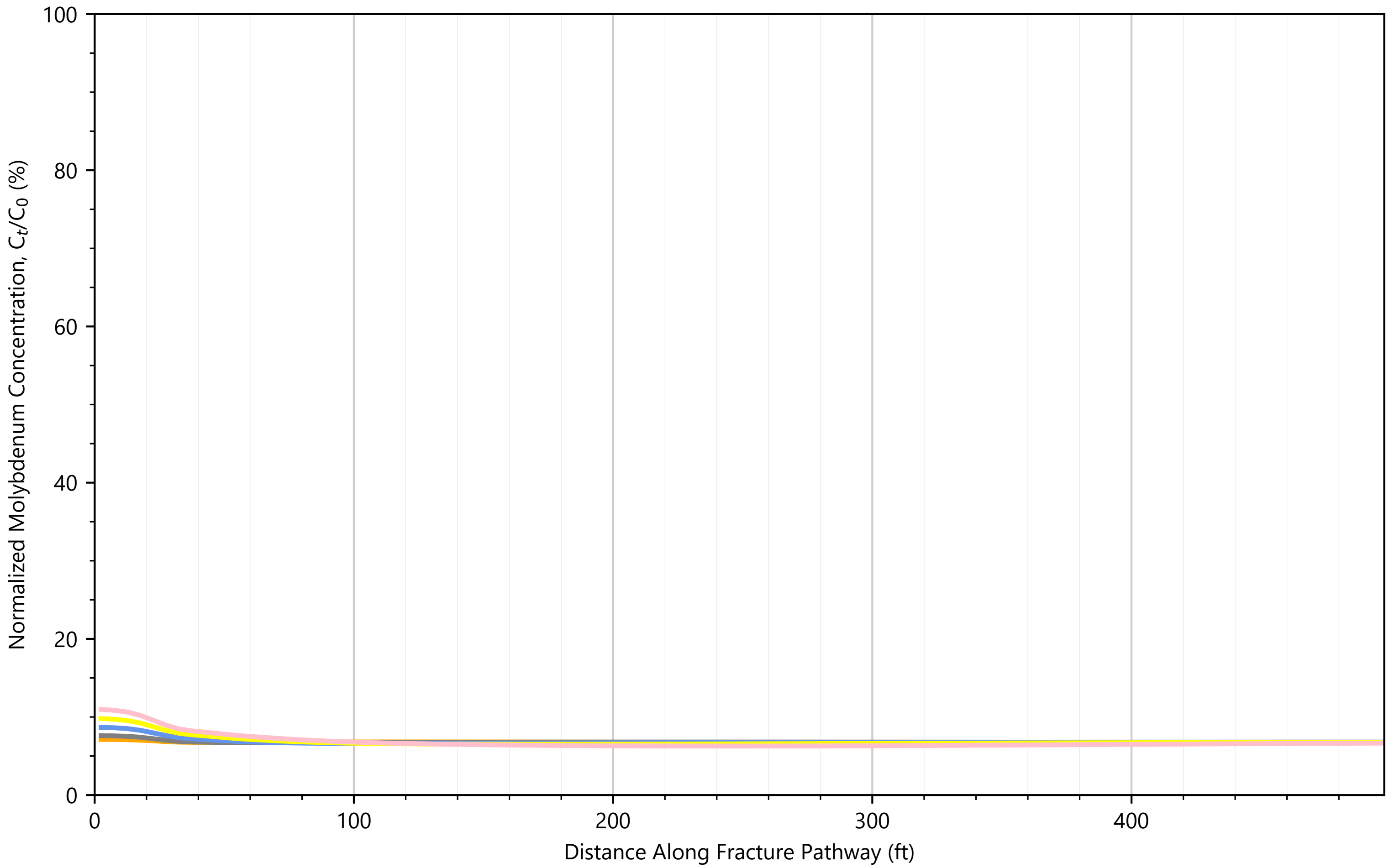
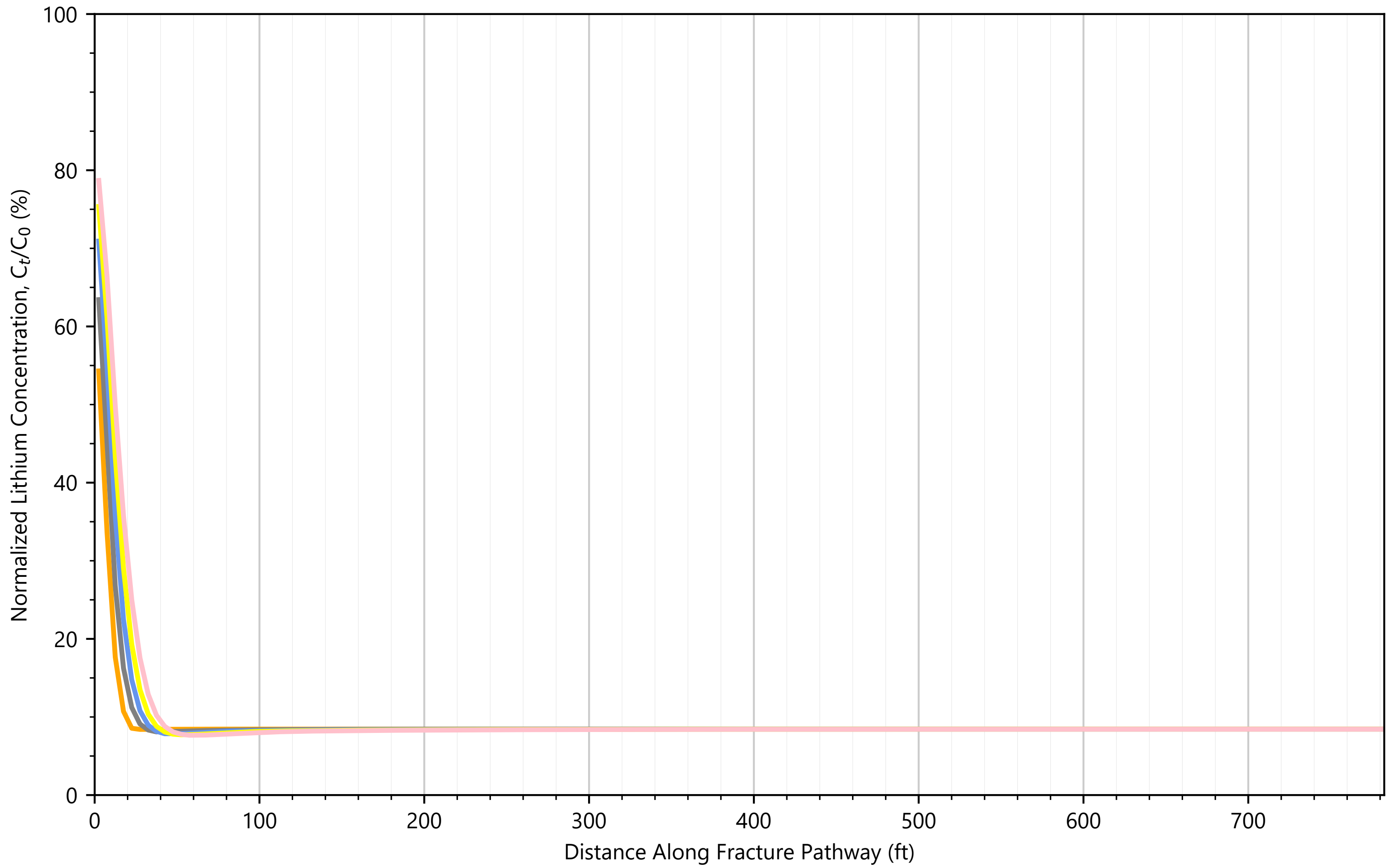
Figure 18c
Normalized Arsenic Concentration (C_t/C_0) Along Simulated Transect 1 Fracture Pathway
Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes
C_t/C_0 equals the simulated concentration, C_t, at any time, t, divided by the initial concentration, C_0.
The initial concentration for Molybdenum is 2.24e-06 moles per liter.

Legend:
1-days
2-days
4-days
6-days
8-days

Figure 18d
Normalized Molybdenum Concentration (C_t/C_0) Along Simulated Transect 1 Fracture Pathway
Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes
C_t/C_0 equals the simulated concentration, C_t, at any time, t, divided by the initial concentration, C_0.
The initial concentration for Lithium is 5.97e-05 moles per liter.

Legend:
1-days
8-days
16-days
24-days
34-days

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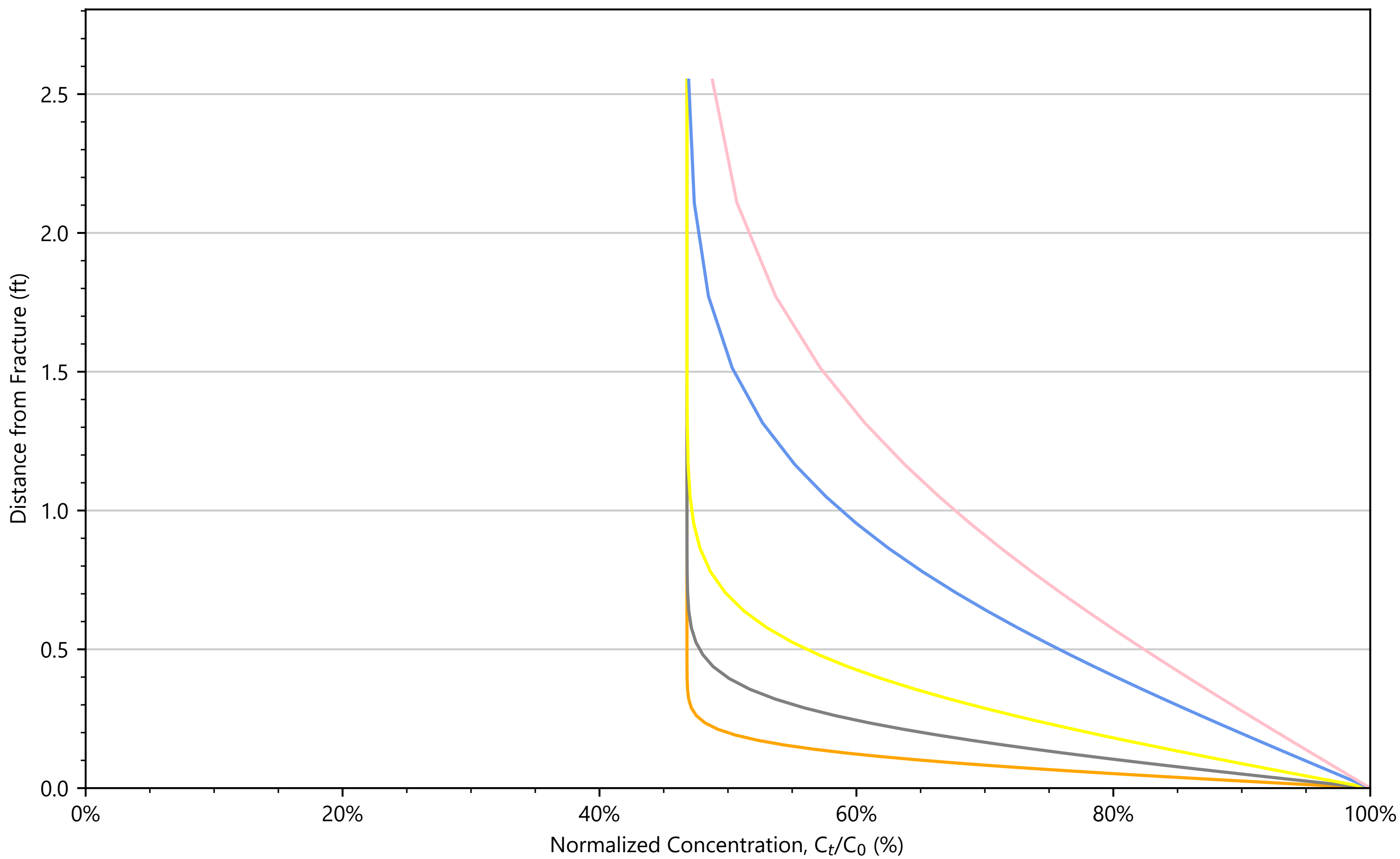
Figure 19
Normalized Lithium Concentration (C_t/C_0) Along Simulated Transect 2 Fracture Pathway
Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes:
Concentrations are plotted at the midpoint of each layer.
C_t/C_0 equals the simulated concentration, C_t, at any time, t, divided by the initial concentration, C_0.
The initial concentration for Chloride is 0.000235 moles per liter.

Legend:
- 30-days
- 120-days
- 1-year
- 5-years
- 10-years

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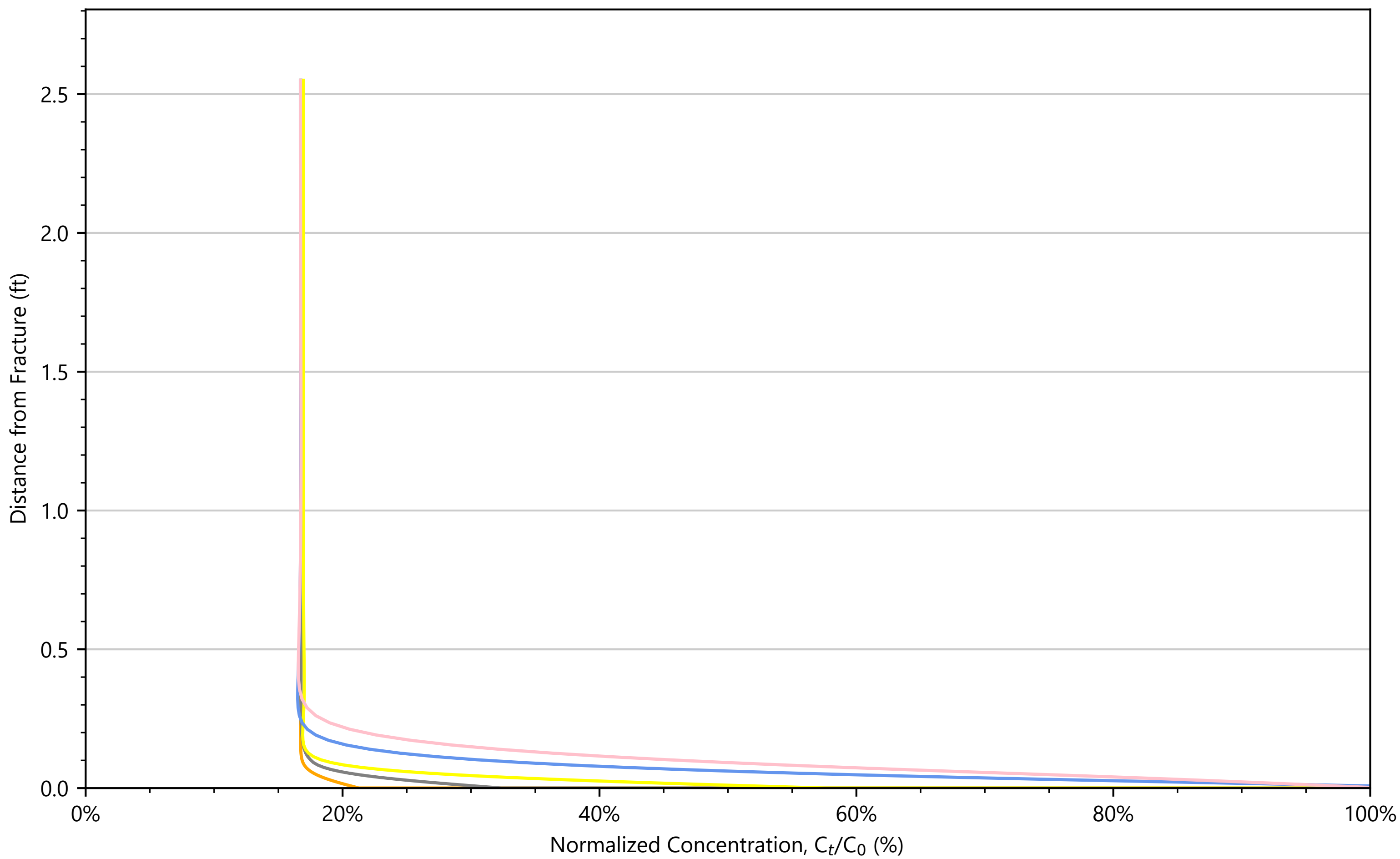
Figure 20a
Normalized Chloride Concentration Vertical Profile for Transect 1
Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes:
Concentrations are plotted at the midpoint of each layer.
C_t/C_0 equals the simulated concentration, C_t, at any time, t, divided by the initial concentration, C_0.
The initial concentration for Lithium is 4.31e-05 moles per liter.

Legend:
30-days
120-days
1-year
5-years
10-years

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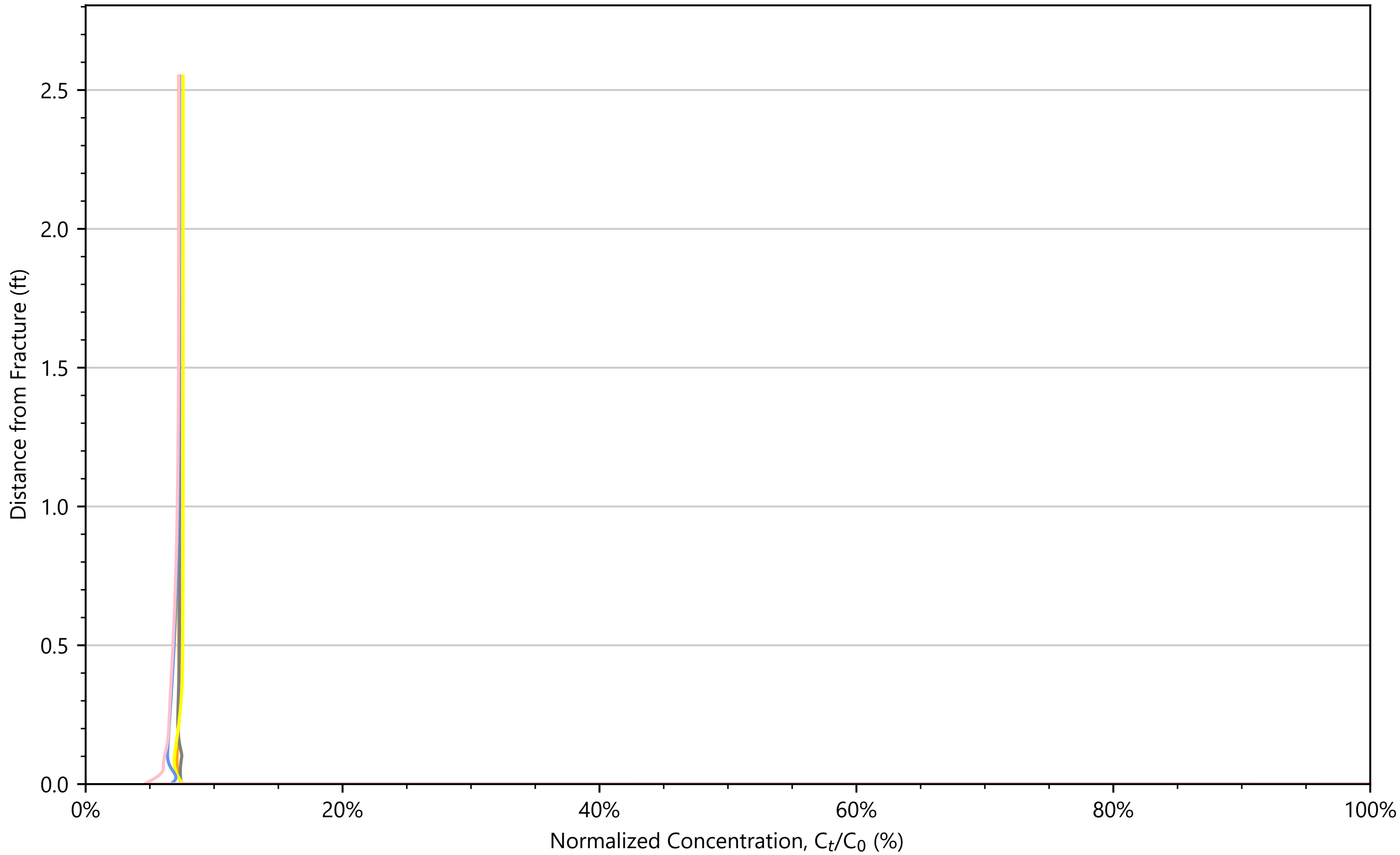
Figure 20b
Normalized Lithium Concentration Vertical Profile for Transect 1
Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes:
Concentrations are plotted at the midpoint of each layer.
C_t/C_0 equals the simulated concentration, C_t, at any time, t, divided by the initial concentration, C_0.
The initial concentration for Arsenic is 4.09e-10 (As(+3)) and 3.76e-06 (As(+5)) moles per liter.

Legend:

- 30-days
- 120-days
- 1-year
- 5-years
- 10-years

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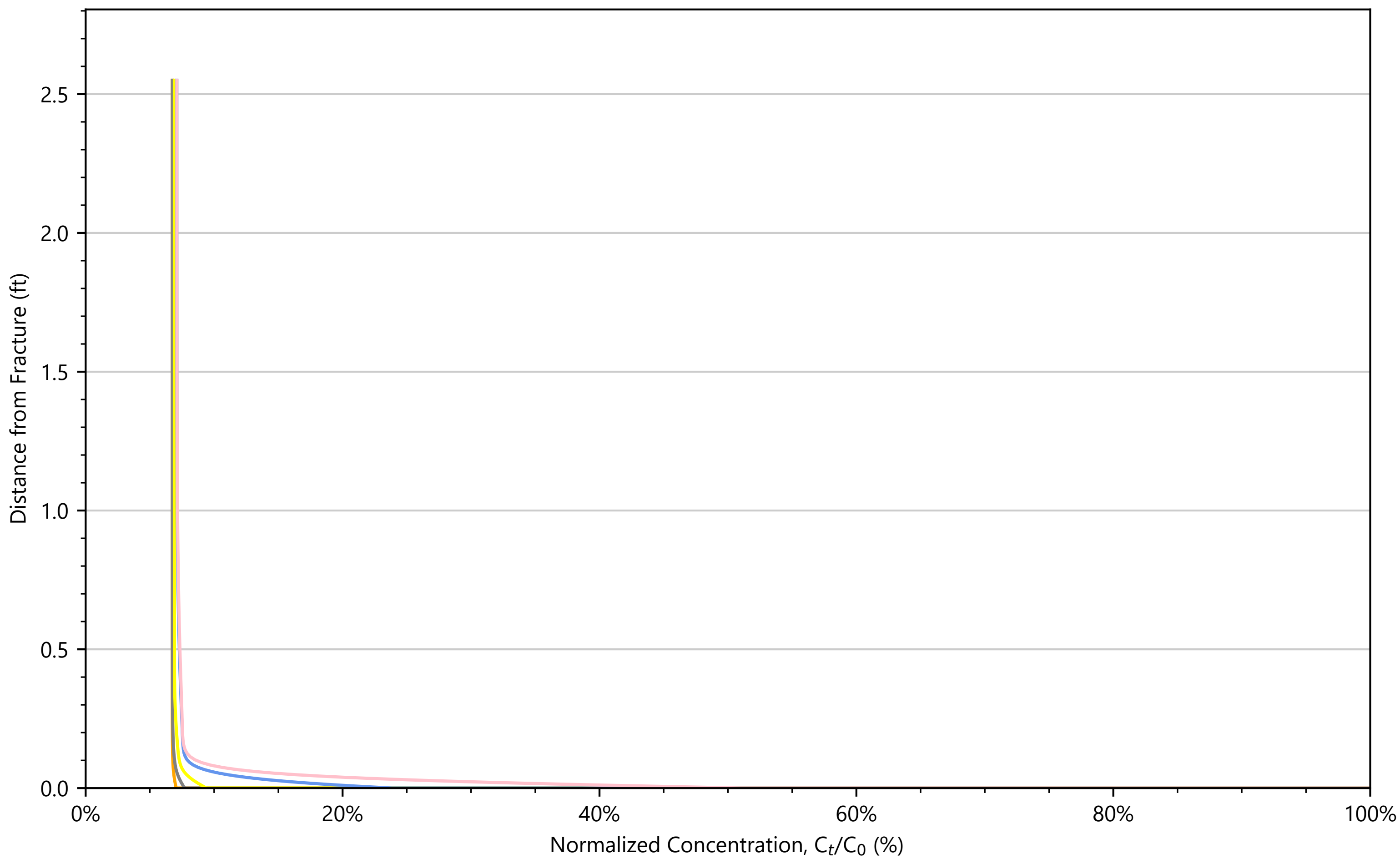
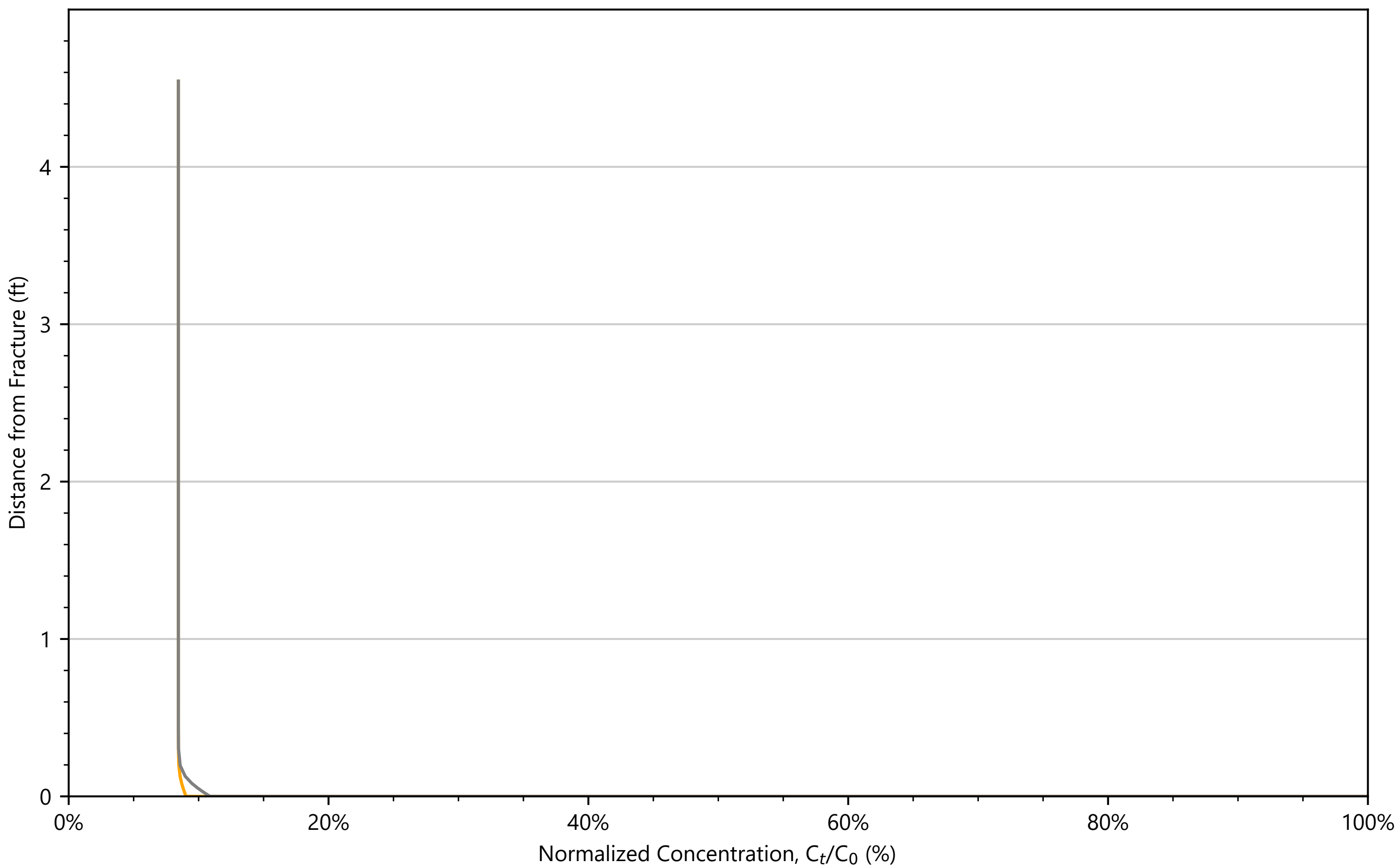
Figure 20c
Normalized Arsenic Concentration Vertical Profile for Transect 1
Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes:
Concentrations are plotted at the midpoint of each layer.
C_t/C_0 equals the simulated concentration, C_t, at any time, t, divided by the initial concentration, C_0.
The initial concentration for Molybdenum is 2.24e-06 moles per liter.

Legend:
- 30-days
- 120-days
- 1-year
- 5-years
- 10-years

Figure 20d
Normalized Molybdenum Concentration Vertical Profile for Transect 1
Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes:
Concentrations are plotted at the midpoint of each layer.
C_t/C_0 equals the simulated concentration, C_t, at any time, t, divided by the initial concentration, C_0.
The initial concentration for Lithium is 5.97e-05 moles per liter.

Legend:
- 30-days
- 120-days
- 1-year
- 5-years
- 10-years

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Figure 21
Normalized Lithium Concentration Vertical Profile for Transect 2
Monitored Natural Attenuation Demonstration
Plant Gorgas

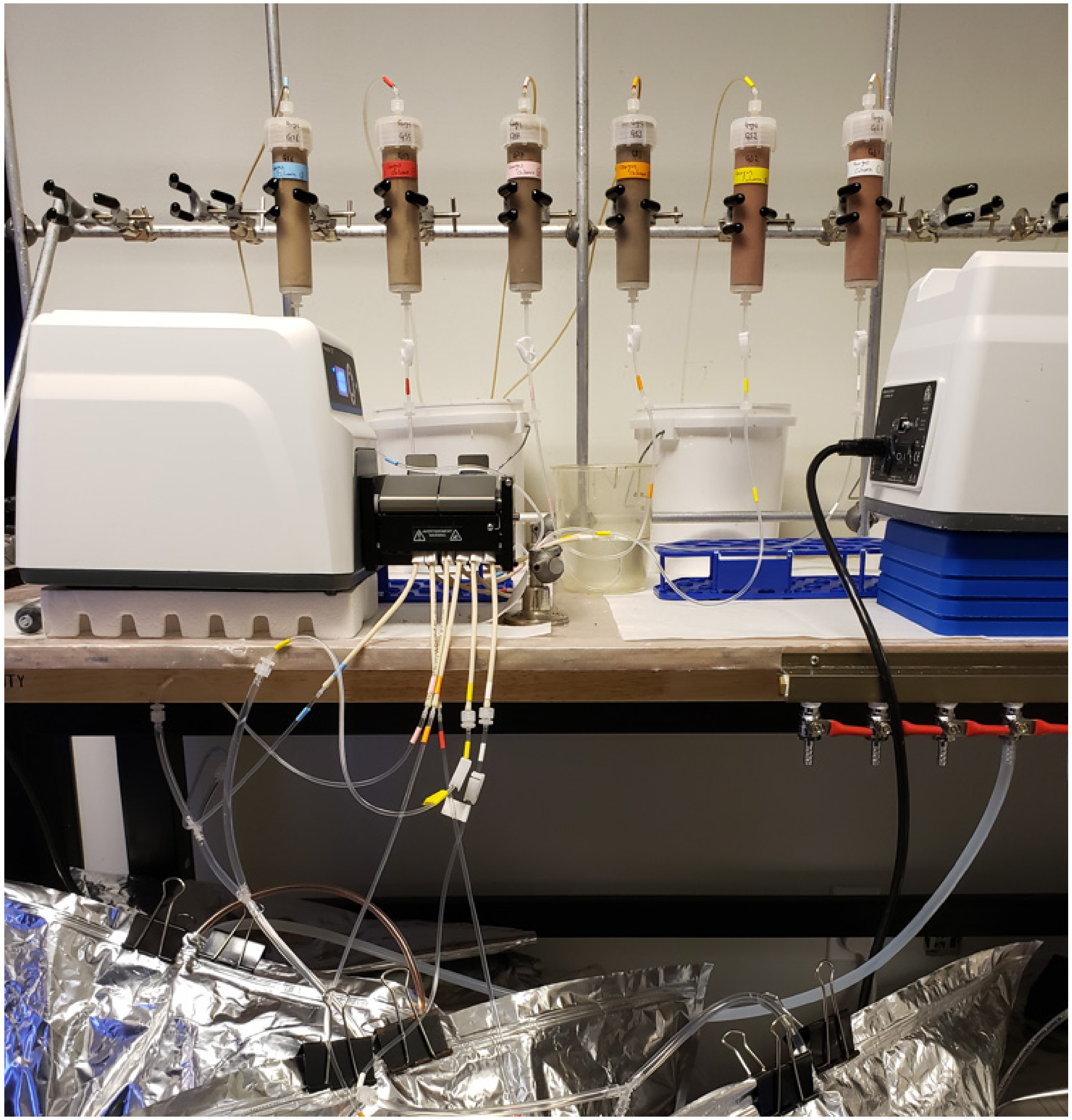

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Figure 22
Column Test Equipment Setup
Monitored Natural Attenuation Demonstration
Plant Gorgas

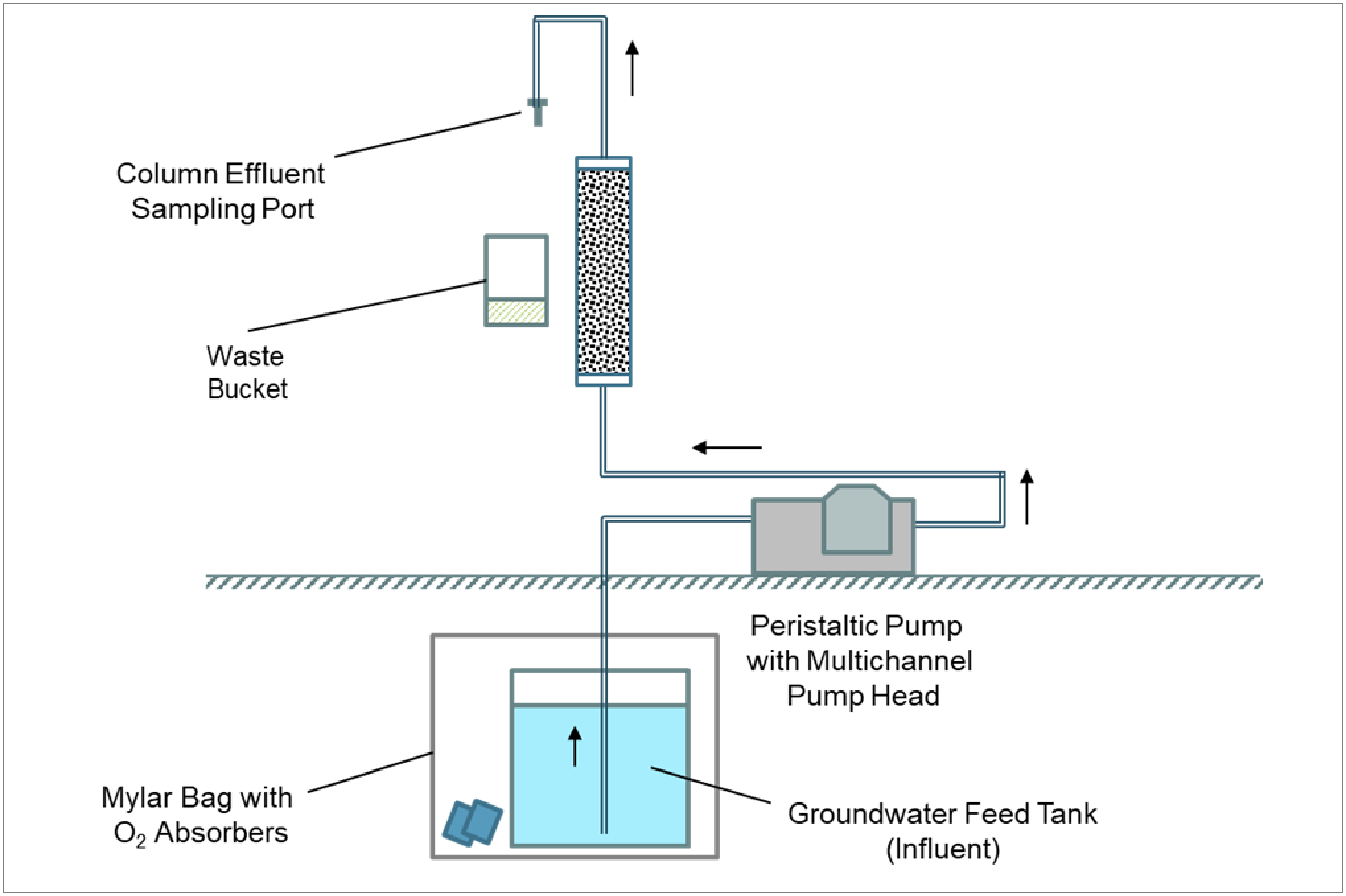
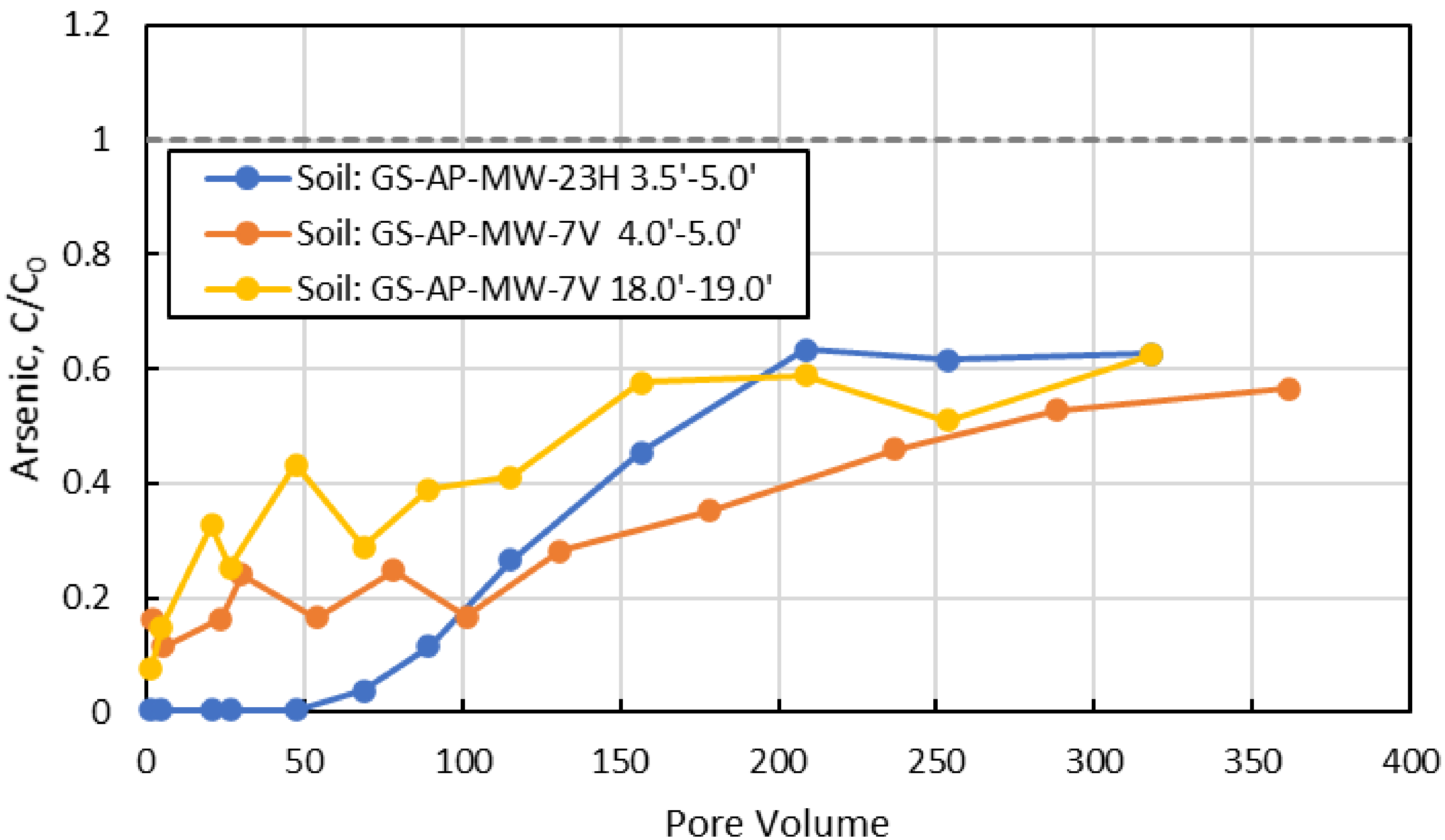
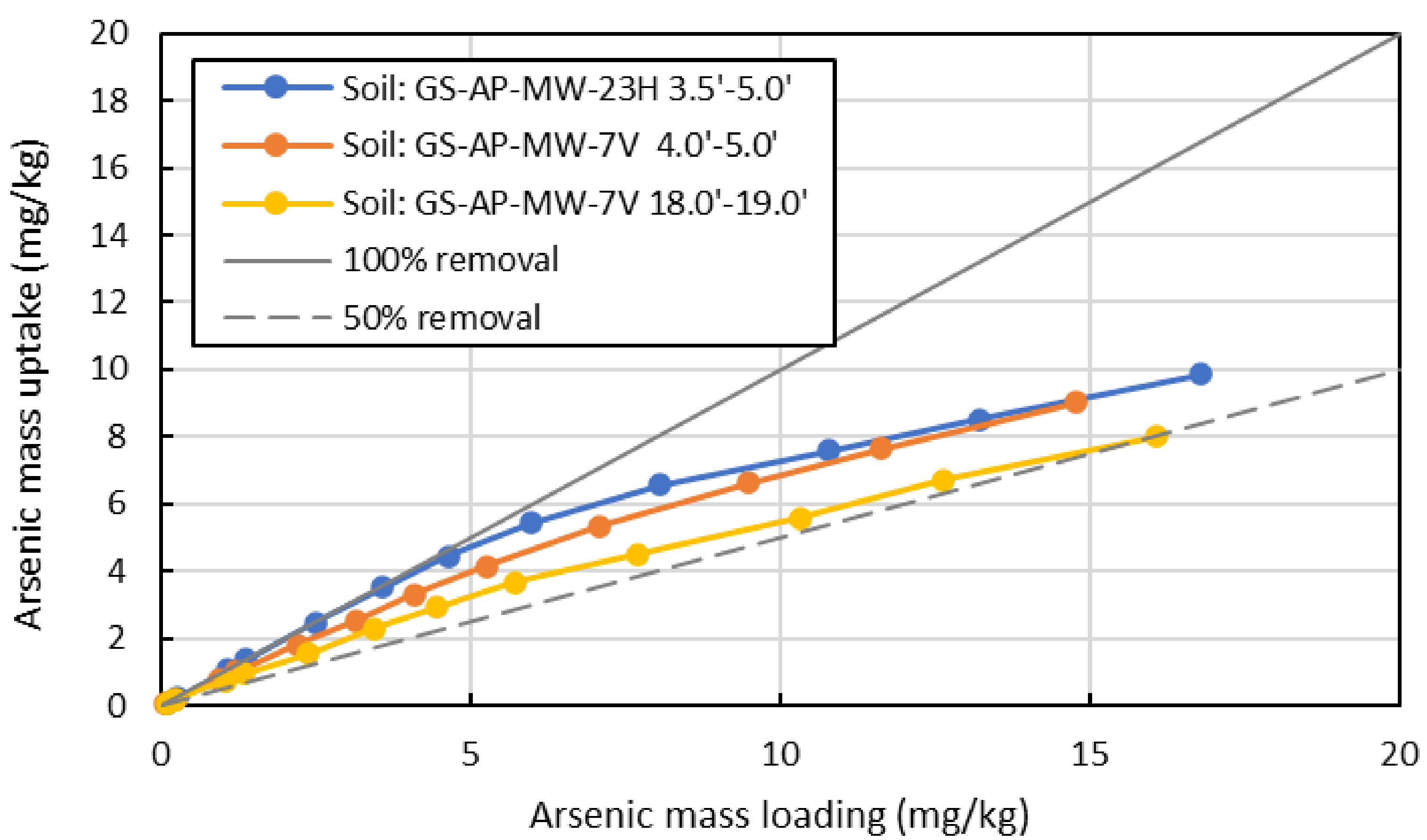


Figure 23
Schematic of Column Test Setup
Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes:
Dashed line indicates effluent concentrations equal influent concentrations (i.e., capacity for attenuation has been consumed).
C/C_0: ratio of concentration in column effluent to that in column influent solution

Figure 24
Dissolved Arsenic Breakthrough Curves: Columns 1, 3, and 5
Monitored Natural Attenuation Demonstration
Plant Gorgas

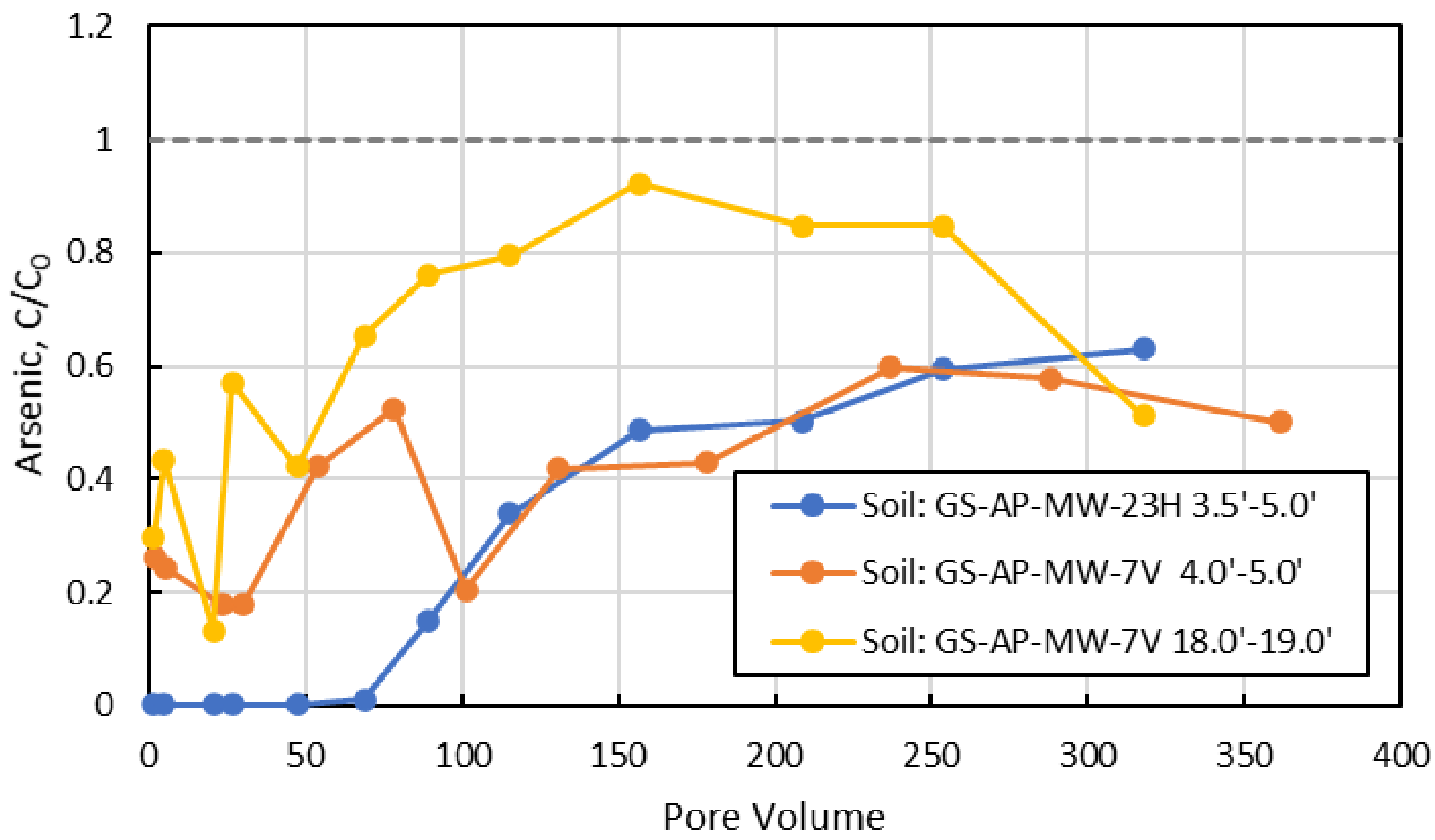


Note:
mg/kg: milligrams per kilogram

Filepath: \\Athena\Mobile\Projects\Southern Company\Alabama Power ACMs - PRIVILEGED & CONFIDENTIAL\MNA Demonstration Reports\Gorgas\Figures\Figure 25 - As Mass Uptake vs As Mass Loading 1.docx

Figure 25
Arsenic Mass Uptake by Site Soils Versus Arsenic Mass Loading: Columns 1, 3, and 5

Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes:
Dashed line indicates effluent concentrations equal influent concentrations (i.e., capacity for attenuation has been consumed).
C/C_0: ratio of concentration in column effluent to that in column influent solution

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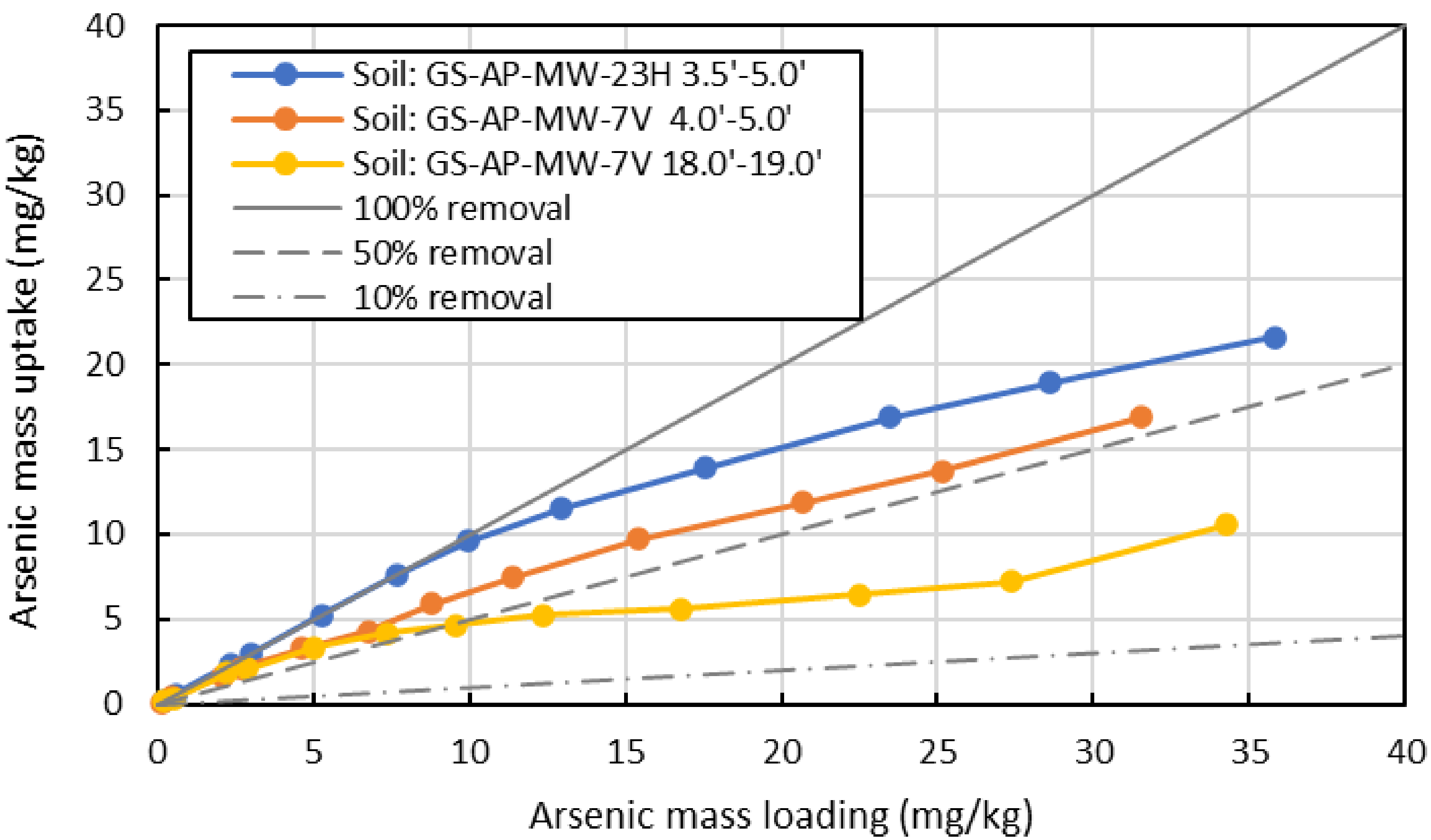
Figure 26
Dissolved Arsenic Breakthrough Curves: Columns 2, 4, and 6
Monitored Natural Attenuation Demonstration
Plant Gorgas



Note:
mg/kg: milligrams per kilogram

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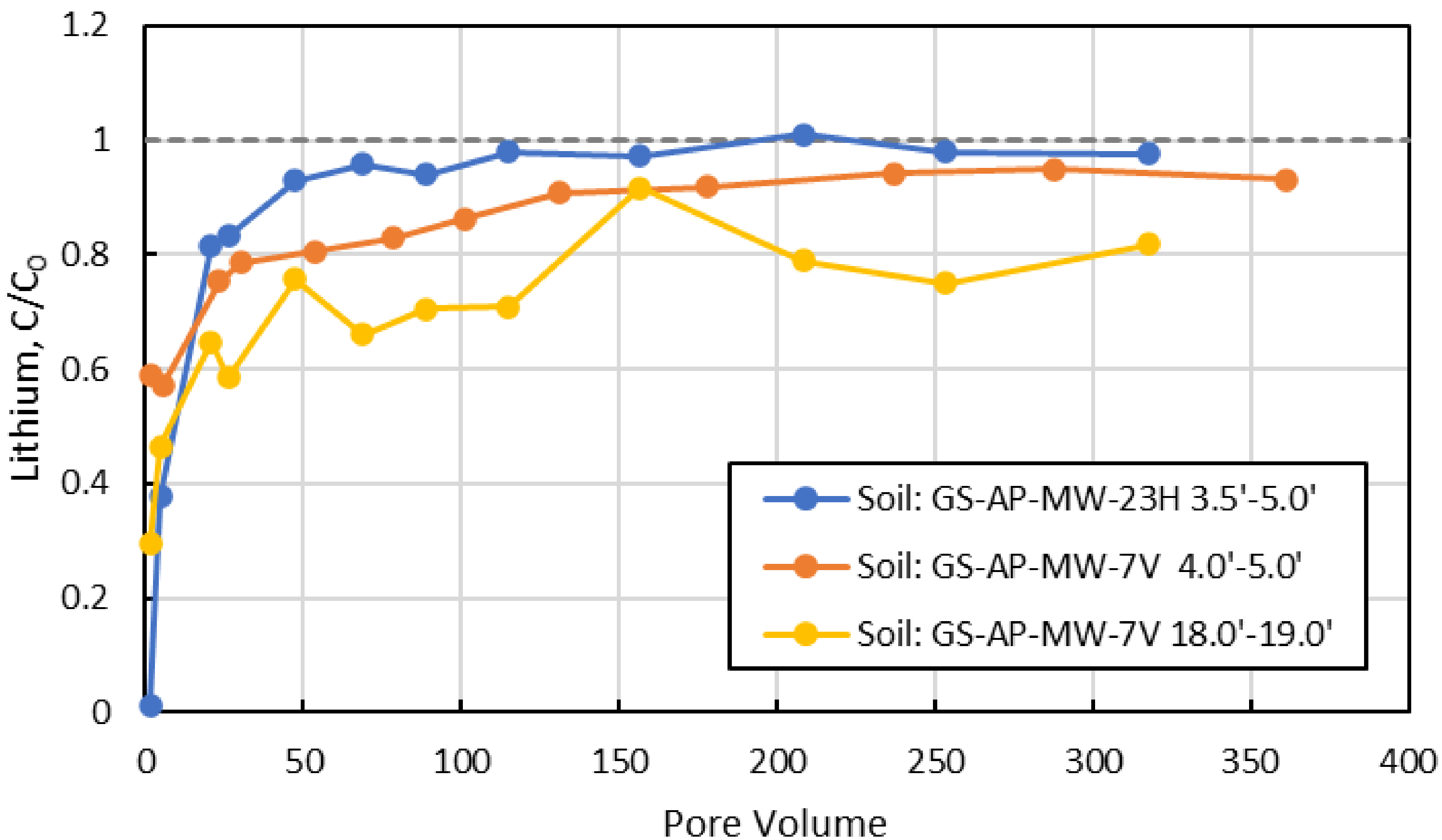
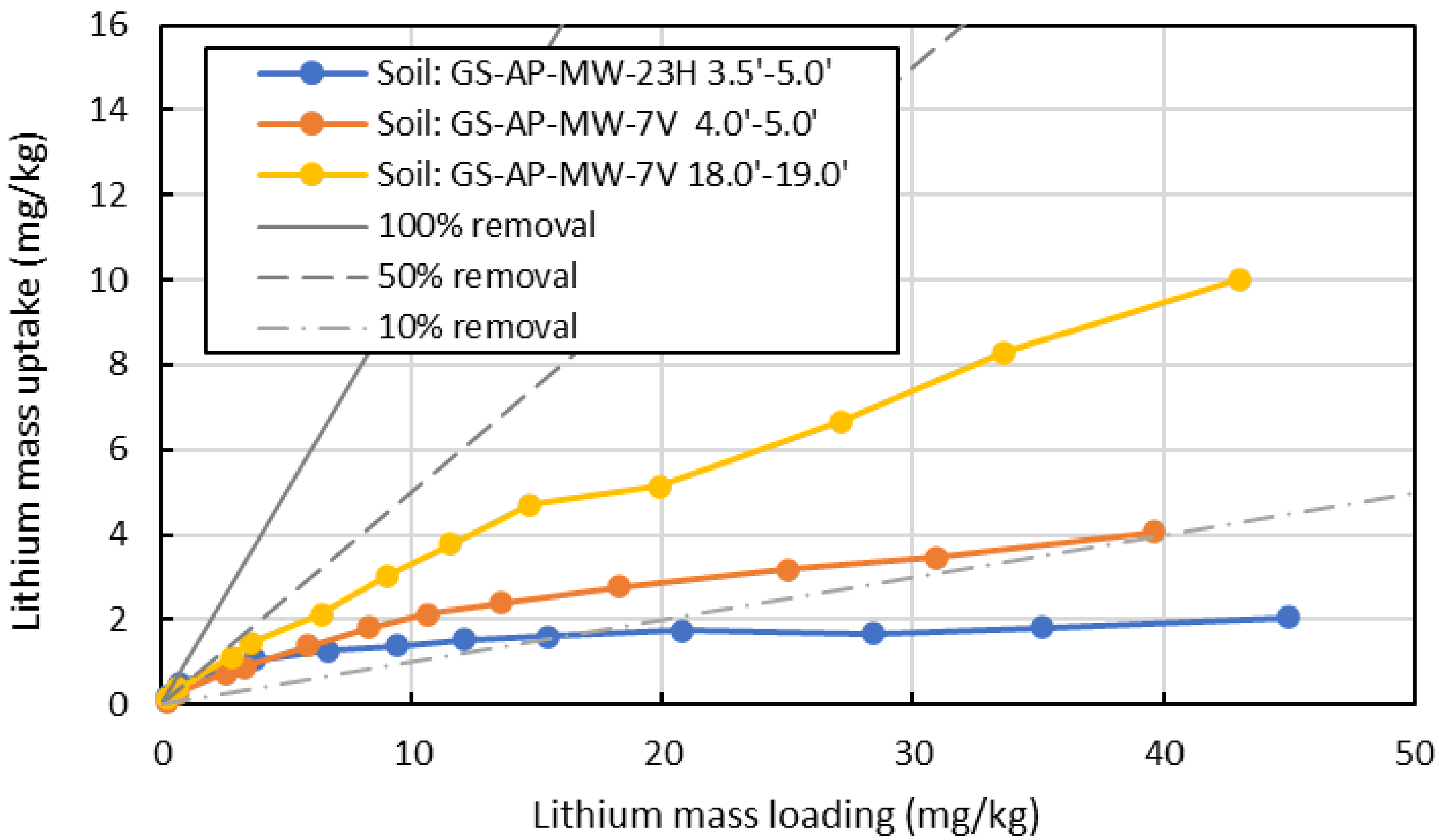
Figure 27
Arsenic Mass Uptake by Site Soils Versus Arsenic Mass Loading: Columns 2, 4, and 6
Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes:
Dashed line indicates effluent concentrations equal influent concentrations (i.e., capacity for attenuation has been consumed).
C/C_0: ratio of concentration in column effluent to that in column influent solution

Figure 28
Dissolved Lithium Breakthrough Curves: Columns 1, 3, and 5
Monitored Natural Attenuation Demonstration
Plant Gorgas



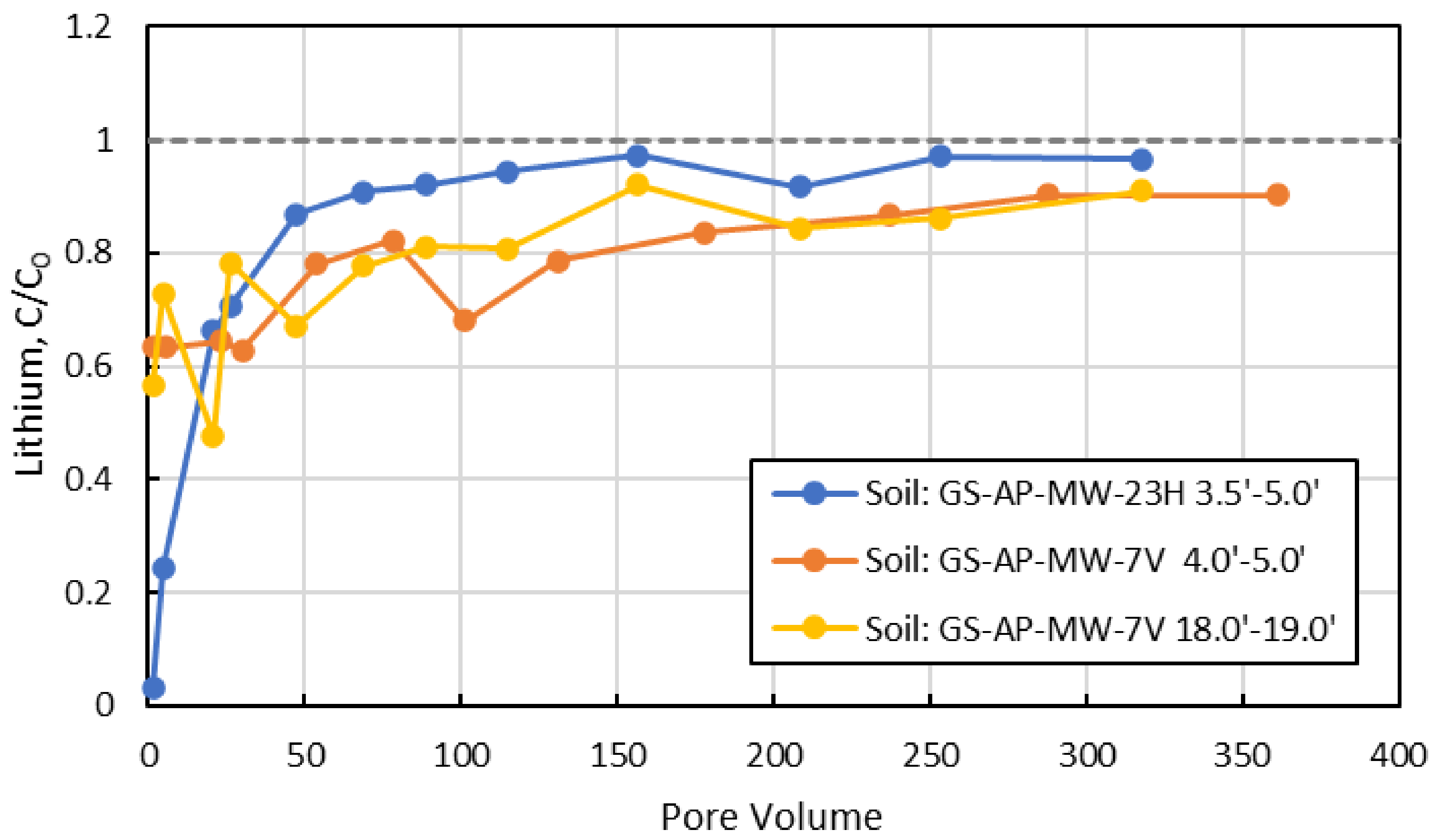
Note:
mg/kg: milligrams per kilogram

Figure 29

Lithium Mass Uptake by Site Soils Versus Lithium Mass Loading: Columns 1, 3, and 5

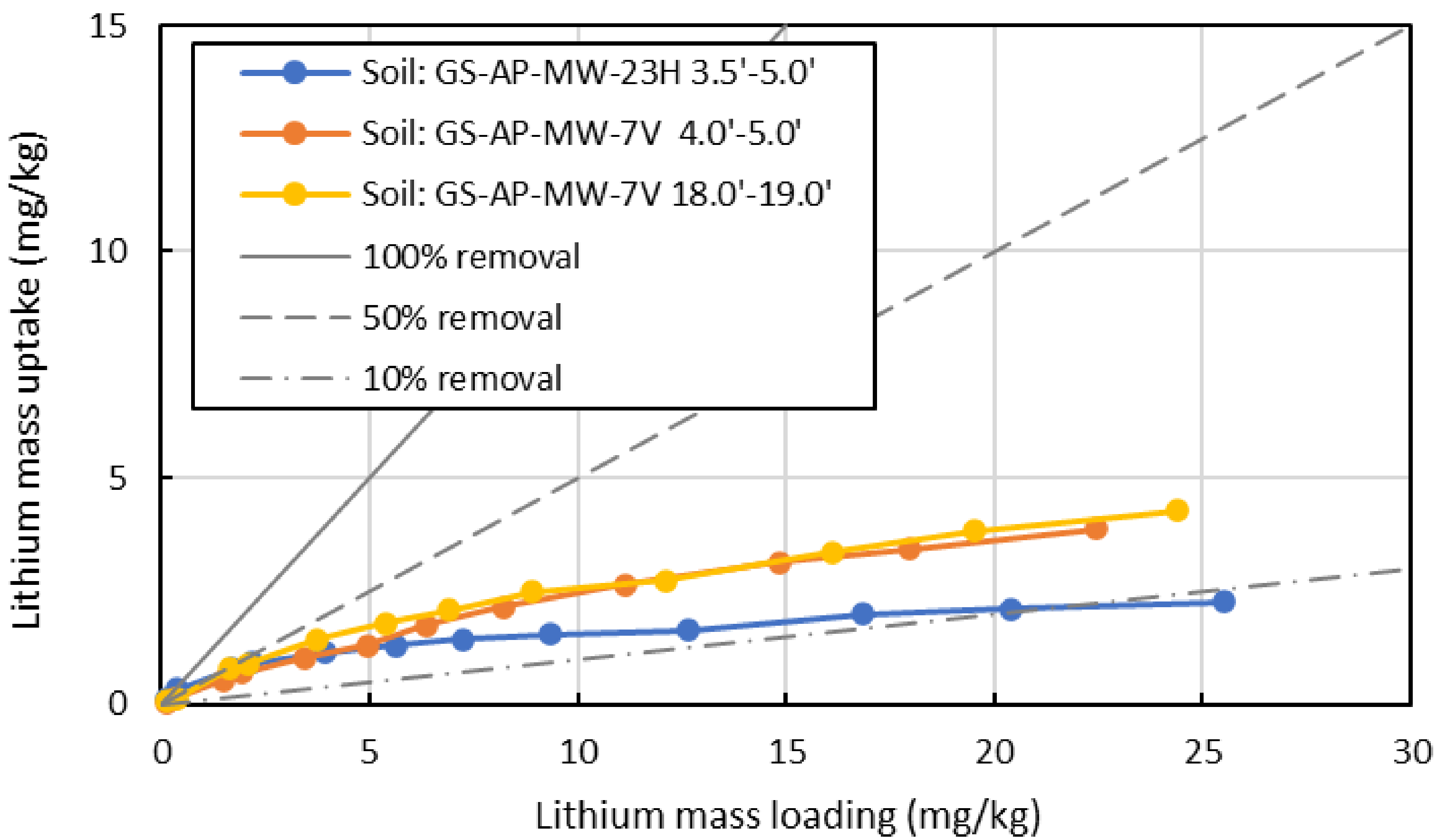
Monitored Natural Attenuation Demonstration

Plant Gorgas



Notes:
Dashed line indicates effluent concentrations equal influent concentrations (i.e., capacity for attenuation has been consumed).
C/C$_0$: ratio of concentration in column effluent to that in column influent solution

Figure 30
Dissolved Lithium Breakthrough Curves: Columns 2, 4, and 6
Monitored Natural Attenuation Demonstration
Plant Gorgas



Note:
mg/kg: milligrams per kilogram

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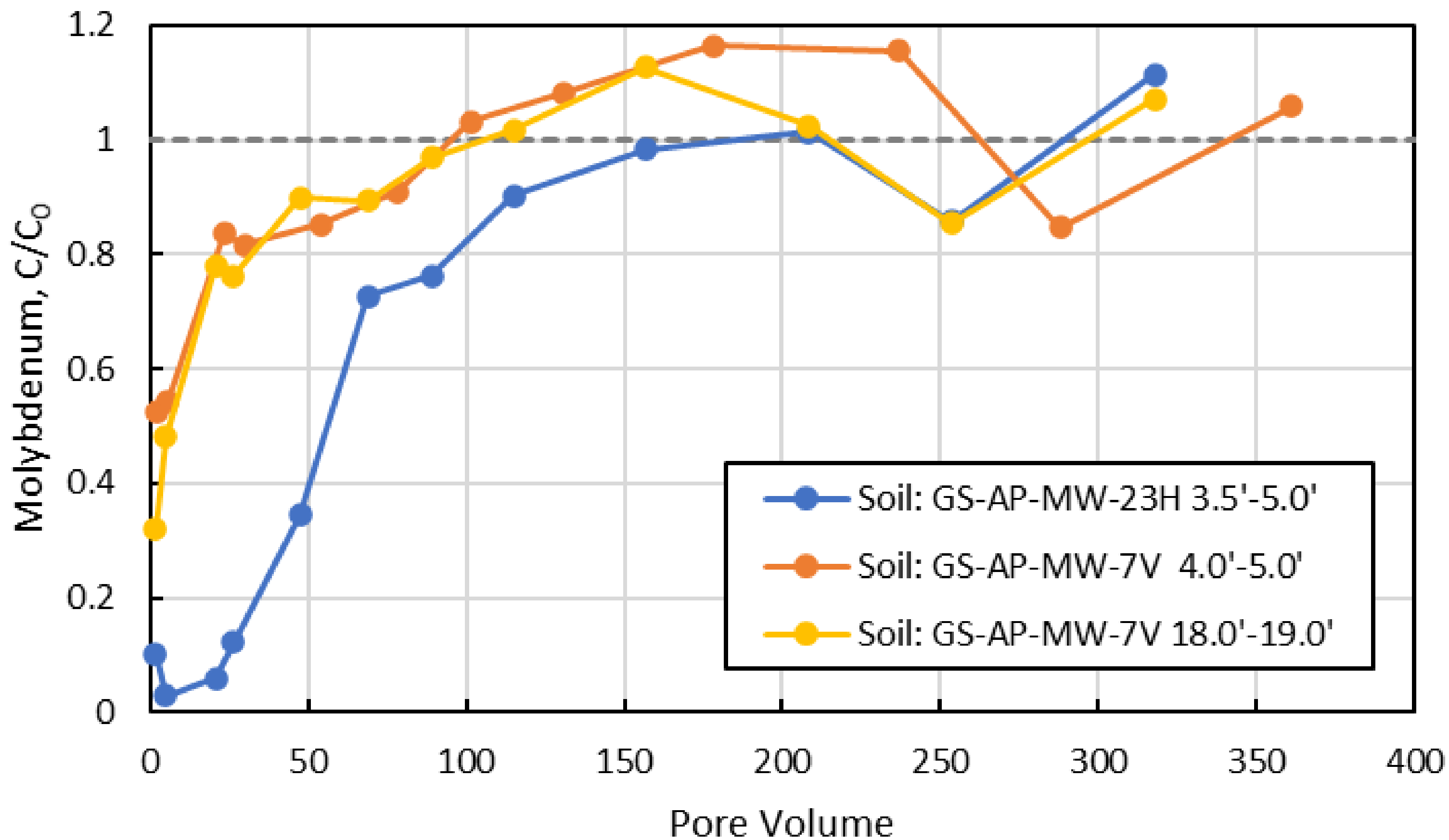
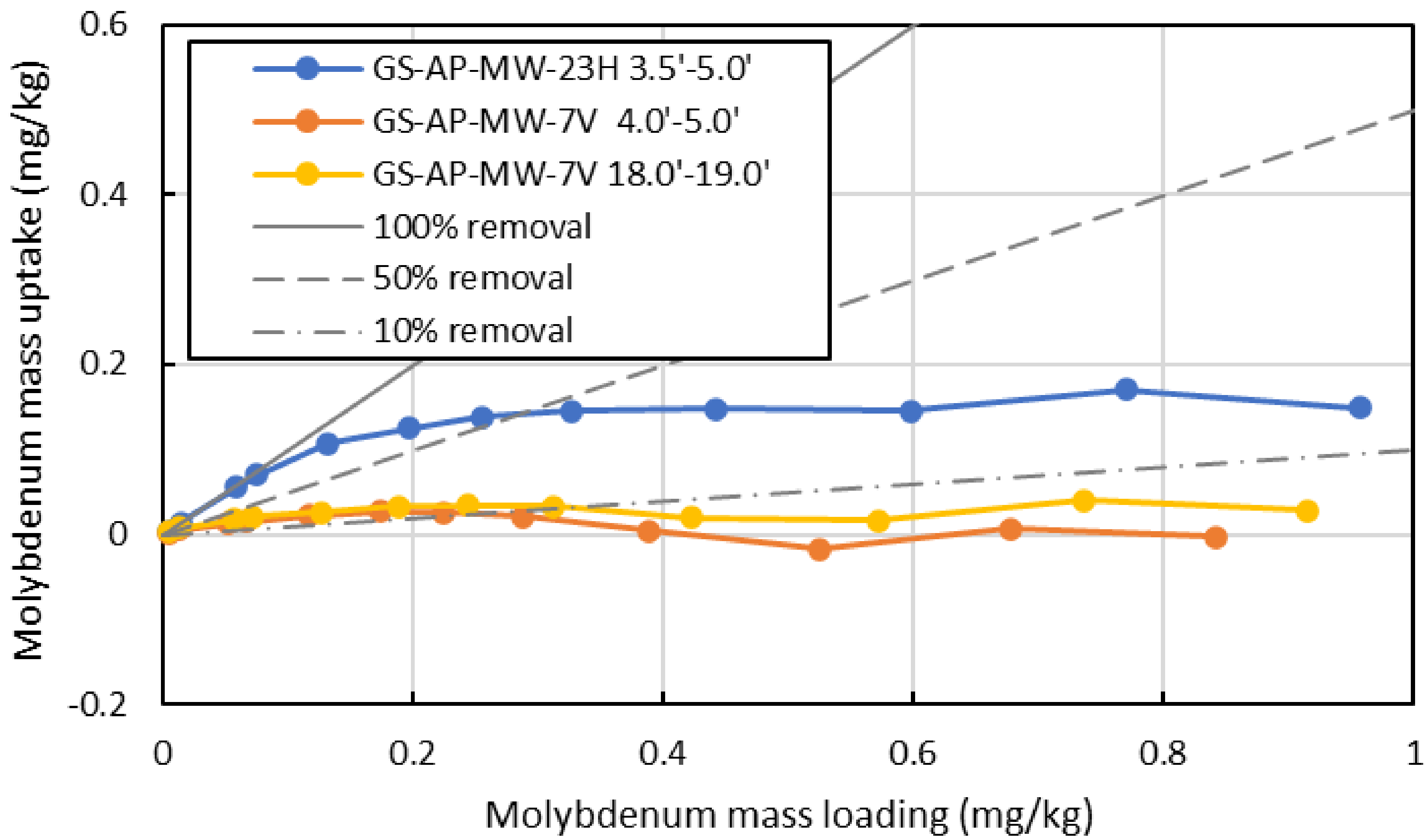
Figure 31
Lithium Mass Uptake by Site Soils Versus Lithium Mass Loading: Columns 2, 4, and 6
Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes:
Dashed line indicates effluent concentrations equal influent concentrations (i.e., capacity for attenuation has been consumed).
C/C_0: ratio of concentration in column effluent to that in column influent solution

Figure 32
Dissolved Molybdenum Breakthrough Curves: Columns 1, 3, and 5



Note:
mg/kg: milligrams per kilogram

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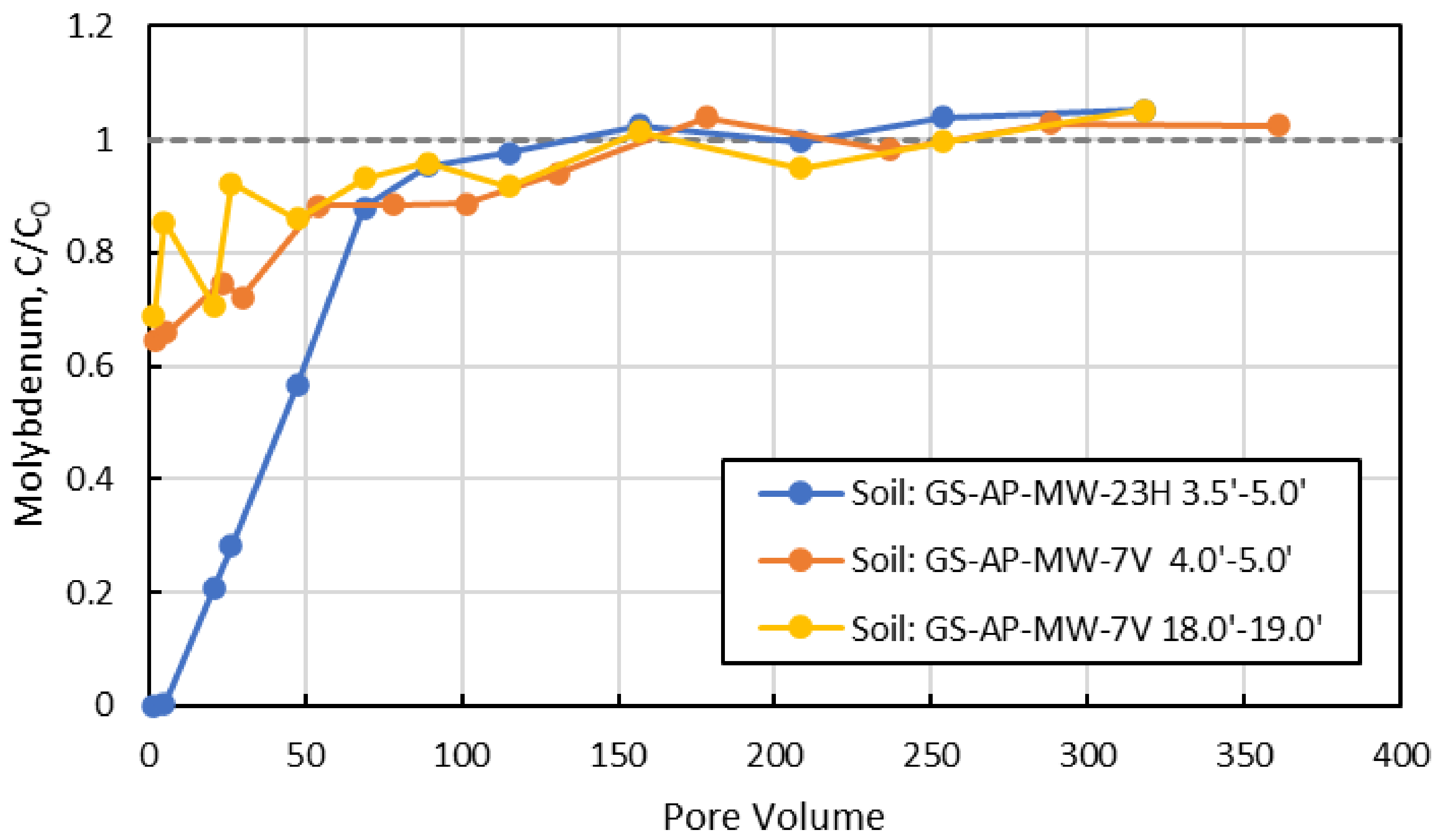
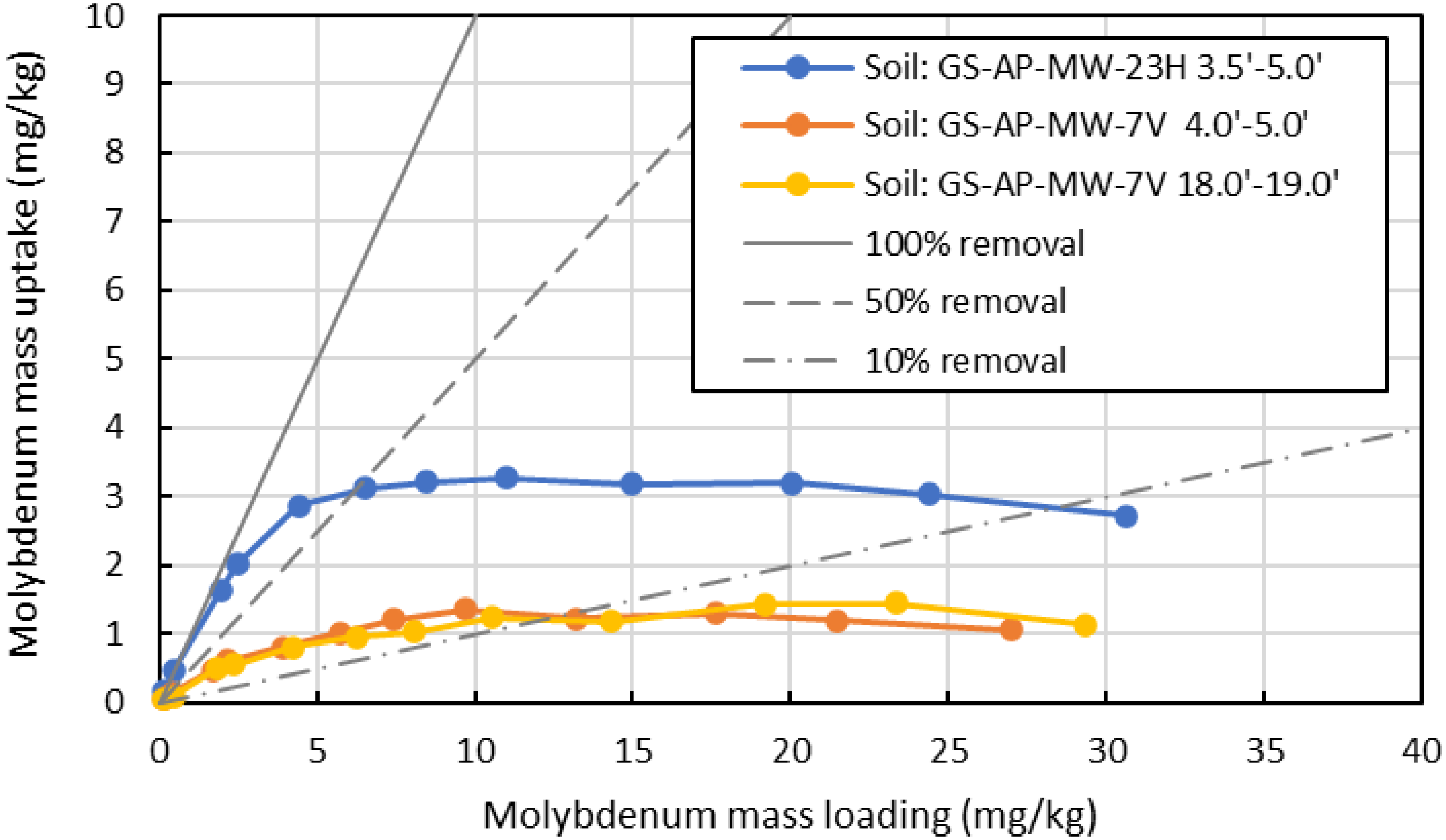
Figure 33
Molybdenum Mass Uptake by Site Soils Versus Molybdenum Mass Loading: Columns 1, 3, and 5
Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes:
Dashed line indicates effluent concentrations equal influent concentrations (i.e., capacity for attenuation has been consumed).
C/C_0: ratio of concentration in column effluent to that in column influent solution

Figure 34
Dissolved Molybdenum Breakthrough Curves: Columns 2, 4, and 6



Note:
mg/kg: milligrams per kilogram

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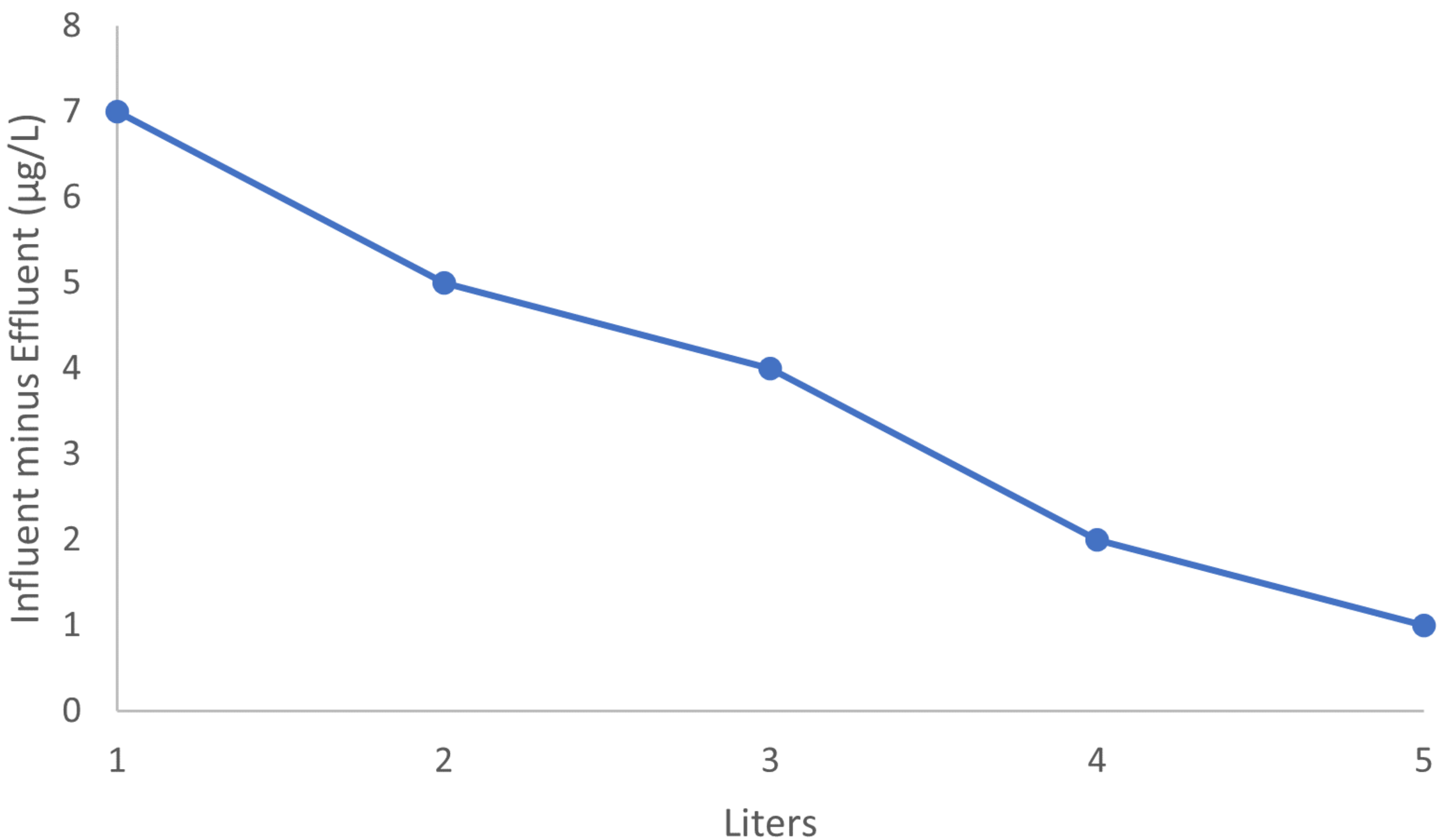
Figure 35
Molybdenum Mass Uptake by Site Soils Versus Molybdenum Mass Loading: Columns 2, 4, and 6
Monitored Natural Attenuation Demonstration
Plant Gorgas



Note:
µg/L: micrograms per liter

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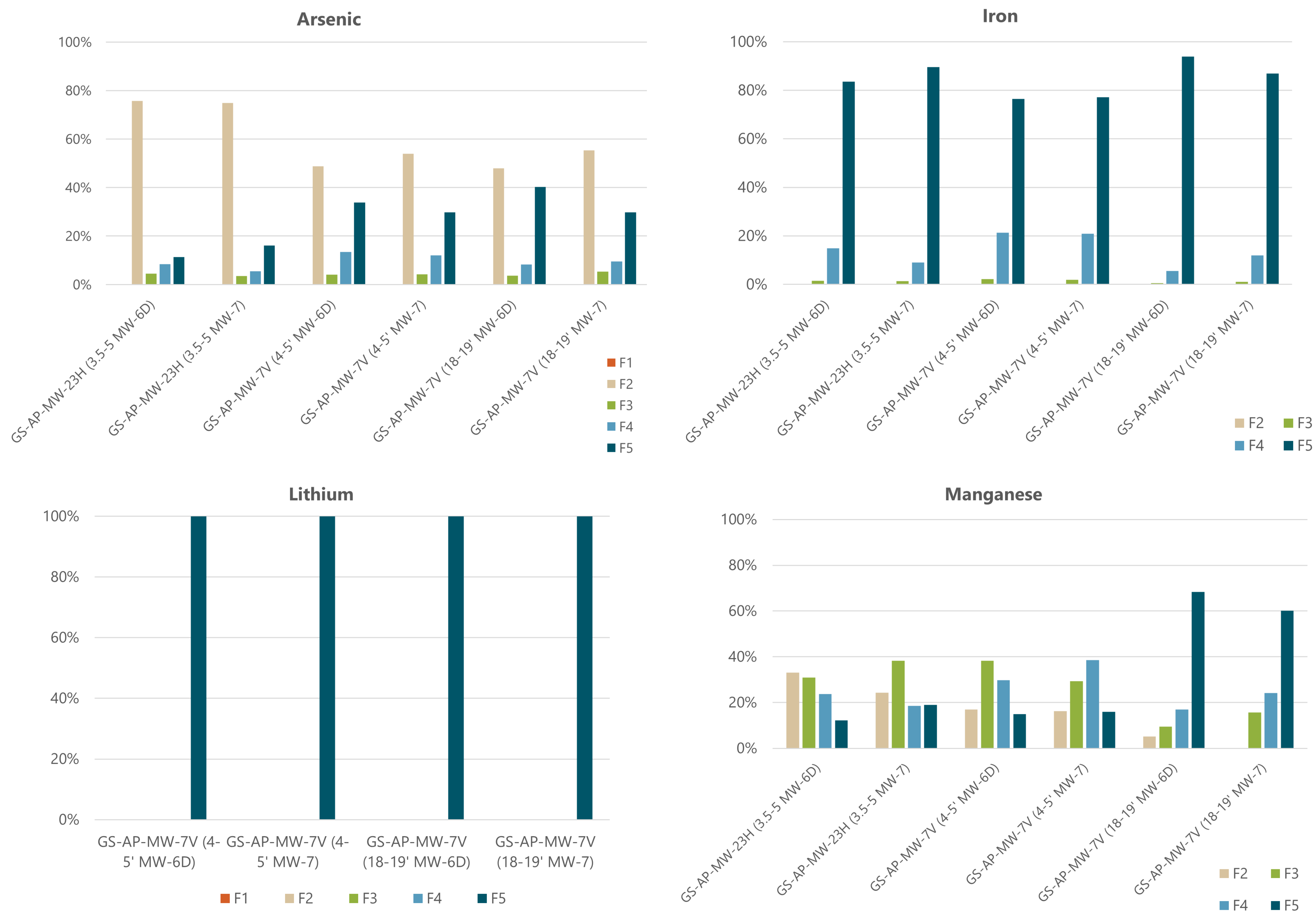
Figure 36
Example Graph to Calculate Mass Attenuated by Columns
Monitored Natural Attenuation Demonstration
Plant Gorgas



Notes:
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)
SSE: selective sequential extraction

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Figure 37
SSE Results for Aquifer Solids
Monitored Natural Attenuation Demonstration
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Appendix A
Concentration Versus Time Graphs

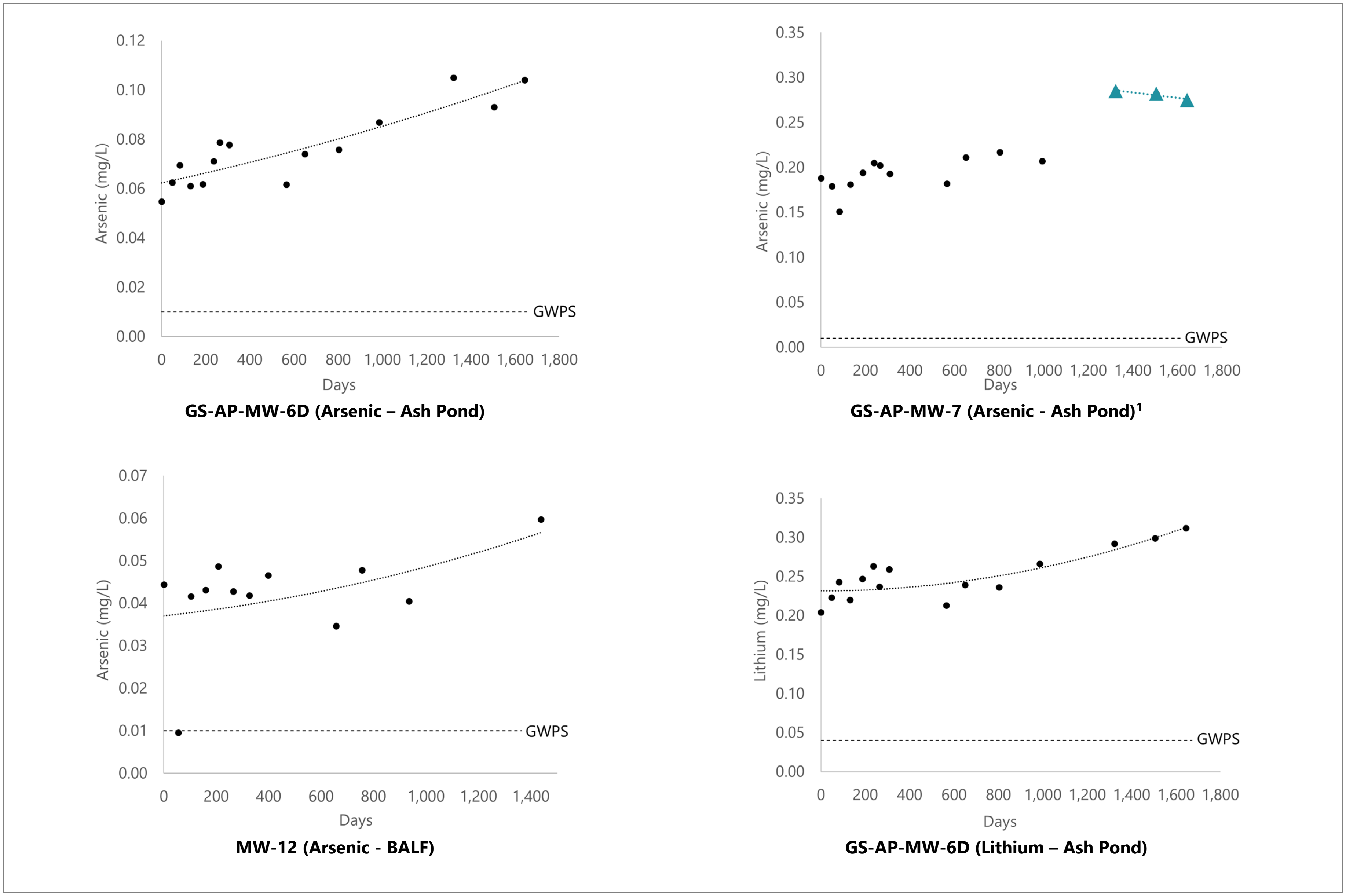
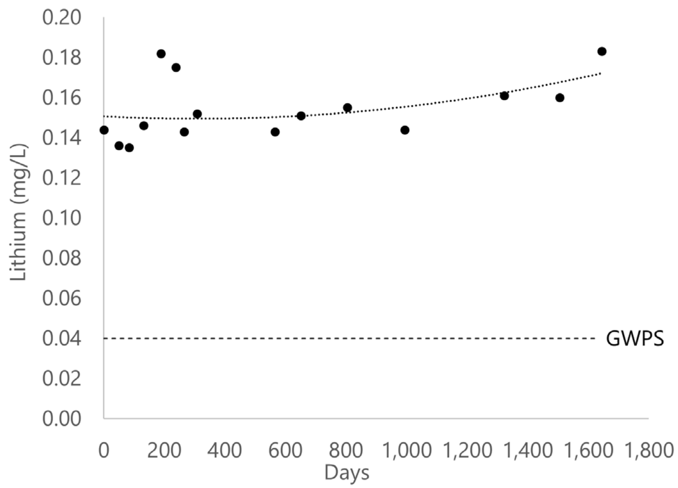


Figure A

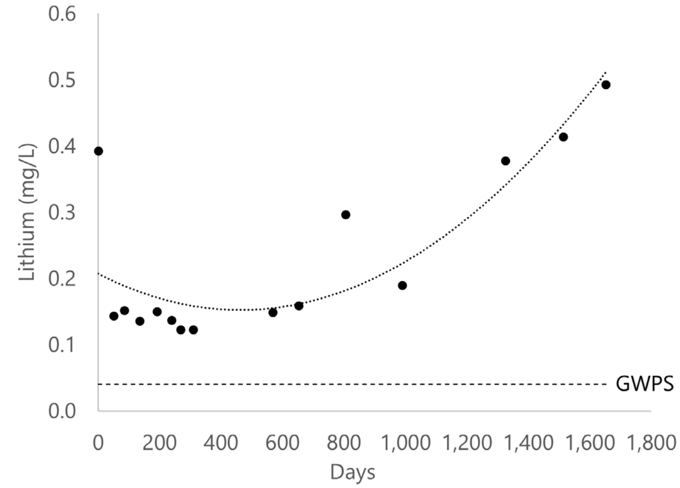
Concentration Versus Time Graphs

Monitored Natural Attenuation Demonstration: Appendix A

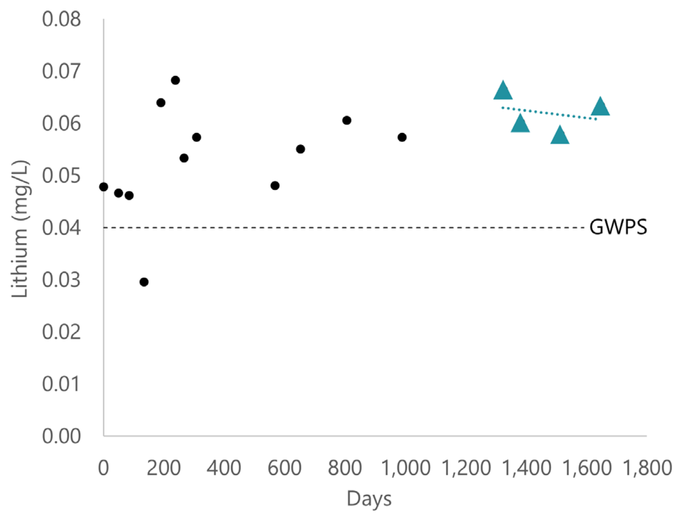
Plant Gorgas



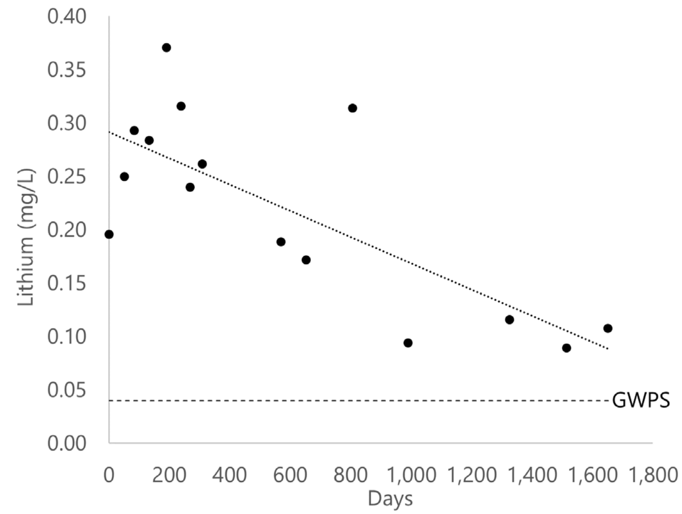
GS-AP-MW-7 (Lithium – Ash Pond)



GS-AP-MW-15 (Lithium – Ash Pond)



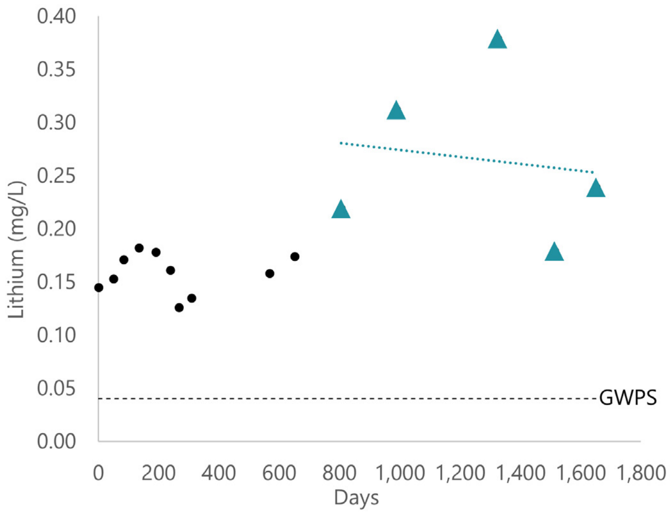
GS-AP-MW-17 (Lithium – Ash Pond)[1]



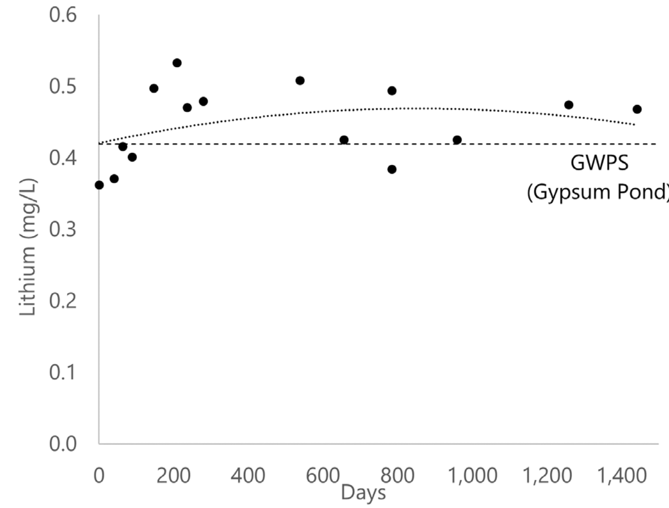
GS-AP-MW-18 (Lithium – Ash Pond)

ANCHOR QEA

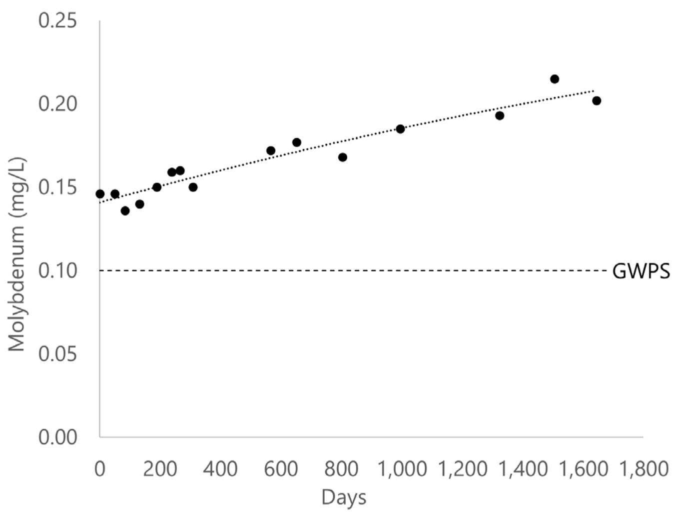
Figure A
Concentration Versus Time Graphs
Monitored Natural Attenuation Demonstration: Appendix A
Plant Gorgas



GS-AP-MW-21 (Lithium – Ash Pond)[1]



GS-GSA-MW-3 (Lithium – Gypsum Pond)



GS-AP-MW-7 (Molybdenum – Ash Pond)

Notes:
Blue triangles indicate recent data was used to determine GWPS rates.
1: Denotes recent data was used to determine time to achieve GWPS

Arsenic GWPS at Ash Pond: 0.01 mg/kg
Lithium GWPS at Ash Pond: 0.04 mg/kg
Lithium GWPS at the Gypsum Pond: 0.419 mg/kg

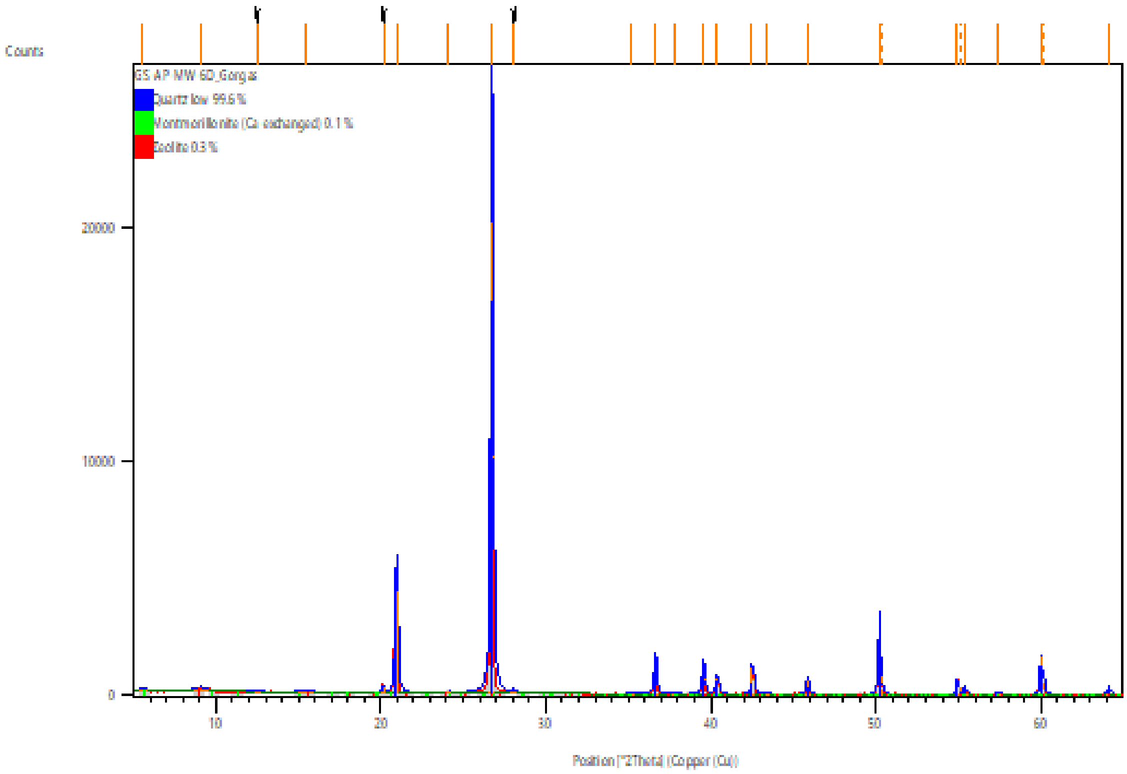
BALF: Bottom Ash Landfill
GWPS: groundwater protection standard
mg/L: milligrams per liter

ANCHOR QEA

Figure A
Concentration Versus Time Graphs
Monitored Natural Attenuation Demonstration: Appendix A
Plant Gorgas

Appendix B
Analytical Data

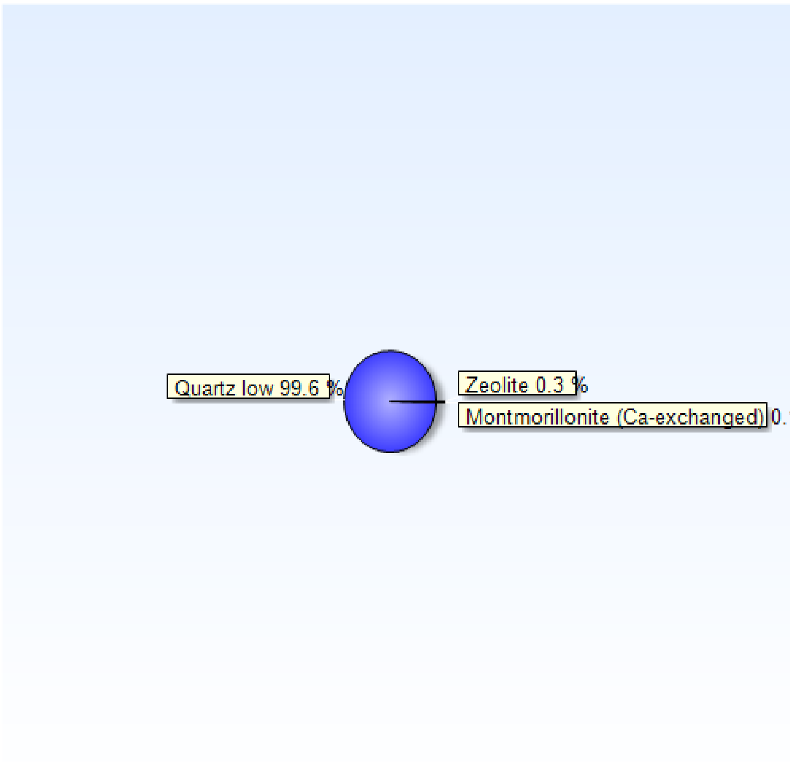
Graphics



Peak List

Pos.[°2Th.]	d-spacing [Å]	Rel. Int. [%]	Matched by
5.5912	15.80668	0.43	98-005-1636
9.0848	9.73445	0.64	98-017-0521
12.4928	7.08556	0.05	
15.4366	5.74028	0.14	98-017-0521
20.1545	4.40597	1.15	
20.9571	4.23900	21.23	98-002-7826
24.0874	3.69474	0.26	98-005-1636;98..
26.7195	3.33646	100.00	98-002-7826;98..
28.0740	3.17849	0.45	
35.2171	2.54845	0.11	98-005-1636
36.6216	2.45387	6.93	98-002-7826;98..
37.8165	2.37904	0.06	98-005-1636
39.5251	2.28005	5.66	98-002-7826;98..
40.3632	2.23462	3.26	98-002-7826;98..
42.5132	2.12646	5.60	98-002-7826
43.4195	2.08415	0.17	98-005-1636
45.8471	1.97929	3.06	98-002-7826
50.1854	1.81638	11.21	98-002-7826;98..
54.9255	1.67031	2.92	98-002-7826;98..
55.3757	1.65779	1.58	98-002-7826;98..
57.3747	1.60469	0.14	98-002-7826;98..
60.0088	1.54039	8.07	98-002-7826;98..
64.0902	1.45179	1.18	98-002-7826;98..

Quantitative Results



Phase Quartz low:	Weight fraction/ %:	100
Phase Montmorillonite :	Weight fraction/ %:	0.11
Phase Zeolite:	Weight fraction/ %:	0.32

Pattern List

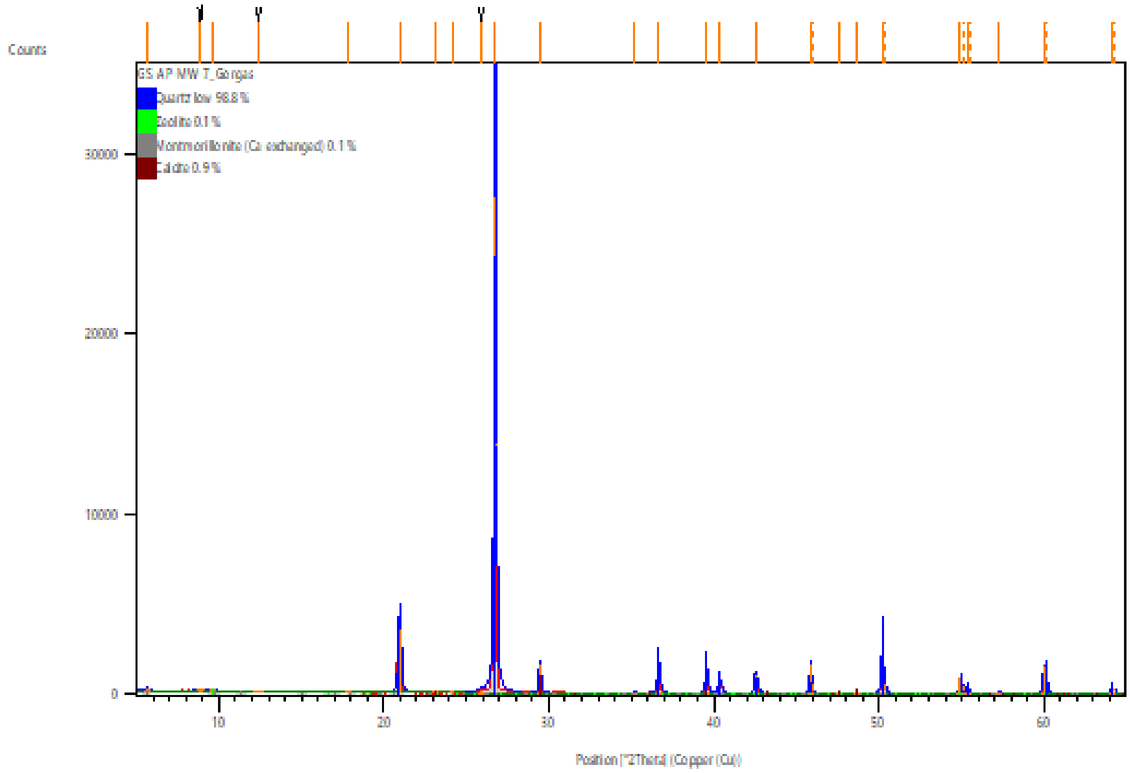
Ref.Code	Score	Compound Name	Chem. Formula
98-002-7826	74	Quartz low	O2 Si1
98-005-1636	25	Montmorillonite	H8.2 Al4 Ca1.2 O27..
98-017-0521	20	Zeolite	O2 Si1

Anchor Scan Parameters

Dataset Name:	GS-AP-MW-6D_Gorgas
File name:	C:\Users\Rick\Documents\RCIA_Win10\AnchorQEA\2020_March\GS-AP-MW-6D_Gorgas.rd
Sample Identification:	GS-AP-MW-6D Gorgas
Comment:	Exported by X'Pert SW Generated by hugo in project AnchorQEA_2
Measurement Date / Time:	3/20/2020 11:37:00 AM
Raw Data Origin:	PHILIPS-binary (scan) (.RD)
Scan Axis:	Gonio
Start Position [°2Th.]:	5.0150
End Position [°2Th.]:	64.9850
Step Size [°2Th.]:	0.0300
Scan Step Time [s]:	2.5000

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

Graphics

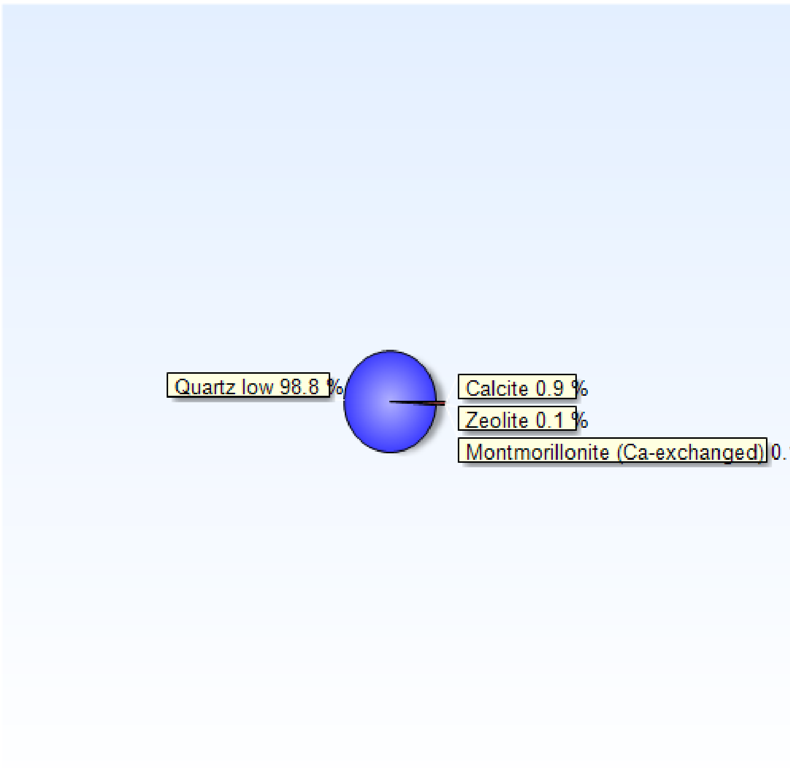


Peak List

Pos.[°2Th.]	d-spacing [Å]	Rel. Int. [%]	Matched by
5.6451	15.65591	0.39	98-005-1636
8.8847	9.95322	0.36	
9.5961	9.21684	0.37	98-017-0492
12.3891	7.14462	0.02	
17.8398	4.97206	0.10	98-005-1636
20.9629	4.23784	12.84	98-009-3974
23.1611	3.84037	0.05	98-017-0492;98..
24.1278	3.68865	0.14	98-005-1636
25.9100	3.43883	0.42	
26.7335	3.33474	100.00	98-009-3974;98..
29.4463	3.03341	5.68	98-002-8827
35.1829	2.55085	0.09	98-017-0492;98..
36.6354	2.45298	5.20	98-009-3974;98..
39.5348	2.27952	4.58	98-009-3974;98..
40.3483	2.23541	2.43	98-009-3974;98..
42.5356	2.12539	3.53	98-009-3974;98..
45.8492	1.97756	6.18	98-009-3974;98..
47.6196	1.90809	0.07	98-017-0492;98..
48.6130	1.87139	0.09	98-005-1636;98..
50.1926	1.81614	7.40	98-009-3974;98..
54.9242	1.67034	3.25	98-009-3974;98..

55.3423	1.65871	1.54	98-009-3974;98..
57.2835	1.60703	0.18	98-009-3974;98..
60.0086	1.54040	5.54	98-009-3974;98..
64.1055	1.45148	1.92	98-009-3974;98..

Quantitative Results



Phase Quartz low:	Weight fraction/ %:	99
Phase Zeolite:	Weight fraction/ %:	0.14
Phase Montmorillonite :	Weight fraction/ %:	0.11
Phase Calcite:	Weight fraction/ %:	0.9

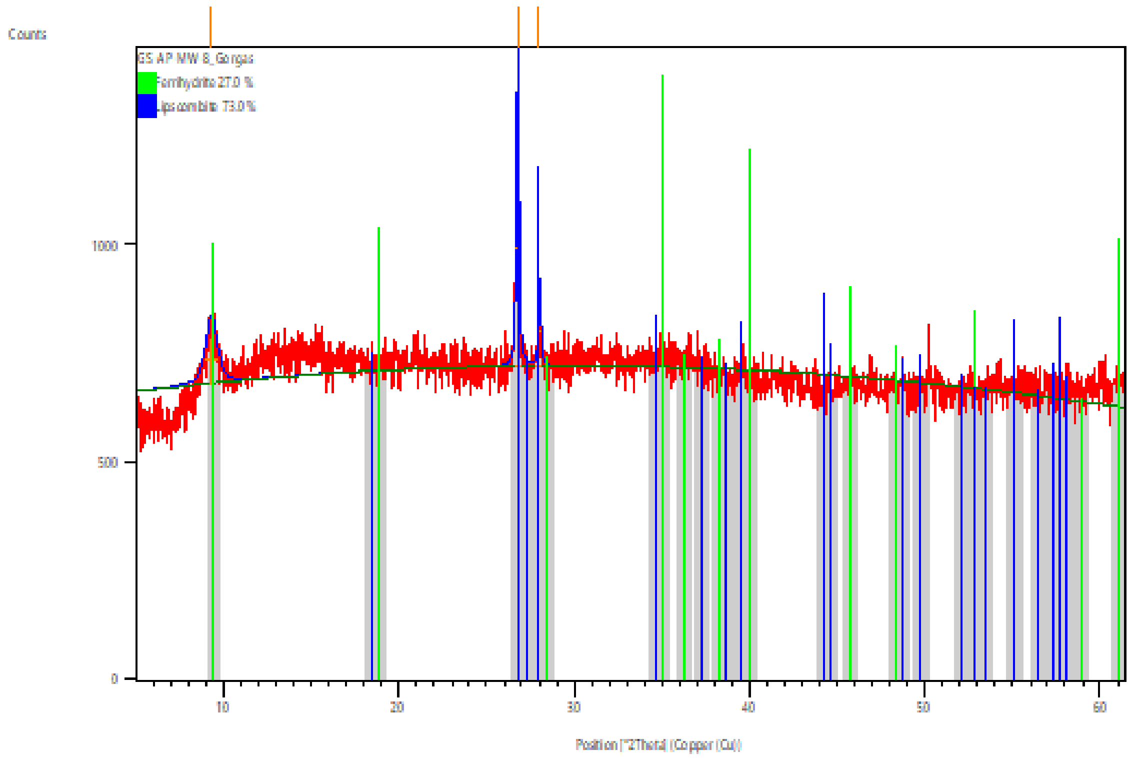
Pattern List

Ref.Code	Score	Compound Name	Chem. Formula
98-009-3974	74	Quartz low	O2 Si1
98-017-0492	23	Zeolite	O2 Si1
98-005-1636	26	Montmorillonite	H8.2 Al4 Ca1.2 O27..
98-002-8827	19	Calcite	C1 Ca1 O3

Anchor Scan Parameters

Dataset Name:	GS-AP-MW-7_Gorgas
File name:	C:\Users\Rick\Documents\RCIA_Win10\AnchorQEA\2020_March\GS-AP-MW-7_Gorgas.rd
Sample Identification:	GS-AP-MW-7 Gorgas
Comment:	Exported by X'Pert SW Generated by hugo in project AnchorQEA_2
Measurement Date / Time:	3/20/2020 2:27:00 PM
Raw Data Origin:	PHILIPS-binary (scan) (.RD)
Scan Axis:	Gonio
Start Position [°2Th.]:	5.0150
End Position [°2Th.]:	64.9850
Step Size [°2Th.]:	0.0300
Scan Step Time [s]:	2.5000
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

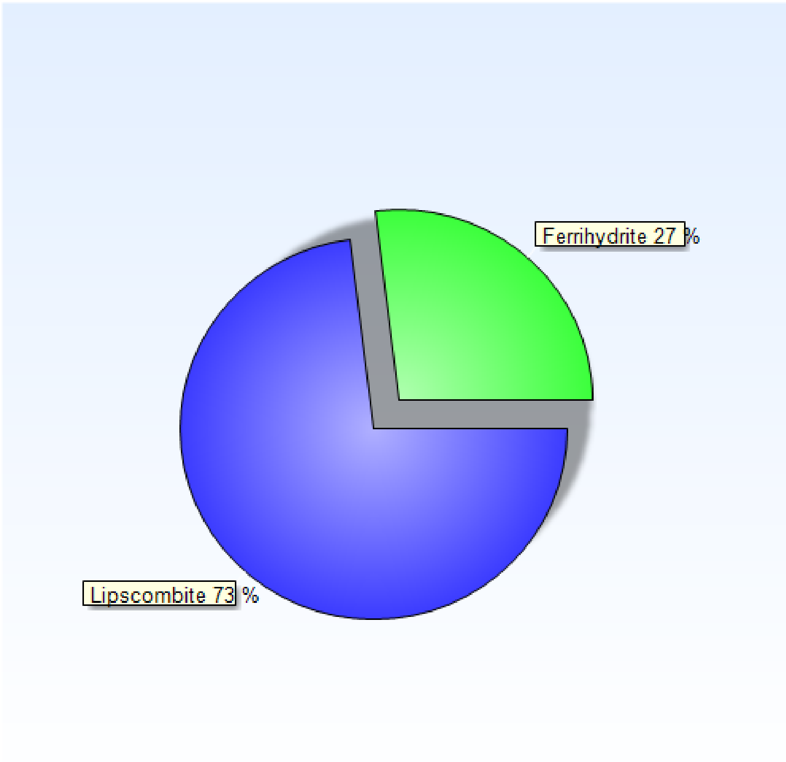
Graphics



Peak List

Pos.[°2Th.]	d-spacing [Å]	Rel. Int. [%]	Matched by
9.2973	9.51244	19.03	98-005-6287
26.7500	3.33272	100.00	98-017-0853
27.9852	3.18837	28.56	98-017-0853

Quantitative Results



Phase Ferrihydrite:	Weight fraction/ %:	27(10)
Phase Lipscombite:	Weight fraction/ %:	73(4)

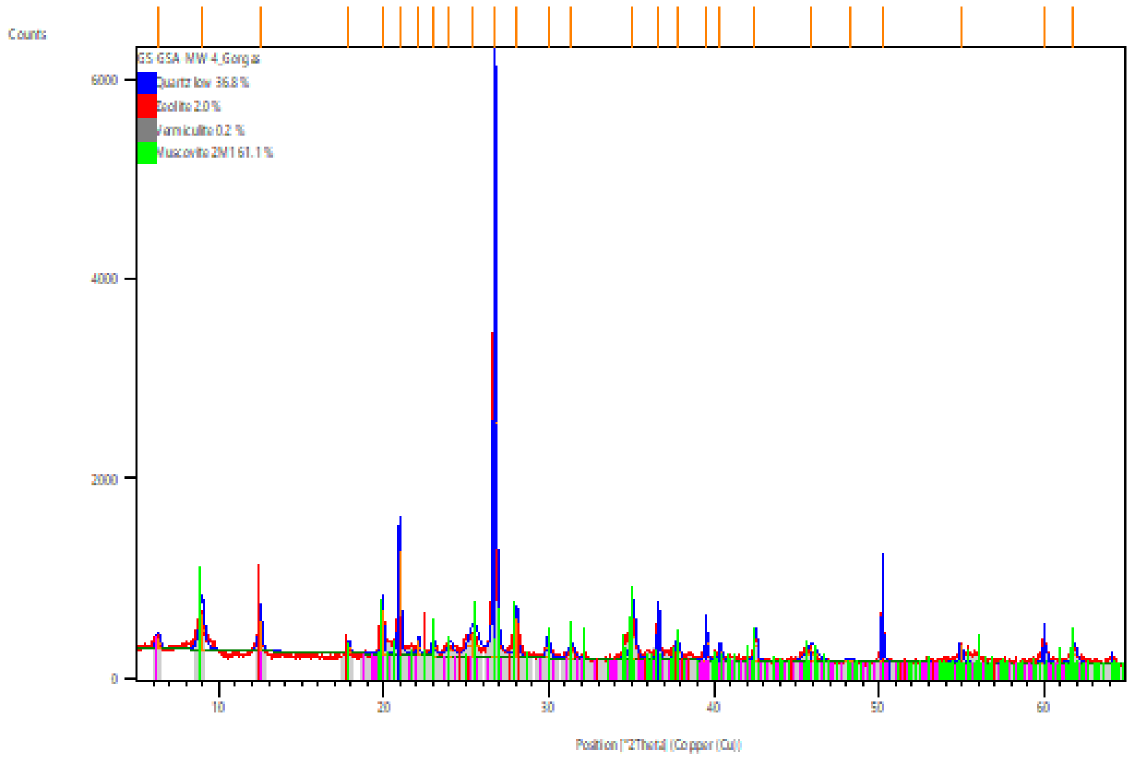
Pattern List

Ref.Code	Score	Compound Name	Chem. Formula
98-005-6287	2	Ferrihydrite	H3.68 Fe1.44 O4
98-017-0853	20	Lipscombite	H1.43 Fe1.176 O5 P1

Anchor Scan Parameters

Dataset Name:	GS-AP-MW-8_Gorgas
File name:	C:\Users\Rick\Documents\RCIA_Win10\AnchorQEA\2020_March\GS-AP-MW-8_Gorgas.rd
Sample Identification:	GS-GSA-MW-8 Gorgas
Comment:	Exported by X'Pert SW Generated by hugo in project AnchorQEA_2
Measurement Date / Time:	3/16/2020 12:01:00 PM
Raw Data Origin:	PHILIPS-binary (scan) (.RD)
Scan Axis:	Gonio
Start Position [°2Th.]:	5.0125
End Position [°2Th.]:	61.4875
Step Size [°2Th.]:	0.0250
Scan Step Time [s]:	2.5000
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

Graphics

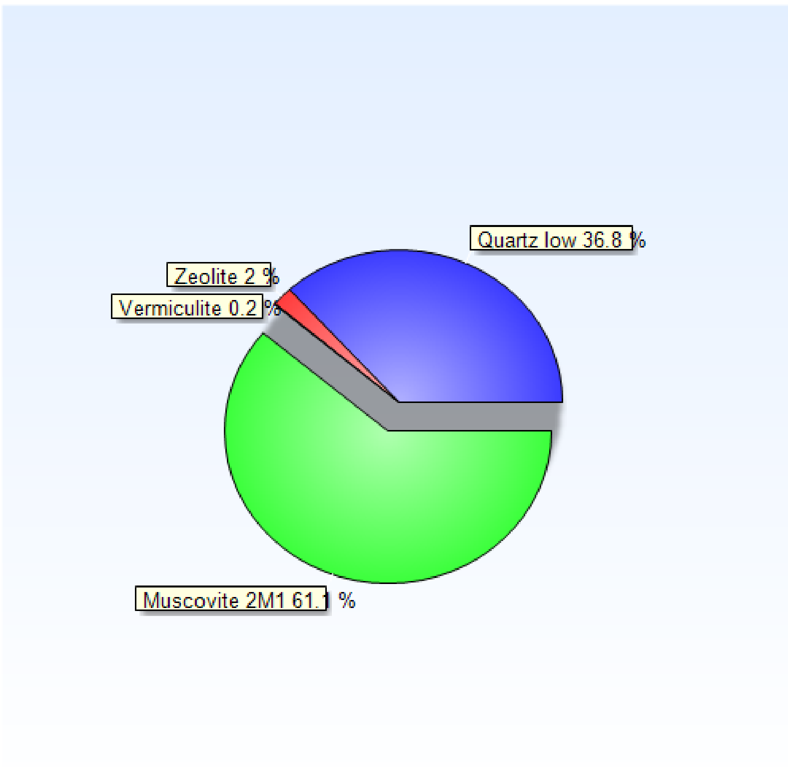


Peak List

Pos.[°2Th.]	d-spacing [Å]	Rel. Int. [%]	Matched by
6.3296	13.96420	2.35	96-900-0010
8.9867	9.84045	7.75	98-009-0144;98..
12.5041	7.07917	6.74	98-017-0517;96..
17.8767	4.96189	1.94	98-017-0517;98..
19.9220	4.45686	9.72	98-009-0144;96..
20.9421	4.24202	21.96	98-002-7826;98..
22.1157	4.01949	3.06	98-009-0144;96..
22.9982	3.86720	2.86	98-009-0144;96..
23.9919	3.70923	1.93	98-009-0144;98..
25.4355	3.50190	4.66	98-009-0144;96..
26.7267	3.33558	100.00	98-002-7826;98..
28.0339	3.18294	8.19	98-017-0517;96..
29.9545	2.98309	3.77	98-009-0144;98..
31.3473	2.85366	2.13	98-009-0144;96..
35.0751	2.55844	9.25	98-009-0144;96..
36.6315	2.45323	10.97	98-002-7826;98..
37.7670	2.38205	3.13	98-017-0517;98..
39.5283	2.27987	7.08	98-002-7826;98..
40.3670	2.23442	3.38	98-002-7826;98..
42.5165	2.12630	6.23	98-002-7826;98..
45.8888	1.97759	2.80	98-002-7826;98..

48.2217	1.88723	0.46	98-009-0144;96..
50.1985	1.81744	11.34	98-002-7826;98..
54.9487	1.67104	3.94	98-002-7826;98..
60.0158	1.54151	6.83	98-002-7826;98..
61.7991	1.50124	3.36	98-009-0144;96..

Quantitative Results



Phase Quartz low:	Weight fraction/ %:	36.8
Phase Zeolite:	Weight fraction/ %:	2.0
Phase Vermiculite:	Weight fraction/ %:	0.17
Phase Muscovite 2M1:	Weight fraction/ %:	61

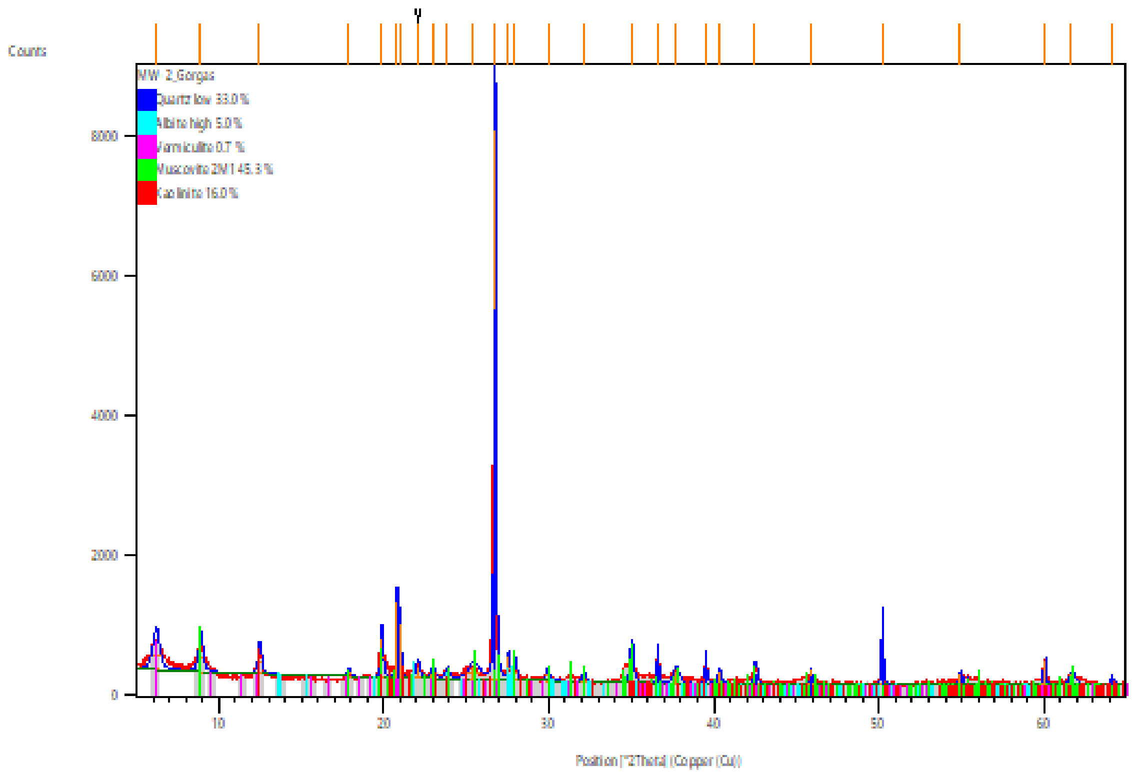
Pattern List

Ref.Code	Score	Compound Name	Chem. Formula
98-002-7826	72	Quartz low	O2 Si1
98-017-0517	27	Zeolite	O2 Si1
96-900-0010	28	Vermiculite	Mg12.00 Si16.00 O4..
98-018-0082	43	Muscovite/Illite	H1.834 Al2.724 F0...

Anchor Scan Parameters

Dataset Name:	GS-GSA-MW-4_Gorgas
File name:	C:\Users\Rick\Documents\RCIA_Win10\AnchorQEA\2020_March\GS-GSA-MW-4_Gorgas.rd
Sample Identification:	GS-GSA-MW-4 Gorgas
Comment:	Exported by X'Pert SW Generated by hugo in project AnchorQEA_2
Measurement Date / Time:	3/19/2020 9:33:00 AM
Raw Data Origin:	PHILIPS-binary (scan) (.RD)
Scan Axis:	Gonio
Start Position [°2Th.]:	5.0125
End Position [°2Th.]:	64.9875
Step Size [°2Th.]:	0.0250
Scan Step Time [s]:	2.5000
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

Graphics

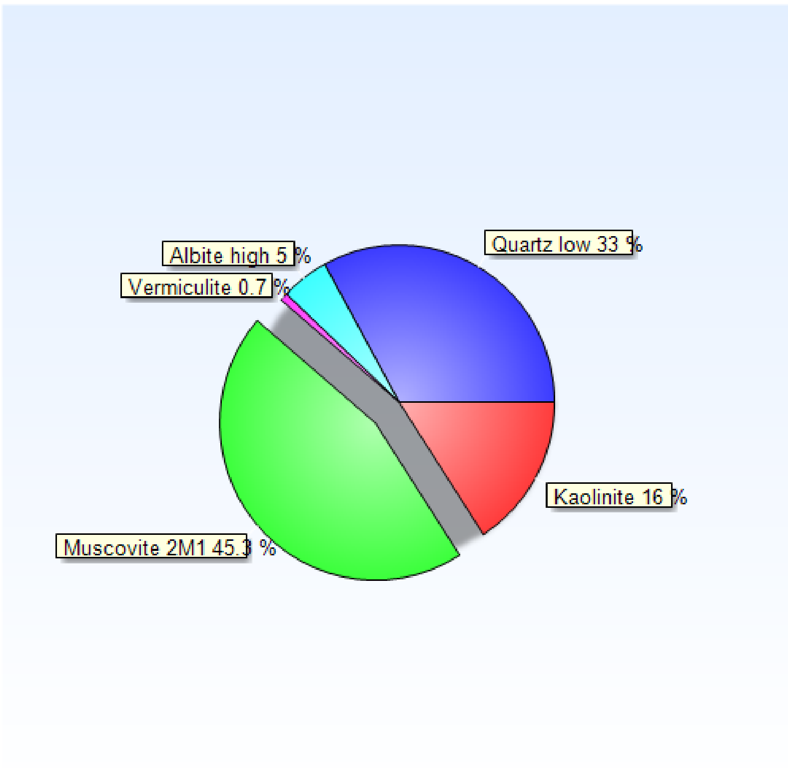


Peak List

Pos.[°2Th.]	d-spacing [Å]	Rel. Int. [%]	Matched by
6.2087	14.23591	5.17	98-016-6064
8.9124	9.92241	5.01	98-009-0144;98..
12.4855	7.08965	4.00	98-016-6064;96..
17.8576	4.96715	1.06	98-016-6064;98..
19.8860	4.46485	7.07	98-009-0144;98..
20.8099	4.26865	13.81	98-002-9210;98..
20.9724	4.23596	10.06	98-002-9210;98..
22.0728	4.02719	2.31	
22.9619	3.87324	1.48	98-010-0505;98..
23.8425	3.73214	1.42	98-010-0505;98..
25.4332	3.50220	2.16	98-016-6064;98..
26.7364	3.33439	100.00	98-002-9210;98..
27.5733	3.23506	4.38	98-010-0505;98..
27.9589	3.19131	3.11	98-010-0505;98..
29.9251	2.98596	1.92	98-010-0505;98..
32.1102	2.78758	1.30	98-009-0144;98..
35.0080	2.56319	5.92	98-016-6064;98..
36.5938	2.45568	4.75	98-002-9210;98..
37.7031	2.38593	2.16	98-016-6064;98..
39.4957	2.28168	3.75	98-002-9210;98..
40.3269	2.23655	2.08	98-002-9210;98..

42.5067	2.12676	3.33	98-002-9210;98..
45.8715	1.97829	2.91	98-002-9210;98..
50.1881	1.81780	9.16	98-002-9210;98..
54.9213	1.67181	1.93	98-002-9210;98..
59.9964	1.54068	4.46	98-002-9210;98..
61.6809	1.50383	1.90	98-010-0505;98..
64.0796	1.45321	0.86	98-002-9210;98..

Quantitative Results



Phase Quartz low:	Weight fraction/ %:	33.0
Phase Albite high:	Weight fraction/ %:	5
Phase Vermiculite:	Weight fraction/ %:	0.75
Phase Muscovite 2M1:	Weight fraction/ %:	45
Phase Kaolinite:	Weight fraction/ %:	16

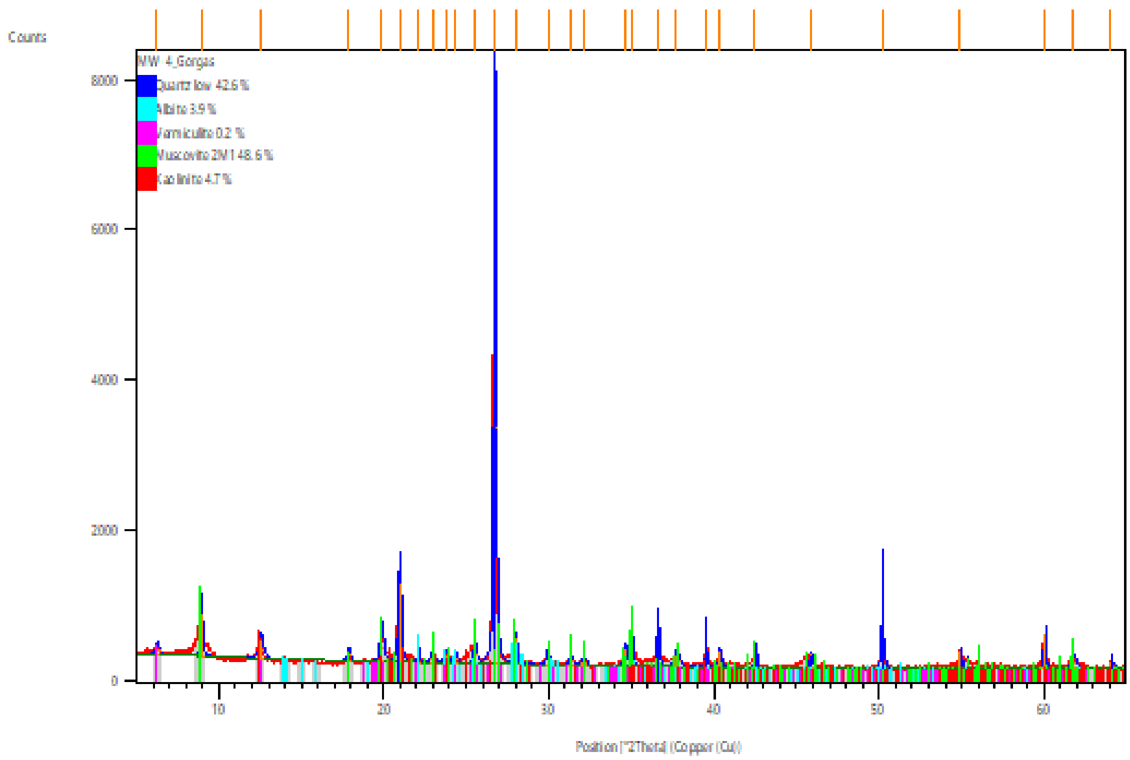
Pattern List

Ref.Code	Score	Compound Name	Chem. Formula
98-002-9210	67	Quartz low	O2 Si1
98-010-0505	16	Albite high	Al1 Na1 O8 Si3
98-016-6064	26	Vermiculite	H10.8 Al2.94 Ca0.0..
98-018-0082	46	Muscovite/Illite	H1.834 Al2.724 F0...
96-900-9235	21	Kaolinite	Al2.00 Si2.00 O9.0..

Anchor Scan Parameters

Dataset Name:	MW-2_Gorgas
File name:	C:\Users\Rick\Documents\RCIA_Win10\AnchorQEA\2020_March\MW-2_Gorgas.rd
Sample Identification:	MW-2 Gorgas
Comment:	Exported by X'Pert SW Generated by hugo in project AnchorQEA_2
Measurement Date / Time:	3/17/2020 3:29:00 PM
Raw Data Origin:	PHILIPS-binary (scan) (.RD)
Scan Axis:	Gonio
Start Position [°2Th.]:	5.0125
End Position [°2Th.]:	64.9875
Step Size [°2Th.]:	0.0250
Scan Step Time [s]:	2.5000
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

Graphics

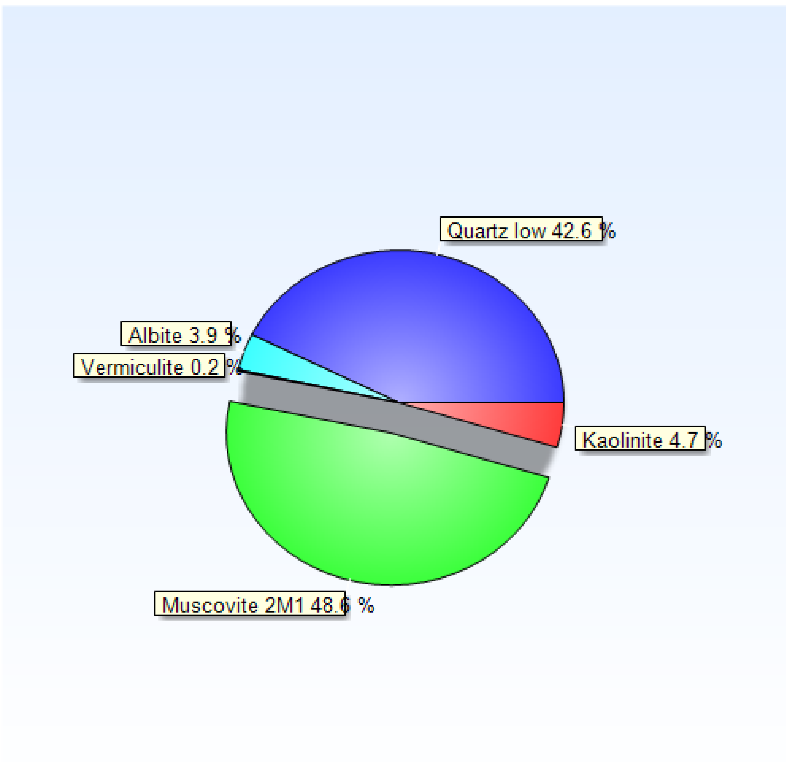


Peak List

Pos.[°2Th.]	d-spacing [Å]	Rel. Int. [%]	Matched by
6.2677	14.10196	1.81	98-015-9384
8.9622	9.86732	9.06	98-018-0082;98..
12.5702	7.04209	3.57	98-015-9384;96..
17.8777	4.96163	2.10	98-018-0082;98..
19.8796	4.46626	6.00	98-015-9384;98..
20.9678	4.23686	16.39	98-002-9210;98..
22.0894	4.02421	3.10	96-900-1633;98..
22.9551	3.87437	1.61	96-900-1633;98..
23.7768	3.74231	1.75	96-900-1633;98..
24.3525	3.65512	1.81	96-900-1633;98..
25.5251	3.48981	3.55	96-900-1633;98..
26.7264	3.33561	100.00	98-002-9210;96..
27.9935	3.18745	5.47	96-900-1633;98..
29.9527	2.98327	2.83	98-018-0082;98..
31.3181	2.85625	1.83	96-900-1633;98..
32.1201	2.78674	1.32	96-900-1633;98..
34.6084	2.59186	3.81	98-015-9384;98..
35.0071	2.56325	7.64	96-900-1633;98..
36.6121	2.45449	8.21	98-002-9210;96..
37.7210	2.38485	2.44	96-900-1633;98..
39.5181	2.28044	5.08	98-002-9210;96..

40.3703	2.23425	3.69	98-002-9210;96..
42.5045	2.12687	5.27	98-002-9210;96..
45.8779	1.97803	3.23	98-002-9210;96..
50.1916	1.81768	9.05	98-002-9210;96..
54.9243	1.67173	3.88	98-002-9210;96..
60.0006	1.54186	7.18	98-002-9210;98..
61.7628	1.50203	2.46	96-900-1633;98..
64.0676	1.45345	1.25	98-002-9210;98..

Quantitative Results



Phase Quartz low:	Weight fraction/ %:	42.6
Phase Albite:	Weight fraction/ %:	3.9
Phase Vermiculite:	Weight fraction/ %:	0.18
Phase Muscovite 2M1:	Weight fraction/ %:	49
Phase Kaolinite:	Weight fraction/ %:	4.7

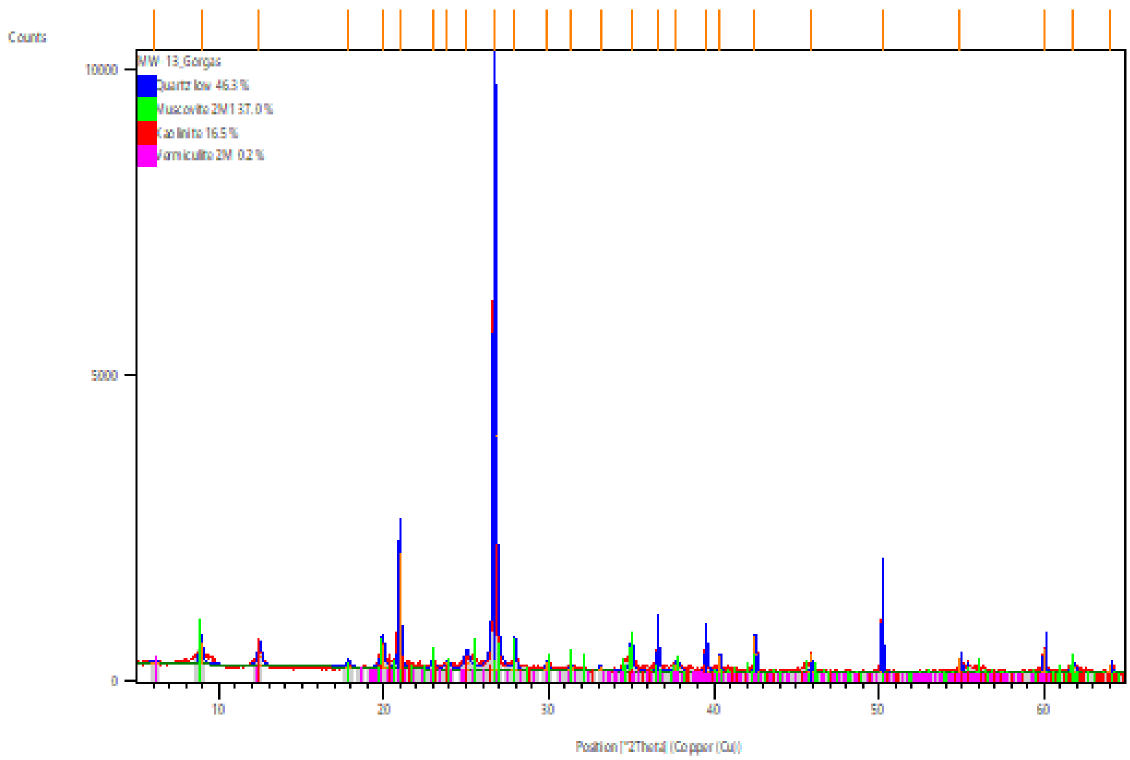
Pattern List

Ref.Code	Score	Compound Name	Chem. Formula
98-002-9210	66	Quartz low	O2 Si1
96-900-1633	22	Albite	Na2.00 Al2.00 Si6...
98-015-9384	29	Vermiculite	H3 Al1 Mg3 O12 Si3
98-018-0082	46	Muscovite/Illite	H1.834 Al2.724 F0...
96-900-9235	15	Kaolinite	Al2.00 Si2.00 O9.0..

Anchor Scan Parameters

Dataset Name:	MW-4_Gorgas
File name:	C:\Users\Rick\Documents\RCIA_Win10\AnchorQEA\2020_March\MW-4_Gorgas.rd
Sample Identification:	MW-4 Gorgas
Comment:	Exported by X'Pert SW Generated by hugo in project AnchorQEA_2
Measurement Date / Time:	3/16/2020 1:37:00 PM
Raw Data Origin:	PHILIPS-binary (scan) (.RD)
Scan Axis:	Gonio
Start Position [°2Th.]:	5.0125
End Position [°2Th.]:	64.9875
Step Size [°2Th.]:	0.0250
Scan Step Time [s]:	2.5000
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

Graphics

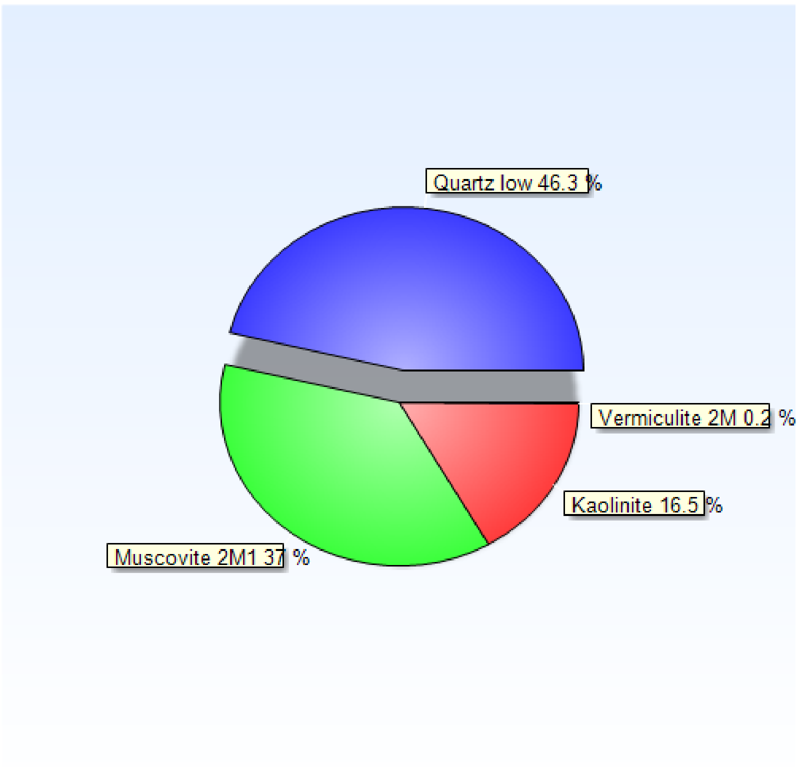


Peak List

Pos.[°2Th.]	d-spacing [Å]	Rel. Int. [%]	Matched by
6.0855	14.52386	0.48	98-003-4812
8.9229	9.91073	4.48	98-009-0144;98..
12.4650	7.10125	3.64	96-900-9235;98..
17.8418	4.97152	1.25	98-009-0144;98..
19.9135	4.45874	4.98	98-009-0144;98..
20.9497	4.24048	24.77	98-002-9210;98..
22.9832	3.86969	1.40	98-009-0144;98..
23.8483	3.73125	1.34	98-009-0144;98..
25.0186	3.55930	2.58	98-018-0082;96..
26.7152	3.33698	100.00	98-002-9210;98..
27.9328	3.19423	6.12	98-018-0082
29.9011	2.98830	1.82	98-009-0144;98..
31.3315	2.85506	1.40	98-018-0082;98..
33.1028	2.70623	0.95	98-003-4812
34.9901	2.56446	5.21	98-009-0144;98..
36.6102	2.45461	5.90	98-002-9210;98..
37.7318	2.38419	1.70	98-009-0144;98..
39.5210	2.28027	7.73	98-002-9210;98..
40.3382	2.23595	3.52	98-002-9210;98..
42.5068	2.12676	7.68	98-002-9210;98..
45.8693	1.97838	4.36	98-002-9210;98..

50.1885	1.81778	12.90	98-002-9210;98..
54.9135	1.67203	3.08	98-002-9210;98..
59.9884	1.54214	5.25	98-002-9210;98..
61.7310	1.50273	2.09	98-009-0144;98..
64.0603	1.45239	1.79	98-002-9210;98..

Quantitative Results



Phase Quartz low:	Weight fraction/ %:	46.3
Phase Muscovite 2M1:	Weight fraction/ %:	37
Phase Kaolinite:	Weight fraction/ %:	17
Phase Vermiculite 2M:	Weight fraction/ %:	0.17

Pattern List

Ref.Code	Score	Compound Name	Chem. Formula
98-002-9210	64	Quartz low	O2 Si1
98-018-0082	37	Muscovite/ Illite	H1.834 Al2.724 F0...
96-900-9235	21	Kaolinite	Al2.00 Si2.00 O9.0..
98-003-4812	7	Vermiculite 2M	H9.44 Al1.14 Mg3.4..

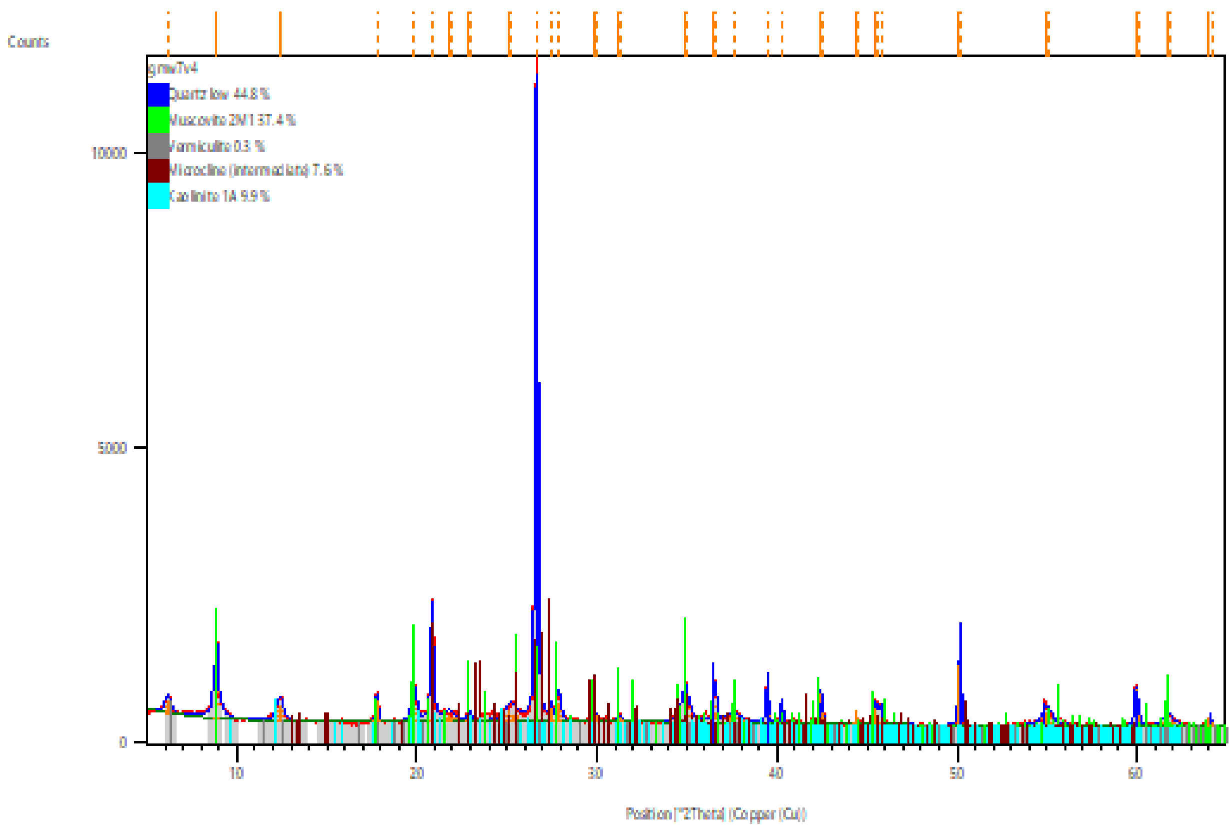
Anchor Scan Parameters

Dataset Name:	MW-13_Gorgas
File name:	C:\Users\Rick\Documents\RCIA_Win10\AnchorQEA\2020_March\MW-13_Gorgas.rd
Sample Identification:	MW-13 Gorgas
Comment:	Exported by X'Pert SW Generated by hugo in project AnchorQEA_2
Measurement Date / Time:	3/17/2020 1:43:00 PM
Raw Data Origin:	PHILIPS-binary (scan) (.RD)
Scan Axis:	Gonio
Start Position [°2Th.]:	5.0125
End Position [°2Th.]:	64.9875
Step Size [°2Th.]:	0.0250
Scan Step Time [s]:	2.5000
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	59	Quartz low	O2 Si1
98-016-1223	32	Muscovite 2M1	H1.85 Al2.87 F0.04..
98-016-6064	15	Vermiculite	H10.8 Al2.94 Ca0.0..
98-003-8135	18	Microcline (interm..	Al1 K1 O8 Si3
98-006-8698	17	Kaolinite 1A	H4 Al2 O9 Si2

Graphics

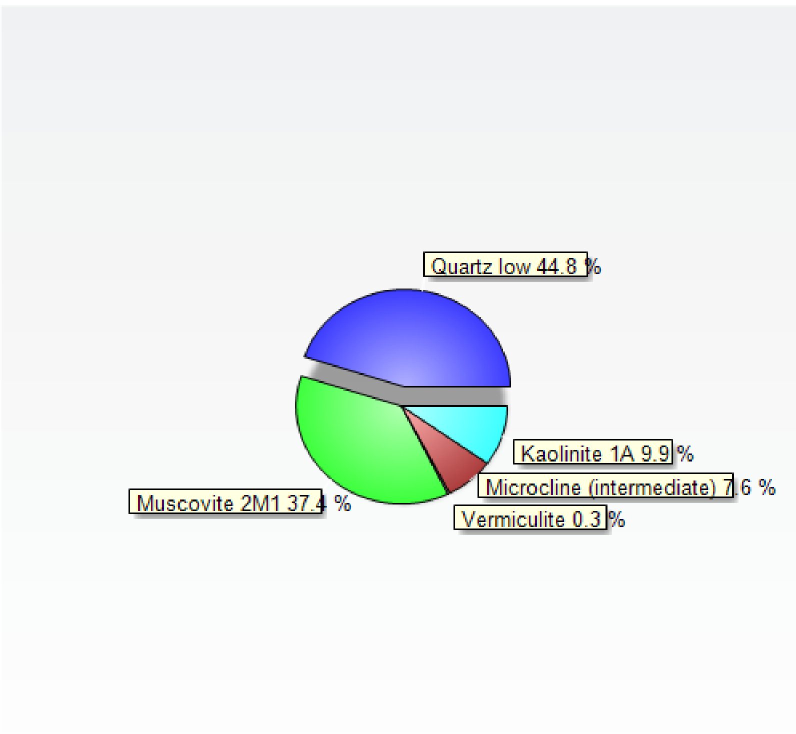


Peak List

Pos.[°2Th.]	d-spacing [Å]	Rel. Int. [%]	Matched by
6.169(9)	14.31644	2.30	98-016-6064
8.859(2)	9.97418	10.92	98-016-1223
12.386(7)	7.14073	3.15	98-016-6064;98..
17.777(4)	4.98528	3.89	98-016-1223;98..
19.831(4)	4.47335	4.88	98-016-1223;98..
20.838(1)	4.25950	17.25	98-008-3849;98..
21.82(2)	4.07028	1.32	98-016-1223
22.886(9)	3.88265	1.55	98-016-1223;98..
25.18(1)	3.53401	2.35	98-016-1223;98..

26.6272(4)	3.34505	100.00	98-008-3849;98..
27.429(4)	3.24910	2.96	98-003-8135;98..
27.861(5)	3.19962	4.11	98-016-1223;98..
29.844(7)	2.99143	1.94	98-016-1223;98..
31.24(2)	2.86116	0.99	98-016-1223;98..
34.890(5)	2.56944	5.31	98-016-1223;98..
36.518(3)	2.45854	6.17	98-008-3849;98..
37.60(2)	2.39015	1.24	98-016-1223;98..
39.440(3)	2.28290	6.17	98-008-3849;98..
40.253(4)	2.23862	4.27	98-008-3849;98..
42.413(3)	2.12948	6.29	98-008-3849;98..
44.4(5)	2.03860	3.11	98-016-1223;98..
45.441(7)	1.99437	3.62	98-016-1223;98..
45.783(8)	1.98027	3.02	98-008-3849;98..
50.109(2)	1.81898	12.30	98-008-3849;98..
54.972(9)	1.66901	2.71	98-008-3849;98..
59.931(3)	1.54221	7.43	98-008-3849;98..
61.71(1)	1.50203	1.54	98-016-1223;98..
64.001(8)	1.45359	1.47	98-008-3849;98..

Quantitative Results



Phase Quartz low:	Weight fraction/ %:	45
Phase Muscovite 2M1:	Weight fraction/ %:	37
Phase Vermiculite:	Weight fraction/ %:	0.3
Phase Microcline (intermediate):	Weight fraction/ %:	8
Phase Kaolinite 1A:	Weight fraction/ %:	10

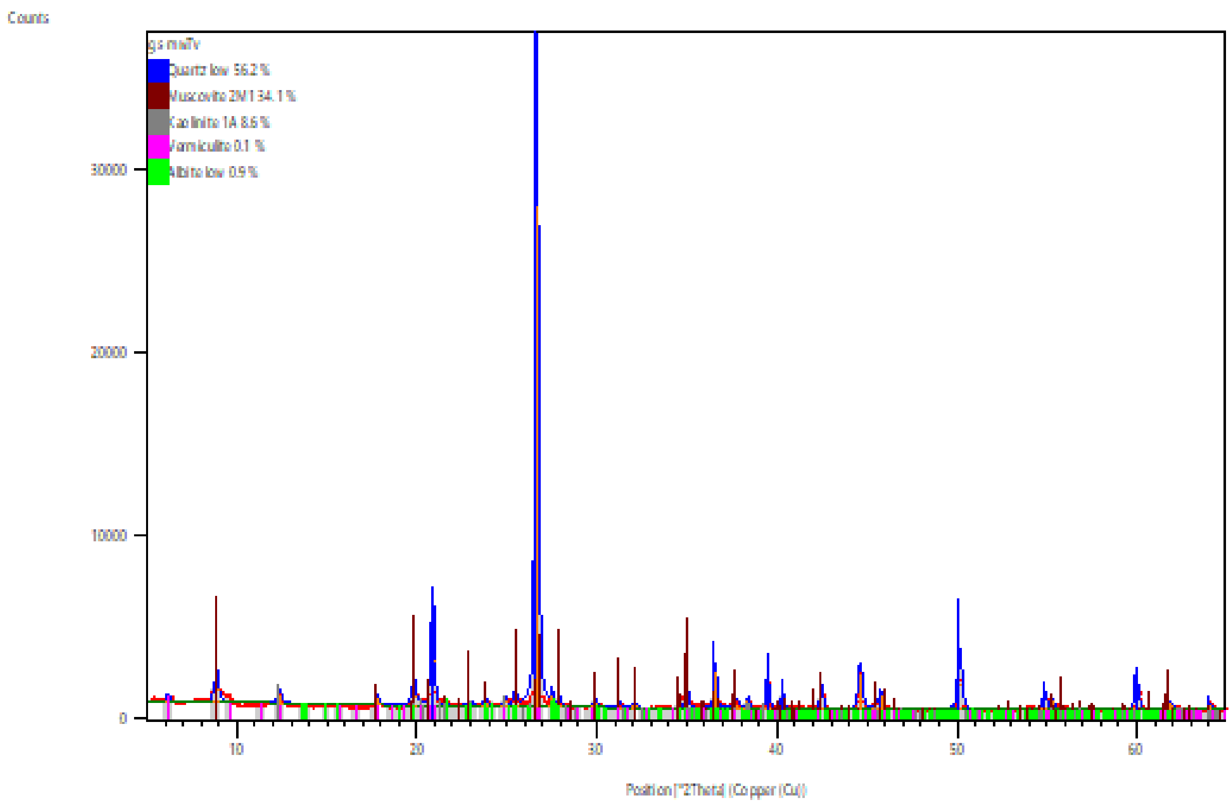
Anchor Scan Parameters

Dataset Name:	gmw7v4
File name:	C:\Users\Rick\Documents\RCIA_Win10\AnchorQEA\2021July26-XRD\gmw7v4.rd
Sample Identification:	GS-AP-MW7V_4-5
Comment:	Exported by X'Pert SW Generated by hugo in project AnchorQEA-2
Measurement Date / Time:	8/6/2021 1:55:00 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	60	Quartz low	O2 Si1
98-016-1221	39	Muscovite 2M1	H1.77 Al2.9 Ba0.01..
98-003-1135	30	Kaolinite 1A	H4 Al2 O9 Si2
98-016-6064	20	Vermiculite	H10.8 Al2.94 Ca0.0..
98-003-4872	12	Albite low	Al1 Na1 O8 Si3

Graphics

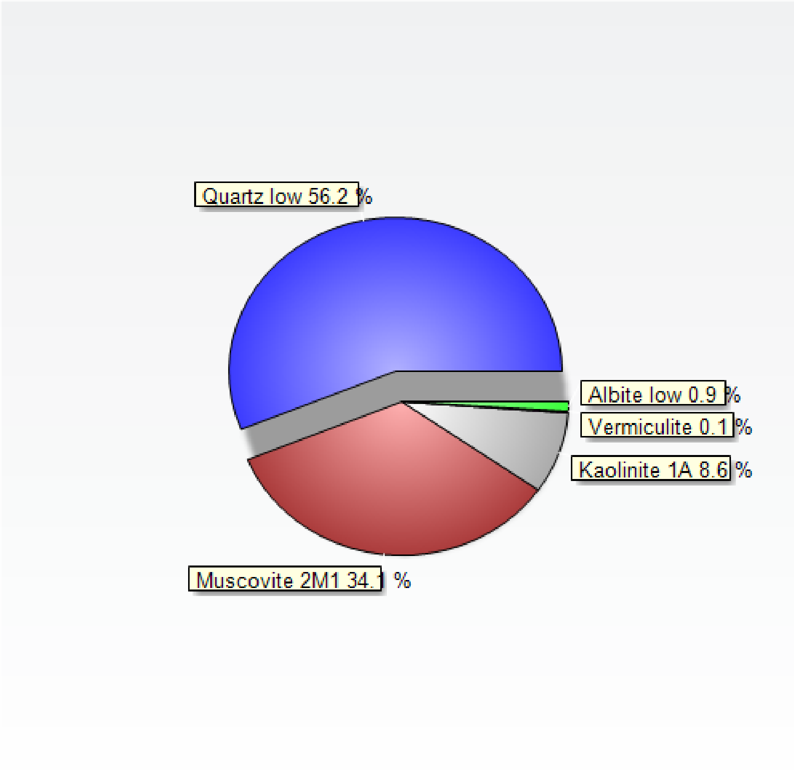


Peak List

Pos.[°2Th.]	d-spacing [Å]	Rel. Int. [%]	Matched by
6.1773	14.30804	1.02	98-016-6064
8.8747	9.96443	4.66	98-016-1221
12.3676	7.15700	1.81	98-003-1135;98..
17.7917	4.98542	1.50	98-016-1221;98..
19.8209	4.47937	3.72	98-016-1221;98..
20.8622	4.25807	17.32	98-009-0145;98..
22.9033	3.88302	0.92	98-016-1221;98..
23.7942	3.73960	1.01	98-016-1221;98..
24.8864	3.57790	1.64	98-016-1221;98..

25.4492	3.50004	1.90	98-016-1221;98..
26.6422	3.34596	100.00	98-009-0145;98..
27.4766	3.24622	2.39	98-003-4872
27.8800	3.20016	1.65	98-016-1221;98..
29.8852	2.98986	1.59	98-016-1221;98..
31.2178	2.86519	1.03	98-016-1221;98..
32.0352	2.79393	0.59	98-016-1221
34.9519	2.56718	3.91	98-016-1221;98..
36.5507	2.45847	7.47	98-009-0145;98..
37.7219	2.38479	1.25	98-016-1221;98..
38.3761	2.34563	1.80	98-003-1135;98..
39.4675	2.28324	5.54	98-009-0145;98..
40.2992	2.23802	3.09	98-009-0145;98..
42.4476	2.12959	4.40	98-009-0145;98..
44.6000	2.03169	7.19	98-016-1221;98..
45.4603	1.99522	1.73	98-009-0145;98..
45.7869	1.98175	2.90	98-009-0145;98..
50.1159	1.82024	9.73	98-009-0145;98..
54.8429	1.67401	3.73	98-009-0145;98..
55.3088	1.66101	1.93	98-009-0145;98..
59.9304	1.54350	7.34	98-009-0145;98..
61.8015	1.50118	1.34	98-016-1221;98..
64.0020	1.45478	1.49	98-009-0145;98..

Quantitative Results



Phase Quartz low:	Weight fraction/ %:	56
Phase Muscovite 2M1:	Weight fraction/ %:	34
Phase Kaolinite 1A:	Weight fraction/ %:	9
Phase Vermiculite:	Weight fraction/ %:	0.1
Phase Albite low:	Weight fraction/ %:	1

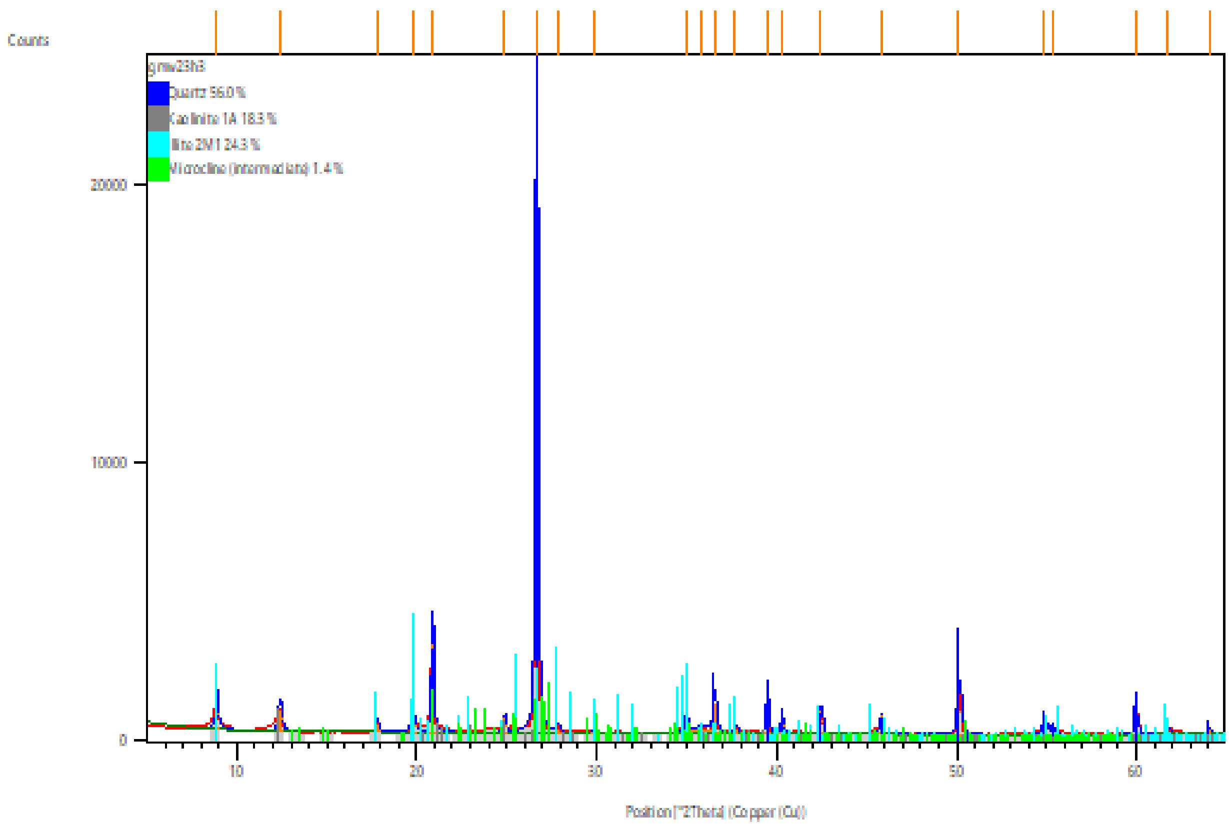
Anchor Scan Parameters

Dataset Name:	gs-mw7v
File name:	C:\Users\Rick\Documents\RCIA_Win10\AnchorQEA\2021July26-XRD\gs-mw7v.rd
Sample Identification:	GS-AP-MW-7V_18-19
Comment:	Exported by X'Pert SW
	Generated by hugo in project AnchorQEA-2
Measurement Date / Time:	8/24/2021 10:21:00 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	68	Quartz	O2 Si1
98-008-0082	24	Kaolinite 1A	H4 Al2 O9 Si2
98-009-0144	27	Illite 2M1	H3 Al4 K1 O12 Si2
98-003-4789	11	Microcline (interm..	Al0.99 K0.92 Na0.0..

Graphics

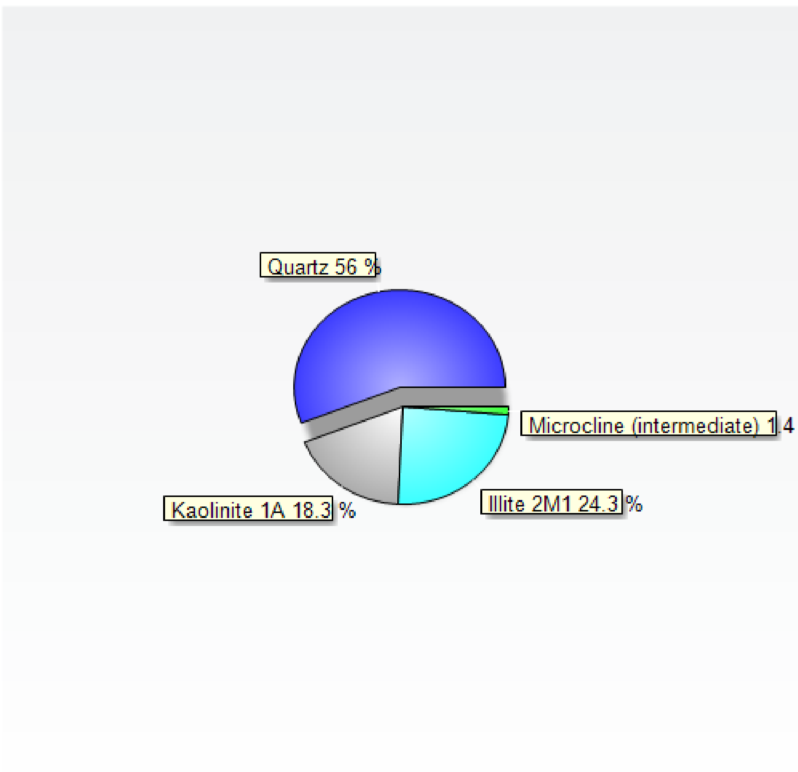


Peak List

Pos.[°2Th.]	d-spacing [Å]	Rel. Int. [%]	Matched by
8.9066	9.92883	5.39	98-009-0144
12.4183	7.12789	4.12	98-008-0082
17.8032	4.98222	1.69	98-009-0144
19.7877	4.48680	2.68	98-008-0082;98..
20.8790	4.25469	16.73	98-015-4289;98..
24.8861	3.57794	2.67	98-008-0082;98..
26.6605	3.34370	100.00	98-015-4289;98..
27.8698	3.20131	1.06	98-009-0144
29.8814	2.99023	0.67	98-009-0144;98..
34.9721	2.56574	3.10	98-008-0082;98..

35.7951	2.50861	0.87	98-008-0082;98..
36.5521	2.45838	5.83	98-015-4289;98..
37.7265	2.38451	1.00	98-008-0082;98..
39.4896	2.28202	6.27	98-015-4289;98..
40.2995	2.23801	2.99	98-015-4289;98..
42.4587	2.12906	4.25	98-015-4289;98..
45.7993	1.98124	3.47	98-015-4289;98..
50.1307	1.81974	8.51	98-015-4289;98..
54.8603	1.67352	3.39	98-015-4289;98..
55.3095	1.66099	2.01	98-015-4289;98..
59.9405	1.54326	6.06	98-015-4289;98..
61.6908	1.50361	0.89	98-008-0082;98..
64.0326	1.45416	1.16	98-015-4289;98..

Quantitative Results



Phase Quartz:	Weight fraction/ %:	56
Phase Kaolinite 1A:	Weight fraction/ %:	18
Phase Illite 2M1:	Weight fraction/ %:	24
Phase Microcline (intermediate):	Weight fraction/ %:	1.5

Anchor Scan Parameters

Dataset Name:	gmw23h3
File name:	C:\Users\Rick\Documents\RCIA_Win10\AnchorQEA\2021July26-XRD\gmw23h3.rd
Sample Identification:	GS-AP-MW23H_3.5-5
Comment:	Exported by X'Pert SW Generated by hugo in project AnchorQEA-2
Measurement Date / Time:	8/9/2021 12:08:00 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: A1G0830 - Alabama Power-Gorgas - 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 A1G0830, 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.

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-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1G0830 - 09 12 21 0521**

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
GS-AP-CEC-1-20210728	A1G0830-01	Water	07/28/21 14:00	07/29/21 09:55
GS-AP-CEC-2-20210728	A1G0830-02	Water	07/28/21 14:05	07/29/21 09:55
GS-AP-CEC-3-20210728	A1G0830-03	Water	07/28/21 14:10	07/29/21 09:55
GS-AP-CEC-4-20210728	A1G0830-04	Water	07/28/21 14:15	07/29/21 09:55
GS-AP-CEC-MB-20210728	A1G0830-05	Water	07/28/21 14:20	07/29/21 09:55

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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-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1G0830 - 09 12 21 0521**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
GS-AP-CEC-1-20210728 (A1G0830-01)				Matrix: Water				
Batch: 1071000								
Aluminum	ND	125	250	ug/L	5	08/02/21 22:13	EPA 6020B	R-04
Arsenic	ND	2.50	5.00	ug/L	5	08/02/21 22:13	EPA 6020B	R-04
Calcium	**108000**	1500	3000	ug/L	5	08/02/21 22:13	EPA 6020B	
Molybdenum	ND	2.50	5.00	ug/L	5	08/02/21 22:13	EPA 6020B	R-04
Potassium	**9300**	250	500	ug/L	5	08/02/21 22:13	EPA 6020B	
Sodium	**1410**	250	500	ug/L	5	08/02/21 22:13	EPA 6020B	
Lithium	ND	12.5	25.0	ug/L	5	08/02/21 22:13	EPA 6020B	R-04
GS-AP-CEC-1-20210728 (A1G0830-01RE1)				Matrix: Water				
Batch: 1071000								
Magnesium	**23300**	375	750	ug/L	5	08/03/21 22:13	EPA 6020B	
GS-AP-CEC-2-20210728 (A1G0830-02)				Matrix: Water				
Batch: 1071000								
Aluminum	ND	125	250	ug/L	5	08/02/21 22:28	EPA 6020B	R-04
Arsenic	ND	2.50	5.00	ug/L	5	08/02/21 22:28	EPA 6020B	R-04
Calcium	**124000**	1500	3000	ug/L	5	08/02/21 22:28	EPA 6020B	
Molybdenum	ND	2.50	5.00	ug/L	5	08/02/21 22:28	EPA 6020B	R-04
Potassium	**32500**	250	500	ug/L	5	08/02/21 22:28	EPA 6020B	
Lithium	ND	12.5	25.0	ug/L	5	08/02/21 22:28	EPA 6020B	R-04
GS-AP-CEC-2-20210728 (A1G0830-02RE1)				Matrix: Water				
Batch: 1071000								
Magnesium	**94500**	375	750	ug/L	5	08/03/21 22:18	EPA 6020B	
Sodium	**4100**	250	500	ug/L	5	08/03/21 22:18	EPA 6020B	
GS-AP-CEC-3-20210728 (A1G0830-03)				Matrix: Water				
Batch: 1071000								
Aluminum	ND	125	250	ug/L	5	08/02/21 22:33	EPA 6020B	R-04
Arsenic	**3.17**	2.50	5.00	ug/L	5	08/02/21 22:33	EPA 6020B	**J, R-04**
Calcium	**97300**	1500	3000	ug/L	5	08/02/21 22:33	EPA 6020B	
Molybdenum	ND	2.50	5.00	ug/L	5	08/02/21 22:33	EPA 6020B	R-04
Potassium	**53500**	250	500	ug/L	5	08/02/21 22:33	EPA 6020B	
Lithium	ND	12.5	25.0	ug/L	5	08/02/21 22:33	EPA 6020B	R-04

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Darwin Thomas, Business Development Director

Apex Laboratories, LLC
6700 S.W. Sandburg Street
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ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1G0830 - 09 12 21 0521**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
GS-AP-CEC-3-20210728 (A1G0830-03RE1)				Matrix: Water				
Batch: 1071000								
Magnesium	**63700**	375	750	ug/L	5	08/03/21 22:23	EPA 6020B	
Sodium	**3870**	250	500	ug/L	5	08/03/21 22:23	EPA 6020B	
GS-AP-CEC-4-20210728 (A1G0830-04)				Matrix: Water				
Batch: 1071000								
Aluminum	ND	125	250	ug/L	5	08/02/21 22:39	EPA 6020B	R-04
Arsenic	**3.06**	2.50	5.00	ug/L	5	08/02/21 22:39	EPA 6020B	**J, R-04**
Calcium	**105000**	1500	3000	ug/L	5	08/02/21 22:39	EPA 6020B	
Molybdenum	ND	2.50	5.00	ug/L	5	08/02/21 22:39	EPA 6020B	R-04
Potassium	**52100**	250	500	ug/L	5	08/02/21 22:39	EPA 6020B	
Lithium	ND	12.5	25.0	ug/L	5	08/02/21 22:39	EPA 6020B	R-04
GS-AP-CEC-4-20210728 (A1G0830-04RE1)				Matrix: Water				
Batch: 1071000								
Magnesium	**65400**	375	750	ug/L	5	08/03/21 22:28	EPA 6020B	
Sodium	**3940**	250	500	ug/L	5	08/03/21 22:28	EPA 6020B	
GS-AP-CEC-MB-20210728 (A1G0830-05)				Matrix: Water				
Batch: 1071000								
Aluminum	ND	125	250	ug/L	5	08/02/21 22:44	EPA 6020B	R-04
Arsenic	ND	2.50	5.00	ug/L	5	08/02/21 22:44	EPA 6020B	R-04
Calcium	ND	1500	3000	ug/L	5	08/02/21 22:44	EPA 6020B	R-04
Magnesium	ND	375	750	ug/L	5	08/02/21 22:44	EPA 6020B	R-04
Molybdenum	ND	2.50	5.00	ug/L	5	08/02/21 22:44	EPA 6020B	R-04
Potassium	ND	250	500	ug/L	5	08/02/21 22:44	EPA 6020B	R-04
Sodium	ND	250	500	ug/L	5	08/02/21 22:44	EPA 6020B	R-04
Lithium	ND	12.5	25.0	ug/L	5	08/02/21 22:44	EPA 6020B	R-04

Apex Laboratories, LLC
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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**	**A1G0830 - 09 12 21 0521**

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 1071000 - EPA 3015A							**Water**					
Blank (1071000-BLK1)			Prepared: 07/30/21 14:15		Analyzed: 08/02/21 20:28							
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	---	---	---	---	---	---	
Magnesium	ND	75.0	150	ug/L	1	---	---	---	---	---	---	
Molybdenum	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Potassium	ND	50.0	100	ug/L	1	---	---	---	---	---	---	
Sodium	ND	50.0	100	ug/L	1	---	---	---	---	---	---	
Lithium	ND	2.50	5.00	ug/L	1	---	---	---	---	---	---	
LCS (1071000-BS1)			Prepared: 07/30/21 14:15		Analyzed: 08/02/21 20:44							
EPA 6020B												
Aluminum	2760	25.0	50.0	ug/L	1	2780	---	99	80-120%	---	---	
Arsenic	56.6	0.500	1.00	ug/L	1	55.6	---	102	80-120%	---	---	
Calcium	2840	300	600	ug/L	1	2780	---	102	80-120%	---	---	
Magnesium	2840	75.0	150	ug/L	1	2780	---	102	80-120%	---	---	
Molybdenum	26.7	0.500	1.00	ug/L	1	27.8	---	96	80-120%	---	---	
Potassium	2820	50.0	100	ug/L	1	2780	---	102	80-120%	---	---	
Sodium	2970	50.0	100	ug/L	1	2780	---	107	80-120%	---	---	
LCS (1071000-BS2)			Prepared: 07/30/21 14:15		Analyzed: 08/02/21 20:49							
EPA 6020B												
Lithium	44.4	2.50	5.00	ug/L	1	44.4	---	100	80-120%	---	---	
LCS Dup (1071000-BSD1)			Prepared: 07/30/21 14:15		Analyzed: 08/02/21 20:33							
EPA 6020B												
Aluminum	2750	25.0	50.0	ug/L	1	2780	---	99	80-120%	0.1	20%	
Arsenic	56.5	0.500	1.00	ug/L	1	55.6	---	102	80-120%	0.2	20%	
Calcium	2830	300	600	ug/L	1	2780	---	102	80-120%	0.3	20%	
Magnesium	2850	75.0	150	ug/L	1	2780	---	103	80-120%	0.3	20%	
Molybdenum	27.2	0.500	1.00	ug/L	1	27.8	---	98	80-120%	2	20%	
Potassium	2820	50.0	100	ug/L	1	2780	---	101	80-120%	0.3	20%	
Sodium	2990	50.0	100	ug/L	1	2780	---	108	80-120%	0.8	20%	

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Apex Laboratories, LLC

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

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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**	**A1G0830 - 09 12 21 0521**

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 1071000 - EPA 3015A							**Water**					
LCS Dup (1071000-BSD2)			Prepared: 07/30/21 14:15		Analyzed: 08/02/21 20:39							
EPA 6020B												
Lithium	46.0	2.50	5.00	ug/L	1	44.4	---	103	80-120%	3	20%	

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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**	**A1G0830 - 09 12 21 0521**

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: 1071000							
A1G0830-01	Water	EPA 6020B	07/28/21 14:00	07/30/21 14:15	45mL/50mL	45mL/50mL	1.00
A1G0830-01RE1	Water	EPA 6020B	07/28/21 14:00	07/30/21 14:15	45mL/50mL	45mL/50mL	1.00
A1G0830-02	Water	EPA 6020B	07/28/21 14:05	07/30/21 14:15	45mL/50mL	45mL/50mL	1.00
A1G0830-02RE1	Water	EPA 6020B	07/28/21 14:05	07/30/21 14:15	45mL/50mL	45mL/50mL	1.00
A1G0830-03	Water	EPA 6020B	07/28/21 14:10	07/30/21 14:15	45mL/50mL	45mL/50mL	1.00
A1G0830-03RE1	Water	EPA 6020B	07/28/21 14:10	07/30/21 14:15	45mL/50mL	45mL/50mL	1.00
A1G0830-04	Water	EPA 6020B	07/28/21 14:15	07/30/21 14:15	45mL/50mL	45mL/50mL	1.00
A1G0830-04RE1	Water	EPA 6020B	07/28/21 14:15	07/30/21 14:15	45mL/50mL	45mL/50mL	1.00
A1G0830-05	Water	EPA 6020B	07/28/21 14:20	07/30/21 14:15	45mL/50mL	45mL/50mL	1.00

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QUALIFIER DEFINITIONS

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

Apex Laboratories

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.

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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Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1G0830 - 09 12 21 0521**

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

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A1G0830

Chain of Custody Record & Laboratory Analysis Request

ANCHOR QEA

Company: Anchor QEA
Date: 7/28/2021
Project Name: Alabama Power - Gorgas
Project Number: 201114-01.01
Project Manager: Anthony Dalton-Atha adalton-atha@anchorqea.com
Phone Number: 503-924-6186
Shipment Method: Pick-up
Samplers: Paloma Spina

Test Parameters

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

Comments: samples are filtered but not preserved.

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

Page 1 of 1

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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**	**A1G0830 - 09 12 21 0521**

APEX LABS COOLER RECEIPT FORM

Client: Anchor QEA Element WO#: A1G0830

Project/Project #: Alabama Power - Gorgas 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: 8

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: ST Witness: JS Cooler Inspected by: 8

ANALYTICAL REPORT

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

Sunday, September 12, 2021

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

RE: A1H0070 - Alabama Power-Gorgas - 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 A1H0070, 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.

ORELAP

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**

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: 201114-01.01	**Report ID:**
Portland, OR 97219	Project Manager: Anthony Dalton-Atha	A1H0070 - 09 12 21 0536

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
GS-AP-AAO-1-20210731	A1H0070-01	Water	07/31/21 14:00	08/03/21 12:35
GS-AP-AAO-2-20210731	A1H0070-02	Water	07/31/21 14:05	08/03/21 12:35
GS-AP-AAO-3-20210731	A1H0070-03	Water	07/31/21 14:10	08/03/21 12:35
GS-AP-AAO-4-20210731	A1H0070-04	Water	07/31/21 14:15	08/03/21 12:35
GS-AP-AAO-MB-20210731	A1H0070-05	Water	07/31/21 14:20	08/03/21 12:35

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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**	**A1H0070 - 09 12 21 0536**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
GS-AP-AAO-1-20210731 (A1H0070-01)				**Matrix: Water**				
Batch: 1080089								
Aluminum	**6020**	125	250	ug/L	5	08/07/21 01:08	EPA 6020B	
Arsenic	**4.96**	2.50	5.00	ug/L	5	08/07/21 01:08	EPA 6020B	**J, A-01, Q-41, R-04**
Iron	**9810**	125	250	ug/L	5	08/07/21 01:08	EPA 6020B	
Manganese	**500**	2.50	5.00	ug/L	5	08/07/21 01:08	EPA 6020B	**A-01, Q-41**
Molybdenum	**2.91**	2.50	5.00	ug/L	5	08/07/21 01:08	EPA 6020B	**J, A-01, R-04**
Lithium	ND	12.5	25.0	ug/L	5	08/07/21 01:08	EPA 6020B	R-04
GS-AP-AAO-2-20210731 (A1H0070-02)				**Matrix: Water**				
Batch: 1080089								
Aluminum	**9700**	125	250	ug/L	5	08/07/21 01:13	EPA 6020B	
Arsenic	**24.9**	2.50	5.00	ug/L	5	08/07/21 01:13	EPA 6020B	**A-01, Q-41**
Iron	**34300**	125	250	ug/L	5	08/07/21 01:13	EPA 6020B	
Manganese	**4080**	2.50	5.00	ug/L	5	08/07/21 01:13	EPA 6020B	**A-01, Q-41**
Molybdenum	**5.78**	2.50	5.00	ug/L	5	08/07/21 01:13	EPA 6020B	**A-01**
Lithium	ND	12.5	25.0	ug/L	5	08/07/21 01:13	EPA 6020B	R-04
GS-AP-AAO-3-20210731 (A1H0070-03)				**Matrix: Water**				
Batch: 1080089								
Aluminum	**12500**	125	250	ug/L	5	08/07/21 01:18	EPA 6020B	
Arsenic	**9.54**	2.50	5.00	ug/L	5	08/07/21 01:18	EPA 6020B	**A-01, Q-41**
Iron	**19300**	125	250	ug/L	5	08/07/21 01:18	EPA 6020B	
Manganese	**469**	2.50	5.00	ug/L	5	08/07/21 01:18	EPA 6020B	**A-01, Q-41**
Molybdenum	**3.22**	2.50	5.00	ug/L	5	08/07/21 01:18	EPA 6020B	**J, A-01, R-04**
Lithium	ND	12.5	25.0	ug/L	5	08/07/21 01:18	EPA 6020B	R-04
GS-AP-AAO-4-20210731 (A1H0070-04)				**Matrix: Water**				
Batch: 1080089								
Aluminum	**12400**	125	250	ug/L	5	08/07/21 01:23	EPA 6020B	
Arsenic	**9.67**	2.50	5.00	ug/L	5	08/07/21 01:23	EPA 6020B	**A-01, Q-41**
Iron	**18400**	125	250	ug/L	5	08/07/21 01:23	EPA 6020B	
Manganese	**467**	2.50	5.00	ug/L	5	08/07/21 01:23	EPA 6020B	**A-01, Q-41**
Molybdenum	**2.85**	2.50	5.00	ug/L	5	08/07/21 01:23	EPA 6020B	**J, A-01, R-04**
Lithium	ND	12.5	25.0	ug/L	5	08/07/21 01:23	EPA 6020B	R-04

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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-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0070 - 09 12 21 0536**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
GS-AP-AAO-MB-20210731 (A1H0070-05)				Matrix: Water				
Batch: 1080089								
Aluminum	ND	125	250	ug/L	5	08/07/21 01:28	EPA 6020B	R-04
Arsenic	ND	2.50	5.00	ug/L	5	08/07/21 01:28	EPA 6020B	A-01, Q-41, R-04
Iron	ND	125	250	ug/L	5	08/07/21 01:28	EPA 6020B	R-04
Manganese	**2.64**	2.50	5.00	ug/L	5	08/07/21 01:28	EPA 6020B	**J, A-01, Q-41, R-04**
Molybdenum	ND	2.50	5.00	ug/L	5	08/07/21 01:28	EPA 6020B	A-01, R-04
Lithium	ND	12.5	25.0	ug/L	5	08/07/21 01:28	EPA 6020B	R-04

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APEX LABORATORIES

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ANALYTICAL REPORT

Anchor QEA, LLC	Project: Alabama Power-Gorgas	
6720 SW Macadam Ave. Suite 125	Project Number: 201114-01.01	Report ID:
Portland, OR 97219	Project Manager: Anthony Dalton-Atha	A1H0070 - 09 12 21 0536

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	---	---	---	---	---	---	
Molybdenum	**0.595**	0.500	1.00	ug/L	1	---	---	---	---	---	---	J
Lithium	ND	2.50	5.00	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
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%	---	---	
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%	---	---	
Molybdenum	26.8	0.500	1.00	ug/L	1	27.8	---	96	80-120%	---	---	
LCS (1080089-BS2)			Prepared: 08/04/21 08:49		Analyzed: 08/07/21 00:25							
EPA 6020B												
Lithium	45.7	2.50	5.00	ug/L	1	44.4	---	103	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%	
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%	
Molybdenum	26.4	0.500	1.00	ug/L	1	27.8	---	95	80-120%	1	20%	
LCS Dup (1080089-BSD2)			Prepared: 08/04/21 08:49		Analyzed: 08/07/21 00:20							
EPA 6020B												
Lithium	45.8	2.50	5.00	ug/L	1	44.4	---	103	80-120%	0.1	20%	

Apex Laboratories

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Darwin Thomas, Business Development Director

APEX LABORATORIES

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

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0070 - 09 12 21 0536**

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**					
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
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
Molybdenum	**8.20**	0.500	1.00	ug/L	1	---	7.27	---	---	12	20%	A-01
Lithium	**15.7**	2.50	5.00	ug/L	1	---	10.9	---	---	**36**	**20%**	Q-05
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
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
Molybdenum	30.2	0.500	1.00	ug/L	1	27.8	7.27	83	75-125%	---	---	A-01
Matrix Spike (1080089-MS2)			Prepared: 08/04/21 08:49	Analyzed: 08/07/21 00:54								
QC Source Sample: Non-SDG (A1H0027-01)												
EPA 6020B												
Lithium	66.1	2.50	5.00	ug/L	1	44.4	10.9	124	75-125%	---	---	

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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**	**A1H0070 - 09 12 21 0536**

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							
A1H0070-01	Water	EPA 6020B	07/31/21 14:00	08/04/21 08:49	45mL/50mL	45mL/50mL	1.00
A1H0070-02	Water	EPA 6020B	07/31/21 14:05	08/04/21 08:49	45mL/50mL	45mL/50mL	1.00
A1H0070-03	Water	EPA 6020B	07/31/21 14:10	08/04/21 08:49	45mL/50mL	45mL/50mL	1.00
A1H0070-04	Water	EPA 6020B	07/31/21 14:15	08/04/21 08:49	45mL/50mL	45mL/50mL	1.00
A1H0070-05	Water	EPA 6020B	07/31/21 14:20	08/04/21 08:49	45mL/50mL	45mL/50mL	1.00

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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.
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-05	Analyses are not controlled on RPD values from sample and duplicate concentrations that are below 5 times the reporting level.
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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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
6700 S.W. Sandburg Street
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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**	**A1H0070 - 09 12 21 0536**

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

Darwin Thomas, Business Development Director

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Portland, OR 97219	Project Manager: Anthony Dalton-Atha	A1H0070 - 09 12 21 0536

A1H0070

Chain of Custody Record & Laboratory Analysis Request

ANCHOR QEA

Company: Anchor QEA
Date: 7/31/2021
Project Name: Alabama Power - Gorgas
Project Number: 201114-01.01
Project Manager: Anthony Dalton-Atha adalton-atha@anchorqea.com
Phone Number: 503-924-6186
Shipment Method: Pick-up
Samplers: Paloma Spina

Line	Field Sample ID	Collection Date	Collection Time	Matrix	No. of Containers	As, Li, Mo, Fe, Al, Mn (Test Parameters)	Comments/Preservation
1	GS-AP-AAO-1-20210731	7/31/2021	14:00	Water	1	x	0.2 M ammonium oxalate in 0.1 M oxalic acid
2	GS-AP-AAO-2-20210731	7/31/2021	14:05	Water	1	x	0.2 M ammonium oxalate in 0.1 M oxalic acid
3	GS-AP-AAO-3-20210731	7/31/2021	14:10	Water	1	x	0.2 M ammonium oxalate in 0.1 M oxalic acid
4	GS-AP-AAO-4-20210731	7/31/2021	14:15	Water	1	x	0.2 M ammonium oxalate in 0.1 M oxalic acid
5	GS-AP-AAO-MB-20210731	7/31/2021	14:20	Water	1	x	0.2 M ammonium oxalate in 0.1 M oxalic acid
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							

Comments: samples are filtered and preserved with nitric acid.

Relinquished By: Anthony Dalton-Atha	Company: AQEA	Received By: Eli Jyw	Company: APEX LABS
Signature/Printed Name	Date/Time 8/3/2021 0945	Signature/Printed Name EW	Date/Time 8/3/21 1235
Relinquished By:	Company:	Received By:	Company:
Signature/Printed Name	Date/Time	Signature/Printed Name	Date/Time

Page 1 of 1

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Darwin Thomas, Business Development Director

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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-Gorgas	
6720 SW Macadam Ave. Suite 125	Project Number: 201114-01.01	Report ID:
Portland, OR 97219	Project Manager: Anthony Dalton-Atha	A1H0070 - 09 12 21 0536

APEX LABS COOLER RECEIPT FORM

Client: Anchor QEA Element WO#: A1 H0070

Project/Project #: Alabama Power - Gorgas 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 @ 1952 By: HAS

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: ___________

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: HAS 8/3/21 HAS 8/3/21

Additional information: ___________

Labeled by: ~~HAS~~ TAM TAM 8/3/21 Witness: HAS Cooler Inspected by: TAG

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: A1H0486 - Alabama Power-Gorgas - 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 A1H0486, which was received by the laboratory on 8/16/2021 at 12:36:00PM.

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   2.1 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

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-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number:	**201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager:	**Anthony Dalton-Atha**	**A1H0486 - 09 12 21 0444**

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
GS-AP-SSE-F1-5-20210809	A1H0486-01	Water	08/09/21 09:20	08/16/21 12:36
GS-AP-SSE-F1-6-20210809	A1H0486-02	Water	08/09/21 09:25	08/16/21 12:36
GS-AP-SSE-F1-7-20210809	A1H0486-03	Water	08/09/21 09:30	08/16/21 12:36
GS-AP-SSE-F1-8-20210809	A1H0486-04	Water	08/09/21 09:35	08/16/21 12:36
GS-AP-SSE-F1-9-20210809	A1H0486-05	Water	08/09/21 09:40	08/16/21 12:36
GS-AP-SSE-F1-10-20210809	A1H0486-06	Water	08/09/21 09:45	08/16/21 12:36
GS-AP-SSE-F1-11-20210809	A1H0486-07	Water	08/09/21 09:50	08/16/21 12:36
GS-AP-SSE-F1-12-20210809	A1H0486-08	Water	08/09/21 09:55	08/16/21 12:36
GS-AP-SSE-F2-5-20210810	A1H0486-09	Water	08/10/21 09:20	08/16/21 12:36
GS-AP-SSE-F2-6-20210810	A1H0486-10	Water	08/10/21 09:25	08/16/21 12:36
GS-AP-SSE-F2-7-20210810	A1H0486-11	Water	08/10/21 09:30	08/16/21 12:36
GS-AP-SSE-F2-8-20210810	A1H0486-12	Water	08/10/21 09:35	08/16/21 12:36
GS-AP-SSE-F2-9-20210810	A1H0486-13	Water	08/10/21 09:40	08/16/21 12:36
GS-AP-SSE-F2-10-20210810	A1H0486-14	Water	08/10/21 09:45	08/16/21 12:36
GS-AP-SSE-F2-11-20210810	A1H0486-15	Water	08/10/21 09:50	08/16/21 12:36
GS-AP-SSE-F2-12-20210810	A1H0486-16	Water	08/10/21 09:55	08/16/21 12:36
GS-AP-SSE-F3-5-20210812	A1H0486-17	Water	08/12/21 09:20	08/16/21 12:36
GS-AP-SSE-F3-6-20210812	A1H0486-18	Water	08/12/21 09:25	08/16/21 12:36
GS-AP-SSE-F3-7-20210812	A1H0486-19	Water	08/12/21 09:30	08/16/21 12:36
GS-AP-SSE-F3-8-20210812	A1H0486-20	Water	08/12/21 09:35	08/16/21 12:36
GS-AP-SSE-F3-9-20210812	A1H0486-21	Water	08/12/21 09:40	08/16/21 12:36
GS-AP-SSE-F3-10-20210812	A1H0486-22	Water	08/12/21 09:45	08/16/21 12:36
GS-AP-SSE-F3-11-20210812	A1H0486-23	Water	08/12/21 09:50	08/16/21 12:36
GS-AP-SSE-F3-12-20210812	A1H0486-24	Water	08/12/21 09:55	08/16/21 12:36
GS-AP-SSE-F4-5-20210813	A1H0486-25	Water	08/13/21 09:20	08/16/21 12:36
GS-AP-SSE-F4-6-20210813	A1H0486-26	Water	08/13/21 09:25	08/16/21 12:36
GS-AP-SSE-F4-7-20210813	A1H0486-27	Water	08/13/21 09:30	08/16/21 12:36
GS-AP-SSE-F4-8-20210813	A1H0486-28	Water	08/13/21 09:35	08/16/21 12:36
GS-AP-SSE-F4-9-20210813	A1H0486-29	Water	08/13/21 09:40	08/16/21 12:36
GS-AP-SSE-F4-10-20210813	A1H0486-30	Water	08/13/21 09:45	08/16/21 12:36
GS-AP-SSE-F4-11-20210813	A1H0486-31	Water	08/13/21 09:50	08/16/21 12:36
GS-AP-SSE-F4-12-20210813	A1H0486-32	Water	08/13/21 09:55	08/16/21 12:36
GS-AP-SSE-F5-5-20210816	A1H0486-33	Solid	08/12/21 09:20	08/16/21 12:36

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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	Project:	**Alabama Power-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number:	**201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager:	**Anthony Dalton-Atha**	**A1H0486 - 09 12 21 0444**

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
GS-AP-SSE-F5-6-20210816	A1H0486-34	Solid	08/12/21 09:25	08/16/21 12:36
GS-AP-SSE-F5-7-20210816	A1H0486-35	Solid	08/12/21 09:30	08/16/21 12:36
GS-AP-SSE-F5-8-20210816	A1H0486-36	Solid	08/12/21 09:35	08/16/21 12:36
GS-AP-SSE-F5-9-20210816	A1H0486-37	Solid	08/12/21 09:40	08/16/21 12:36
GS-AP-SSE-F5-10-20210816	A1H0486-38	Solid	08/12/21 09:45	08/16/21 12:36
GS-AP-SSE-F5-11-20210816	A1H0486-39	Solid	08/12/21 09:50	08/16/21 12:36

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-Gorgas** Project Number: **201114-01.01** Project Manager: **Anthony Dalton-Atha**	**Report ID:** **A1H0486 - 09 12 21 0444**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
GS-AP-SSE-F1-5-20210809 (A1H0486-01)				**Matrix: Water**				
Batch: 1080545								
Arsenic	ND	25.0	50.0	ug/L	50	08/19/21 03:01	EPA 6020B	A-01a, Q-06, R-04
Molybdenum	ND	25.0	50.0	ug/L	50	08/19/21 03:01	EPA 6020B	A-01a, Q-06, R-04
Lithium	ND	125	250	ug/L	50	08/19/21 03:01	EPA 6020B	A-01a, Q-06, R-04
GS-AP-SSE-F1-6-20210809 (A1H0486-02)				**Matrix: Water**				
Batch: 1080545								
Arsenic	ND	25.0	50.0	ug/L	50	08/19/21 03:06	EPA 6020B	A-01a, Q-06, R-04
Molybdenum	ND	25.0	50.0	ug/L	50	08/19/21 03:06	EPA 6020B	A-01a, Q-06, R-04
Lithium	ND	125	250	ug/L	50	08/19/21 03:06	EPA 6020B	A-01a, Q-06, R-04
GS-AP-SSE-F1-7-20210809 (A1H0486-03)				**Matrix: Water**				
Batch: 1080545								
Arsenic	ND	25.0	50.0	ug/L	50	08/19/21 03:21	EPA 6020B	A-01a, Q-06, R-04
Molybdenum	ND	25.0	50.0	ug/L	50	08/19/21 03:21	EPA 6020B	A-01a, Q-06, R-04
Lithium	ND	125	250	ug/L	50	08/19/21 03:21	EPA 6020B	A-01a, Q-06, R-04
GS-AP-SSE-F1-8-20210809 (A1H0486-04)				**Matrix: Water**				
Batch: 1080545								
Arsenic	ND	25.0	50.0	ug/L	50	08/19/21 03:25	EPA 6020B	A-01a, Q-06, R-04
Molybdenum	ND	25.0	50.0	ug/L	50	08/19/21 03:25	EPA 6020B	A-01a, Q-06, R-04
Lithium	ND	125	250	ug/L	50	08/19/21 03:25	EPA 6020B	A-01a, Q-06, R-04
GS-AP-SSE-F1-9-20210809 (A1H0486-05)				**Matrix: Water**				
Batch: 1080545								
Arsenic	ND	25.0	50.0	ug/L	50	08/19/21 03:30	EPA 6020B	A-01a, Q-06, R-04
Molybdenum	ND	25.0	50.0	ug/L	50	08/19/21 03:30	EPA 6020B	A-01a, Q-06, R-04

Apex Laboratories

Darwin Thomas, Business Development Director

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

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0486 - 09 12 21 0444**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
GS-AP-SSE-F1-9-20210809 (A1H0486-05)				Matrix: Water				
Lithium	ND	125	250	ug/L	50	08/19/21 03:30	EPA 6020B	A-01a, Q-06, R-04
GS-AP-SSE-F1-10-20210809 (A1H0486-06)				Matrix: Water				
Batch: 1080545								
Arsenic	ND	25.0	50.0	ug/L	50	08/19/21 03:35	EPA 6020B	A-01a, Q-06, R-04
Molybdenum	ND	25.0	50.0	ug/L	50	08/19/21 03:35	EPA 6020B	A-01a, Q-06, R-04
Lithium	ND	125	250	ug/L	50	08/19/21 03:35	EPA 6020B	A-01a, Q-06, R-04
GS-AP-SSE-F1-11-20210809 (A1H0486-07)				Matrix: Water				
Batch: 1080545								
Arsenic	ND	25.0	50.0	ug/L	50	08/19/21 03:40	EPA 6020B	A-01a, Q-06, R-04
Molybdenum	ND	25.0	50.0	ug/L	50	08/19/21 03:40	EPA 6020B	A-01a, Q-06, R-04
Lithium	ND	125	250	ug/L	50	08/19/21 03:40	EPA 6020B	A-01a, Q-06, R-04
GS-AP-SSE-F1-12-20210809 (A1H0486-08)				Matrix: Water				
Batch: 1080545								
Arsenic	ND	25.0	50.0	ug/L	50	08/19/21 03:45	EPA 6020B	A-01a, Q-06, R-04
Molybdenum	ND	25.0	50.0	ug/L	50	08/19/21 03:45	EPA 6020B	A-01a, Q-06, R-04
Lithium	ND	125	250	ug/L	50	08/19/21 03:45	EPA 6020B	A-01a, Q-06, R-04
GS-AP-SSE-F2-5-20210810 (A1H0486-09)				Matrix: Water				
Batch: 1080545								
Arsenic	**54.0**	25.0	50.0	ug/L	50	08/19/21 03:50	EPA 6020B	
Iron	ND	1250	2500	ug/L	50	08/19/21 03:50	EPA 6020B	R-04
Manganese	**48.6**	25.0	50.0	ug/L	50	08/19/21 03:50	EPA 6020B	**J, R-04**
Molybdenum	ND	25.0	50.0	ug/L	50	08/19/21 03:50	EPA 6020B	R-04
Lithium	ND	125	250	ug/L	50	08/19/21 03:50	EPA 6020B	R-04
GS-AP-SSE-F2-6-20210810 (A1H0486-10)				Matrix: Water				
Batch: 1080545								

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ANALYTICAL REPORT

Anchor QEA, LLC	Project:	Alabama Power-Gorgas	
6720 SW Macadam Ave. Suite 125	Project Number:	201114-01.01	Report ID:
Portland, OR 97219	Project Manager:	Anthony Dalton-Atha	A1H0486 - 09 12 21 0444

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
GS-AP-SSE-F2-6-20210810 (A1H0486-10)				**Matrix: Water**				
Arsenic	**102**	25.0	50.0	ug/L	50	08/19/21 03:55	EPA 6020B	
Iron	ND	1250	2500	ug/L	50	08/19/21 03:55	EPA 6020B	R-04
Manganese	**41.5**	25.0	50.0	ug/L	50	08/19/21 03:55	EPA 6020B	**J, R-04**
Molybdenum	ND	25.0	50.0	ug/L	50	08/19/21 03:55	EPA 6020B	R-04
Lithium	ND	125	250	ug/L	50	08/19/21 03:55	EPA 6020B	R-04
GS-AP-SSE-F2-7-20210810 (A1H0486-11)				**Matrix: Water**				
Batch: 1080545								
Arsenic	**33.9**	25.0	50.0	ug/L	50	08/19/21 04:00	EPA 6020B	**J, R-04**
Iron	ND	1250	2500	ug/L	50	08/19/21 04:00	EPA 6020B	R-04
Manganese	**306**	25.0	50.0	ug/L	50	08/19/21 04:00	EPA 6020B	
Molybdenum	ND	25.0	50.0	ug/L	50	08/19/21 04:00	EPA 6020B	R-04
Lithium	ND	125	250	ug/L	50	08/19/21 04:00	EPA 6020B	R-04
GS-AP-SSE-F2-8-20210810 (A1H0486-12)				**Matrix: Water**				
Batch: 1080545								
Arsenic	**61.5**	25.0	50.0	ug/L	50	08/19/21 04:05	EPA 6020B	
Iron	ND	1250	2500	ug/L	50	08/19/21 04:05	EPA 6020B	R-04
Manganese	**291**	25.0	50.0	ug/L	50	08/19/21 04:05	EPA 6020B	
Molybdenum	ND	25.0	50.0	ug/L	50	08/19/21 04:05	EPA 6020B	R-04
Lithium	ND	125	250	ug/L	50	08/19/21 04:05	EPA 6020B	R-04
GS-AP-SSE-F2-9-20210810 (A1H0486-13)				**Matrix: Water**				
Batch: 1080545								
Arsenic	**34.7**	25.0	50.0	ug/L	50	08/19/21 04:19	EPA 6020B	**J, R-04**
Iron	ND	1250	2500	ug/L	50	08/19/21 04:19	EPA 6020B	R-04
Manganese	**31.4**	25.0	50.0	ug/L	50	08/19/21 04:19	EPA 6020B	**J, R-04**
Molybdenum	ND	25.0	50.0	ug/L	50	08/19/21 04:19	EPA 6020B	R-04
Lithium	ND	125	250	ug/L	50	08/19/21 04:19	EPA 6020B	R-04
GS-AP-SSE-F2-10-20210810 (A1H0486-14)				**Matrix: Water**				
Batch: 1080545								
Arsenic	**28.0**	25.0	50.0	ug/L	50	08/19/21 04:24	EPA 6020B	**J, R-04**
Iron	ND	1250	2500	ug/L	50	08/19/21 04:24	EPA 6020B	R-04
Manganese	ND	25.0	50.0	ug/L	50	08/19/21 04:24	EPA 6020B	R-04

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Darwin Thomas, Business Development Director

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

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0486 - 09 12 21 0444**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
GS-AP-SSE-F2-10-20210810 (A1H0486-14)				**Matrix: Water**				
Molybdenum	ND	25.0	50.0	ug/L	50	08/19/21 04:24	EPA 6020B	R-04
Lithium	ND	125	250	ug/L	50	08/19/21 04:24	EPA 6020B	R-04
GS-AP-SSE-F2-11-20210810 (A1H0486-15)				**Matrix: Water**				
Batch: 1080545								
Arsenic	**31.9**	25.0	50.0	ug/L	50	08/19/21 04:29	EPA 6020B	**J, R-04**
Iron	ND	1250	2500	ug/L	50	08/19/21 04:29	EPA 6020B	R-04
Manganese	ND	25.0	50.0	ug/L	50	08/19/21 04:29	EPA 6020B	R-04
Molybdenum	ND	25.0	50.0	ug/L	50	08/19/21 04:29	EPA 6020B	R-04
Lithium	ND	125	250	ug/L	50	08/19/21 04:29	EPA 6020B	R-04
GS-AP-SSE-F2-12-20210810 (A1H0486-16)				**Matrix: Water**				
Batch: 1080545								
Arsenic	ND	25.0	50.0	ug/L	50	08/19/21 04:34	EPA 6020B	R-04
Iron	ND	1250	2500	ug/L	50	08/19/21 04:34	EPA 6020B	R-04
Manganese	ND	25.0	50.0	ug/L	50	08/19/21 04:34	EPA 6020B	R-04
Molybdenum	ND	25.0	50.0	ug/L	50	08/19/21 04:34	EPA 6020B	R-04
Lithium	ND	125	250	ug/L	50	08/19/21 04:34	EPA 6020B	R-04
GS-AP-SSE-F3-5-20210812 (A1H0486-17)				**Matrix: Water**				
Batch: 1080545								
Arsenic	**3.16**	2.50	5.00	ug/L	5	08/19/21 01:42	EPA 6020B	**J, R-04**
Iron	**488**	125	250	ug/L	5	08/19/21 01:42	EPA 6020B	**A-01a, Q-06**
Manganese	**45.3**	2.50	5.00	ug/L	5	08/19/21 01:42	EPA 6020B	
Molybdenum	ND	2.50	5.00	ug/L	5	08/19/21 01:42	EPA 6020B	R-04
Lithium	ND	12.5	25.0	ug/L	5	08/19/21 01:42	EPA 6020B	A-01a, Q-06, R-04
GS-AP-SSE-F3-6-20210812 (A1H0486-18)				**Matrix: Water**				
Batch: 1080563								
Arsenic	**4.79**	2.50	5.00	ug/L	5	08/18/21 22:45	EPA 6020B	**J, R-04**
Iron	**723**	125	250	ug/L	5	08/18/21 22:45	EPA 6020B	
Manganese	**65.4**	2.50	5.00	ug/L	5	08/18/21 22:45	EPA 6020B	
Molybdenum	ND	2.50	5.00	ug/L	5	08/18/21 22:45	EPA 6020B	R-04
Lithium	ND	12.5	25.0	ug/L	5	08/18/21 22:45	EPA 6020B	R-04

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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**

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0486 - 09 12 21 0444**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
GS-AP-SSE-F3-7-20210812 (A1H0486-19)				**Matrix: Water**				
Batch: 1080563								
Arsenic	**2.79**	2.50	5.00	ug/L	5	08/18/21 22:50	EPA 6020B	**J, R-04**
Iron	**2420**	125	250	ug/L	5	08/18/21 22:50	EPA 6020B	
Manganese	**687**	2.50	5.00	ug/L	5	08/18/21 22:50	EPA 6020B	
Molybdenum	ND	2.50	5.00	ug/L	5	08/18/21 22:50	EPA 6020B	R-04
Lithium	ND	12.5	25.0	ug/L	5	08/18/21 22:50	EPA 6020B	R-04
GS-AP-SSE-F3-8-20210812 (A1H0486-20)				**Matrix: Water**				
Batch: 1080544								
Arsenic	**4.76**	2.50	5.00	ug/L	5	08/19/21 01:32	EPA 6020B	**J, R-04**
Iron	**2540**	125	250	ug/L	5	08/19/21 01:32	EPA 6020B	
Manganese	**525**	2.50	5.00	ug/L	5	08/19/21 01:32	EPA 6020B	
Molybdenum	ND	2.50	5.00	ug/L	5	08/19/21 01:32	EPA 6020B	R-04
Lithium	ND	12.5	25.0	ug/L	5	08/19/21 01:32	EPA 6020B	A-01a, Q-06, R-04
GS-AP-SSE-F3-9-20210812 (A1H0486-21)				**Matrix: Water**				
Batch: 1080563								
Arsenic	**2.60**	2.50	5.00	ug/L	5	08/18/21 22:55	EPA 6020B	**J, R-04**
Iron	**923**	125	250	ug/L	5	08/18/21 22:55	EPA 6020B	
Manganese	**57.5**	2.50	5.00	ug/L	5	08/18/21 22:55	EPA 6020B	
Molybdenum	ND	2.50	5.00	ug/L	5	08/18/21 22:55	EPA 6020B	R-04
Lithium	ND	12.5	25.0	ug/L	5	08/18/21 22:55	EPA 6020B	R-04
GS-AP-SSE-F3-10-20210812 (A1H0486-22)				**Matrix: Water**				
Batch: 1080563								
Arsenic	**2.72**	2.50	5.00	ug/L	5	08/18/21 22:59	EPA 6020B	**J, R-04**
Iron	**863**	125	250	ug/L	5	08/18/21 22:59	EPA 6020B	
Manganese	**67.8**	2.50	5.00	ug/L	5	08/18/21 22:59	EPA 6020B	
Molybdenum	ND	2.50	5.00	ug/L	5	08/18/21 22:59	EPA 6020B	R-04
Lithium	ND	12.5	25.0	ug/L	5	08/18/21 22:59	EPA 6020B	R-04
GS-AP-SSE-F3-11-20210812 (A1H0486-23)				**Matrix: Water**				
Batch: 1080563								
Arsenic	**2.91**	2.50	5.00	ug/L	5	08/18/21 23:04	EPA 6020B	**J, R-04**

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

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0486 - 09 12 21 0444**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
GS-AP-SSE-F3-11-20210812 (A1H0486-23)				**Matrix: Water**				
Iron	**632**	125	250	ug/L	5	08/18/21 23:04	EPA 6020B	
Manganese	**79.6**	2.50	5.00	ug/L	5	08/18/21 23:04	EPA 6020B	
Molybdenum	ND	2.50	5.00	ug/L	5	08/18/21 23:04	EPA 6020B	R-04
Lithium	ND	12.5	25.0	ug/L	5	08/18/21 23:04	EPA 6020B	R-04
GS-AP-SSE-F3-12-20210812 (A1H0486-24)				**Matrix: Water**				
Batch: 1080563								
Arsenic	ND	2.50	5.00	ug/L	5	08/18/21 23:09	EPA 6020B	
Iron	ND	125	250	ug/L	5	08/18/21 23:09	EPA 6020B	R-04
Manganese	ND	2.50	5.00	ug/L	5	08/18/21 23:09	EPA 6020B	R-04
Molybdenum	ND	2.50	5.00	ug/L	5	08/18/21 23:09	EPA 6020B	R-04
Lithium	ND	12.5	25.0	ug/L	5	08/18/21 23:09	EPA 6020B	R-04
GS-AP-SSE-F4-5-20210813 (A1H0486-25)				**Matrix: Water**				
Batch: 1080563								
Arsenic	**6.02**	2.50	5.00	ug/L	5	08/18/21 23:24	EPA 6020B	
Iron	**4860**	125	250	ug/L	5	08/18/21 23:24	EPA 6020B	
Manganese	**34.9**	2.50	5.00	ug/L	5	08/18/21 23:24	EPA 6020B	
Molybdenum	ND	2.50	5.00	ug/L	5	08/18/21 23:24	EPA 6020B	R-04
Lithium	ND	12.5	25.0	ug/L	5	08/18/21 23:24	EPA 6020B	R-04
GS-AP-SSE-F4-6-20210813 (A1H0486-26)				**Matrix: Water**				
Batch: 1080563								
Arsenic	**7.46**	2.50	5.00	ug/L	5	08/18/21 23:29	EPA 6020B	
Iron	**4870**	125	250	ug/L	5	08/18/21 23:29	EPA 6020B	
Manganese	**31.8**	2.50	5.00	ug/L	5	08/18/21 23:29	EPA 6020B	
Molybdenum	ND	2.50	5.00	ug/L	5	08/18/21 23:29	EPA 6020B	R-04
Lithium	ND	12.5	25.0	ug/L	5	08/18/21 23:29	EPA 6020B	R-04
GS-AP-SSE-F4-7-20210813 (A1H0486-27)				**Matrix: Water**				
Batch: 1080563								
Arsenic	**9.36**	2.50	5.00	ug/L	5	08/18/21 23:34	EPA 6020B	
Iron	**24200**	125	250	ug/L	5	08/18/21 23:34	EPA 6020B	
Manganese	**536**	2.50	5.00	ug/L	5	08/18/21 23:34	EPA 6020B	
Molybdenum	ND	2.50	5.00	ug/L	5	08/18/21 23:34	EPA 6020B	R-04

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Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0486 - 09 12 21 0444**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
GS-AP-SSE-F4-7-20210813 (A1H0486-27)				Matrix: Water				
Lithium	ND	12.5	25.0	ug/L	5	08/18/21 23:34	EPA 6020B	R-04
GS-AP-SSE-F4-8-20210813 (A1H0486-28)				Matrix: Water				
Batch: 1080563								
Arsenic	**13.8**	2.50	5.00	ug/L	5	08/18/21 23:39	EPA 6020B	
Iron	**27900**	125	250	ug/L	5	08/18/21 23:39	EPA 6020B	
Manganese	**690**	2.50	5.00	ug/L	5	08/18/21 23:39	EPA 6020B	
Molybdenum	ND	2.50	5.00	ug/L	5	08/18/21 23:39	EPA 6020B	R-04
Lithium	ND	12.5	25.0	ug/L	5	08/18/21 23:39	EPA 6020B	R-04
GS-AP-SSE-F4-9-20210813 (A1H0486-29)				Matrix: Water				
Batch: 1080563								
Arsenic	**6.02**	2.50	5.00	ug/L	5	08/18/21 23:44	EPA 6020B	
Iron	**9550**	125	250	ug/L	5	08/18/21 23:44	EPA 6020B	
Manganese	**103**	2.50	5.00	ug/L	5	08/18/21 23:44	EPA 6020B	
Molybdenum	ND	2.50	5.00	ug/L	5	08/18/21 23:44	EPA 6020B	R-04
Lithium	ND	12.5	25.0	ug/L	5	08/18/21 23:44	EPA 6020B	R-04
GS-AP-SSE-F4-10-20210813 (A1H0486-30)				Matrix: Water				
Batch: 1080563								
Arsenic	**4.86**	2.50	5.00	ug/L	5	08/18/21 23:49	EPA 6020B	**J, R-04**
Iron	**9150**	125	250	ug/L	5	08/18/21 23:49	EPA 6020B	
Manganese	**104**	2.50	5.00	ug/L	5	08/18/21 23:49	EPA 6020B	
Molybdenum	ND	2.50	5.00	ug/L	5	08/18/21 23:49	EPA 6020B	R-04
Lithium	ND	12.5	25.0	ug/L	5	08/18/21 23:49	EPA 6020B	R-04
GS-AP-SSE-F4-11-20210813 (A1H0486-31)				Matrix: Water				
Batch: 1080563								
Arsenic	**5.99**	2.50	5.00	ug/L	5	08/18/21 23:54	EPA 6020B	
Iron	**10500**	125	250	ug/L	5	08/18/21 23:54	EPA 6020B	
Manganese	**148**	2.50	5.00	ug/L	5	08/18/21 23:54	EPA 6020B	
Molybdenum	ND	2.50	5.00	ug/L	5	08/18/21 23:54	EPA 6020B	R-04
Lithium	ND	12.5	25.0	ug/L	5	08/18/21 23:54	EPA 6020B	R-04
GS-AP-SSE-F4-12-20210813 (A1H0486-32)				Matrix: Water				

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Darwin Thomas, Business Development Director

APEX LABORATORIES

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

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0486 - 09 12 21 0444**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
GS-AP-SSE-F4-12-20210813 (A1H0486-32)				**Matrix: Water**				
Batch: 1080563								
Arsenic	ND	2.50	5.00	ug/L	5	08/18/21 23:59	EPA 6020B	R-04
Iron	ND	125	250	ug/L	5	08/18/21 23:59	EPA 6020B	R-04
Manganese	**4.68**	2.50	5.00	ug/L	5	08/18/21 23:59	EPA 6020B	**J, R-04**
Molybdenum	ND	2.50	5.00	ug/L	5	08/18/21 23:59	EPA 6020B	R-04
Lithium	ND	12.5	25.0	ug/L	5	08/18/21 23:59	EPA 6020B	R-04
GS-AP-SSE-F5-5-20210816 (A1H0486-33)				**Matrix: Solid**				
Batch: 1080542								
Arsenic	**0.639**	0.546	1.09	mg/kg	10	08/18/21 21:26	EPA 6020B	**J**
Iron	**2140**	27.3	54.6	mg/kg	10	08/18/21 21:26	EPA 6020B	
Manganese	**1.41**	0.546	1.09	mg/kg	10	08/18/21 21:26	EPA 6020B	
Molybdenum	ND	0.546	1.09	mg/kg	10	08/18/21 21:26	EPA 6020B	
Lithium	ND	2.73	5.46	mg/kg	10	08/18/21 21:26	EPA 6020B	
GS-AP-SSE-F5-6-20210816 (A1H0486-34)				**Matrix: Solid**				
Batch: 1080542								
Arsenic	**1.84**	0.532	1.06	mg/kg	10	08/18/21 21:31	EPA 6020B	
Iron	**4070**	26.6	53.2	mg/kg	10	08/18/21 21:31	EPA 6020B	
Manganese	**2.73**	0.532	1.06	mg/kg	10	08/18/21 21:31	EPA 6020B	
Molybdenum	ND	0.532	1.06	mg/kg	10	08/18/21 21:31	EPA 6020B	
Lithium	ND	2.66	5.32	mg/kg	10	08/18/21 21:31	EPA 6020B	
GS-AP-SSE-F5-7-20210816 (A1H0486-35)				**Matrix: Solid**				
Batch: 1080542								
Arsenic	**1.85**	0.515	1.03	mg/kg	10	08/18/21 21:36	EPA 6020B	
Iron	**6840**	25.8	51.5	mg/kg	10	08/18/21 21:36	EPA 6020B	
Manganese	**21.1**	0.515	1.03	mg/kg	10	08/18/21 21:36	EPA 6020B	
Molybdenum	ND	0.515	1.03	mg/kg	10	08/18/21 21:36	EPA 6020B	
Lithium	**3.51**	2.58	5.15	mg/kg	10	08/18/21 21:36	EPA 6020B	**J**
GS-AP-SSE-F5-8-20210816 (A1H0486-36)				**Matrix: Solid**				
Batch: 1080542								
Arsenic	**2.63**	0.536	1.07	mg/kg	10	08/18/21 21:41	EPA 6020B	
Iron	**7980**	26.8	53.6	mg/kg	10	08/18/21 21:41	EPA 6020B	

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

ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0486 - 09 12 21 0444**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
GS-AP-SSE-F5-8-20210816 (A1H0486-36)				**Matrix: Solid**				
Manganese	**22.2**	0.536	1.07	mg/kg	10	08/18/21 21:41	EPA 6020B	
Molybdenum	ND	0.536	1.07	mg/kg	10	08/18/21 21:41	EPA 6020B	
Lithium	**3.56**	2.68	5.36	mg/kg	10	08/18/21 21:41	EPA 6020B	J
GS-AP-SSE-F5-9-20210816 (A1H0486-37)				**Matrix: Solid**				
Batch: 1080542								
Arsenic	**2.26**	0.508	1.02	mg/kg	10	08/18/21 21:46	EPA 6020B	
Iron	**12500**	25.4	50.8	mg/kg	10	08/18/21 21:46	EPA 6020B	
Manganese	**32.2**	0.508	1.02	mg/kg	10	08/18/21 21:46	EPA 6020B	
Molybdenum	ND	0.508	1.02	mg/kg	10	08/18/21 21:46	EPA 6020B	
Lithium	**5.09**	2.54	5.08	mg/kg	10	08/18/21 21:46	EPA 6020B	
GS-AP-SSE-F5-10-20210816 (A1H0486-38)				**Matrix: Solid**				
Batch: 1080542								
Arsenic	**1.51**	0.549	1.10	mg/kg	10	08/18/21 21:51	EPA 6020B	
Iron	**6670**	27.5	54.9	mg/kg	10	08/18/21 21:51	EPA 6020B	
Manganese	**25.9**	0.549	1.10	mg/kg	10	08/18/21 21:51	EPA 6020B	
Molybdenum	ND	0.549	1.10	mg/kg	10	08/18/21 21:51	EPA 6020B	
Lithium	**5.47**	2.75	5.49	mg/kg	10	08/18/21 21:51	EPA 6020B	J
GS-AP-SSE-F5-11-20210816 (A1H0486-39)				**Matrix: Solid**				
Batch: 1080542								
Arsenic	**3.46**	0.542	1.08	mg/kg	10	08/18/21 21:55	EPA 6020B	
Iron	**10400**	27.1	54.2	mg/kg	10	08/18/21 21:55	EPA 6020B	
Manganese	**62.7**	0.542	1.08	mg/kg	10	08/18/21 21:55	EPA 6020B	
Molybdenum	ND	0.542	1.08	mg/kg	10	08/18/21 21:55	EPA 6020B	
Lithium	**8.72**	2.71	5.42	mg/kg	10	08/18/21 21:55	EPA 6020B	

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ANALYTICAL REPORT

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

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

Report ID:
A1H0486 - 09 12 21 0444

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 1080542 - EPA 3051A							**Solid**					
Blank (1080542-BLK1)			Prepared: 08/17/21 08:47			Analyzed: 08/18/21 18:39						
EPA 6020B												
Arsenic	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	---	---	---	---	---	---	
Molybdenum	ND	0.481	0.962	mg/kg	10	---	---	---	---	---	---	
Blank (1080542-BLK2)			Prepared: 08/17/21 08:47			Analyzed: 08/18/21 20:33						
EPA 6020B												
Lithium	ND	2.40	4.81	mg/kg	10	---	---	---	---	---	---	
LCS (1080542-BS1)			Prepared: 08/17/21 08:47			Analyzed: 08/18/21 18:44						
EPA 6020B												
Arsenic	49.3	0.500	1.00	mg/kg	10	50.0	---	99	80-120%	---	---	
Iron	2540	25.0	50.0	mg/kg	10	2500	---	102	80-120%	---	---	
Manganese	49.5	0.500	1.00	mg/kg	10	50.0	---	99	80-120%	---	---	
Molybdenum	24.8	0.500	1.00	mg/kg	10	25.0	---	99	80-120%	---	---	
LCS (1080542-BS2)			Prepared: 08/17/21 08:47			Analyzed: 08/18/21 20:38						
EPA 6020B												
Lithium	39.3	2.50	5.00	mg/kg	10	40.0	---	98	80-120%	---	---	
Duplicate (1080542-DUP1)			Prepared: 08/17/21 08:47			Analyzed: 08/18/21 19:04						
QC Source Sample: Non-SDG (A1H0342-04)												
Arsenic	ND	0.531	1.06	mg/kg	10	---	ND	---	---	---	20%	
Iron	**1820**	26.5	53.1	mg/kg	10	---	1770	---	---	3	20%	
Manganese	**35.8**	0.531	1.06	mg/kg	10	---	35.7	---	---	0.2	20%	
Molybdenum	**0.662**	0.531	1.06	mg/kg	10	---	0.694	---	---	5	20%	J
Duplicate (1080542-DUP2)			Prepared: 08/17/21 08:47			Analyzed: 08/18/21 20:48						
QC Source Sample: Non-SDG (A1H0342-04)												
Lithium	ND	2.65	5.31	mg/kg	10	---	ND	---	---	---	20%	
Matrix Spike (1080542-MS1)			Prepared: 08/17/21 08:47			Analyzed: 08/18/21 19:09						

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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 1080542 - EPA 3051A							**Solid**					
Matrix Spike (1080542-MS1)			Prepared: 08/17/21 08:47		Analyzed: 08/18/21 19:09							
QC Source Sample: Non-SDG (A1H0342-04)												
EPA 6020B												
Arsenic	49.0	0.490	0.980	mg/kg	10	49.0	ND	100	75-125%	---	---	
Iron	4320	24.5	49.0	mg/kg	10	2450	1770	104	75-125%	---	---	
Manganese	84.5	0.490	0.980	mg/kg	10	49.0	35.7	100	75-125%	---	---	
Molybdenum	25.2	0.490	0.980	mg/kg	10	24.5	0.694	100	75-125%	---	---	
Matrix Spike (1080542-MS2)			Prepared: 08/17/21 08:47		Analyzed: 08/18/21 20:53							
QC Source Sample: Non-SDG (A1H0342-04)												
EPA 6020B												
Lithium	41.6	2.68	5.35	mg/kg	10	42.8	ND	97	75-125%	---	---	
Matrix Spike Dup (1080542-MSD1)			Prepared: 08/17/21 08:47		Analyzed: 08/18/21 19:14							
QC Source Sample: Non-SDG (A1H0342-04)												
Arsenic	49.4	2.45	4.90	mg/kg	50	49.0	ND	101	75-125%	0.9	20%	
Iron	4390	123	245	mg/kg	50	2450	1770	107	75-125%	2	20%	
Manganese	84.3	2.45	4.90	mg/kg	50	49.0	35.7	99	75-125%	0.2	20%	
Molybdenum	25.1	2.45	4.90	mg/kg	50	24.5	ND	103	75-125%	0.1	20%	

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Anchor QEA, LLC	Project: **Alabama Power-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0486 - 09 12 21 0444**

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 1080544 - EPA 3015A							**Water**					
Blank (1080544-BLK1)			Prepared: 08/17/21 09:10		Analyzed: 08/18/21 19:19							
EPA 6020B												
Arsenic	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	---	---	---	---	---	---	
Molybdenum	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Blank (1080544-BLK2)			Prepared: 08/17/21 09:10		Analyzed: 08/19/21 00:09							
EPA 6020B												
Lithium	ND	2.50	5.00	ug/L	1	---	---	---	---	---	---	
LCS (1080544-BS1)			Prepared: 08/17/21 09:10		Analyzed: 08/18/21 19:24							
EPA 6020B												
Arsenic	55.6	0.500	1.00	ug/L	1	55.6	---	100	80-120%	---	---	
Iron	2840	25.0	50.0	ug/L	1	2780	---	102	80-120%	---	---	
Manganese	55.3	0.500	1.00	ug/L	1	55.6	---	100	80-120%	---	---	
Molybdenum	27.6	0.500	1.00	ug/L	1	27.8	---	99	80-120%	---	---	
LCS (1080544-BS2)			Prepared: 08/17/21 09:10		Analyzed: 08/19/21 00:23							
EPA 6020B												
Lithium	42.5	2.50	5.00	ug/L	1	44.4	---	96	80-120%	---	---	A-01a
Duplicate (1080544-DUP1)			Prepared: 08/17/21 09:10		Analyzed: 08/18/21 19:34							
QC Source Sample: Non-SDG (A1H0387-01)												
Arsenic	**5.89**	0.500	1.00	ug/L	1	---	5.91	---	---	0.4	20%	
Iron	**21600**	25.0	50.0	ug/L	1	---	21900	---	---	1	20%	
Manganese	**1720**	0.500	1.00	ug/L	1	---	1740	---	---	1	20%	
Molybdenum	**1.01**	0.500	1.00	ug/L	1	---	1.07	---	---	6	20%	
Duplicate (1080544-DUP2)			Prepared: 08/17/21 09:10		Analyzed: 08/19/21 00:33							
QC Source Sample: Non-SDG (A1H0387-01)												
Lithium	ND	2.50	5.00	ug/L	1	---	ND	---	---	---	20%	A-01a, R-04
Matrix Spike (1080544-MS1)			Prepared: 08/17/21 09:10		Analyzed: 08/18/21 19:39							

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ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0486 - 09 12 21 0444**

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 1080544 - EPA 3015A							**Water**					
Matrix Spike (1080544-MS1)			Prepared: 08/17/21 09:10		Analyzed: 08/18/21 19:39							
QC Source Sample: Non-SDG (A1H0387-01)												
EPA 6020B												
Arsenic	62.1	0.500	1.00	ug/L	1	55.6	5.91	101	75-125%	---	---	
Iron	24400	25.0	50.0	ug/L	1	2780	21900	91	75-125%	---	---	
Manganese	1760	0.500	1.00	ug/L	1	55.6	1740	**30**	**75-125%**	---	---	Q-03
Molybdenum	30.1	0.500	1.00	ug/L	1	27.8	1.07	104	75-125%	---	---	
Matrix Spike (1080544-MS2)			Prepared: 08/17/21 09:10		Analyzed: 08/19/21 01:27							
QC Source Sample: Non-SDG (A1H0483-16)												
EPA 6020B												
Lithium	55.8	12.5	25.0	ug/L	5	44.4	ND	**126**	**75-125%**	---	---	A-01, Q-11

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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 1080545 - EPA 3015A							**Water**					
Blank (1080545-BLK1)				Prepared: 08/17/21 09:22	Analyzed: 08/18/21 18:08							
EPA 6020B												
Arsenic	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	---	---	---	---	---	---	
Molybdenum	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Blank (1080545-BLK2)				Prepared: 08/17/21 09:22	Analyzed: 08/19/21 02:36							
EPA 6020B												
Lithium	ND	2.50	5.00	ug/L	1	---	---	---	---	---	---	
LCS (1080545-BS1)				Prepared: 08/17/21 09:22	Analyzed: 08/18/21 18:14							
EPA 6020B												
Arsenic	55.4	0.500	1.00	ug/L	1	55.6	---	100	80-120%	---	---	
Iron	2780	25.0	50.0	ug/L	1	2780	---	100	80-120%	---	---	
Manganese	54.8	0.500	1.00	ug/L	1	55.6	---	99	80-120%	---	---	
Molybdenum	28.3	0.500	1.00	ug/L	1	27.8	---	102	80-120%	---	---	
LCS (1080545-BS2)				Prepared: 08/17/21 09:22	Analyzed: 08/19/21 02:41							
EPA 6020B												
Lithium	43.9	2.50	5.00	ug/L	1	44.4	---	99	80-120%	---	---	
Duplicate (1080545-DUP1)				Prepared: 08/17/21 09:22	Analyzed: 08/18/21 18:24							
QC Source Sample: Non-SDG (A1H0479-01)												
Arsenic	**1.57**	0.500	1.00	ug/L	1	---	1.57	---	---	0.3	20%	
Iron	**118**	25.0	50.0	ug/L	1	---	119	---	---	0.9	20%	
Manganese	**7.60**	0.500	1.00	ug/L	1	---	7.73	---	---	2	20%	
Molybdenum	ND	0.500	1.00	ug/L	1	---	ND	---	---	---	20%	
Duplicate (1080545-DUP2)				Prepared: 08/17/21 09:22	Analyzed: 08/19/21 02:51							
QC Source Sample: Non-SDG (A1H0479-01)												
Lithium	ND	12.5	25.0	ug/L	5	---	ND	---	---	---	20%	
Matrix Spike (1080545-MS1)				Prepared: 08/17/21 09:22	Analyzed: 08/18/21 18:29							

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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 1080545 - EPA 3015A							**Water**					
Matrix Spike (1080545-MS1)			Prepared: 08/17/21 09:22 Analyzed: 08/18/21 18:29									
QC Source Sample: Non-SDG (A1H0479-01)												
EPA 6020B												
Arsenic	58.6	0.500	1.00	ug/L	1	55.6	1.57	103	75-125%	---	---	
Iron	2900	25.0	50.0	ug/L	1	2780	119	100	75-125%	---	---	
Manganese	62.1	0.500	1.00	ug/L	1	55.6	7.73	98	75-125%	---	---	
Molybdenum	30.7	0.500	1.00	ug/L	1	27.8	ND	111	75-125%	---	---	
Matrix Spike (1080545-MS2)			Prepared: 08/17/21 09:22 Analyzed: 08/19/21 02:56									
QC Source Sample: Non-SDG (A1H0479-01)												
EPA 6020B												
Lithium	45.2	12.5	25.0	ug/L	5	44.4	ND	102	75-125%	---	---	
Matrix Spike Dup (1080545-MSD1)			Prepared: 08/17/21 09:22 Analyzed: 08/18/21 18:34									
QC Source Sample: Non-SDG (A1H0479-01)												
Arsenic	59.2	2.50	5.00	ug/L	5	55.6	ND	107	75-125%	1	20%	
Iron	2990	125	250	ug/L	5	2780	ND	108	75-125%	3	20%	
Manganese	62.9	2.50	5.00	ug/L	5	55.6	7.73	99	75-125%	1	20%	
Molybdenum	30.6	2.50	5.00	ug/L	5	27.8	ND	110	75-125%	0.2	20%	

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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 1080563 - EPA 3015A							Water					
Blank (1080563-BLK1)			Prepared: 08/17/21 13:50 Analyzed: 08/18/21 19:49									
EPA 6020B												
Arsenic	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	---	---	---	---	---	---	
Molybdenum	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Blank (1080563-BLK2)			Prepared: 08/17/21 13:50 Analyzed: 08/18/21 22:05									
EPA 6020B												
Lithium	ND	2.50	5.00	ug/L	1	---	---	---	---	---	---	
LCS (1080563-BS1)			Prepared: 08/17/21 13:50 Analyzed: 08/18/21 20:04									
EPA 6020B												
Arsenic	56.1	0.500	1.00	ug/L	1	55.6	---	101	80-120%	---	---	
Iron	2860	25.0	50.0	ug/L	1	2780	---	103	80-120%	---	---	
Manganese	55.8	0.500	1.00	ug/L	1	55.6	---	101	80-120%	---	---	
Molybdenum	28.0	0.500	1.00	ug/L	1	27.8	---	101	80-120%	---	---	
LCS (1080563-BS2)			Prepared: 08/17/21 13:50 Analyzed: 08/18/21 22:10									
EPA 6020B												
Lithium	42.7	2.50	5.00	ug/L	1	44.4	---	96	80-120%	---	---	
Duplicate (1080563-DUP1)			Prepared: 08/17/21 13:50 Analyzed: 08/18/21 20:19									
QC Source Sample: Non-SDG (A1H0387-04)												
Arsenic	**2.98**	0.500	1.00	ug/L	1	---	2.98	---	---	0.02	20%	
Iron	**10600**	25.0	50.0	ug/L	1	---	10500	---	---	0.7	20%	
Manganese	**2130**	0.500	1.00	ug/L	1	---	2130	---	---	0.2	20%	
Molybdenum	**0.594**	0.500	1.00	ug/L	1	---	0.657	---	---	10	20%	J
Duplicate (1080563-DUP2)			Prepared: 08/17/21 13:50 Analyzed: 08/18/21 22:30									
QC Source Sample: Non-SDG (A1H0387-04)												
Lithium	ND	2.50	5.00	ug/L	1	---	ND	---	---	---	20%	
Matrix Spike (1080563-MS1)			Prepared: 08/17/21 13:50 Analyzed: 08/18/21 20:24									

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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 1080563 - EPA 3015A							**Water**					
Matrix Spike (1080563-MS1)			Prepared: 08/17/21 13:50 Analyzed: 08/18/21 20:24									
QC Source Sample: Non-SDG (A1H0387-04)												
EPA 6020B												
Arsenic	59.3	0.500	1.00	ug/L	1	55.6	2.98	101	75-125%	---	---	
Iron	13000	25.0	50.0	ug/L	1	2780	10500	92	75-125%	---	---	
Manganese	2130	0.500	1.00	ug/L	1	55.6	2130	**3**	**75-125%**	---	---	Q-03
Molybdenum	29.2	0.500	1.00	ug/L	1	27.8	0.657	103	75-125%	---	---	
Matrix Spike (1080563-MS2)			Prepared: 08/17/21 13:50 Analyzed: 08/18/21 22:40									
QC Source Sample: Non-SDG (A1H0387-05)												
EPA 6020B												
Lithium	47.8	2.50	5.00	ug/L	1	44.4	3.28	100	75-125%	---	---	

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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: 1080544							
A1H0486-20	Water	EPA 6020B	08/12/21 09:35	08/17/21 09:10	45mL/50mL	45mL/50mL	1.00
Batch: 1080545							
A1H0486-01	Water	EPA 6020B	08/09/21 09:20	08/17/21 09:22	45mL/50mL	45mL/50mL	1.00
A1H0486-02	Water	EPA 6020B	08/09/21 09:25	08/17/21 09:22	45mL/50mL	45mL/50mL	1.00
A1H0486-03	Water	EPA 6020B	08/09/21 09:30	08/17/21 09:22	45mL/50mL	45mL/50mL	1.00
A1H0486-04	Water	EPA 6020B	08/09/21 09:35	08/17/21 09:22	45mL/50mL	45mL/50mL	1.00
A1H0486-05	Water	EPA 6020B	08/09/21 09:40	08/17/21 09:22	45mL/50mL	45mL/50mL	1.00
A1H0486-06	Water	EPA 6020B	08/09/21 09:45	08/17/21 09:22	45mL/50mL	45mL/50mL	1.00
A1H0486-07	Water	EPA 6020B	08/09/21 09:50	08/17/21 09:22	45mL/50mL	45mL/50mL	1.00
A1H0486-08	Water	EPA 6020B	08/09/21 09:55	08/17/21 09:22	45mL/50mL	45mL/50mL	1.00
A1H0486-09	Water	EPA 6020B	08/10/21 09:20	08/17/21 09:22	45mL/50mL	45mL/50mL	1.00
A1H0486-10	Water	EPA 6020B	08/10/21 09:25	08/17/21 09:22	45mL/50mL	45mL/50mL	1.00
A1H0486-11	Water	EPA 6020B	08/10/21 09:30	08/17/21 09:22	45mL/50mL	45mL/50mL	1.00
A1H0486-12	Water	EPA 6020B	08/10/21 09:35	08/17/21 09:22	45mL/50mL	45mL/50mL	1.00
A1H0486-13	Water	EPA 6020B	08/10/21 09:40	08/17/21 09:22	45mL/50mL	45mL/50mL	1.00
A1H0486-14	Water	EPA 6020B	08/10/21 09:45	08/17/21 09:22	45mL/50mL	45mL/50mL	1.00
A1H0486-15	Water	EPA 6020B	08/10/21 09:50	08/17/21 09:22	45mL/50mL	45mL/50mL	1.00
A1H0486-16	Water	EPA 6020B	08/10/21 09:55	08/17/21 09:22	45mL/50mL	45mL/50mL	1.00
A1H0486-17	Water	EPA 6020B	08/12/21 09:20	08/17/21 09:22	45mL/50mL	45mL/50mL	1.00
Batch: 1080563							
A1H0486-18	Water	EPA 6020B	08/12/21 09:25	08/17/21 13:50	45mL/50mL	45mL/50mL	1.00
A1H0486-19	Water	EPA 6020B	08/12/21 09:30	08/17/21 13:50	45mL/50mL	45mL/50mL	1.00
A1H0486-21	Water	EPA 6020B	08/12/21 09:40	08/17/21 13:50	45mL/50mL	45mL/50mL	1.00
A1H0486-22	Water	EPA 6020B	08/12/21 09:45	08/17/21 13:50	45mL/50mL	45mL/50mL	1.00
A1H0486-23	Water	EPA 6020B	08/12/21 09:50	08/17/21 13:50	45mL/50mL	45mL/50mL	1.00
A1H0486-24	Water	EPA 6020B	08/12/21 09:55	08/17/21 13:50	45mL/50mL	45mL/50mL	1.00
A1H0486-25	Water	EPA 6020B	08/13/21 09:20	08/17/21 13:50	45mL/50mL	45mL/50mL	1.00
A1H0486-26	Water	EPA 6020B	08/13/21 09:25	08/17/21 13:50	45mL/50mL	45mL/50mL	1.00
A1H0486-27	Water	EPA 6020B	08/13/21 09:30	08/17/21 13:50	45mL/50mL	45mL/50mL	1.00
A1H0486-28	Water	EPA 6020B	08/13/21 09:35	08/17/21 13:50	45mL/50mL	45mL/50mL	1.00
A1H0486-29	Water	EPA 6020B	08/13/21 09:40	08/17/21 13:50	45mL/50mL	45mL/50mL	1.00
A1H0486-30	Water	EPA 6020B	08/13/21 09:45	08/17/21 13:50	45mL/50mL	45mL/50mL	1.00
A1H0486-31	Water	EPA 6020B	08/13/21 09:50	08/17/21 13:50	45mL/50mL	45mL/50mL	1.00
A1H0486-32	Water	EPA 6020B	08/13/21 09:55	08/17/21 13:50	45mL/50mL	45mL/50mL	1.00

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Darwin Thomas, Business Development Director

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SAMPLE PREPARATION INFORMATION

Total Metals by EPA 6020B (ICPMS)

Prep: EPA 3051A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 1080542							
A1H0486-33	Solid	EPA 6020B	08/12/21 09:20	08/17/21 08:47	0.458g/50mL	0.5g/50mL	1.09
A1H0486-34	Solid	EPA 6020B	08/12/21 09:25	08/17/21 08:47	0.47g/50mL	0.5g/50mL	1.06
A1H0486-35	Solid	EPA 6020B	08/12/21 09:30	08/17/21 08:47	0.485g/50mL	0.5g/50mL	1.03
A1H0486-36	Solid	EPA 6020B	08/12/21 09:35	08/17/21 08:47	0.466g/50mL	0.5g/50mL	1.07
A1H0486-37	Solid	EPA 6020B	08/12/21 09:40	08/17/21 08:47	0.492g/50mL	0.5g/50mL	1.02
A1H0486-38	Solid	EPA 6020B	08/12/21 09:45	08/17/21 08:47	0.455g/50mL	0.5g/50mL	1.10
A1H0486-39	Solid	EPA 6020B	08/12/21 09:50	08/17/21 08:47	0.461g/50mL	0.5g/50mL	1.08

Apex Laboratories, LLC

6700 S.W. Sandburg Street
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503-718-2323
ORELAP ID: **OR100062**

Anchor QEA, LLC	Project: **Alabama Power-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0486 - 09 12 21 0444**

QUALIFIER DEFINITIONS

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

Apex Laboratories

A-01	MS2 is failing for lithium becase source sample is calculating as non detect <MRL and its value is not being calculated..
A-01a	Results do not meet EPA 6020B and/or Apex SOP criteria. Results reported for research per client request.
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-06	Internal Standard area outside of method specified limits. Data is Not Reported. See previous or subsequent runs for reportable sample data.
Q-11	Spike recovery cannot be accurately quantified due to sample dilution required for high analyte concentration and/or matrix interference.
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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6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0486 - 09 12 21 0444**

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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6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0486 - 09 12 21 0444**

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, LLC

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ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0486 - 09 12 21 0444**

A1H0486

Chain of Custody Record & Laboratory Analysis Request

ANCHOR QEA

Company: Anchor QEA
Date: 7/28/2021
Project Name: Alabama Power - Gorgas
Project Number: 201114-01.01
Project Manager: Anthony Dalton-Atha adalton-atha@anchorqea.com
Phone Number: 503-924-6186
Shipment Method: Pick-up
Samplers: Paloma Spina

Test Parameters

Line	Field Sample ID	Collection Date	Time	Matrix	No. of Containers	Arsenic	Lithium	Molybdenum	Iron	Manganese	Comments/Preservation
1	GS-AP-SSE-F1-5-20210809	8/9/2021	9:20	Water	1	x	x	x			1 M magnesium chloride
2	GS-AP-SSE-F1-6-20210809	8/9/2021	9:25	Water	1	x	x	x			1 M magnesium chloride
3	GS-AP-SSE-F1-7-20210809	8/9/2021	9:30	Water	1	x	x	x			1 M magnesium chloride
4	GS-AP-SSE-F1-8-20210809	8/9/2021	9:35	Water	1	x	x	x			1 M magnesium chloride
5	GS-AP-SSE-F1-9-20210809	8/9/2021	9:40	Water	1	x	x	x			1 M magnesium chloride
6	GS-AP-SSE-F1-10-20210809	8/9/2021	9:45	Water	1	x	x	x			1 M magnesium chloride
7	GS-AP-SSE-F1-11-20210809	8/9/2021	9:50	Water	1	x	x	x			1 M magnesium chloride
8	GS-AP-SSE-F1-12-20210809	8/9/2021	9:55	Water	1	x	x	x			1 M magnesium chloride
9	GS-AP-SSE-F2-5-20210810	8/10/2021	9:20	Water	1	x	x	x	x	x	1 M monosodium phosphate
10	GS-AP-SSE-F2-6-20210810	8/10/2021	9:25	Water	1	x	x	x	x	x	1 M monosodium phosphate
11	GS-AP-SSE-F2-7-20210810	8/10/2021	9:30	Water	1	x	x	x	x	x	1 M monosodium phosphate
12	GS-AP-SSE-F2-8-20210810	8/10/2021	9:35	Water	1	x	x	x	x	x	1 M monosodium phosphate
13	GS-AP-SSE-F2-9-20210810	8/10/2021	9:40	Water	1	x	x	x	x	x	1 M monosodium phosphate
14	GS-AP-SSE-F2-10-20210810	8/10/2021	9:45	Water	1	x	x	x	x	x	1 M monosodium phosphate
15	GS-AP-SSE-F2-11-20210810	8/10/2021	9:50	Water	1	x	x	x	x	x	1 M monosodium phosphate
16	GS-AP-SSE-F2-12-20210810	8/10/2021	9:55	Water	1	x	x	x	x	x	1 M monosodium phosphate

Comments: samples are filtered and preserved with nitric acid.

3-day TAT

Relinquished By: Paloma Spina	Company: AQ	Received By:	Company: Apex Labs
Signature/Printed Name	Date/Time 9/16/2021 11:00AM	Signature/Printed Name Michael Kuchinsk	Date/Time 8-16-21/1236
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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503-718-2323
ORELAP ID: **OR100062**

Anchor QEA, LLC	Project: **Alabama Power-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0486 - 09 12 21 0444**

A1H0486

Chain of Custody Record & Laboratory Analysis Request

ANCHOR QEA

Company: Anchor QEA
Date: 7/28/2021
Project Name: Alabama Power - Gorgas
Project Number: 201114-01.01
Project Manager: Anthony Dalton-Atha adalton-atha@anchorqea.com
Phone Number: 503-924-6186
Shipment Method: Pick-up
Samplers: Paloma Spina

Test Parameters

Line	Field Sample ID	Collection Date/Time		Matrix	No. of Containers	Arsenic	Lithium	Molybdenum	Iron	Manganese	Comments/Preservation
1	GS-AP-SSE-F3-5-20210812	8/12/2021	9:20	Water	1	x	x	x	x	x	0.1 M hydroxylamine hydrochloride
2	GS-AP-SSE-F3-6-20210812	8/12/2021	9:25	Water	1	x	x	x	x	x	0.1 M hydroxylamine hydrochloride
3	GS-AP-SSE-F3-7-20210812	8/12/2021	9:30	Water	1	x	x	x	x	x	0.1 M hydroxylamine hydrochloride
4	GS-AP-SSE-F3-8-20210812	8/12/2021	9:35	Water	1	x	x	x	x	x	0.1 M hydroxylamine hydrochloride
5	GS-AP-SSE-F3-9-20210812	8/12/2021	9:40	Water	1	x	x	x	x	x	0.1 M hydroxylamine hydrochloride
6	GS-AP-SSE-F3-10-20210812	8/12/2021	9:45	Water	1	x	x	x	x	x	0.1 M hydroxylamine hydrochloride
7	GS-AP-SSE-F3-11-20210812	8/12/2021	9:50	Water	1	x	x	x	x	x	0.1 M hydroxylamine hydrochloride
8	GS-AP-SSE-F3-12-20210812	8/12/2021	9:55	Water	1	x	x	x	x	x	0.1 M hydroxylamine hydrochloride
9	GS-AP-SSE-F4-5-20210813	8/13/2021	9:20	Water	1	x	x	x	x	x	16 M nitric acid
10	GS-AP-SSE-F4-6-20210813	8/13/2021	9:25	Water	1	x	x	x	x	x	16 M nitric acid
11	GS-AP-SSE-F4-7-20210813	8/13/2021	9:30	Water	1	x	x	x	x	x	16 M nitric acid
12	GS-AP-SSE-F4-8-20210813	8/13/2021	9:35	Water	1	x	x	x	x	x	16 M nitric acid
13	GS-AP-SSE-F4-9-20210813	8/13/2021	9:40	Water	1	x	x	x	x	x	16 M nitric acid
14	GS-AP-SSE-F4-10-20210813	8/13/2021	9:45	Water	1	x	x	x	x	x	16 M nitric acid
15	GS-AP-SSE-F4-11-20210813	8/13/2021	9:50	Water	1	x	x	x	x	x	16 M nitric acid
16	GS-AP-SSE-F4-12-20210813	8/13/2021	9:55	Water	1	x	x	x	x	x	16 M nitric acid

Comments: samples are filtered and preserved with nitric acid.
3-day TAT

Relinquished By: Paloma Spina	Company: AQ
Signature/Printed Name: Paloma Spina	Date/Time: 9/16/21 11AM
Received By: [signature]	Company: Apex Labs
Signature/Printed Name: Michael Kuchnik	Date/Time: 8-16-21/1736

Relinquished By:	Company:
Signature/Printed Name	Date/Time
Received By:	Company:
Signature/Printed Name	Date/Time

(2)

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Anchor QEA, LLC	Project: **Alabama Power-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0486 - 09 12 21 0444**

A1H0486

Chain of Custody Record & Laboratory Analysis Request

ANCHOR QEA

Company: Anchor QEA
Date: 7/28/2021
Project Name: Alabama Power - Gorgas
Project Number: 201114-01.01
Project Manager: Anthony Dalton-Atha adalton-atha@anchorqea.com
Phone Number: 503-924-6186
Shipment Method: Pick-up
Samplers: Paloma Spina

Line	Field Sample ID	Collection Date	Collection Time	Matrix	No. of Containers	Arsenic	Lithium	Molybdenum	Iron	Manganese	Comments/Preservation
1	GS-AP-SSE-F5-5-20210816	8/12/2021	9:20	Solid	1	x	x	x	x	x	none
2	GS-AP-SSE-F5-6-20210816	8/12/2021	9:25	Solid	1	x	x	x	x	x	none
3	GS-AP-SSE-F5-7-20210816	8/12/2021	9:30	Solid	1	x	x	x	x	x	none
4	GS-AP-SSE-F5-8-20210816	8/12/2021	9:35	Solid	1	x	x	x	x	x	none
5	GS-AP-SSE-F5-9-20210816	8/12/2021	9:40	Solid	1	x	x	x	x	x	none
6	GS-AP-SSE-F5-10-20210816	8/12/2021	9:45	Solid	1	x	x	x	x	x	none
7	GS-AP-SSE-F5-11-20210816	8/12/2021	9:50	Solid	1	x	x	x	x	x	none
8											
9											
10											
11											
12											
13											
14											
15											
16											

Comments: no preservation of soil samples.
3-day TAT

Relinquished By: Paloma Spina Company: AQ
Signature/Printed Name: Pal Spi Date/Time: 8/16/21 11AM

Received By: [signature] Company: Apex Labs
Signature/Printed Name: Michael Kudrnik Date/Time: 8-16-21/1136

Relinquished By: Company:
Signature/Printed Name Date/Time

Received By: Company:
Signature/Printed Name Date/Time

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

Anchor QEA, LLC	Project: **Alabama Power-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0486 - 09 12 21 0444**

A1H0486
Revised

Chain of Custody Record & Laboratory Analysis Request

ANCHOR QEA

Company: Anchor QEA
Date: 7/28/2021
Project Name: Alabama Power - Gorgas
Project Number: 201114-01.01
Project Manager: Anthony Dalton-Atha adalton-atha@anchorqea.com
Phone Number: 503-924-6186
Shipment Method: Pick-up
Samplers: Paloma Spina

Line	Field Sample ID	Collection Date	Time	Matrix	No. of Containers	Arsenic	Lithium	Molybdenum	Iron	Manganese	Comments/Preservation
1	GS-AP-SSE-F1-5-20210809	8/9/2021	9:20	Water	1	x	x	x			1 M magnesium chloride
2	GS-AP-SSE-F1-6-20210809	8/9/2021	9:25	Water	1	x	x	x			1 M magnesium chloride
3	GS-AP-SSE-F1-7-20210809	8/9/2021	9:30	Water	1	x	x	x			1 M magnesium chloride
4	GS-AP-SSE-F1-8-20210809	8/9/2021	9:35	Water	1	x	x	x			1 M magnesium chloride
5	GS-AP-SSE-F1-9-20210809	8/9/2021	9:40	Water	1	x	x	x			1 M magnesium chloride
6	GS-AP-SSE-F1-10-20210809	8/9/2021	9:45	Water	1	x	x	x			1 M magnesium chloride
7	GS-AP-SSE-F1-11-20210809	8/9/2021	9:50	Water	1	x	x	x			1 M magnesium chloride
8	GS-AP-SSE-F1-12-20210809	8/9/2021	9:55	Water	1	x	x	x			1 M magnesium chloride
9	GS-AP-SSE-F2-5-20210810	8/10/2021	9:20	Water	1	x	x	x	x	x	1 M monosodium phosphate
10	GS-AP-SSE-F2-6-20210810	8/10/2021	9:25	Water	1	x	x	x	x	x	1 M monosodium phosphate
11	GS-AP-SSE-F2-7-20210810	8/10/2021	9:30	Water	1	x	x	x	x	x	1 M monosodium phosphate
12	GS-AP-SSE-F2-8-20210810	8/10/2021	9:35	Water	1	x	x	x	x	x	1 M monosodium phosphate
13	GS-AP-SSE-F2-9-20210810	8/10/2021	9:40	Water	1	x	x	x	x	x	1 M monosodium phosphate
14	GS-AP-SSE-F2-10-20210810	8/10/2021	9:45	Water	1	x	x	x	x	x	1 M monosodium phosphate
15	GS-AP-SSE-F2-11-20210810	8/10/2021	9:50	Water	1	x	x	x	x	x	1 M monosodium phosphate
16	GS-AP-SSE-F2-12-20210810	8/10/2021	9:55	Water	1	x	x	x	x	x	1 M monosodium phosphate

Comments: samples are filtered and preserved with nitric acid.
3-day TAT

Relinquished By: Paloma Spina	Company: AQ	Received By:	Company: Apex Labs
Signature/Printed Name:	Date/Time: 8/16/2021 11:00AM	Signature/Printed Name: Michael Kuchinski	Date/Time: 8-16-21/1136
Relinquished By:	Company:	Received By:	Company:
Signature/Printed Name	Date/Time	Signature/Printed Name	Date/Time

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ANALYTICAL REPORT

Anchor QEA, LLC	Project: **Alabama Power-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: 201114-01.01	**Report ID:**
Portland, OR 97219	Project Manager: Anthony Dalton-Atha	A1H0486 - 09 12 21 0444

A1H0486 Revised

Chain of Custody Record & Laboratory Analysis Request

ANCHOR QEA

Company: Anchor QEA
Date: 7/28/2021
Project Name: Alabama Power - Gorgas
Project Number: 201114-01.01
Project Manager: Anthony Dalton-Atha adalton-atha@anchorqea.com
Phone Number: 503-924-6186
Shipment Method: Pick-up
Samplers: Paloma Spina

Test Parameters

Line	Field Sample ID	Collection Date	Time	Matrix	No. of Containers	Arsenic	Lithium	Molybdenum	Iron	Manganese	Comments/Preservation
1	GS-AP-SSE-F3-5-20210812	8/12/2021	9:20	Water	1	x	x	x	x	x	0.1 M hydroxylamine hydrochloride
2	GS-AP-SSE-F3-6-20210812	8/12/2021	9:25	Water	1	x	x	x	x	x	0.1 M hydroxylamine hydrochloride
3	GS-AP-SSE-F3-7-20210812	8/12/2021	9:30	Water	1	x	x	x	x	x	0.1 M hydroxylamine hydrochloride
4	GS-AP-SSE-F3-8-20210812	8/12/2021	9:35	Water	1	x	x	x	x	x	0.1 M hydroxylamine hydrochloride
5	GS-AP-SSE-F3-9-20210812	8/12/2021	9:40	Water	1	x	x	x	x	x	0.1 M hydroxylamine hydrochloride
6	GS-AP-SSE-F3-10-20210812	8/12/2021	9:45	Water	1	x	x	x	x	x	0.1 M hydroxylamine hydrochloride
7	GS-AP-SSE-F3-11-20210812	8/12/2021	9:50	Water	1	x	x	x	x	x	0.1 M hydroxylamine hydrochloride
8	GS-AP-SSE-F3-12-20210812	8/12/2021	9:55	Water	1	x	x	x	x	x	0.1 M hydroxylamine hydrochloride
9	GS-AP-SSE-F4-5-20210813	8/13/2021	9:20	Water	1	x	x	x	x	x	16 M nitric acid
10	GS-AP-SSE-F4-6-20210813	8/13/2021	9:25	Water	1	x	x	x	x	x	16 M nitric acid
11	GS-AP-SSE-F4-7-20210813	8/13/2021	9:30	Water	1	x	x	x	x	x	16 M nitric acid
12	GS-AP-SSE-F4-8-20210813	8/13/2021	9:35	Water	1	x	x	x	x	x	16 M nitric acid
13	GS-AP-SSE-F4-9-20210813	8/13/2021	9:40	Water	1	x	x	x	x	x	16 M nitric acid
14	GS-AP-SSE-F4-10-20210813	8/13/2021	9:45	Water	1	x	x	x	x	x	16 M nitric acid
15	GS-AP-SSE-F4-11-20210813	8/13/2021	9:50	Water	1	x	x	x	x	x	16 M nitric acid
16	GS-AP-SSE-F4-12-20210813	8/13/2021	9:55	Water	1	x	x	x	x	x	16 M nitric acid

Comments: samples are filtered and preserved with nitric acid.
3-day TAT

Relinquished By: Paloma Spina	Company: AQ	Received By:	Company: Apex Labs
Signature/Printed Name	Date/Time 8/16/21 11AM	Signature/Printed Name Michael Kuchmik	Date/Time 8-16-21/1136
Relinquished By:	Company:	Received By:	Company:
Signature/Printed Name	Date/Time	Signature/Printed Name	Date/Time

(2)

Page 1 of 1

Anchor QEA, LLC	Project: **Alabama Power-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0486 - 09 12 21 0444**

A1H0486
Revised

ANCHOR QEA

Chain of Custody Record & Laboratory Analysis Request

Company: Anchor QEA
Date: 7/28/2021
Project Name: Alabama Power - Gorgas
Project Number: 201114-01.01
Project Manager: Anthony Dalton-Atha adalton-atha@anchorqea.com
Phone Number: 503-924-6186
Shipment Method: Pick-up
Samplers: Paloma Spina

Line	Field Sample ID	Collection Date/Time		Matrix	No. of Containers	Arsenic	Lithium	Molybdenum	Iron	Manganese	Comments/Preservation
1	GS-AP-SSE-F5-5-20210816	8/12/2021	9:20	Solid	1	x	x	x	x	x	none
2	GS-AP-SSE-F5-6-20210816	8/12/2021	9:25	Solid	1	x	x	x	x	x	none
3	GS-AP-SSE-F5-7-20210816	8/12/2021	9:30	Solid	1	x	x	x	x	x	none
4	GS-AP-SSE-F5-8-20210816	8/12/2021	9:35	Solid	1	x	x	x	x	x	none
5	GS-AP-SSE-F5-9-20210816	8/12/2021	9:40	Solid	1	x	x	x	x	x	none
6	GS-AP-SSE-F5-10-20210816	8/12/2021	9:45	Solid	1	x	x	x	x	x	none
7	GS-AP-SSE-F5-11-20210816	8/12/2021	9:50	Solid	1	x	x	x	x	x	none
8											
9											
10											
11											
12											
13											
14											
15											
16											

Comments: no preservation of soil samples.
3-day TAT

Relinquished By: Paloma Spina Company: AQ	Received By: Company: Apex Labs
Signature/Printed Name: Date/Time: 8/16/21 11AM	Signature/Printed Name: Michael Kuzinsk Date/Time: 8-16-21/1236
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-Gorgas**	
6720 SW Macadam Ave. Suite 125	Project Number: **201114-01.01**	**Report ID:**
Portland, OR 97219	Project Manager: **Anthony Dalton-Atha**	**A1H0486 - 09 12 21 0444**

APEX LABS COOLER RECEIPT FORM

Client: Anchor QEA Element WO#: A1 H0486

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

Delivery Info:

Date/time received: 8-16-21 @ 1236 By: MK

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

Cooler Inspection Date/time inspected: 8-16-21 @ 1310 By: MK

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)	2.1						
Received on ice? (Y/N)	Y						
Temp. blanks? (Y/N)	Y						
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: 8/16/21 @ 1552 By: SO

All samples intact? Yes X No ___ Comments: ___

Bottle labels/COCs agree? Yes ___ No X Comments: Dates on F5 samples read 8/16/21

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: ___

Labeled by: SO Witness: MK Cooler Inspected by: SO

August 09, 2021 Service Request No:K2107416

Masa Kanematsu
Anchor QEA, LLC
6720 SW Macadam Avenue
Suite 125
Portland, OR 97219

Laboratory Results for: Gorgas

Dear Masa,

Enclosed are the results of the sample(s) submitted to our laboratory June 25, 2021
For your reference, these analyses have been assigned our service request number **K2107416.**

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

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: Anchor QEA, LLC
Project: Gorgas
Sample Matrix: Water

Service Request: K2107416
Date Received: 06/25/2021

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:

Two water samples were received for analysis at ALS Environmental on 06/25/2021. 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:

Method 200.8, 08/06/2021: The Method Blank KQ2111792-01 contained low levels of Manganese above the Method Reporting Limit (MRL). Since all of the associated sample results were more than twenty times the level found in the Method Blank no corrective action or data qualification was required.

Method 200.8, 08/06/2021: The Method Blank KQ2111952-01 contained low levels of Iron above the Method Reporting Limit (MRL). In accordance with ALS QA/QC policy, all sample results less than twenty times the level found in the Method Blank were flagged as estimated.

General Chemistry:

Method 300.0, 06/26/2021: The analysis of samples GGS-MW-6D-20210624 and GGS-MW-7-20210624 was initially performed past the recommended holding time. Issues with getting the instrumentation up and running prevented the samples from being analyzed within hold. The samples were analyzed 7 minutes and 15 minutes past hold, respectively. The data was flagged to indicate the holding time violation.

Approved by Noel D. Dair

Date 08/09/2021

SAMPLE DETECTION SUMMARY

CLIENT ID: GGS-MW-6D-20210624 **Lab ID: K2107416-001**

Analyte	Results	Flag	MDL	MRL	Units	Method
Alkalinity as CaCO3, Total	182		3	15	mg/L	SM 2320 B
Ammonia as Nitrogen	0.567		0.020	0.050	mg/L	350.1
Bicarbonate as CaCO3	182		3	15	mg/L	SM 2320 B
Carbon, Total Organic	0.90		0.07	0.50	mg/L	SM 5310 C
Chloride	8.06		0.02	0.20	mg/L	300.0
Orthophosphate as Phosphorus	0.187		0.020	0.050	mg/L	SM 4500-P E
Sulfate	68.0		0.4	4.0	mg/L	300.0
Aluminum, Dissolved	5	J	3	20	ug/L	200.8
Arsenic, Dissolved	118		0.5	2.5	ug/L	200.8
Barium, Dissolved	537		0.10	0.25	ug/L	200.8
Boron, Dissolved	1510		10	40	ug/L	200.8
Calcium, Dissolved	57800		3	21	ug/L	6010C
Iron, Dissolved	17		2	10	ug/L	200.8
Lithium, Dissolved	335		0.50	0.50	ug/L	200.8
Magnesium, Dissolved	15400		0.4	5.3	ug/L	6010C
Manganese, Dissolved	191		0.2	1.0	ug/L	200.8
Molybdenum, Dissolved	5.72		0.15	0.50	ug/L	200.8
Potassium, Dissolved	2250		60	210	ug/L	6010C
Silicon, Dissolved	6850		30	210	ug/L	6010C
Sodium, Dissolved	26200		30	210	ug/L	6010C
Zinc, Dissolved	3	J	3	10	ug/L	200.8
Aluminum	5	J	3	20	ug/L	200.8
Iron	22		2	10	ug/L	200.8
Manganese	182		0.2	1.0	ug/L	200.8

CLIENT ID: GGS-MW-7-20210624 **Lab ID: K2107416-002**

Analyte	Results	Flag	MDL	MRL	Units	Method
Alkalinity as CaCO3, Total	104		3	15	mg/L	SM 2320 B
Ammonia as Nitrogen	0.406		0.020	0.050	mg/L	350.1
Bicarbonate as CaCO3	104		3	15	mg/L	SM 2320 B
Carbon, Total Organic	0.46	J	0.07	0.50	mg/L	SM 5310 C
Chloride	5.88		0.02	0.20	mg/L	300.0
Orthophosphate as Phosphorus	0.199		0.020	0.050	mg/L	SM 4500-P E
Sulfate	140		0.8	8.0	mg/L	300.0
Aluminum, Dissolved	6	J	3	20	ug/L	200.8
Arsenic, Dissolved	254		0.5	2.5	ug/L	200.8
Barium, Dissolved	57.4		0.10	0.25	ug/L	200.8
Boron, Dissolved	1790		10	40	ug/L	200.8
Calcium, Dissolved	11600		3	21	ug/L	6010C
Iron, Dissolved	11		2	10	ug/L	200.8
Lithium, Dissolved	186		0.50	0.50	ug/L	200.8
Magnesium, Dissolved	3880		0.4	5.3	ug/L	6010C

SAMPLE DETECTION SUMMARY

CLIENT ID: GGS-MW-7-20210624 **Lab ID: K2107416-002**

Analyte	Results	Flag	MDL	MRL	Units	Method
Manganese, Dissolved	36.0		0.2	1.0	ug/L	200.8
Molybdenum, Dissolved	218		0.15	0.50	ug/L	200.8
Potassium, Dissolved	1180		60	210	ug/L	6010C
Silicon, Dissolved	5370		30	210	ug/L	6010C
Sodium, Dissolved	91000		30	210	ug/L	6010C
Zinc, Dissolved	3	J	3	10	ug/L	200.8
Aluminum	6	J	3	20	ug/L	200.8
Iron	172		2	10	ug/L	200.8
Manganese	35.6		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

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K2107416-001	GGS-MW-6D-20210624	6/24/2021	1330
K2107416-002	GGS-MW-7-20210624	6/24/2021	1400

K2107416

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number:	503-972-5019
Date:	6/25/2021
Project Name:	Gorgas
Project Number:	201114-01.01 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, Lithium, Boron (diss.) 3d TAT	Molybdenum (diss.) 3d TAT	Dissolved metals	Total Metals (Al, Fe, Mn)	Anions	Ortho-Phosphate	Alkalinity	Total Organic Carbon	Ammonia as N								Comments/Preservation
1	GGS-MW-6D-20210624	6/24/2021	13:30	Water	6	X		X	X	X	X	X	X	X								
2	GGS-MW-7-20210624	6/24/2021	14:00	Water	6	X	X	X	X	X	X	X	X	X								
3																						
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, Li, B, and Mo), please analyze by EPA 200.8 with 5 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), Alkalinity with carbonate/bicarbonate speciation

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	Perry Jones ALS 6/25/21 1335	
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
[signature]	6/25/2020 9:00		

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

PM MH

Cooler Receipt and Preservation Form

Client Anchor Service Request K21 07416

Received: 6/25/21 Opened: 6/25/21 By: PJ Unloaded: 6/25/21 By: PJ

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
—	4.8	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.* CG 6/25 **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
GGS-MW-6D-20210624	1-125ml P			X	H_2SO_4	0.5ml	19-GEN-07-35-C	CG	1820
GGS-MW-7-20210624	—			X	—	—	—	CG	1820

Notes, Discrepancies, Resolutions: ______

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	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02		

Sample Name:	GGS-MW-6D-20210624	**Date Collected:**	06/24/21
Lab Code:	K2107416-001	**Date Received:**	06/25/21
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
200.8	RMOORE	EMCALLISTER
200.8	JHINSON	EMCALLISTER
300.0		KABROWN
350.1	ESCHLOSS	ESCHLOSS
6010C	ABOYER	EMCALLISTER
SM 2320 B		GOLSON
SM 4500-P E		BNETLING
SM 5310 C		MSPECHT

Sample Name:	GGS-MW-6D-20210624	**Date Collected:**	06/24/21
Lab Code:	K2107416-001.R01	**Date Received:**	06/25/21
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		KABROWN

Sample Name:	GGS-MW-7-20210624	**Date Collected:**	06/24/21
Lab Code:	K2107416-002	**Date Received:**	06/25/21
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
200.8	RMOORE	EMCALLISTER
200.8	JHINSON	EMCALLISTER
300.0		KABROWN
350.1	ESCHLOSS	ESCHLOSS
6010C	ABOYER	EMCALLISTER
SM 2320 B		GOLSON
SM 4500-P E		BNETLING
SM 5310 C		MSPECHT

Analyst Summary report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02		

Sample Name:	GGS-MW-7-20210624	**Date Collected:**	06/24/21
Lab Code:	K2107416-002.R01	**Date Received:**	06/25/21
Sample Matrix:	Water		

Analysis Method	**Extracted/Digested By**	**Analyzed By**
300.0		KABROWN

Sample Results

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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:**	K2107416
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	06/24/21 13:30
Sample Matrix:	Water		**Date Received:**	06/25/21 13:35
Sample Name:	GGS-MW-6D-20210624		**Basis:**	NA
Lab Code:	K2107416-001			

Dissolved 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	08/06/21 17:02	06/29/21	
Antimony	200.8	ND	U	ug/L	0.25	0.10	5	08/06/21 17:02	06/29/21	
Arsenic	200.8	**118**		ug/L	2.5	0.5	5	08/06/21 17:02	06/29/21	
Barium	200.8	**537**		ug/L	0.25	0.10	5	08/06/21 17:02	06/29/21	
Beryllium	200.8	ND	U	ug/L	0.10	0.03	5	08/06/21 17:02	06/29/21	
Boron	200.8	**1510**		ug/L	40	10	20	08/06/21 13:36	06/29/21	
Cadmium	200.8	ND	U	ug/L	0.10	0.04	5	08/06/21 17:02	06/29/21	
Calcium	6010C	**57800**		ug/L	21	3	1	07/22/21 16:27	07/01/21	
Chromium	200.8	ND	U	ug/L	1.0	0.2	5	08/06/21 17:02	06/29/21	
Cobalt	200.8	ND	U	ug/L	0.10	0.05	5	08/06/21 17:02	06/29/21	
Iron	200.8	**17**		ug/L	10	2	5	08/06/21 17:02	06/29/21	X
Lead	200.8	ND	U	ug/L	0.10	0.03	5	08/06/21 17:02	06/29/21	
Lithium	200.8	**335**		ug/L	0.50	0.50	5	08/06/21 17:02	06/29/21	
Magnesium	6010C	**15400**		ug/L	5.3	0.4	1	07/22/21 16:27	07/01/21	
Manganese	200.8	**191**		ug/L	1.0	0.2	5	08/06/21 17:02	06/29/21	
Molybdenum	200.8	**5.72**		ug/L	0.50	0.15	5	08/06/21 17:02	06/29/21	
Nickel	200.8	ND	U	ug/L	1.0	0.2	5	08/06/21 17:02	06/29/21	
Potassium	6010C	**2250**		ug/L	210	60	1	07/22/21 16:27	07/01/21	
Selenium	200.8	ND	U	ug/L	5.0	1.0	5	08/06/21 17:02	06/29/21	
Silicon	6010C	**6850**		ug/L	210	30	1	07/22/21 16:27	07/01/21	
Silver	200.8	ND	U	ug/L	0.10	0.05	5	08/06/21 17:02	06/29/21	
Sodium	6010C	**26200**		ug/L	210	30	1	07/22/21 16:27	07/01/21	
Thallium	200.8	ND	U	ug/L	0.10	0.05	5	08/06/21 17:02	06/29/21	
Zinc	200.8	**3**	**J**	ug/L	10	3	5	08/06/21 17:02	06/29/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21 13:30
Sample Matrix:	Water	**Date Received:**	06/25/21 13:35
Sample Name:	GGS-MW-6D-20210624	**Basis:**	NA
Lab Code:	K2107416-001		

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	08/06/21 18:53	07/08/21	
Iron	200.8	**22**	ug/L	10	2	5	08/06/21 18:53	07/08/21	X
Manganese	200.8	**182**	ug/L	1.0	0.2	5	08/06/21 18:53	07/08/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21 14:00
Sample Matrix:	Water	**Date Received:**	06/25/21 13:35
Sample Name:	GGS-MW-7-20210624	**Basis:**	NA
Lab Code:	K2107416-002		

Dissolved Metals

Analyte Name	Analysis Method	Result		Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	200.8	**6**	**J**	ug/L	20	3	5	08/06/21 17:09	06/29/21	
Antimony	200.8	ND	U	ug/L	0.25	0.10	5	08/06/21 17:09	06/29/21	
Arsenic	200.8	**254**		ug/L	2.5	0.5	5	08/06/21 17:09	06/29/21	
Barium	200.8	**57.4**		ug/L	0.25	0.10	5	08/06/21 17:09	06/29/21	
Beryllium	200.8	ND	U	ug/L	0.10	0.03	5	08/06/21 17:09	06/29/21	
Boron	200.8	**1790**		ug/L	40	10	20	08/06/21 13:43	06/29/21	
Cadmium	200.8	ND	U	ug/L	0.10	0.04	5	08/06/21 17:09	06/29/21	
Calcium	6010C	**11600**		ug/L	21	3	1	07/22/21 16:39	07/01/21	
Chromium	200.8	ND	U	ug/L	1.0	0.2	5	08/06/21 17:09	06/29/21	
Cobalt	200.8	ND	U	ug/L	0.10	0.05	5	08/06/21 17:09	06/29/21	
Iron	200.8	**11**		ug/L	10	2	5	08/06/21 17:09	06/29/21	X
Lead	200.8	ND	U	ug/L	0.10	0.03	5	08/06/21 17:09	06/29/21	
Lithium	200.8	**186**		ug/L	0.50	0.50	5	08/06/21 17:09	06/29/21	
Magnesium	6010C	**3880**		ug/L	5.3	0.4	1	07/22/21 16:39	07/01/21	
Manganese	200.8	**36.0**		ug/L	1.0	0.2	5	08/06/21 17:09	06/29/21	
Molybdenum	200.8	**218**		ug/L	0.50	0.15	5	08/06/21 17:09	06/29/21	
Nickel	200.8	ND	U	ug/L	1.0	0.2	5	08/06/21 17:09	06/29/21	
Potassium	6010C	**1180**		ug/L	210	60	1	07/22/21 16:39	07/01/21	
Selenium	200.8	ND	U	ug/L	5.0	1.0	5	08/06/21 17:09	06/29/21	
Silicon	6010C	**5370**		ug/L	210	30	1	07/22/21 16:39	07/01/21	
Silver	200.8	ND	U	ug/L	0.10	0.05	5	08/06/21 17:09	06/29/21	
Sodium	6010C	**91000**		ug/L	210	30	1	07/22/21 16:39	07/01/21	
Thallium	200.8	ND	U	ug/L	0.10	0.05	5	08/06/21 17:09	06/29/21	
Zinc	200.8	**3**	**J**	ug/L	10	3	5	08/06/21 17:09	06/29/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	06/24/21 14:00
Sample Matrix:	Water		**Date Received:**	06/25/21 13:35
Sample Name:	GGS-MW-7-20210624		**Basis:**	NA
Lab Code:	K2107416-002			

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	200.8	**6 J**	ug/L	20	3	5	08/06/21 18:55	07/08/21	
Iron	200.8	**172**	ug/L	10	2	5	08/06/21 18:55	07/08/21	
Manganese	200.8	**35.6**	ug/L	1.0	0.2	5	08/06/21 18:55	07/08/21	

General Chemistry

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1317 South 13th Avenue, Kelso, WA 98626
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Client:	Anchor QEA, LLC		**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	06/24/21 13:30
Sample Matrix:	Water		**Date Received:**	06/25/21 13:35
Sample Name:	GGS-MW-6D-20210624		**Basis:**	NA
Lab Code:	K2107416-001			

General Chemistry Parameters

Analyte Name	Analysis Method	Result		Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Alkalinity as CaCO3, Total	SM 2320 B	**182**		mg/L	15	3	1	06/29/21 16:23	NA	
Ammonia as Nitrogen	350.1	**0.567**		mg/L	0.050	0.020	1	06/30/21 11:28	06/30/21	
Bicarbonate as CaCO3	SM 2320 B	**182**		mg/L	15	3	1	06/29/21 16:23	NA	
Carbon, Total Organic	SM 5310 C	**0.90**		mg/L	0.50	0.07	1	07/14/21 14:07	NA	
Carbonate as CaCO3	SM 2320 B	ND	U	mg/L	15	3	1	06/29/21 16:23	NA	
Chloride	300.0	**8.06**		mg/L	0.20	0.02	2	06/26/21 13:37	NA	
Fluoride	300.0	ND	U	mg/L	0.20	0.01	2	06/26/21 13:37	NA	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.050	0.007	1	06/26/21 13:37	NA	*
Nitrite as Nitrogen	300.0	ND	U	mg/L	0.050	0.003	1	06/26/21 13:37	NA	*
Orthophosphate as Phosphorus	SM 4500-P E	**0.187**		mg/L	0.050	0.020	1	06/26/21 13:10	NA	
Sulfate	300.0	**68.0**		mg/L	4.0	0.4	20	06/30/21 21:06	NA	

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 Task 02
Sample Matrix: Water

Service Request: K2107416
Date Collected: 06/24/21 14:00
Date Received: 06/25/21 13:35

Sample Name: GGS-MW-7-20210624
Lab Code: K2107416-002

Basis: NA

General Chemistry Parameters

Analyte Name	Analysis Method	Result		Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Alkalinity as CaCO3, Total	SM 2320 B	**104**		mg/L	15	3	1	06/29/21 16:23	NA	
Ammonia as Nitrogen	350.1	**0.406**		mg/L	0.050	0.020	1	06/30/21 11:28	06/30/21	
Bicarbonate as CaCO3	SM 2320 B	**104**		mg/L	15	3	1	06/29/21 16:23	NA	
Carbon, Total Organic	SM 5310 C	**0.46**	**J**	mg/L	0.50	0.07	1	07/14/21 14:07	NA	
Carbonate as CaCO3	SM 2320 B	ND	U	mg/L	15	3	1	06/29/21 16:23	NA	
Chloride	300.0	**5.88**		mg/L	0.20	0.02	2	06/26/21 14:15	NA	
Fluoride	300.0	ND	U	mg/L	0.20	0.01	2	06/26/21 14:15	NA	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.050	0.007	1	06/26/21 14:15	NA	*
Nitrite as Nitrogen	300.0	ND	U	mg/L	0.050	0.003	1	06/26/21 14:15	NA	*
Orthophosphate as Phosphorus	SM 4500-P E	**0.199**		mg/L	0.050	0.020	1	06/26/21 13:10	NA	
Sulfate	300.0	**140**		mg/L	8.0	0.8	40	06/30/21 21:18	NA	

QC Summary Forms

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1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Metals

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	KQ2111792-01		

Dissolved Metals

Analyte Name	Analysis Method	Result		Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	200.8	**1.3**	**J**	ug/L	4.0	0.5	1	08/06/21 13:32	06/29/21	
Antimony	200.8	ND	U	ug/L	0.050	0.020	1	08/06/21 13:32	06/29/21	
Arsenic	200.8	ND	U	ug/L	0.50	0.09	1	08/06/21 13:32	06/29/21	
Barium	200.8	ND	U	ug/L	0.050	0.020	1	08/06/21 13:32	06/29/21	
Beryllium	200.8	ND	U	ug/L	0.020	0.005	1	08/06/21 13:32	06/29/21	
Boron	200.8	ND	U	ug/L	2.0	0.5	1	08/06/21 13:32	06/29/21	
Cadmium	200.8	ND	U	ug/L	0.020	0.008	1	08/06/21 13:32	06/29/21	
Chromium	200.8	ND	U	ug/L	0.20	0.03	1	08/06/21 13:32	06/29/21	
Cobalt	200.8	ND	U	ug/L	0.020	0.009	1	08/06/21 13:32	06/29/21	
Iron	200.8	ND	U	ug/L	2.0	0.3	1	08/06/21 13:32	06/29/21	
Lead	200.8	ND	U	ug/L	0.020	0.006	1	08/06/21 13:32	06/29/21	
Lithium	200.8	ND	U	ug/L	0.10	0.10	1	08/06/21 13:32	06/29/21	
Manganese	200.8	**0.62**		ug/L	0.20	0.04	1	08/06/21 13:32	06/29/21	
Molybdenum	200.8	ND	U	ug/L	0.10	0.03	1	08/06/21 13:32	06/29/21	
Nickel	200.8	**0.08**	**J**	ug/L	0.20	0.04	1	08/06/21 13:32	06/29/21	
Selenium	200.8	ND	U	ug/L	1.0	0.2	1	08/06/21 13:32	06/29/21	
Silver	200.8	ND	U	ug/L	0.020	0.009	1	08/06/21 13:32	06/29/21	
Thallium	200.8	ND	U	ug/L	0.020	0.009	1	08/06/21 13:32	06/29/21	
Zinc	200.8	**0.7**	**J**	ug/L	2.0	0.5	1	08/06/21 13:32	06/29/21	

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 Task 02
Sample Matrix: Water

Service Request: K2107416
Date Collected: NA
Date Received: NA

Sample Name: Method Blank
Lab Code: KQ2111938-02

Basis: NA

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	6010C	**5 J**	ug/L	21	3	1	07/22/21 16:20	07/01/21	
Magnesium	6010C	**0.5 J**	ug/L	5.3	0.4	1	07/22/21 16:20	07/01/21	
Potassium	6010C	ND U	ug/L	210	60	1	07/22/21 16:20	07/01/21	
Silicon	6010C	**40 J**	ug/L	210	30	1	07/22/21 16:20	07/01/21	
Sodium	6010C	ND U	ug/L	210	30	1	07/22/21 16:20	07/01/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	KQ2111952-01		

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	200.8	**2.0 J**	ug/L	4.0	0.5	1	08/06/21 18:49	07/08/21	
Iron	200.8	**5.6**	ug/L	2.0	0.3	1	08/06/21 18:49	07/08/21	
Manganese	200.8	ND U	ug/L	0.20	0.04	1	08/06/21 18:49	07/08/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	08/6/21
		Date Extracted:	06/29/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	GGS-MW-6D-20210624	**Units:**	ug/L
Lab Code:	K2107416-001	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2111792-06

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	5 J	104	100	99	70-130
Antimony	ND U	11.4	10.0	114	70-130
Arsenic	118	174	50.0	113	70-130
Barium	537	638	100	101 #	70-130
Beryllium	ND U	2.64	2.50	105	70-130
Boron	1510	1570	25	259 #	70-130
Cadmium	ND U	27.3	25.0	109	70-130
Chromium	ND U	10.6	10.0	106	70-130
Cobalt	ND U	25.0	25.0	100	70-130
Iron	17	68	50	102	70-130
Lead	ND U	54.9	50.0	110	70-130
Lithium	335	387	50.0	105 #	70-130
Manganese	191	221	25.0	121 #	70-130
Molybdenum	5.72	33.3	25.0	110	70-130
Nickel	ND U	24.5	25.0	98	70-130
Selenium	ND U	54.4	50.0	109	70-130
Silver	ND U	12.7	12.5	102	70-130
Thallium	ND U	55.8	50.0	112	70-130
Zinc	3 J	29	25	106	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:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	07/22/21
		Date Extracted:	07/1/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	GGS-MW-6D-20210624	**Units:**	ug/L
Lab Code:	K2107416-001	**Basis:**	NA
Analysis Method:	6010C		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2111938-05

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Calcium	57800	69700	10000	119 #	75-125
Magnesium	15400	23800	10000	84	75-125
Potassium	2250	11200	10000	90	75-125
Sodium	26200	33800	10000	76	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:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	07/22/21
		Date Extracted:	07/1/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	GGS-MW-6D-20210624	**Units:**	ug/L
Lab Code:	K2107416-001	**Basis:**	NA
Analysis Method:	6010C		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2111938-06

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Silicon	6850	16100	10000	92	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:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	08/6/21
		Date Extracted:	07/8/21

Matrix Spike Summary
Total Metals

Sample Name:	GGS-MW-7-20210624	**Units:**	ug/L
Lab Code:	K2107416-002	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2111952-04

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	6 J	101	100	95	70-130
Iron	172	221	50	97	70-130
Manganese	35.6	55.1	25.0	78	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:**	K2107416
Project	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	08/06/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	GGS-MW-6D-20210624	**Units:**	ug/L
Lab Code:	K2107416-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2111792-05 Result	Average	RPD	RPD Limit
Aluminum	200.8	20	3	5 J	5 J	5	<1	20
Antimony	200.8	0.25	0.10	ND U	ND U	ND	-	20
Arsenic	200.8	2.5	0.5	118	116	117	2	20
Barium	200.8	0.25	0.10	537	529	533	2	20
Beryllium	200.8	0.10	0.03	ND U	0.03 J	NC	NC	20
Boron	200.8	40	10	1510	1560	1540	3	20
Cadmium	200.8	0.10	0.04	ND U	ND U	ND	-	20
Chromium	200.8	1.0	0.2	ND U	0.2 J	NC	NC	20
Cobalt	200.8	0.10	0.05	ND U	ND U	ND	-	20
Iron	200.8	10	2	17	16	17	6	20
Lead	200.8	0.10	0.03	ND U	ND U	ND	-	20
Lithium	200.8	0.50	0.50	335	328	332	2	20
Manganese	200.8	1.0	0.2	191	188	190	2	20
Molybdenum	200.8	0.50	0.15	5.72	5.83	5.78	2	20
Nickel	200.8	1.0	0.2	ND U	ND U	ND	-	20
Selenium	200.8	5.0	1.0	ND U	ND U	ND	-	20
Silver	200.8	0.10	0.05	ND U	ND U	ND	-	20
Thallium	200.8	0.10	0.05	ND U	ND U	ND	-	20
Zinc	200.8	10	3	3 J	3 J	3	<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.

Printed 8/9/2021 3:07:17 PM   Superset Reference:21-0000594763 rev 00

QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	07/22/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	GGS-MW-6D-20210624	**Units:**	ug/L
Lab Code:	K2107416-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2111938-04 Result	Average	RPD	RPD Limit
Calcium	6010C	21	3	57800	57700	57800	<1	20
Magnesium	6010C	5.3	0.4	15400	15000	15200	3	20
Potassium	6010C	210	60	2250	2230	2240	<1	20
Silicon	6010C	210	30	6850	6690	6770	2	20
Sodium	6010C	210	30	26200	25600	25900	2	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.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	08/06/21

Replicate Sample Summary
Total Metals

Sample Name:	GGS-MW-7-20210624	**Units:**	ug/L
Lab Code:	K2107416-002	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2111952-03 Result	Average	RPD	RPD Limit
Aluminum	200.8	20	3	6 J	6 J	6	<1	20
Iron	200.8	10	2	172	179	176	4	20
Manganese	200.8	1.0	0.2	35.6	36.8	36.2	3	20

Results flagged with an asterisk (*) indicate values outside control criteria.

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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Analyzed:**	08/06/21
Sample Matrix:	Water		

Lab Control Sample Summary
Dissolved Metals

Units: ug/L
Basis: NA

Lab Control Sample
KQ2111792-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	200.8	106	100	106	85-115
Antimony	200.8	11.5	10.0	115	85-115
Arsenic	200.8	55.7	50.0	111	85-115
Barium	200.8	107	100	107	85-115
Beryllium	200.8	2.70	2.50	108	85-115
Boron	200.8	26.9	25.0	108	85-115
Cadmium	200.8	28.3	25.0	113	85-115
Chromium	200.8	10.6	10.0	106	85-115
Cobalt	200.8	26.5	25.0	106	85-115
Iron	200.8	53.9	50.0	108	85-115
Lead	200.8	56.2	50.0	112	85-115
Lithium	200.8	55.9	50.0	112	85-115
Manganese	200.8	28.3	25.0	113	85-115
Molybdenum	200.8	28.3	25.0	113	85-115
Nickel	200.8	26.5	25.0	106	85-115
Selenium	200.8	56.6	50.0	113	85-115
Silver	200.8	13.4	12.5	107	85-115
Thallium	200.8	56.9	50.0	114	85-115
Zinc	200.8	25.6	25.0	102	85-115

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 Task 02
Sample Matrix: Water

Service Request: K2107416
Date Analyzed: 07/22/21

Lab Control Sample Summary
Dissolved Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2111938-01

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Calcium	6010C	12900	12500	103	80-120
Magnesium	6010C	12400	12500	99	80-120
Potassium	6010C	12100	12500	97	80-120
Sodium	6010C	12000	12500	96	80-120

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 Task 02
Sample Matrix: Water

Service Request: K2107416
Date Analyzed: 07/22/21

Lab Control Sample Summary
Dissolved Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2111938-03

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Silicon	6010C	9750	10000	97	80-120

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 Task 02
Sample Matrix: Water

Service Request: K2107416
Date Analyzed: 08/06/21

Lab Control Sample Summary
Total Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2111952-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	200.8	100	100	100	85-115
Iron	200.8	55.4	50.0	111	85-115
Manganese	200.8	24.3	25.0	97	85-115

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	NA
Sample Matrix:	Water		**Date Received:**	NA
Sample Name:	Method Blank		**Basis:**	NA
Lab Code:	K2107416-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	06/29/21 16:23	NA	
Ammonia as Nitrogen	350.1	ND	U	mg/L	0.050	0.020	1	06/30/21 11:28	06/30/21	
Bicarbonate as CaCO3	SM 2320 B	**5**	**J**	mg/L	15	3	1	06/29/21 16:23	NA	
Carbon, Total Organic	SM 5310 C	ND	U	mg/L	0.50	0.07	1	07/14/21 14:07	NA	
Carbonate as CaCO3	SM 2320 B	ND	U	mg/L	15	3	1	06/29/21 16:23	NA	
Chloride	300.0	ND	U	mg/L	0.10	0.007	1	06/26/21 13:28	NA	
Fluoride	300.0	ND	U	mg/L	0.10	0.005	1	06/26/21 13:28	NA	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.050	0.007	1	06/26/21 13:28	NA	
Nitrite as Nitrogen	300.0	ND	U	mg/L	0.050	0.003	1	06/26/21 13:28	NA	
Orthophosphate as Phosphorus	SM 4500-P E	ND	U	mg/L	0.050	0.020	1	06/26/21 13:10	NA	
Sulfate	300.0	ND	U	mg/L	0.20	0.02	1	06/26/21 13:28	NA	

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K2107416-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	07/14/21 14:07	
Sulfate	300.0	ND U	mg/L	0.20	0.02	1	06/30/21 14:02	

QA/QC Report

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 Task 02
Sample Matrix: Water

Service Request: K2107416
Date Collected: 06/24/21
Date Received: 06/25/21
Date Analyzed: 06/26/21 - 06/30/21

Duplicate Matrix Spike Summary
General Chemistry Parameters

Sample Name: GGS-MW-6D-20210624
Lab Code: K2107416-001

Units: mg/L
Basis: NA

			Matrix Spike K2107416-001MS			Duplicate Matrix Spike K2107416-001DMS					
Analyte Name	**Method**	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Ammonia as Nitrogen	350.1	0.567	1.55	1.00	99	1.59	1.00	102	90-110	2	20
Nitrate as Nitrogen	300.0	ND U	7.95	8.00	99	7.77	8.00	97	90-110	2	20
Fluoride	300.0	ND U	8.44	8.00	106	8.43	8.00	105	90-110	<1	20
Chloride	300.0	8.06	15.8	8.00	96	15.7	8.00	96	90-110	<1	20
Sulfate	300.0	68.0	81.2	8.00	166 #	80.8	8.00	161 #	90-110	<1	20
Nitrite as Nitrogen	300.0	ND U	7.99	8.00	100	8.00	8.00	100	90-110	<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.

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	06/26/21
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Orthophosphate as Phosphorus

Sample Name:	GGS-MW-7-20210624	**Units:**	mg/L
Lab Code:	K2107416-002	**Basis:**	NA
Analysis Method:	SM 4500-P E		
Prep Method:	None		

		Matrix Spike K2107416-002MS			Duplicate Matrix Spike K2107416-002DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Orthophosphate as Phosphorus	0.199	1.05	0.80	106	1.06	0.80	107	75-125	<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.

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:**	K2107416
Project	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	06/26/21 - 06/30/21

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	GGS-MW-6D-20210624	**Units:**	mg/L
Lab Code:	K2107416-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K2107416-001DUP Result	Average	RPD	RPD Limit
Ammonia as Nitrogen	350.1	0.050	0.020	0.567	0.576	0.572	2	20
Bicarbonate as CaCO3	SM 2320 B	15	3	182	183	183	<1	20
Carbonate as CaCO3	SM 2320 B	15	3	ND U	ND U	NC	NC	20
Chloride	300.0	0.20	0.02	8.06	8.23	8.15	2	20
Fluoride	300.0	0.20	0.01	ND U	ND U	NC	NC	20
Nitrate as Nitrogen	300.0	0.050	0.007	ND U	ND U	NC	NC	20
Sulfate	300.0	0.40	0.04	68.0	77.2	72.6	13	20
Alkalinity as CaCO3, Total	SM 2320 B	15	3	182	183	183	<1	20
Nitrite as Nitrogen	300.0	0.050	0.003	ND U	ND U	NC	NC	20

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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	06/26/21

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	GGS-MW-7-20210624	**Units:**	mg/L
Lab Code:	K2107416-002	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K2107416-002DUP Result	Average	RPD	RPD Limit
Orthophosphate as Phosphorus	SM 4500-P E	0.050	0.020	0.199	0.201	0.200	1	20

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Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 Task 02
Sample Matrix: Water

Service Request: K2107416
Date Analyzed: 06/26/21 - 07/14/21

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
K2107416-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	4.53	4.58	99	86-114
Bicarbonate as CaCO3	SM 2320 B	107	109	98	85-115
Carbon, Total Organic	SM 5310 C	23.5	25.0	94	83-117
Carbonate as CaCO3	SM 2320 B	107	109	98	85-115
Chloride	300.0	4.79	5.00	96	90-110
Fluoride	300.0	4.77	5.00	95	90-110
Nitrate as Nitrogen	300.0	2.46	2.50	98	90-110
Nitrite as Nitrogen	300.0	2.49	2.50	99	90-110
Orthophosphate as Phosphorus	SM 4500-P E	1.67	1.57	106	85-115
Sulfate	300.0	4.91	5.00	98	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 Task 02
Sample Matrix: Water

Service Request: K2107416
Date Analyzed: 06/29/21 - 06/30/21

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Lab Control Sample
K2107416-LCS3

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Alkalinity as CaCO3, Total	SM 2320 B	109	109	100	90-110
Bicarbonate as CaCO3	SM 2320 B	109	109	100	85-115
Carbonate as CaCO3	SM 2320 B	109	109	100	85-115
Sulfate	300.0	4.69	5.00	94	90-110

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Analyzed:**	07/14/21
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:	731060

	Lab Control Sample K2107416-LCS1			Duplicate Lab Control Sample K2107416-DLCS1					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Carbon, Total Organic	23.7	25.0	95	24.0	25.0	96	83-117	1	10

July 21, 2021 Service Request No:K2107418

Masa Kanematsu
Anchor QEA, LLC
6720 SW Macadam Avenue
Suite 125
Portland, OR 97219

Laboratory Results for: Gorgas

Dear Masa,

Enclosed are the results of the sample(s) submitted to our laboratory June 25, 2021
For your reference, these analyses have been assigned our service request number **K2107418.**

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
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ALS Environmental

Client: Anchor QEA, LLC
Project: Gorgas
Sample Matrix: Water

Service Request: K2107418
Date Received: 06/25/2021

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:

Two water samples were received for analysis at ALS Environmental on 06/25/2021. 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 07/21/2021

SAMPLE DETECTION SUMMARY

CLIENT ID: GGS-MW-6D-20210624 **Lab ID: K2107418-001**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	114		0.5	2.5	ug/L	200.8
Boron, Dissolved	1280		10	40	ug/L	200.8
Lithium, Dissolved	312		2.0	2.0	ug/L	200.8

CLIENT ID: GGS-MW-7-20210624 **Lab ID: K2107418-002**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	248		2	10	ug/L	200.8
Boron, Dissolved	1610		10	40	ug/L	200.8
Lithium, Dissolved	171		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	204		0.6	2.0	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:** K2107418
Project: Gorgas/201114-01.01 Task 02

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K2107418-001	GGS-MW-6D-20210624	6/24/2021	1330
K2107418-002	GGS-MW-7-20210624	6/24/2021	1400

K2107418

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number: 503-972-5019

Date:	6/25/2021
Project Name:	Gorgas
Project Number:	201114-01.01 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, Lithium, Boron (diss.) 3d TAT	Molybdenum (diss.) 3d TAT	Dissolved metals	Total Metals (Al, Fe, Mn)	Anions	Ortho-Phosphate	Alkalinity	Total Organic Carbon	Ammonia as N								Comments/Preservation
1	GGS-MW-6D-20210624	6/24/2021	13:30	Water	6	X		X	X	X	X	X	X	X								
2	GGS-MW-7-20210624	6/24/2021	14:00	Water	6	X	X	X	X	X	X	X	X	X								
3																						
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, Li, B, and Mo), please analyze by EPA 200.8 with 5 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), Alkalinity with carbonate/bicarbonate speciation

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	Perry Jones ALS	6/25/21 1335
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
[signature]	6/25/2020 9:00		

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

PM M H

Cooler Receipt and Preservation Form

Client Anchor Service Request K21 07418

Received: 6/25/21 Opened: 6/25/21 By: PJ Unloaded: 6/25/21 By: PJ

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
—	4.8	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.* 6/25 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: ____

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:** K2107418
Project:	Gorgas/201114-01.01 Task 02	

Sample Name:	GGS-MW-6D-20210624	**Date Collected:** 06/24/21
Lab Code:	K2107418-001	**Date Received:** 06/25/21
Sample Matrix:	Water	

Analysis Method	Extracted/Digested By	Analyzed By
200.8	RMOORE	RMOORE

Sample Name:	GGS-MW-7-20210624	**Date Collected:** 06/24/21
Lab Code:	K2107418-002	**Date Received:** 06/25/21
Sample Matrix:	Water	

Analysis Method	Extracted/Digested By	Analyzed By
200.8	RMOORE	RMOORE

Sample Results

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Metals

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Client:	Anchor QEA, LLC		**Service Request:**	K2107418
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	06/24/21 13:30
Sample Matrix:	Water		**Date Received:**	06/25/21 13:35
Sample Name:	GGS-MW-6D-20210624		**Basis:**	NA
Lab Code:	K2107418-001			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**114**	ug/L	2.5	0.5	5	07/19/21 19:58	06/29/21	
Boron	200.8	**1280**	ug/L	40	10	20	07/19/21 19:01	06/29/21	
Lithium	200.8	**312**	ug/L	2.0	2.0	20	07/19/21 19:01	06/29/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2107418
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	06/24/21 14:00
Sample Matrix:	Water		**Date Received:**	06/25/21 13:35
Sample Name:	GGS-MW-7-20210624		**Basis:**	NA
Lab Code:	K2107418-002			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**248**	ug/L	10	2	20	07/19/21 19:05	06/29/21	
Boron	200.8	**1610**	ug/L	40	10	20	07/19/21 19:05	06/29/21	
Lithium	200.8	**171**	ug/L	2.0	2.0	20	07/19/21 19:05	06/29/21	
Molybdenum	200.8	**204**	ug/L	2.0	0.6	20	07/19/21 19:05	06/29/21	

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:**	K2107418
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	KQ2111792-01		

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	07/19/21 18:57	06/29/21	
Boron	200.8	ND U	ug/L	2.0	0.5	1	07/19/21 18:57	06/29/21	
Lithium	200.8	ND U	ug/L	0.10	0.10	1	07/19/21 18:57	06/29/21	
Molybdenum	200.8	ND U	ug/L	0.10	0.03	1	07/19/21 18:57	06/29/21	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107418
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	07/19/21
		Date Extracted:	06/29/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	GGS-MW-6D-20210624	**Units:**	ug/L
Lab Code:	K2107418-001	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2111792-03

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	114	164	50.0	100	70-130
Boron	1280	1310	25	126 #	70-130
Lithium	312	357	50.0	90 #	70-130
Molybdenum	5.97	32.1	25.0	105	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:**	K2107418
Project	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	07/19/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	GGS-MW-6D-20210624	**Units:**	ug/L
Lab Code:	K2107418-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2111792-04 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	114	115	115	<1	20
Boron	200.8	40	10	1280	1290	1290	<1	20
Lithium	200.8	2.0	2.0	312	302	307	3	20
Molybdenum	200.8	0.50	0.15	5.97	5.45	5.71	9	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: Gorgas/201114-01.01 Task 02
Sample Matrix: Water

Service Request: K2107418
Date Analyzed: 07/19/21

Lab Control Sample Summary
Dissolved Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2111792-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	200.8	49.5	50.0	99	85-115
Boron	200.8	23.5	25.0	94	85-115
Lithium	200.8	49.0	50.0	98	85-115
Molybdenum	200.8	24.6	25.0	98	85-115

August 09, 2021

Service Request No:K2107416

Masa Kanematsu
Anchor QEA, LLC
6720 SW Macadam Avenue
Suite 125
Portland, OR 97219

Laboratory Results for: Gorgas

Dear Masa,

Enclosed are the results of the sample(s) submitted to our laboratory June 25, 2021
For your reference, these analyses have been assigned our service request number **K2107416.**

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: Gorgas
Sample Matrix: Water

Service Request: K2107416
Date Received: 06/25/2021

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:

Two water samples were received for analysis at ALS Environmental on 06/25/2021. 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:

Method 200.8, 08/06/2021: The Method Blank KQ2111792-01 contained low levels of Manganese above the Method Reporting Limit (MRL). Since all of the associated sample results were more than twenty times the level found in the Method Blank no corrective action or data qualification was required.

Method 200.8, 08/06/2021: The Method Blank KQ2111952-01 contained low levels of Iron above the Method Reporting Limit (MRL). In accordance with ALS QA/QC policy, all sample results less than twenty times the level found in the Method Blank were flagged as estimated.

General Chemistry:

Method 300.0, 06/26/2021: The analysis of samples GGS-MW-6D-20210624 and GGS-MW-7-20210624 was initially performed past the recommended holding time. Issues with getting the instrumentation up and running prevented the samples from being analyzed within hold. The samples were analyzed 7 minutes and 15 minutes past hold, respectively. The data was flagged to indicate the holding time violation.

Approved by Noel D. Dair

Date 08/09/2021

SAMPLE DETECTION SUMMARY

CLIENT ID: GGS-MW-6D-20210624	Lab ID: K2107416-001					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Alkalinity as CaCO3, Total	182		3	15	mg/L	SM 2320 B
Ammonia as Nitrogen	0.567		0.020	0.050	mg/L	350.1
Bicarbonate as CaCO3	182		3	15	mg/L	SM 2320 B
Carbon, Total Organic	0.90		0.07	0.50	mg/L	SM 5310 C
Chloride	8.06		0.02	0.20	mg/L	300.0
Orthophosphate as Phosphorus	0.187		0.020	0.050	mg/L	SM 4500-P E
Sulfate	68.0		0.4	4.0	mg/L	300.0
Aluminum, Dissolved	5	J	3	20	ug/L	200.8
Arsenic, Dissolved	118		0.5	2.5	ug/L	200.8
Barium, Dissolved	537		0.10	0.25	ug/L	200.8
Boron, Dissolved	1510		10	40	ug/L	200.8
Calcium, Dissolved	57800		3	21	ug/L	6010C
Iron, Dissolved	17		2	10	ug/L	200.8
Lithium, Dissolved	335		0.50	0.50	ug/L	200.8
Magnesium, Dissolved	15400		0.4	5.3	ug/L	6010C
Manganese, Dissolved	191		0.2	1.0	ug/L	200.8
Molybdenum, Dissolved	5.72		0.15	0.50	ug/L	200.8
Potassium, Dissolved	2250		60	210	ug/L	6010C
Silicon, Dissolved	6850		30	210	ug/L	6010C
Sodium, Dissolved	26200		30	210	ug/L	6010C
Zinc, Dissolved	3	J	3	10	ug/L	200.8
Aluminum	5	J	3	20	ug/L	200.8
Iron	22		2	10	ug/L	200.8
Manganese	182		0.2	1.0	ug/L	200.8

CLIENT ID: GGS-MW-7-20210624	Lab ID: K2107416-002					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Alkalinity as CaCO3, Total	104		3	15	mg/L	SM 2320 B
Ammonia as Nitrogen	0.406		0.020	0.050	mg/L	350.1
Bicarbonate as CaCO3	104		3	15	mg/L	SM 2320 B
Carbon, Total Organic	0.46	J	0.07	0.50	mg/L	SM 5310 C
Chloride	5.88		0.02	0.20	mg/L	300.0
Orthophosphate as Phosphorus	0.199		0.020	0.050	mg/L	SM 4500-P E
Sulfate	140		0.8	8.0	mg/L	300.0
Aluminum, Dissolved	6	J	3	20	ug/L	200.8
Arsenic, Dissolved	254		0.5	2.5	ug/L	200.8
Barium, Dissolved	57.4		0.10	0.25	ug/L	200.8
Boron, Dissolved	1790		10	40	ug/L	200.8
Calcium, Dissolved	11600		3	21	ug/L	6010C
Iron, Dissolved	11		2	10	ug/L	200.8
Lithium, Dissolved	186		0.50	0.50	ug/L	200.8
Magnesium, Dissolved	3880		0.4	5.3	ug/L	6010C

SAMPLE DETECTION SUMMARY

CLIENT ID: GGS-MW-7-20210624		Lab ID: K2107416-002				
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Manganese, Dissolved	36.0		0.2	1.0	ug/L	200.8
Molybdenum, Dissolved	218		0.15	0.50	ug/L	200.8
Potassium, Dissolved	1180		60	210	ug/L	6010C
Silicon, Dissolved	5370		30	210	ug/L	6010C
Sodium, Dissolved	91000		30	210	ug/L	6010C
Zinc, Dissolved	3	J	3	10	ug/L	200.8
Aluminum	6	J	3	20	ug/L	200.8
Iron	172		2	10	ug/L	200.8
Manganese	35.6		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

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K2107416-001	GGS-MW-6D-20210624	6/24/2021	1330
K2107416-002	GGS-MW-7-20210624	6/24/2021	1400

K2107416

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number: 503-972-5019

Date:	6/25/2021
Project Name:	Gorgas
Project Number:	201114-01.01 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, Lithium, Boron (diss.) 3d TAT	Molybdenum (diss.) 3d TAT	Dissolved metals	Total Metals (Al, Fe, Mn)	Anions	Ortho-Phosphate	Alkalinity	Total Organic Carbon	Ammonia as N	Comments/Preservation
1	GGS-MW-6D-20210624	6/24/2021	13:30	Water	6	X		X	X	X	X	X	X	X	
2	GGS-MW-7-20210624	6/24/2021	14:00	Water	6	X	X	X	X	X	X	X	X	X	
3															
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, Li, B, and Mo), please analyze by EPA 200.8 with 5 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), Alkalinity with carbonate/bicarbonate speciation

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	Perry Jones	ALS 6/25/21 1335
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
	6/25/2020 9:00		
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

PM MH

Cooler Receipt and Preservation Form

Client Anchor Service Request K21 07416

Received: 6/25/21 Opened: 6/25/21 By: PJ Unloaded: 6/25/21 By: PJ

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
—	4.8	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.* CG 6/25 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
GGS-MW-6D-20210624	1-125ml P			X	H_2SO_4	0.5ml	19-GEN-07-35-C	CG	1820
GGS-MW-7-20210624	⟋			X	⟋	⟋	⟋	CG	1820

Notes, Discrepancies, Resolutions: ______

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.

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Analyst Summary report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02		

Sample Name:	GGS-MW-6D-20210624	**Date Collected:**	06/24/21
Lab Code:	K2107416-001	**Date Received:**	06/25/21
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
200.8	RMOORE	EMCALLISTER
200.8	JHINSON	EMCALLISTER
300.0		KABROWN
350.1	ESCHLOSS	ESCHLOSS
6010C	ABOYER	EMCALLISTER
SM 2320 B		GOLSON
SM 4500-P E		BNETLING
SM 5310 C		MSPECHT

Sample Name:	GGS-MW-6D-20210624	**Date Collected:**	06/24/21
Lab Code:	K2107416-001.R01	**Date Received:**	06/25/21
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		KABROWN

Sample Name:	GGS-MW-7-20210624	**Date Collected:**	06/24/21
Lab Code:	K2107416-002	**Date Received:**	06/25/21
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
200.8	RMOORE	EMCALLISTER
200.8	JHINSON	EMCALLISTER
300.0		KABROWN
350.1	ESCHLOSS	ESCHLOSS
6010C	ABOYER	EMCALLISTER
SM 2320 B		GOLSON
SM 4500-P E		BNETLING
SM 5310 C		MSPECHT

Analyst Summary report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02		

Sample Name:	GGS-MW-7-20210624	**Date Collected:**	06/24/21
Lab Code:	K2107416-002.R01	**Date Received:**	06/25/21
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		KABROWN

Sample Results

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1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Metals

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21 13:30
Sample Matrix:	Water	**Date Received:**	06/25/21 13:35
Sample Name:	GGS-MW-6D-20210624	**Basis:**	NA
Lab Code:	K2107416-001		

Dissolved 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	08/06/21 17:02	06/29/21	
Antimony	200.8	ND	U	ug/L	0.25	0.10	5	08/06/21 17:02	06/29/21	
Arsenic	200.8	**118**		ug/L	2.5	0.5	5	08/06/21 17:02	06/29/21	
Barium	200.8	**537**		ug/L	0.25	0.10	5	08/06/21 17:02	06/29/21	
Beryllium	200.8	ND	U	ug/L	0.10	0.03	5	08/06/21 17:02	06/29/21	
Boron	200.8	**1510**		ug/L	40	10	20	08/06/21 13:36	06/29/21	
Cadmium	200.8	ND	U	ug/L	0.10	0.04	5	08/06/21 17:02	06/29/21	
Calcium	6010C	**57800**		ug/L	21	3	1	07/22/21 16:27	07/01/21	
Chromium	200.8	ND	U	ug/L	1.0	0.2	5	08/06/21 17:02	06/29/21	
Cobalt	200.8	ND	U	ug/L	0.10	0.05	5	08/06/21 17:02	06/29/21	
Iron	200.8	**17**		ug/L	10	2	5	08/06/21 17:02	06/29/21	X
Lead	200.8	ND	U	ug/L	0.10	0.03	5	08/06/21 17:02	06/29/21	
Lithium	200.8	**335**		ug/L	0.50	0.50	5	08/06/21 17:02	06/29/21	
Magnesium	6010C	**15400**		ug/L	5.3	0.4	1	07/22/21 16:27	07/01/21	
Manganese	200.8	**191**		ug/L	1.0	0.2	5	08/06/21 17:02	06/29/21	
Molybdenum	200.8	**5.72**		ug/L	0.50	0.15	5	08/06/21 17:02	06/29/21	
Nickel	200.8	ND	U	ug/L	1.0	0.2	5	08/06/21 17:02	06/29/21	
Potassium	6010C	**2250**		ug/L	210	60	1	07/22/21 16:27	07/01/21	
Selenium	200.8	ND	U	ug/L	5.0	1.0	5	08/06/21 17:02	06/29/21	
Silicon	6010C	**6850**		ug/L	210	30	1	07/22/21 16:27	07/01/21	
Silver	200.8	ND	U	ug/L	0.10	0.05	5	08/06/21 17:02	06/29/21	
Sodium	6010C	**26200**		ug/L	210	30	1	07/22/21 16:27	07/01/21	
Thallium	200.8	ND	U	ug/L	0.10	0.05	5	08/06/21 17:02	06/29/21	
Zinc	200.8	**3**	**J**	ug/L	10	3	5	08/06/21 17:02	06/29/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21 13:30
Sample Matrix:	Water	**Date Received:**	06/25/21 13:35
Sample Name:	GGS-MW-6D-20210624	**Basis:**	NA
Lab Code:	K2107416-001		

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	08/06/21 18:53	07/08/21	
Iron	200.8	**22**	ug/L	10	2	5	08/06/21 18:53	07/08/21	X
Manganese	200.8	**182**	ug/L	1.0	0.2	5	08/06/21 18:53	07/08/21	

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21 14:00
Sample Matrix:	Water	**Date Received:**	06/25/21 13:35
Sample Name:	GGS-MW-7-20210624	**Basis:**	NA
Lab Code:	K2107416-002		

Dissolved Metals

Analyte Name	Analysis Method	Result		Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	200.8	**6**	**J**	ug/L	20	3	5	08/06/21 17:09	06/29/21	
Antimony	200.8	ND	U	ug/L	0.25	0.10	5	08/06/21 17:09	06/29/21	
Arsenic	200.8	**254**		ug/L	2.5	0.5	5	08/06/21 17:09	06/29/21	
Barium	200.8	**57.4**		ug/L	0.25	0.10	5	08/06/21 17:09	06/29/21	
Beryllium	200.8	ND	U	ug/L	0.10	0.03	5	08/06/21 17:09	06/29/21	
Boron	200.8	**1790**		ug/L	40	10	20	08/06/21 13:43	06/29/21	
Cadmium	200.8	ND	U	ug/L	0.10	0.04	5	08/06/21 17:09	06/29/21	
Calcium	6010C	**11600**		ug/L	21	3	1	07/22/21 16:39	07/01/21	
Chromium	200.8	ND	U	ug/L	1.0	0.2	5	08/06/21 17:09	06/29/21	
Cobalt	200.8	ND	U	ug/L	0.10	0.05	5	08/06/21 17:09	06/29/21	
Iron	200.8	**11**		ug/L	10	2	5	08/06/21 17:09	06/29/21	X
Lead	200.8	ND	U	ug/L	0.10	0.03	5	08/06/21 17:09	06/29/21	
Lithium	200.8	**186**		ug/L	0.50	0.50	5	08/06/21 17:09	06/29/21	
Magnesium	6010C	**3880**		ug/L	5.3	0.4	1	07/22/21 16:39	07/01/21	
Manganese	200.8	**36.0**		ug/L	1.0	0.2	5	08/06/21 17:09	06/29/21	
Molybdenum	200.8	**218**		ug/L	0.50	0.15	5	08/06/21 17:09	06/29/21	
Nickel	200.8	ND	U	ug/L	1.0	0.2	5	08/06/21 17:09	06/29/21	
Potassium	6010C	**1180**		ug/L	210	60	1	07/22/21 16:39	07/01/21	
Selenium	200.8	ND	U	ug/L	5.0	1.0	5	08/06/21 17:09	06/29/21	
Silicon	6010C	**5370**		ug/L	210	30	1	07/22/21 16:39	07/01/21	
Silver	200.8	ND	U	ug/L	0.10	0.05	5	08/06/21 17:09	06/29/21	
Sodium	6010C	**91000**		ug/L	210	30	1	07/22/21 16:39	07/01/21	
Thallium	200.8	ND	U	ug/L	0.10	0.05	5	08/06/21 17:09	06/29/21	
Zinc	200.8	**3**	**J**	ug/L	10	3	5	08/06/21 17:09	06/29/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	06/24/21 14:00
Sample Matrix:	Water		**Date Received:**	06/25/21 13:35
Sample Name:	GGS-MW-7-20210624		**Basis:**	NA
Lab Code:	K2107416-002			

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	200.8	**6 J**	ug/L	20	3	5	08/06/21 18:55	07/08/21	
Iron	200.8	**172**	ug/L	10	2	5	08/06/21 18:55	07/08/21	
Manganese	200.8	**35.6**	ug/L	1.0	0.2	5	08/06/21 18:55	07/08/21	

General Chemistry

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21 13:30
Sample Matrix:	Water	**Date Received:**	06/25/21 13:35
Sample Name:	GGS-MW-6D-20210624	**Basis:**	NA
Lab Code:	K2107416-001		

General Chemistry Parameters

Analyte Name	Analysis Method	Result		Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Alkalinity as CaCO3, Total	SM 2320 B	**182**		mg/L	15	3	1	06/29/21 16:23	NA	
Ammonia as Nitrogen	350.1	**0.567**		mg/L	0.050	0.020	1	06/30/21 11:28	06/30/21	
Bicarbonate as CaCO3	SM 2320 B	**182**		mg/L	15	3	1	06/29/21 16:23	NA	
Carbon, Total Organic	SM 5310 C	**0.90**		mg/L	0.50	0.07	1	07/14/21 14:07	NA	
Carbonate as CaCO3	SM 2320 B	ND	U	mg/L	15	3	1	06/29/21 16:23	NA	
Chloride	300.0	**8.06**		mg/L	0.20	0.02	2	06/26/21 13:37	NA	
Fluoride	300.0	ND	U	mg/L	0.20	0.01	2	06/26/21 13:37	NA	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.050	0.007	1	06/26/21 13:37	NA	*
Nitrite as Nitrogen	300.0	ND	U	mg/L	0.050	0.003	1	06/26/21 13:37	NA	*
Orthophosphate as Phosphorus	SM 4500-P E	**0.187**		mg/L	0.050	0.020	1	06/26/21 13:10	NA	
Sulfate	300.0	**68.0**		mg/L	4.0	0.4	20	06/30/21 21:06	NA	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21 14:00
Sample Matrix:	Water	**Date Received:**	06/25/21 13:35
Sample Name:	GGS-MW-7-20210624	**Basis:**	NA
Lab Code:	K2107416-002		

General Chemistry Parameters

Analyte Name	Analysis Method	Result		Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Alkalinity as CaCO3, Total	SM 2320 B	**104**		mg/L	15	3	1	06/29/21 16:23	NA	
Ammonia as Nitrogen	350.1	**0.406**		mg/L	0.050	0.020	1	06/30/21 11:28	06/30/21	
Bicarbonate as CaCO3	SM 2320 B	**104**		mg/L	15	3	1	06/29/21 16:23	NA	
Carbon, Total Organic	SM 5310 C	**0.46**	**J**	mg/L	0.50	0.07	1	07/14/21 14:07	NA	
Carbonate as CaCO3	SM 2320 B	ND	U	mg/L	15	3	1	06/29/21 16:23	NA	
Chloride	300.0	**5.88**		mg/L	0.20	0.02	2	06/26/21 14:15	NA	
Fluoride	300.0	ND	U	mg/L	0.20	0.01	2	06/26/21 14:15	NA	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.050	0.007	1	06/26/21 14:15	NA	*
Nitrite as Nitrogen	300.0	ND	U	mg/L	0.050	0.003	1	06/26/21 14:15	NA	*
Orthophosphate as Phosphorus	SM 4500-P E	**0.199**		mg/L	0.050	0.020	1	06/26/21 13:10	NA	
Sulfate	300.0	**140**		mg/L	8.0	0.8	40	06/30/21 21:18	NA	

ALS Environmental

QC Summary Forms

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1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
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Metals

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	KQ2111792-01		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	200.8	**1.3 J**	ug/L	4.0	0.5	1	08/06/21 13:32	06/29/21	
Antimony	200.8	ND U	ug/L	0.050	0.020	1	08/06/21 13:32	06/29/21	
Arsenic	200.8	ND U	ug/L	0.50	0.09	1	08/06/21 13:32	06/29/21	
Barium	200.8	ND U	ug/L	0.050	0.020	1	08/06/21 13:32	06/29/21	
Beryllium	200.8	ND U	ug/L	0.020	0.005	1	08/06/21 13:32	06/29/21	
Boron	200.8	ND U	ug/L	2.0	0.5	1	08/06/21 13:32	06/29/21	
Cadmium	200.8	ND U	ug/L	0.020	0.008	1	08/06/21 13:32	06/29/21	
Chromium	200.8	ND U	ug/L	0.20	0.03	1	08/06/21 13:32	06/29/21	
Cobalt	200.8	ND U	ug/L	0.020	0.009	1	08/06/21 13:32	06/29/21	
Iron	200.8	ND U	ug/L	2.0	0.3	1	08/06/21 13:32	06/29/21	
Lead	200.8	ND U	ug/L	0.020	0.006	1	08/06/21 13:32	06/29/21	
Lithium	200.8	ND U	ug/L	0.10	0.10	1	08/06/21 13:32	06/29/21	
Manganese	200.8	**0.62**	ug/L	0.20	0.04	1	08/06/21 13:32	06/29/21	
Molybdenum	200.8	ND U	ug/L	0.10	0.03	1	08/06/21 13:32	06/29/21	
Nickel	200.8	**0.08 J**	ug/L	0.20	0.04	1	08/06/21 13:32	06/29/21	
Selenium	200.8	ND U	ug/L	1.0	0.2	1	08/06/21 13:32	06/29/21	
Silver	200.8	ND U	ug/L	0.020	0.009	1	08/06/21 13:32	06/29/21	
Thallium	200.8	ND U	ug/L	0.020	0.009	1	08/06/21 13:32	06/29/21	
Zinc	200.8	**0.7 J**	ug/L	2.0	0.5	1	08/06/21 13:32	06/29/21	

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 Task 02
Sample Matrix: Water

Service Request: K2107416
Date Collected: NA
Date Received: NA

Sample Name: Method Blank
Lab Code: KQ2111938-02

Basis: NA

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	6010C	**5 J**	ug/L	21	3	1	07/22/21 16:20	07/01/21	
Magnesium	6010C	**0.5 J**	ug/L	5.3	0.4	1	07/22/21 16:20	07/01/21	
Potassium	6010C	ND U	ug/L	210	60	1	07/22/21 16:20	07/01/21	
Silicon	6010C	**40 J**	ug/L	210	30	1	07/22/21 16:20	07/01/21	
Sodium	6010C	ND U	ug/L	210	30	1	07/22/21 16:20	07/01/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	KQ2111952-01		

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	200.8	**2.0 J**	ug/L	4.0	0.5	1	08/06/21 18:49	07/08/21	
Iron	200.8	**5.6**	ug/L	2.0	0.3	1	08/06/21 18:49	07/08/21	
Manganese	200.8	ND U	ug/L	0.20	0.04	1	08/06/21 18:49	07/08/21	

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QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	08/6/21
		Date Extracted:	06/29/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	GGS-MW-6D-20210624	**Units:**	ug/L
Lab Code:	K2107416-001	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2111792-06

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	5 J	104	100	99	70-130
Antimony	ND U	11.4	10.0	114	70-130
Arsenic	118	174	50.0	113	70-130
Barium	537	638	100	101 #	70-130
Beryllium	ND U	2.64	2.50	105	70-130
Boron	1510	1570	25	259 #	70-130
Cadmium	ND U	27.3	25.0	109	70-130
Chromium	ND U	10.6	10.0	106	70-130
Cobalt	ND U	25.0	25.0	100	70-130
Iron	17	68	50	102	70-130
Lead	ND U	54.9	50.0	110	70-130
Lithium	335	387	50.0	105 #	70-130
Manganese	191	221	25.0	121 #	70-130
Molybdenum	5.72	33.3	25.0	110	70-130
Nickel	ND U	24.5	25.0	98	70-130
Selenium	ND U	54.4	50.0	109	70-130
Silver	ND U	12.7	12.5	102	70-130
Thallium	ND U	55.8	50.0	112	70-130
Zinc	3 J	29	25	106	70-130

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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:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	07/22/21
		Date Extracted:	07/1/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	GGS-MW-6D-20210624	**Units:**	ug/L
Lab Code:	K2107416-001	**Basis:**	NA
Analysis Method:	6010C		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2111938-05

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Calcium	57800	69700	10000	119 #	75-125
Magnesium	15400	23800	10000	84	75-125
Potassium	2250	11200	10000	90	75-125
Sodium	26200	33800	10000	76	75-125

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Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	07/22/21
		Date Extracted:	07/1/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	GGS-MW-6D-20210624	**Units:**	ug/L
Lab Code:	K2107416-001	**Basis:**	NA
Analysis Method:	6010C		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2111938-06

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Silicon	6850	16100	10000	92	75-125

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QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	08/6/21
		Date Extracted:	07/8/21

Matrix Spike Summary
Total Metals

Sample Name:	GGS-MW-7-20210624	**Units:**	ug/L
Lab Code:	K2107416-002	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2111952-04

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	6 J	101	100	95	70-130
Iron	172	221	50	97	70-130
Manganese	35.6	55.1	25.0	78	70-130

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Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	08/06/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	GGS-MW-6D-20210624	**Units:**	ug/L
Lab Code:	K2107416-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2111792-05 Result	Average	RPD	RPD Limit
Aluminum	200.8	20	3	5 J	5 J	5	<1	20
Antimony	200.8	0.25	0.10	ND U	ND U	ND	-	20
Arsenic	200.8	2.5	0.5	118	116	117	2	20
Barium	200.8	0.25	0.10	537	529	533	2	20
Beryllium	200.8	0.10	0.03	ND U	0.03 J	NC	NC	20
Boron	200.8	40	10	1510	1560	1540	3	20
Cadmium	200.8	0.10	0.04	ND U	ND U	ND	-	20
Chromium	200.8	1.0	0.2	ND U	0.2 J	NC	NC	20
Cobalt	200.8	0.10	0.05	ND U	ND U	ND	-	20
Iron	200.8	10	2	17	16	17	6	20
Lead	200.8	0.10	0.03	ND U	ND U	ND	-	20
Lithium	200.8	0.50	0.50	335	328	332	2	20
Manganese	200.8	1.0	0.2	191	188	190	2	20
Molybdenum	200.8	0.50	0.15	5.72	5.83	5.78	2	20
Nickel	200.8	1.0	0.2	ND U	ND U	ND	-	20
Selenium	200.8	5.0	1.0	ND U	ND U	ND	-	20
Silver	200.8	0.10	0.05	ND U	ND U	ND	-	20
Thallium	200.8	0.10	0.05	ND U	ND U	ND	-	20
Zinc	200.8	10	3	3 J	3 J	3	<1	20

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QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	07/22/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	GGS-MW-6D-20210624	**Units:**	ug/L
Lab Code:	K2107416-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2111938-04 Result	Average	RPD	RPD Limit
Calcium	6010C	21	3	57800	57700	57800	<1	20
Magnesium	6010C	5.3	0.4	15400	15000	15200	3	20
Potassium	6010C	210	60	2250	2230	2240	<1	20
Silicon	6010C	210	30	6850	6690	6770	2	20
Sodium	6010C	210	30	26200	25600	25900	2	20

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QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	08/06/21

Replicate Sample Summary
Total Metals

Sample Name:	GGS-MW-7-20210624	**Units:**	ug/L
Lab Code:	K2107416-002	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2111952-03 Result	Average	RPD	RPD Limit
Aluminum	200.8	20	3	6 J	6 J	6	<1	20
Iron	200.8	10	2	172	179	176	4	20
Manganese	200.8	1.0	0.2	35.6	36.8	36.2	3	20

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QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Analyzed:**	08/06/21
Sample Matrix:	Water		

Lab Control Sample Summary
Dissolved Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2111792-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	200.8	106	100	106	85-115
Antimony	200.8	11.5	10.0	115	85-115
Arsenic	200.8	55.7	50.0	111	85-115
Barium	200.8	107	100	107	85-115
Beryllium	200.8	2.70	2.50	108	85-115
Boron	200.8	26.9	25.0	108	85-115
Cadmium	200.8	28.3	25.0	113	85-115
Chromium	200.8	10.6	10.0	106	85-115
Cobalt	200.8	26.5	25.0	106	85-115
Iron	200.8	53.9	50.0	108	85-115
Lead	200.8	56.2	50.0	112	85-115
Lithium	200.8	55.9	50.0	112	85-115
Manganese	200.8	28.3	25.0	113	85-115
Molybdenum	200.8	28.3	25.0	113	85-115
Nickel	200.8	26.5	25.0	106	85-115
Selenium	200.8	56.6	50.0	113	85-115
Silver	200.8	13.4	12.5	107	85-115
Thallium	200.8	56.9	50.0	114	85-115
Zinc	200.8	25.6	25.0	102	85-115

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QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Analyzed:**	07/22/21
Sample Matrix:	Water		

Lab Control Sample Summary
Dissolved Metals

Units: ug/L
Basis: NA

Lab Control Sample
KQ2111938-01

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Calcium	6010C	12900	12500	103	80-120
Magnesium	6010C	12400	12500	99	80-120
Potassium	6010C	12100	12500	97	80-120
Sodium	6010C	12000	12500	96	80-120

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 Task 02
Sample Matrix: Water

Service Request: K2107416
Date Analyzed: 07/22/21

Lab Control Sample Summary
Dissolved Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2111938-03

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Silicon	6010C	9750	10000	97	80-120

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 Task 02
Sample Matrix: Water

Service Request: K2107416
Date Analyzed: 08/06/21

Lab Control Sample Summary
Total Metals

Units: ug/L
Basis: NA

Lab Control Sample
KQ2111952-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	200.8	100	100	100	85-115
Iron	200.8	55.4	50.0	111	85-115
Manganese	200.8	24.3	25.0	97	85-115

General Chemistry

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K2107416-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	06/29/21 16:23	NA	
Ammonia as Nitrogen	350.1	ND	U	mg/L	0.050	0.020	1	06/30/21 11:28	06/30/21	
Bicarbonate as CaCO3	SM 2320 B	**5**	**J**	mg/L	15	3	1	06/29/21 16:23	NA	
Carbon, Total Organic	SM 5310 C	ND	U	mg/L	0.50	0.07	1	07/14/21 14:07	NA	
Carbonate as CaCO3	SM 2320 B	ND	U	mg/L	15	3	1	06/29/21 16:23	NA	
Chloride	300.0	ND	U	mg/L	0.10	0.007	1	06/26/21 13:28	NA	
Fluoride	300.0	ND	U	mg/L	0.10	0.005	1	06/26/21 13:28	NA	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.050	0.007	1	06/26/21 13:28	NA	
Nitrite as Nitrogen	300.0	ND	U	mg/L	0.050	0.003	1	06/26/21 13:28	NA	
Orthophosphate as Phosphorus	SM 4500-P E	ND	U	mg/L	0.050	0.020	1	06/26/21 13:10	NA	
Sulfate	300.0	ND	U	mg/L	0.20	0.02	1	06/26/21 13:28	NA	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K2107416-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	07/14/21 14:07	
Sulfate	300.0	ND U	mg/L	0.20	0.02	1	06/30/21 14:02	

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 Task 02
Sample Matrix: Water

Service Request: K2107416
Date Collected: 06/24/21
Date Received: 06/25/21
Date Analyzed: 06/26/21 - 06/30/21

Duplicate Matrix Spike Summary
General Chemistry Parameters

Sample Name: GGS-MW-6D-20210624
Lab Code: K2107416-001

Units: mg/L
Basis: NA

			Matrix Spike K2107416-001MS			Duplicate Matrix Spike K2107416-001DMS					
Analyte Name	**Method**	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Ammonia as Nitrogen	350.1	0.567	1.55	1.00	99	1.59	1.00	102	90-110	2	20
Nitrate as Nitrogen	300.0	ND U	7.95	8.00	99	7.77	8.00	97	90-110	2	20
Fluoride	300.0	ND U	8.44	8.00	106	8.43	8.00	105	90-110	<1	20
Chloride	300.0	8.06	15.8	8.00	96	15.7	8.00	96	90-110	<1	20
Sulfate	300.0	68.0	81.2	8.00	166 #	80.8	8.00	161 #	90-110	<1	20
Nitrite as Nitrogen	300.0	ND U	7.99	8.00	100	8.00	8.00	100	90-110	<1	20

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Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	06/26/21
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Orthophosphate as Phosphorus

Sample Name:	GGS-MW-7-20210624	**Units:**	mg/L
Lab Code:	K2107416-002	**Basis:**	NA
Analysis Method:	SM 4500-P E		
Prep Method:	None		

		Matrix Spike K2107416-002MS			Duplicate Matrix Spike K2107416-002DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Orthophosphate as Phosphorus	0.199	1.05	0.80	106	1.06	0.80	107	75-125	<1	20

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Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	06/26/21 - 06/30/21

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	GGS-MW-6D-20210624	**Units:**	mg/L
Lab Code:	K2107416-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K2107416-001DUP Result	Average	RPD	RPD Limit
Ammonia as Nitrogen	350.1	0.050	0.020	0.567	0.576	0.572	2	20
Bicarbonate as CaCO3	SM 2320 B	15	3	182	183	183	<1	20
Carbonate as CaCO3	SM 2320 B	15	3	ND U	ND U	NC	NC	20
Chloride	300.0	0.20	0.02	8.06	8.23	8.15	2	20
Fluoride	300.0	0.20	0.01	ND U	ND U	NC	NC	20
Nitrate as Nitrogen	300.0	0.050	0.007	ND U	ND U	NC	NC	20
Sulfate	300.0	0.40	0.04	68.0	77.2	72.6	13	20
Alkalinity as CaCO3, Total	SM 2320 B	15	3	182	183	183	<1	20
Nitrite as Nitrogen	300.0	0.050	0.003	ND U	ND U	NC	NC	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:**	K2107416
Project	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	06/26/21

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	GGS-MW-7-20210624	**Units:**	mg/L
Lab Code:	K2107416-002	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K2107416-002DUP Result	Average	RPD	RPD Limit
Orthophosphate as Phosphorus	SM 4500-P E	0.050	0.020	0.199	0.201	0.200	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.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Analyzed:**	06/26/21 - 07/14/21
Sample Matrix:	Water		

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
K2107416-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	4.53	4.58	99	86-114
Bicarbonate as CaCO3	SM 2320 B	107	109	98	85-115
Carbon, Total Organic	SM 5310 C	23.5	25.0	94	83-117
Carbonate as CaCO3	SM 2320 B	107	109	98	85-115
Chloride	300.0	4.79	5.00	96	90-110
Fluoride	300.0	4.77	5.00	95	90-110
Nitrate as Nitrogen	300.0	2.46	2.50	98	90-110
Nitrite as Nitrogen	300.0	2.49	2.50	99	90-110
Orthophosphate as Phosphorus	SM 4500-P E	1.67	1.57	106	85-115
Sulfate	300.0	4.91	5.00	98	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Analyzed:**	06/29/21 - 06/30/21
Sample Matrix:	Water		

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
K2107416-LCS3

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Alkalinity as CaCO3, Total	SM 2320 B	109	109	100	90-110
Bicarbonate as CaCO3	SM 2320 B	109	109	100	85-115
Carbonate as CaCO3	SM 2320 B	109	109	100	85-115
Sulfate	300.0	4.69	5.00	94	90-110

Client:	Anchor QEA, LLC	**Service Request:**	K2107416
Project:	Gorgas/201114-01.01 Task 02	**Date Analyzed:**	07/14/21
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:	731060

	Lab Control Sample K2107416-LCS1			Duplicate Lab Control Sample K2107416-DLCS1					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Carbon, Total Organic	23.7	25.0	95	24.0	25.0	96	83-117	1	10

July 21, 2021 Service Request No:K2107418

Masa Kanematsu
Anchor QEA, LLC
6720 SW Macadam Avenue
Suite 125
Portland, OR 97219

Laboratory Results for: Gorgas

Dear Masa,

Enclosed are the results of the sample(s) submitted to our laboratory June 25, 2021
For your reference, these analyses have been assigned our service request number **K2107418.**

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

Client: Anchor QEA, LLC
Project: Gorgas
Sample Matrix: Water

Service Request: K2107418
Date Received: 06/25/2021

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:

Two water samples were received for analysis at ALS Environmental on 06/25/2021. 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 Noel D. Dair

Date 07/21/2021

SAMPLE DETECTION SUMMARY

CLIENT ID: GGS-MW-6D-20210624 — **Lab ID: K2107418-001**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	114		0.5	2.5	ug/L	200.8
Boron, Dissolved	1280		10	40	ug/L	200.8
Lithium, Dissolved	312		2.0	2.0	ug/L	200.8

CLIENT ID: GGS-MW-7-20210624 — **Lab ID: K2107418-002**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	248		2	10	ug/L	200.8
Boron, Dissolved	1610		10	40	ug/L	200.8
Lithium, Dissolved	171		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	204		0.6	2.0	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:** K2107418
Project: Gorgas/201114-01.01 Task 02

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K2107418-001	GGS-MW-6D-20210624	6/24/2021	1330
K2107418-002	GGS-MW-7-20210624	6/24/2021	1400

K2107418

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number: 503-972-5019

Date:	6/25/2021
Project Name:	Gorgas
Project Number:	201114-01.01 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, Lithium, Boron (diss.) 3d TAT	Molybdenum (diss.) 3d TAT	Dissolved metals	Total Metals (Al, Fe, Mn)	Anions	Ortho-Phosphate	Alkalinity	Total Organic Carbon	Ammonia as N								Comments/Preservation
1	GGS-MW-6D-20210624	6/24/2021	13:30	Water	6	X		X	X	X	X	X	X	X								
2	GGS-MW-7-20210624	6/24/2021	14:00	Water	6	X	X	X	X	X	X	X	X	X								
3																						
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, Li, B, and Mo), please analyze by EPA 200.8 with 5 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), Alkalinity with carbonate/bicarbonate speciation

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	Perry Jones ALS	6/25/21 1335
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
[signature]	6/25/2020 9:00		

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

PM MH

Cooler Receipt and Preservation Form

Client Anchor Service Request K21 07418

Received: 6/25/21 Opened: 6/25/21 By: PJ Unloaded: 6/25/21 By: PJ

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
—	4.8	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.* 6/25 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: ______

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.

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client:	Anchor QEA, LLC	**Service Request:**	K2107418
Project:	Gorgas/201114-01.01 Task 02		

Sample Name:	GGS-MW-6D-20210624	**Date Collected:**	06/24/21
Lab Code:	K2107418-001	**Date Received:**	06/25/21
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
200.8	RMOORE	RMOORE

Sample Name:	GGS-MW-7-20210624	**Date Collected:**	06/24/21
Lab Code:	K2107418-002	**Date Received:**	06/25/21
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
200.8	RMOORE	RMOORE

Sample Results

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Metals

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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107418
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21 13:30
Sample Matrix:	Water	**Date Received:**	06/25/21 13:35
Sample Name:	GGS-MW-6D-20210624	**Basis:**	NA
Lab Code:	K2107418-001		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**114**	ug/L	2.5	0.5	5	07/19/21 19:58	06/29/21	
Boron	200.8	**1280**	ug/L	40	10	20	07/19/21 19:01	06/29/21	
Lithium	200.8	**312**	ug/L	2.0	2.0	20	07/19/21 19:01	06/29/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2107418
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	06/24/21 14:00
Sample Matrix:	Water		**Date Received:**	06/25/21 13:35
Sample Name:	GGS-MW-7-20210624		**Basis:**	NA
Lab Code:	K2107418-002			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**248**	ug/L	10	2	20	07/19/21 19:05	06/29/21	
Boron	200.8	**1610**	ug/L	40	10	20	07/19/21 19:05	06/29/21	
Lithium	200.8	**171**	ug/L	2.0	2.0	20	07/19/21 19:05	06/29/21	
Molybdenum	200.8	**204**	ug/L	2.0	0.6	20	07/19/21 19:05	06/29/21	

QC Summary Forms

ALS Environmental—Kelso Laboratory
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Metals

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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2107418
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	KQ2111792-01		

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	07/19/21 18:57	06/29/21	
Boron	200.8	ND U	ug/L	2.0	0.5	1	07/19/21 18:57	06/29/21	
Lithium	200.8	ND U	ug/L	0.10	0.10	1	07/19/21 18:57	06/29/21	
Molybdenum	200.8	ND U	ug/L	0.10	0.03	1	07/19/21 18:57	06/29/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2107418
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	07/19/21
		Date Extracted:	06/29/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	GGS-MW-6D-20210624	**Units:**	ug/L
Lab Code:	K2107418-001	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2111792-03

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	114	164	50.0	100	70-130
Boron	1280	1310	25	126 #	70-130
Lithium	312	357	50.0	90 #	70-130
Molybdenum	5.97	32.1	25.0	105	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:**	K2107418
Project	Gorgas/201114-01.01 Task 02	**Date Collected:**	06/24/21
Sample Matrix:	Water	**Date Received:**	06/25/21
		Date Analyzed:	07/19/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	GGS-MW-6D-20210624	**Units:**	ug/L
Lab Code:	K2107418-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2111792-04 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	114	115	115	<1	20
Boron	200.8	40	10	1280	1290	1290	<1	20
Lithium	200.8	2.0	2.0	312	302	307	3	20
Molybdenum	200.8	0.50	0.15	5.97	5.45	5.71	9	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:**	K2107418
Project:	Gorgas/201114-01.01 Task 02	**Date Analyzed:**	07/19/21
Sample Matrix:	Water		

Lab Control Sample Summary
Dissolved Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2111792-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	200.8	49.5	50.0	99	85-115
Boron	200.8	23.5	25.0	94	85-115
Lithium	200.8	49.0	50.0	98	85-115
Molybdenum	200.8	24.6	25.0	98	85-115

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

August 18, 2021

Analytical Report for Service Request No: K2108799

Masa Kanematsu
Anchor QEA, LLC
6720 SW Macadam Avenue
Suite 125
Portland, OR 97219

RE: Gorgas / 201114-01.01 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 **K2108799.**

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

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

Table of Contents

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

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: Anchor QEA, LLC
Project: Gorgas
Sample Matrix: Water

Service Request: K2108799
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 IV requested by the client.

Sample Receipt:

Twenty 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 ______________________ Date 08/18/2021

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

K2108799

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number: 503-972-5019	
Date:	7/29/2021
Project Name:	Gorgas
Project Number:	201114-01.01 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	As, Li, Mo (dissolved, Method 200.8)	Boron (dissolved, Method 200.8)	Comments/Preservation
1	GGS-COL-INF-MW-6D-1	7/26/2021	14:40	Water	1	X		HNO_3 preserved, filtered
2	GGS-COL-1-1	7/26/2021	14:40	Water	1	X		HNO_3 preserved, filtered
3	GGS-COL-3-1	7/26/2021	14:40	Water	1	X		HNO_3 preserved, filtered
4	GGS-COL-5-1	7/26/2021	14:40	Water	1	X		HNO_3 preserved, filtered
5	GGS-COL-1-2	7/26/2021	18:30	Water	1	X		HNO_3 preserved, filtered
6	GGS-COL-3-2	7/26/2021	18:30	Water	1	X		HNO_3 preserved, filtered
7	GGS-COL-5-2	7/26/2021	18:30	Water	1	X		HNO_3 preserved, filtered
8	GGS-COL-INF-MW-6D-3	7/27/2021	10:30	Water	1	X		HNO_3 preserved, filtered
9	GGS-COL-1-3	7/27/2021	10:30	Water	1	X		HNO_3 preserved, filtered
10	GGS-COL-3-3	7/27/2021	10:30	Water	1	X		HNO_3 preserved, filtered
11	GGS-COL-5-3	7/27/2021	10:30	Water	1	X		HNO_3 preserved, filtered
12	GGS-COL-1-4	7/27/2021	16:30	Water	1	X		HNO_3 preserved, filtered
13	GGS-COL-3-4	7/27/2021	16:30	Water	1	X		HNO_3 preserved, filtered
14	GGS-COL-5-4	7/27/2021	16:30	Water	1	X		HNO_3 preserved, filtered
15	GGS-COL-INF-MW-6D-5	7/28/2021	14:20	Water	1	X		HNO_3 preserved, filtered

Notes: **Please analyze all analytes with** standard TAT **on this page. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L), B (<10 ug/L), and Mo (<1 ug/L). For Lithium, please use Method 200.8 for better detection limit if possible. Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	[signature]	7/29/21 1125
Signature/Print Name: [signature]	Date/Time: 7/29/2021 9:00	Signature/Print Name:	Date/Time:

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 3

KZ1108799

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number:	503-972-5019
Date:	7/29/2021
Project Name:	Gorgas
Project Number:	201114-01.01 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	As, Li, Mo (dissolved, Method 200.8)	Boron (dissolved, Method 200.8)	Comments/Preservation
16	GGS-COL-1-5	7/28/2021	14:20	Water	1	X		HNO_3 preserved, filtered
17	GGS-COL-3-5	7/28/2021	14:20	Water	1	X		HNO_3 preserved, filtered
18	GGS-COL-5-5	7/28/2021	14:20	Water	1	X		HNO_3 preserved, filtered
19	GGS-COL-INF-MW-7-1	7/26/2021	14:40	Water	1	X	X	HNO_3 preserved, filtered
20	GGS-COL-2-1	7/26/2021	14:40	Water	1	X	X	HNO_3 preserved, filtered
21	GGS-COL-4-1	7/26/2021	14:40	Water	1	X	X	HNO_3 preserved, filtered
22	GGS-COL-6-1	7/26/2021	14:40	Water	1	X	X	HNO_3 preserved, filtered
23	GGS-COL-2-2	7/26/2021	18:30	Water	1	X	X	HNO_3 preserved, filtered
24	GGS-COL-4-2	7/26/2021	18:30	Water	1	X	X	HNO_3 preserved, filtered
25	GGS-COL-6-2	7/26/2021	18:30	Water	1	X	X	HNO_3 preserved, filtered
26	GGS-COL-INF-MW-7-3	7/27/2021	10:30	Water	1	X	X	HNO_3 preserved, filtered
27	GGS-COL-2-3	7/27/2021	10:30	Water	1	X	X	HNO_3 preserved, filtered
28	GGS-COL-4-3	7/27/2021	10:30	Water	1	X	X	HNO_3 preserved, filtered
29	GGS-COL-6-3	7/27/2021	10:30	Water	1	X	X	HNO_3 preserved, filtered
30	GGS-COL-2-4	7/27/2021	16:30	Water	1	X	X	HNO_3 preserved, filtered

Notes: **Please analyze all analytes with** standard TAT **on this page. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L), B (<10 ug/L), and Mo (<1 ug/L). For Lithium, please use Method 200.8 for better detection limit if possible. Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	[signature]	7/29/21 1125
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
[signature]	7/29/2021 9:00		

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 2 of 3

K21108799

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number: 503-972-5019	
Date:	7/29/2021
Project Name:	Gorgas
Project Number:	201114-01.01 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: As, Li, Mo (dissolved, Method 200.8)	Parameters: Boron (dissolved, Method 200.8)	Comments/Preservation
31	GGS-COL-4-4	7/27/2021	16:30	Water	1	X	X	HNO_3 preserved, filtered
32	GGS-COL-6-4	7/27/2021	16:30	Water	1	X	X	HNO_3 preserved, filtered
33	GGS-COL-INF-MW-7-5	7/28/2021	14:20	Water	1	X	X	HNO_3 preserved, filtered
34	GGS-COL-2-5	7/28/2021	14:20	Water	1	X	X	HNO_3 preserved, filtered
35	GGS-COL-4-5	7/28/2021	14:20	Water	1	X	X	HNO_3 preserved, filtered
36	GGS-COL-6-5	7/28/2021	14:20	Water	1	X	X	HNO_3 preserved, filtered
37								
38								
39								
40								
41								
42								
43								
44								
45								

Notes: **Please analyze all analytes with** standard TAT **on this page. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L), B (<10 ug/L), and Mo (<1 ug/L). For Lithium, please use Method 200.8 for better detection limit if possible. Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:
Masa Kanematsu	Anchor QEA
Signature/Print Name: [illegible]	Date/Time: 7/29/2021 9:00

Received by: [illegible]	Company:
Signature/Print Name:	Date/Time: 7/29/21 1125

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 3 of 3

PM MH

Cooler Receipt and Preservation Form

Client Anchor Service Request **K21** 108799

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-~~PP~~ 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:**	K2108799
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	07/26/21 14:40
Sample Matrix:	Water		**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-INF-MW-6D-1		**Basis:**	NA
Lab Code:	K2108799-001			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**115**	ug/L	2.5	0.5	5	08/16/21 16:34	08/05/21	
Lithium	200.8	**310**	ug/L	0.50	0.50	5	08/16/21 16:34	08/05/21	
Molybdenum	200.8	**6.61**	ug/L	0.50	0.15	5	08/16/21 16:34	08/05/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/26/21 14:40
Sample Matrix:	Water	**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-1-1	**Basis:**	NA
Lab Code:	K2108799-002		

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	08/16/21 16:39	08/05/21	
Lithium	200.8	**3.81**	ug/L	0.50	0.50	5	08/16/21 16:39	08/05/21	
Molybdenum	200.8	**0.68**	ug/L	0.50	0.15	5	08/16/21 16:39	08/05/21	

Printed 8/17/2021 5:42:39 PM

Superset Reference:

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/26/21 14:40
Sample Matrix:	Water	**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-3-1	**Basis:**	NA
Lab Code:	K2108799-003		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**18.7**	ug/L	2.5	0.5	5	08/16/21 16:44	08/05/21	
Lithium	200.8	**183**	ug/L	0.50	0.50	5	08/16/21 16:44	08/05/21	
Molybdenum	200.8	**3.48**	ug/L	0.50	0.15	5	08/16/21 16:44	08/05/21	

Printed 8/17/2021 5:42:39 PM Superset Reference:

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/26/21 14:40
Sample Matrix:	Water	**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-5-1	**Basis:**	NA
Lab Code:	K2108799-004		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**8.9**	ug/L	2.5	0.5	5	08/16/21 16:45	08/05/21	
Lithium	200.8	**91.2**	ug/L	0.50	0.50	5	08/16/21 16:45	08/05/21	
Molybdenum	200.8	**2.11**	ug/L	0.50	0.15	5	08/16/21 16:45	08/05/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/26/21 18:30
Sample Matrix:	Water	**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-1-2	**Basis:**	NA
Lab Code:	K2108799-005		

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	08/16/21 16:47	08/05/21	
Lithium	200.8	**117**	ug/L	0.50	0.50	5	08/16/21 16:47	08/05/21	
Molybdenum	200.8	**0.19 J**	ug/L	0.50	0.15	5	08/16/21 16:47	08/05/21	

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Superset Reference:

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/26/21 18:30
Sample Matrix:	Water	**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-3-2	**Basis:**	NA
Lab Code:	K2108799-006		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**13.2**	ug/L	2.5	0.5	5	08/16/21 16:55	08/05/21	
Lithium	200.8	**177**	ug/L	0.50	0.50	5	08/16/21 16:55	08/05/21	
Molybdenum	200.8	**3.59**	ug/L	0.50	0.15	5	08/16/21 16:55	08/05/21	

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Superset Reference:

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/26/21 18:30
Sample Matrix:	Water	**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-5-2	**Basis:**	NA
Lab Code:	K2108799-007		

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	08/16/21 16:57	08/05/21	
Lithium	200.8	**144**	ug/L	0.50	0.50	5	08/16/21 16:57	08/05/21	
Molybdenum	200.8	**3.18**	ug/L	0.50	0.15	5	08/16/21 16:57	08/05/21	

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Client:	Anchor QEA, LLC		**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	07/27/21 10:30
Sample Matrix:	Water		**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-INF-MW-6D-3		**Basis:**	NA
Lab Code:	K2108799-008			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**115**	ug/L	2.5	0.5	5	08/16/21 16:58	08/05/21	
Lithium	200.8	**309**	ug/L	0.50	0.50	5	08/16/21 16:58	08/05/21	
Molybdenum	200.8	**6.21**	ug/L	0.50	0.15	5	08/16/21 16:58	08/05/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/27/21 10:30
Sample Matrix:	Water	**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-1-3	**Basis:**	NA
Lab Code:	K2108799-009		

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	08/16/21 17:00	08/05/21	
Lithium	200.8	**252**	ug/L	0.50	0.50	5	08/16/21 17:00	08/05/21	
Molybdenum	200.8	**0.37 J**	ug/L	0.50	0.15	5	08/16/21 17:00	08/05/21	

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Client:	Anchor QEA, LLC		**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	07/27/21 10:30
Sample Matrix:	Water		**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-3-3		**Basis:**	NA
Lab Code:	K2108799-010			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**18.7**	ug/L	2.5	0.5	5	08/16/21 17:01	08/05/21	
Lithium	200.8	**233**	ug/L	0.50	0.50	5	08/16/21 17:01	08/05/21	
Molybdenum	200.8	**5.19**	ug/L	0.50	0.15	5	08/16/21 17:01	08/05/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/27/21 10:30
Sample Matrix:	Water	**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-5-3	**Basis:**	NA
Lab Code:	K2108799-011		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**37.5**	ug/L	2.5	0.5	5	08/16/21 17:03	08/05/21	
Lithium	200.8	**200**	ug/L	0.50	0.50	5	08/16/21 17:03	08/05/21	
Molybdenum	200.8	**4.85**	ug/L	0.50	0.15	5	08/16/21 17:03	08/05/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/27/21 16:30
Sample Matrix:	Water	**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-1-4	**Basis:**	NA
Lab Code:	K2108799-012		

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	08/16/21 17:04	08/05/21	
Lithium	200.8	**257**	ug/L	0.50	0.50	5	08/16/21 17:04	08/05/21	
Molybdenum	200.8	**0.76**	ug/L	0.50	0.15	5	08/16/21 17:04	08/05/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	07/27/21 16:30
Sample Matrix:	Water		**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-3-4		**Basis:**	NA
Lab Code:	K2108799-013			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**27.6**	ug/L	2.5	0.5	5	08/16/21 17:06	08/05/21	
Lithium	200.8	**243**	ug/L	0.50	0.50	5	08/16/21 17:06	08/05/21	
Molybdenum	200.8	**5.07**	ug/L	0.50	0.15	5	08/16/21 17:06	08/05/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/27/21 16:30
Sample Matrix:	Water	**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-5-4	**Basis:**	NA
Lab Code:	K2108799-014		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**29.2**	ug/L	2.5	0.5	5	08/16/21 17:08	08/05/21	
Lithium	200.8	**181**	ug/L	0.50	0.50	5	08/16/21 17:08	08/05/21	
Molybdenum	200.8	**4.74**	ug/L	0.50	0.15	5	08/16/21 17:08	08/05/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/28/21 14:20
Sample Matrix:	Water	**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-INF-MW-6D-5	**Basis:**	NA
Lab Code:	K2108799-015		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**117**	ug/L	2.5	0.5	5	08/16/21 17:09	08/05/21	
Lithium	200.8	**308**	ug/L	0.50	0.50	5	08/16/21 17:09	08/05/21	
Molybdenum	200.8	**5.99**	ug/L	0.50	0.15	5	08/16/21 17:09	08/05/21	

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Client:	Anchor QEA, LLC	**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/28/21 14:20
Sample Matrix:	Water	**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-1-5	**Basis:**	NA
Lab Code:	K2108799-016		

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	08/16/21 17:14	08/05/21	
Lithium	200.8	**286**	ug/L	0.50	0.50	5	08/16/21 17:14	08/05/21	
Molybdenum	200.8	**2.06**	ug/L	0.50	0.15	5	08/16/21 17:14	08/05/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/28/21 14:20
Sample Matrix:	Water	**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-3-5	**Basis:**	NA
Lab Code:	K2108799-017		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**19.4**	ug/L	2.5	0.5	5	08/16/21 17:16	08/05/21	
Lithium	200.8	**248**	ug/L	0.50	0.50	5	08/16/21 17:16	08/05/21	
Molybdenum	200.8	**5.10**	ug/L	0.50	0.15	5	08/16/21 17:16	08/05/21	

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Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	07/28/21 14:20
Sample Matrix:	Water		**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-5-5		**Basis:**	NA
Lab Code:	K2108799-018			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**50.5**	ug/L	2.5	0.5	5	08/16/21 17:17	08/05/21	
Lithium	200.8	**233**	ug/L	0.50	0.50	5	08/16/21 17:17	08/05/21	
Molybdenum	200.8	**5.38**	ug/L	0.50	0.15	5	08/16/21 17:17	08/05/21	

Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	07/26/21 14:40
Sample Matrix:	Water		**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-INF-MW-7-1		**Basis:**	NA
Lab Code:	K2108799-019			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**254**	ug/L	2.5	0.5	5	08/16/21 17:19	08/05/21	
Boron	200.8	**1620**	ug/L	40	10	20	08/16/21 16:26	08/05/21	
Lithium	200.8	**177**	ug/L	0.50	0.50	5	08/16/21 17:19	08/05/21	
Molybdenum	200.8	**211**	ug/L	0.50	0.15	5	08/16/21 17:19	08/05/21	

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Superset Reference:

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/26/21 14:40
Sample Matrix:	Water	**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-2-1	**Basis:**	NA
Lab Code:	K2108799-020		

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	08/16/21 17:20	08/05/21	
Boron	200.8	**1140**	ug/L	40	10	20	08/16/21 16:28	08/05/21	
Lithium	200.8	**5.30**	ug/L	0.50	0.50	5	08/16/21 17:20	08/05/21	
Molybdenum	200.8	ND U	ug/L	0.50	0.15	5	08/16/21 17:20	08/05/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	KQ2114524-01		

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	08/16/21 16:13	08/05/21	
Boron	200.8	ND U	ug/L	2.0	0.5	1	08/16/21 16:13	08/05/21	
Lithium	200.8	ND U	ug/L	0.10	0.10	1	08/16/21 16:13	08/05/21	
Molybdenum	200.8	ND U	ug/L	0.10	0.03	1	08/16/21 16:13	08/05/21	

QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108799
Project	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/26/21
Sample Matrix:	Water	**Date Received:**	07/29/21
		Date Analyzed:	08/16/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	GGS-COL-INF-MW-6D-1	**Units:**	ug/L
Lab Code:	K2108799-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2114524-03 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	115	114	115	<1	20
Boron	200.8	40	10	1240	1240	1240	<1	20
Lithium	200.8	0.50	0.50	310	304	307	2	20
Molybdenum	200.8	0.50	0.15	6.61	6.23	6.42	6	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:**	K2108799
Project	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/26/21
Sample Matrix:	Water	**Date Received:**	07/29/21
		Date Analyzed:	08/16/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	GGS-COL-1-1	**Units:**	ug/L
Lab Code:	K2108799-002	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2114524-04 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	ND U	ND U	ND	-	20
Boron	200.8	40	10	807	806	807	<1	20
Lithium	200.8	0.50	0.50	3.81	3.37	3.59	12	20
Molybdenum	200.8	0.50	0.15	0.68	0.70	0.69	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.

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Superset Reference:

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QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/26/21
Sample Matrix:	Water	**Date Received:**	07/29/21
		Date Analyzed:	08/16/21
		Date Extracted:	08/5/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	GGS-COL-1-1	**Units:**	ug/L
Lab Code:	K2108799-002	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2114524-05

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	ND U	48.1	50.0	96	70-130
Boron	807	843	25	144 #	70-130
Lithium	3.81	52.4	50.0	97	70-130
Molybdenum	0.68	26.9	25.0	105	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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Client:	Anchor QEA, LLC	**Service Request:**	K2108799
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/26/21
Sample Matrix:	Water	**Date Received:**	07/29/21
		Date Analyzed:	08/16/21
		Date Extracted:	08/5/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	GGS-COL-INF-MW-6D-1	**Units:**	ug/L
Lab Code:	K2108799-001	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2114524-06

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	115	160	50.0	90	70-130
Boron	1240	1280	25	146 #	70-130
Lithium	310	354	50.0	89 #	70-130
Molybdenum	6.61	32.4	25.0	103	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
Project: Gorgas/201114-01.01 Task 02
Sample Matrix: Water

Service Request: K2108799
Date Analyzed: 08/16/21

Lab Control Sample Summary
Dissolved Metals

Units: ug/L
Basis: NA

Lab Control Sample
KQ2114524-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	200.8	48.1	50.0	96	85-115
Boron	200.8	23.6	25.0	95	85-115
Lithium	200.8	49.7	50.0	99	85-115
Molybdenum	200.8	25.5	25.0	102	85-115

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Prep Summary Report

Client: Anchor QEA, LLC
Service Request: K2108799
Project: Gorgas/201114-01.01 Task 02
Sample Matrix: Water

Metals

Prep Method: EPA CLP ILM04.0
Extraction Lot: 384408
Analytical Method: 200.8
Extraction Date: 08/05/21 13:02

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Amount	Percent Solids
GGS-COL-INF-MW-6D-1	K2108799-001	7/26/21	7/29/21	10 mL	10 mL	
GGS-COL-1-1	K2108799-002	7/26/21	7/29/21	10 mL	10 mL	
GGS-COL-3-1	K2108799-003	7/26/21	7/29/21	10 mL	10 mL	
GGS-COL-5-1	K2108799-004	7/26/21	7/29/21	10 mL	10 mL	
GGS-COL-1-2	K2108799-005	7/26/21	7/29/21	10 mL	10 mL	
GGS-COL-3-2	K2108799-006	7/26/21	7/29/21	10 mL	10 mL	
GGS-COL-5-2	K2108799-007	7/26/21	7/29/21	10 mL	10 mL	
GGS-COL-INF-MW-6D-3	K2108799-008	7/27/21	7/29/21	10 mL	10 mL	
GGS-COL-1-3	K2108799-009	7/27/21	7/29/21	10 mL	10 mL	
GGS-COL-3-3	K2108799-010	7/27/21	7/29/21	10 mL	10 mL	
GGS-COL-5-3	K2108799-011	7/27/21	7/29/21	10 mL	10 mL	
GGS-COL-1-4	K2108799-012	7/27/21	7/29/21	10 mL	10 mL	
GGS-COL-3-4	K2108799-013	7/27/21	7/29/21	10 mL	10 mL	
GGS-COL-5-4	K2108799-014	7/27/21	7/29/21	10 mL	10 mL	
GGS-COL-INF-MW-6D-5	K2108799-015	7/28/21	7/29/21	10 mL	10 mL	
GGS-COL-1-5	K2108799-016	7/28/21	7/29/21	10 mL	10 mL	
GGS-COL-3-5	K2108799-017	7/28/21	7/29/21	10 mL	10 mL	
GGS-COL-5-5	K2108799-018	7/28/21	7/29/21	10 mL	10 mL	
GGS-COL-INF-MW-7-1	K2108799-019	7/26/21	7/29/21	10 mL	10 mL	
GGS-COL-2-1	K2108799-020	7/26/21	7/29/21	10 mL	10 mL	
Method Blank	KQ2114524-01MB	NA	NA	10 mL	10 mL	
Lab Control Sample	KQ2114524-02LCS	NA	NA	10 mL	10.4 mL	
Duplicate	KQ2114524-03DUP	7/26/21	7/29/21	10 mL	10 mL	
Duplicate	KQ2114524-04DUP	7/26/21	7/29/21	10 mL	10 mL	
Matrix Spike	KQ2114524-05MS	7/26/21	7/29/21	10 mL	10.4 mL	
Matrix Spike	KQ2114524-06MS	7/26/21	7/29/21	10 mL	10.4 mL	

Printed 8/17/2021 5:42:43 PM
Superset Reference:

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QA/QC Report

Client: Anchor QEA, LLC **Service Request:** K2108799
Project: Gorgas/201114-01.01 Task 02

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

Sample ID / Analyte	Method	Analysis Batch:	Result	True Value	% Rec	% Rec. Limits
ICV 08/16/21 16:05						
Arsenic	200.8	735207	25.3	25.0	101	90-110
Lithium	200.8	735207	25.9	25.0	103	90-110
Molybdenum	200.8	735207	25.1	25.0	100	90-110
Boron	200.8	735207	24.5	25.0	98	90-110
CCV 08/16/21 16:07						
Arsenic	200.8	735207	24.3	25.0	97	90-110
Lithium	200.8	735207	25.1	25.0	101	90-110
Molybdenum	200.8	735207	12.6	12.5	101	90-110
Boron	200.8	735207	25.5	25.0	102	90-110
CCV 08/16/21 16:29						
Arsenic	200.8	735207	25.7	25.0	103	90-110
Lithium	200.8	735207	25.0	25.0	100	90-110
Molybdenum	200.8	735207	12.4	12.5	99	90-110
Boron	200.8	735207	26.3	25.0	105	90-110
CCV 08/16/21 16:49						
Arsenic	200.8	735207	25.2	25.0	101	90-110
Lithium	200.8	735207	24.9	25.0	100	90-110
Molybdenum	200.8	735207	12.4	12.5	99	90-110
CCV 08/16/21 17:11						
Arsenic	200.8	735207	25.0	25.0	100	90-110
Lithium	200.8	735207	25.3	25.0	101	90-110
Molybdenum	200.8	735207	12.5	12.5	100	90-110
CCV 08/16/21 17:22						
Arsenic	200.8	735207	24.9	25.0	100	90-110
Lithium	200.8	735207	24.8	25.0	99	90-110
Molybdenum	200.8	735207	12.5	12.5	100	90-110

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QA/QC Report

Client: Anchor QEA, LLC **Service Request:** K2108799
Project: Gorgas/201114-01.01 Task 02

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

Sample ID / Analyte	Method	Analysis Batch:	Result	C
ICB 08/16/21 16:09				
Arsenic	200.8	735207	0.09	U
Lithium	200.8	735207	0.10	U
Molybdenum	200.8	735207	0.03	U
Boron	200.8	735207	0.5	U
CCB 08/16/21 16:10				
Arsenic	200.8	735207	0.09	U
Lithium	200.8	735207	0.10	U
Molybdenum	200.8	735207	0.03	U
Boron	200.8	735207	0.5	U
CCB 08/16/21 16:31				
Arsenic	200.8	735207	0.09	U
Lithium	200.8	735207	0.10	U
Molybdenum	200.8	735207	0.03	U
Boron	200.8	735207	0.6	J
CCB 08/16/21 16:53				
Arsenic	200.8	735207	0.09	U
Lithium	200.8	735207	0.10	U
Molybdenum	200.8	735207	0.03	U
CCB 08/16/21 17:12				
Arsenic	200.8	735207	0.09	U
Lithium	200.8	735207	0.10	U
Molybdenum	200.8	735207	0.03	U
CCB 08/16/21 17:24				
Arsenic	200.8	735207	0.09	U
Lithium	200.8	735207	0.10	U
Molybdenum	200.8	735207	0.03	U

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QA/QC Report

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 Task 02

Service Request: K2108799

LOW LEVEL INITIAL AND LOW LEVEL CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

Sample ID / Analyte	Method	Analysis Batch:	Result	True Value	% Rec	% Rec. Limits	Analysis Date
LLICV							
Arsenic	200.8	735207	0.44	0.5	89	50-199	08/16/21 16:12
Lithium	200.8	735207	0.12	0.1	121	50-199	08/16/21 16:12
Molybdenum	200.8	735207	0.090	0.1	90	50-199	08/16/21 16:12
Boron	200.8	735207	1.3	2.0	67	50-199	08/16/21 16:12

Client: Anchor QEA, LLC **Service Request:** K2108799
Project: Gorgas/201114-01.01 Task 02

Detection Limits

Instrument: K-ICP-MS-06 **Matrix:** Water

Analyte	Mass	Units	MRL	MDL	Method
Arsenic	75	ug/L	0.5	0.09	200.8
Boron	11	ug/L	2	0.5	200.8
Lithium	7	ug/L	0.1	0.1	200.8
Molybdenum	95	ug/L	0.1	0.03	200.8

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QA/QC Report

Client: Anchor QEA, LLC **Service Request:** K2108799
Project: Gorgas/201114-01.01 Task 02

ICP Linear Range (Quarterly)

Instrument: K-ICP-MS-06

Analyte	Concentration (ug/L)	Method
Arsenic 75	4500	200.8
Boron 11	9000	200.8
Molybdenum 95	4500	200.8

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QA/QC Report

Client: Anchor QEA, LLC | **Service Request:** K2108799
Project: Gorgas/201114-01.01 Task 02

Analysis Run Log

Instrument ID: **K-ICP-MS-06** | **Analytical BatchID:** **735207**

Sample	Dilution Factor	Date/Time	As	B	Li	Mo
ZZZZZZ	1	08/16/21 16:02				
ZZZZZZ	1	08/16/21 16:04				
ICV	1	08/16/21 16:05	X	X	X	X
CCV	1	08/16/21 16:07	X	X	X	X
ICB	1	08/16/21 16:09	X	X	X	X
CCB	1	08/16/21 16:10	X	X	X	X
LLICVW	1	08/16/21 16:12	X	X	X	X
KQ2114524-01MB	1	08/16/21 16:13	X	X	X	X
KQ2114524-02LCS	1	08/16/21 16:15	X	X	X	X
ZZZZZZ	20	08/16/21 16:17				
K2108799-001DUP	20	08/16/21 16:18		X		
K2108799-001MS	20	08/16/21 16:20		X		
ZZZZZZ	20	08/16/21 16:21				
K2108799-002DUP	20	08/16/21 16:23		X		
K2108799-002MS	20	08/16/21 16:25		X		
K2108799-019	20	08/16/21 16:26		X		
K2108799-020	20	08/16/21 16:28		X		
CCV	1	08/16/21 16:29	X	X	X	X
CCB	1	08/16/21 16:31	X	X	X	X
ZZZZZZ	10	08/16/21 16:33				
K2108799-001	5	08/16/21 16:34	X		X	X
K2108799-001DUP	5	08/16/21 16:36	X		X	X
K2108799-001MS	5	08/16/21 16:37	X		X	X
K2108799-002	5	08/16/21 16:39	X		X	X
K2108799-002DUP	5	08/16/21 16:41	X		X	X
K2108799-002MS	5	08/16/21 16:42	X		X	X
K2108799-003	5	08/16/21 16:44	X		X	X
K2108799-004	5	08/16/21 16:45	X		X	X
K2108799-005	5	08/16/21 16:47	X		X	X
CCV	1	08/16/21 16:49	X		X	X
CCB	1	08/16/21 16:53	X		X	X
K2108799-006	5	08/16/21 16:55	X		X	X
K2108799-007	5	08/16/21 16:57	X		X	X
K2108799-008	5	08/16/21 16:58	X		X	X
K2108799-009	5	08/16/21 17:00	X		X	X
K2108799-010	5	08/16/21 17:01	X		X	X
K2108799-011	5	08/16/21 17:03	X		X	X

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QA/QC Report

Client: Anchor QEA, LLC **Service Request:** K2108799
Project: Gorgas/201114-01.01 Task 02

Analysis Run Log

Instrument ID: **K-ICP-MS-06** **Analytical BatchID:** **735207**

Sample	Dilution Factor	Date/Time	As	B	Li	Mo
K2108799-012	5	08/16/21 17:04	X		X	X
K2108799-013	5	08/16/21 17:06	X		X	X
K2108799-014	5	08/16/21 17:08	X		X	X
K2108799-015	5	08/16/21 17:09	X		X	X
CCV	1	08/16/21 17:11	X		X	X
CCB	1	08/16/21 17:12	X		X	X
K2108799-016	5	08/16/21 17:14	X		X	X
K2108799-017	5	08/16/21 17:16	X		X	X
K2108799-018	5	08/16/21 17:17	X		X	X
K2108799-019	5	08/16/21 17:19	X		X	X
K2108799-020	5	08/16/21 17:20	X		X	X
CCV	1	08/16/21 17:22	X		X	X
CCB	1	08/16/21 17:24	X		X	X
ZZZZZZ	1	08/16/21 17:25				
ZZZZZZ	1	08/16/21 17:27				
ZZZZZZ	5	08/16/21 17:28				
ZZZZZZ	5	08/16/21 17:30				
ZZZZZZ	5	08/16/21 17:32				
ZZZZZZ	5	08/16/21 17:33				
ZZZZZZ	5	08/16/21 17:35				
ZZZZZZ	5	08/16/21 17:36				
ZZZZZZ	5	08/16/21 17:38				
ZZZZZZ	5	08/16/21 17:39				
ZZZZZZ	1	08/16/21 17:41				
ZZZZZZ	1	08/16/21 17:43				
ZZZZZZ	5	08/16/21 17:44				
ZZZZZZ	5	08/16/21 17:46				
ZZZZZZ	5	08/16/21 17:47				
ZZZZZZ	5	08/16/21 17:49				
ZZZZZZ	5	08/16/21 17:51				
ZZZZZZ	5	08/16/21 17:52				
ZZZZZZ	5	08/16/21 17:54				
ZZZZZZ	5	08/16/21 17:55				
ZZZZZZ	5	08/16/21 17:57				
ZZZZZZ	5	08/16/21 17:59				
ZZZZZZ	1	08/16/21 18:00				
ZZZZZZ	1	08/16/21 18:02				

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QA/QC Report

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 Task 02

Service Request: K2108799

Analysis Run Log

Instrument ID: **K-ICP-MS-06**

Analytical BatchID: **735207**

Sample	Dilution Factor	Date/Time	As	B	Li	Mo
ZZZZZZ	5	08/16/21 18:03				
ZZZZZZ	1	08/16/21 18:05				
ZZZZZZ	1	08/16/21 18:07				

Client: Anchor QEA, LLC **Service Request:** K2108799
Project: Gorgas/201114-01.01 Task 02

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Instrument ID: **K-ICP-MS-06** **Analytical BatchID:** **735207**

Sample	Date/Time	Sc45NG	Ge72He	In115He
ZZZZZZ	08/16/21 16:02			
ZZZZZZ	08/16/21 16:04			
ICV	08/16/21 16:05	98	99	99
CCV	08/16/21 16:07	98	103	99
ICB	08/16/21 16:09	97	98	99
CCB	08/16/21 16:10	98	101	99
LLICVW	08/16/21 16:12	98	100	98
KQ2114524-01MB	08/16/21 16:13	97	98	97
KQ2114524-02LCS	08/16/21 16:15	100	101	100
ZZZZZZ	08/16/21 16:17			
K2108799-001DUP	08/16/21 16:18	100	102	100
K2108799-001MS	08/16/21 16:20	98	102	99
ZZZZZZ	08/16/21 16:21			
K2108799-002DUP	08/16/21 16:23	101	97	98
K2108799-002MS	08/16/21 16:25	99	98	100
K2108799-019	08/16/21 16:26	98	99	98
K2108799-020	08/16/21 16:28	99	100	99
CCV	08/16/21 16:29	98	99	98
CCB	08/16/21 16:31	98	100	100
ZZZZZZ	08/16/21 16:33			
K2108799-001	08/16/21 16:34	100	100	100
K2108799-001DUP	08/16/21 16:36	101	100	100
K2108799-001MS	08/16/21 16:37	102	103	98
K2108799-002	08/16/21 16:39	101	100	100
K2108799-002DUP	08/16/21 16:41	102	100	99
K2108799-002MS	08/16/21 16:42	100	102	98
K2108799-003	08/16/21 16:44	102	102	100
K2108799-004	08/16/21 16:45	101	103	102
K2108799-005	08/16/21 16:47	104	102	101
CCV	08/16/21 16:49	101	102	100
CCB	08/16/21 16:53	101	99	101
K2108799-006	08/16/21 16:55	102	107	101
K2108799-007	08/16/21 16:57	101	101	99
K2108799-008	08/16/21 16:58	100	104	100
K2108799-009	08/16/21 17:00	100	103	101
K2108799-010	08/16/21 17:01	100	102	100
K2108799-011	08/16/21 17:03	100	102	101

ALS Group USA, Corp.
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QA/QC Report

Client: Anchor QEA, LLC **Service Request:** K2108799
Project: Gorgas/201114-01.01 Task 02

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Instrument ID: **K-ICP-MS-06** **Analytical BatchID:** **735207**

Sample	Date/Time	Sc45NG	Ge72He	In115He
K2108799-012	08/16/21 17:04	101	103	100
K2108799-013	08/16/21 17:06	100	101	99
K2108799-014	08/16/21 17:08	101	101	100
K2108799-015	08/16/21 17:09	100	98	99
CCV	08/16/21 17:11	97	100	100
CCB	08/16/21 17:12	99	100	99
K2108799-016	08/16/21 17:14	100	101	101
K2108799-017	08/16/21 17:16	100	101	98
K2108799-018	08/16/21 17:17	100	100	100
K2108799-019	08/16/21 17:19	99	98	97
K2108799-020	08/16/21 17:20	96	100	99
CCV	08/16/21 17:22	98	96	95
CCB	08/16/21 17:24	99	100	97
ZZZZZZ	08/16/21 17:25			
ZZZZZZ	08/16/21 17:27			
ZZZZZZ	08/16/21 17:28			
ZZZZZZ	08/16/21 17:30			
ZZZZZZ	08/16/21 17:32			
ZZZZZZ	08/16/21 17:33			
ZZZZZZ	08/16/21 17:35			
ZZZZZZ	08/16/21 17:36			
ZZZZZZ	08/16/21 17:38			
ZZZZZZ	08/16/21 17:39			
ZZZZZZ	08/16/21 17:41			
ZZZZZZ	08/16/21 17:43			
ZZZZZZ	08/16/21 17:44			
ZZZZZZ	08/16/21 17:46			
ZZZZZZ	08/16/21 17:47			
ZZZZZZ	08/16/21 17:49			
ZZZZZZ	08/16/21 17:51			
ZZZZZZ	08/16/21 17:52			
ZZZZZZ	08/16/21 17:54			
ZZZZZZ	08/16/21 17:55			
ZZZZZZ	08/16/21 17:57			
ZZZZZZ	08/16/21 17:59			
ZZZZZZ	08/16/21 18:00			
ZZZZZZ	08/16/21 18:02			

ALS Group USA, Corp.
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QA/QC Report

Client: Anchor QEA, LLC **Service Request:** K2108799
Project: Gorgas/201114-01.01 Task 02

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Instrument ID: **K-ICP-MS-06** **Analytical BatchID:** **735207**

Sample	**Date/Time**	Sc45NG	Ge72He	In115He
ZZZZZZ	08/16/21 18:03			
ZZZZZZ	08/16/21 18:05			
ZZZZZZ	08/16/21 18:07			

Raw Data

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Metals

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Preparation Information Benchsheet

Prep Run: 384408 **Prep Workflow**: MetDigAqMS **Status**: Prepped **Prep Date**: 08/05/2021 13:02
Team: Metals **Prep Method**: EPA CLP ILM04.0 **Current Step**: Digestion **Due Date**: 08/18/2021
Analyst: Anna Boyer **Rush/NPDES**: N/A **Hold Date**: 01/22/2022

Lab Code	Client ID	Bottle #	Initial Amt	Final Volume	Spike Amt	Spike ID	TestNo List	Comments
KQ2114524-01	Method Blank		10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
KQ2114524-02	Lab Control Sample		10 mL	10.4 mL	0.05 mL 0.05 mL 0.1 mL 0.05 mL 0.1 mL 0.1 mL	214237 217052 217137 217336 217670 218187	Metals D	1%HNO3,0.2%HCl
K2108799-001	GGS-COL-INF-MW-6D-1	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-001: KQ2114524-03	Duplicate	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-001: KQ2114524-06	Matrix Spike	.03	10 mL	10.4 mL	0.05 mL 0.05 mL 0.1 mL 0.05 mL 0.1 mL 0.1 mL	214237 217052 217137 217336 217670 218187	Metals D	1%HNO3,0.2%HCl
K2108799-002	GGS-COL-1-1	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-002: KQ2114524-04	Duplicate	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-002: KQ2114524-05	Matrix Spike	.03	10 mL	10.4 mL	0.05 mL 0.05 mL 0.1 mL 0.05 mL 0.1 mL 0.1 mL	214237 217052 217137 217336 217670 218187	Metals D	1%HNO3,0.2%HCl
K2108799-003	GGS-COL-3-1	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-004	GGS-COL-5-1	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-005	GGS-COL-1-2	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-006	GGS-COL-3-2	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-007	GGS-COL-5-2	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-008	GGS-COL-INF-MW-6D-3	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-009	GGS-COL-1-3	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-010	GGS-COL-3-3	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-011	GGS-COL-5-3	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-012	GGS-COL-1-4	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-013	GGS-COL-3-4	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-014	GGS-COL-5-4	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-015	GGS-COL-INF-MW-6D-5	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-016	GGS-COL-1-5	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-017	GGS-COL-3-5	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl

K2108799-018	GGS-COL-5-5	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-019	GGS-COL-INF-MW-7-1	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-020	GGS-COL-2-1	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl

26 Total Samples consisting of 20 Client Samples, 4 Client QC Samples, 2 Batch QC Samples associated with the current Prep Run.

Spiking Solutions

Name	Type	ID	Expires	Name	Type	ID	Expires
K-MET 10ppm Li	Spike	217336	4/30/2022	k-met 1/100 QCP CICV-1	Spike	217670	3/15/2022
K-MET 5ppm Alt. 200.8	Spike	214237	11/30/2021	k-met 1/100 QCP-CICV-3	Spike	218187	3/2/2022
K-MET Mo/U 5ppm	Spike	217052	9/30/2021	k-met Sb 1ug/mL Sb	Spike	217137	5/16/2022

Preparation Materials

Step	Name	ID	Step	Name	ID
Digestion	K-MET HNO3	213649	Digestion	K-MET HCl ULTREX	217887
Digestion	K-MET 16 mL Tube	216994			

Preparation Hardware / Equipment

Step	Name	Property	Value		Step	Name	Property	Value	
Digestion	K-BlockDigester-18	IR Thermometer ID: IR03			Digestion	K-BlockDigester-18	Temperature Check Location	17	
Digestion	K-BlockDigester-18	Temperature	93	deg C	Digestion	K-CR 20-200 A			

Preparation Steps

Step	Started	Finished	By	Assisted By	Training?	Comments
Digestion	05-AUG-21 13:02	05-AUG-21 15:02	Anna Boyer		N	

Comments

Review

Reviewed by: mr Date: 8-6-21

ICPMS LCSW AND SPIKING SOLUTIONS

5.00mL to 500mL Dilution of Inorganics Ventures QCP-CICV-1

k-met 1/100 QCP-CCV-1

Analyte	Concentration in solution (ppb)	Concentration in digest (ppb)
Al	10000	100
Ba	10000	100
Co	2500	25
Mn	2500	25
Ni	2500	25
V	2500	25
Zn	2500	25
Cu	1250	12.5
Ag	1250	12.5
Cr	1000	10
Be	250	2.5

0.1mL to 100mL Dilution of 1000ppm Sb

k-met 1ug/mL Sb

Analyte	Concentration in solution (ppb)	Concentration in digest (ppb)
Sb	1000	10

5.00mL to 500mL Dilution of Inorganics Ventures QCP-CICV-3

k-met 1/100 QCP-CICV-3

Analyte	Concentration in solution (ppb)	Concentration in digest (ppb)
As	5000	50
Pb	5000	50
Se	5000	50
Tl	5000	50
Cd	2500	25

0.5mL to 100mL Dilution of 1,000 ppm Mo and 1,000 ppm U

k-met Mo/U 5ppm

Analyte	Concentration in solution (ppb)	Concentration in digest (ppb)
Mo	5000	25
U	5000	25

1:02-3:02
B118|L17|93C

A H
L; 217336
8/19

Preparation Information Benchsheet

Prep Run: 384408 **Prep Workflow**: MetDigAqMS **Status**: Draft **Prep Date**: 08/02/2021 11:21
Team: Metals **Prep Method**: EPA CLP ILM04.0 **Current Step**: Digestion **Due Date**: 08/06/2021
Analyst: ABOYER **Rush/NPDES**: N/A **Hold Date**: 01/22/2022

24

Lab Code	Client ID	Bottle #	Initial Amt	Final Volume	Spike Amt	Spike ID	TestNo List	Comments
KQ2114524-01	Method Blank		10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
KQ2114524-02	Lab Control Sample		10 mL	10.4 mL	0.05 mL 0.05 mL 0.1 mL 0.1 mL 0.1 mL	214237 217052 217137 217670 218187	Metals D	1%HNO3,0.2%HCl
K2108799-001	GGS-COL-INF-MW-6D-1	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-001: KQ2114524-03	Duplicate	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-001: KQ2114524-06	Matrix Spike	.03	10 mL	10.4 mL	0.05 mL 0.05 mL 0.1 mL 0.1 mL 0.1 mL	214237 217052 217137 217670 218187	Metals D	1%HNO3,0.2%HCl
K2108799-002	GGS-COL-1-1	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-002: KQ2114524-04	Duplicate	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-002: KQ2114524-05	Matrix Spike	.03	10 mL	10.4 mL	0.05 mL 0.05 mL 0.1 mL 0.1 mL 0.1 mL	214237 217052 217137 217670 218187	Metals D	1%HNO3,0.2%HCl
K2108799-003	GGS-COL-3-1	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-004	GGS-COL-5-1	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-005	GGS-COL-1-2	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-006	GGS-COL-3-2	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-007	GGS-COL-5-2	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-008	GGS-COL-INF-MW-6D-3	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-009	GGS-COL-1-3	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-010	GGS-COL-3-3	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-011	GGS-COL-5-3	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-012	GGS-COL-1-4	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-013	GGS-COL-3-4	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-014	GGS-COL-5-4	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-015	GGS-COL-INF-MW-6D-5	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-016	GGS-COL-1-5	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-017	GGS-COL-3-5	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl

K2108799-018	GGS-COL-5-5	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-019	GGS-COL-INF-MW-7-1	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl
K2108799-020	GGS-COL-2-1	.03	10 mL	10 mL			Metals D	1%HNO3,0.2%HCl

26 Total Samples consisting of 20 Client Samples, 4 Client QC Samples, 2 Batch QC Samples associated with the current Prep Run.

Spiking Solutions

Name	Type	ID	Expires
K-MET 5ppm Alt. 200.8	Spike	214237	11/30/2021
K-MET Mo/U 5ppm	Spike	217052	9/30/2021
k-met 1/100 QCP CICV-1	Spike	217670	3/15/2022
k-met 1/100 QCP-CICV-3	Spike	218187	3/2/2022
k-met Sb 1ug/mL Sb	Spike	217137	5/16/2022

Preparation Materials

Preparation Hardware / Equipment

Preparation Steps

Step	Started	Finished	By	Assisted By	Training?	Comments
Digestion					N	

Comments

Review

Reviewed by: ________________________ Date: ____________

Service Request # K2108799; K2108287 #3 Li Dilution; K2107414
Calibration: 081621BICPMS06
ALS LIMS Run# 735207
Pipette IDs: 16006318, 19070685, 18010244
Pipette Check Due: 08/19/21
Cal Std: MS28-45-D
ICV Std: MS28-24-D
LLICV Std: MS28-41-B
I.S. Solution: MS27-100-E
Tune Std: MS28-3-A

ICSA: MS28-44-H
ICSAB: MS28-44-I

ICP-MS Data Review Form

	Yes	No	NA
1. Appropriate standardization completed	X		
2. ICV in control (+/- 10%)	X		
3. CCV's in control (+/- 10%)	X		
4. ICB/CCB's below MRL	X		
5. LLICV standard analyzed and in control	X		
6. ICS standards within 20% of true value			X
6. All analytes within instrument linear range	X		
7. Adequate rinse out time allowed	X		
8. Internal standards in control	X		
9. Interferences checked	X		
10. Was the run terminated? If so, why.		X	

See Benchsheet exception report for sample batch QC information.
Comments: After 4:31 NR B.

Prep Batches: 384408, 383661, 382300

Primary Review by ___ Date 8/16/21

Secondary Review by ___ Date 8/17/21

Data Review Form

Instrument ID#:	**K-ICP-MS-06**
DataFile Name:	**R:\ICP\WIP\DATA\K-ICP-MS-06 (Agilent 7800)\081621B.csv**
RUNNO:	**735207**

K2107414

No exceptions to report.

K2108287

No exceptions to report.

K2108799

No exceptions to report.

Primary Approver: GM 8/16/21
Secondary Approver: JC 8/17/21

Page 1 of 1

	Sample								
		Rjct	Data File	Acq. Date-Time	Type	L	Sample Name	Co...	Vial Number
1			001SMPL.	2021-08-16 3:48:11 P	Sampl		Conditioning	10X	1306
2			002SMPL.	2021-08-16 3:49:47 P	Sampl		Conditioning	10X	1307
3			003SMPL.	2021-08-16 3:51:23 P	Sampl		Conditioning	10X	1308
4			004SMPL.	2021-08-16 3:52:59 P	Sampl		Conditioning	10X	1306
5			005SMPL.	2021-08-16 3:54:34 P	Sampl		Conditioning	10X	1307
6			006SMPL.	2021-08-16 3:56:09 P	Sampl		Conditioning	10X	1308
7			007SMPL.	2021-08-16 3:57:46 P	Sampl		PRIMER		2
8			008SMPL.	2021-08-16 3:59:22 P	Sampl		RINSE		1
9			009SMPL.	2021-08-16 4:00:58 P	Sampl		RINSE		1
10			010CALB.	2021-08-16 4:02:34 P	CalBlk		Blank		1
11			011CALS.	2021-08-16 4:04:10 P	CalStd		25ppb		2
12			012_ICV.d	2021-08-16 4:05:54 P	ICV		ICV		2101
13			013_CCV.	2021-08-16 4:07:31 P	CCV		CCV		2
14			014_ICB.d	2021-08-16 4:09:07 P	ICB		ICB		1
15			015_CCB.	2021-08-16 4:10:44 P	CCB		CCB		1
16			016LICV.d	2021-08-16 4:12:21 P	LLICV		LLICVW		2102
17			017_PB.d	2021-08-16 4:13:57 P	PB		KQ2114524-0		1309
18			018_LCS.d	2021-08-16 4:15:33 P	LCS		KQ2114524-0		1310
19			019SMPL.	2021-08-16 4:17:08 P	Sampl		K2108799-001	D 2	1311
20			020SMPL.	2021-08-16 4:18:44 P	Sampl		KQ2114524-0	D 2	1312
21			021SMPL.	2021-08-16 4:20:20 P	Sampl		KQ2114524-0	D 2	1401
22			022SMPL.	2021-08-16 4:21:56 P	Sampl		K2108799-002	D 2	1402
23			023SMPL.	2021-08-16 4:23:31 P	Sampl		KQ2114524-0	D 2	1403
24			024SMPL.	2021-08-16 4:25:06 P	Sampl		KQ2114524-0	D 2	1404
25			025SMPL.	2021-08-16 4:26:41 P	Sampl		K2108799-019	D 2	1405
26			026SMPL.	2021-08-16 4:28:17 P	Sampl		K2108799-020	D 2	1406
27			027_CCV.	2021-08-16 4:29:54 P	CCV		CCV		2
28			028_CCB.	2021-08-16 4:31:30 P	CCB		CCB		1
29			029SMPL.	2021-08-16 4:33:07 P	Sampl		K2108287-003	D 1	3107
30			030_ARF.d	2021-08-16 4:34:42 P	AllRef		K2108799-001	D 5	1407
31			031SMPL.	2021-08-16 4:36:17 P	Sampl		KQ2114524-0	D 5	1408
32			032_SPK.d	2021-08-16 4:37:53 P	Spike		KQ2114524-0	D 5	1409
33			033_ARF.d	2021-08-16 4:39:29 P	AllRef		K2108799-002	D 5	1410
34			034SMPL.	2021-08-16 4:41:05 P	Sampl		KQ2114524-0	D 5	1411
35			035_SPK.d	2021-08-16 4:42:40 P	Spike		KQ2114524-0	D 5	1412

	Sample								
		Rjct	Data File	Acq. Date-Time	Type	L	Sample Name	Co...	Vial Number
36			036SMPL.	2021-08-16 4:44:16 P	Sampl		K2108799-003	D 5	1501
37			037SMPL.	2021-08-16 4:45:51 P	Sampl		K2108799-004	D 5	1502
38			038SMPL.	2021-08-16 4:47:27 P	Sampl		K2108799-005	D 5	1503
39			039_CCV.	2021-08-16 4:49:04 P	CCV		CCV		2
40			040_CCB.	2021-08-16 4:53:48 P	CCB		CCB		1
41			041SMPL.	2021-08-16 4:55:25 P	Sampl		K2108799-006	D 5	1504
42			042SMPL.	2021-08-16 4:57:00 P	Sampl		K2108799-007	D 5	1505
43			043SMPL.	2021-08-16 4:58:36 P	Sampl		K2108799-008	D 5	1506
44			044SMPL.	2021-08-16 5:00:12 P	Sampl		K2108799-009	D 5	1507
45			045SMPL.	2021-08-16 5:01:47 P	Sampl		K2108799-010	D 5	1508
46			046SMPL.	2021-08-16 5:03:23 P	Sampl		K2108799-011	D 5	1509
47			047SMPL.	2021-08-16 5:04:57 P	Sampl		K2108799-012	D 5	1510
48			048SMPL.	2021-08-16 5:06:33 P	Sampl		K2108799-013	D 5	1511
49			049SMPL.	2021-08-16 5:08:07 P	Sampl		K2108799-014	D 5	1512
50			050SMPL.	2021-08-16 5:09:43 P	Sampl		K2108799-015	D 5	3101
51			051_CCV.	2021-08-16 5:11:19 P	CCV		CCV		2
52			052_CCB.	2021-08-16 5:12:55 P	CCB		CCB		1
53			053SMPL.	2021-08-16 5:14:30 P	Sampl		K2108799-016	D 5	3102
54			054SMPL.	2021-08-16 5:16:06 P	Sampl		K2108799-017	D 5	3103
55			055SMPL.	2021-08-16 5:17:41 P	Sampl		K2108799-018	D 5	3104
56			056SMPL.	2021-08-16 5:19:16 P	Sampl		K2108799-019	D 5	3105
57			057SMPL.	2021-08-16 5:20:51 P	Sampl		K2108799-020	D 5	3106
58			058_CCV.	2021-08-16 5:22:28 P	CCV		CCV		2
59			059_CCB.	2021-08-16 5:24:04 P	CCB		CCB		1
60			060_PB.d	2021-08-16 5:25:41 P	PB		KQ2111985-0		3108
61			061_LCS.d	2021-08-16 5:27:17 P	LCS		KQ2111985-0		3109
62			062_ARF.d	2021-08-16 5:28:53 P	AllRef		K2107414-001	D 5	3110
63			063SMPL.	2021-08-16 5:30:28 P	Sampl		KQ2111985-0	D 5	3111
64			064_SPK.d	2021-08-16 5:32:03 P	Spike		KQ2111985-0	D 5	3112
65			065_ARF.d	2021-08-16 5:33:37 P	AllRef		K2107414-002	D 5	3201
66			066SMPL.	2021-08-16 5:35:13 P	Sampl		KQ2111985-0	D 5	3202
67			067_SPK.d	2021-08-16 5:36:47 P	Spike		KQ2111985-0	D 5	3203
68			068SMPL.	2021-08-16 5:38:22 P	Sampl		K2107414-003	D 5	3204
69			069SMPL.	2021-08-16 5:39:57 P	Sampl		K2107414-004	D 5	3205
70			070_CCV.	2021-08-16 5:41:33 P	CCV		CCV		2

	Sample								
		Rjct	Data File	Acq. Date-Time	Type	L	Sample Name	Co...	Vial Number
71			071_CCB.	2021-08-16 5:43:09 P	CCB		CCB		1
72			072SMPL.	2021-08-16 5:44:46 P	Sampl		K2107414-005	D 5	3206
73			073SMPL.	2021-08-16 5:46:21 P	Sampl		K2107414-006	D 5	3207
74			074SMPL.	2021-08-16 5:47:56 P	Sampl		K2107414-007	D 5	3208
75			075SMPL.	2021-08-16 5:49:32 P	Sampl		K2107414-008	D 5	3209
76			076SMPL.	2021-08-16 5:51:08 P	Sampl		K2107414-009	D 5	3210
77			077SMPL.	2021-08-16 5:52:43 P	Sampl		K2107414-010	D 5	3211
78			078SMPL.	2021-08-16 5:54:19 P	Sampl		K2107414-011	D 5	3212
79			079SMPL.	2021-08-16 5:55:54 P	Sampl		K2107414-012	D 5	3301
80			080SMPL.	2021-08-16 5:57:30 P	Sampl		K2107414-013	D 5	3302
81			081SMPL.	2021-08-16 5:59:07 P	Sampl		K2107414-014	D 5	3303
82			082_CCV.	2021-08-16 6:00:43 P	CCV		CCV		2
83			083_CCB.	2021-08-16 6:02:18 P	CCB		CCB		1
84			084SMPL.	2021-08-16 6:03:54 P	Sampl		K2107414-015	D 5	3304
85			085_CCV.	2021-08-16 6:05:30 P	CCV		CCV		2
86			086_CCB.	2021-08-16 6:07:06 P	CCB		CCB		1

	Analyte					
	Name	Mass	ISTD	Tune Mode	Units	Replicate
1	Li	7	45	No Gas	ug/l	3
2	B	11	45	No Gas	ug/l	3
3	As	75	72	He	ug/l	3
4	Mo	95	115	He	ug/l	3
5	Mo	98	115	He	ug/l	3
6	Sc	45		No Gas		3
7	Sc	45		He		3
8	Ge	72		He		3
9	In	115		He		3

US EPA Tune Check Report

Operator Name	ALKLS NoUser
Acq/Data Batch	D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621 Water.b
Acq. Date-Time	2021-08-16 3:08:56 PM
Report Comment	---
Instrument Name	G8421A JP16310358

[No Gas]

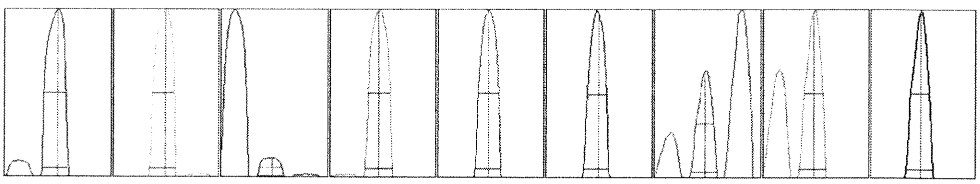
Sensitivity

Mass	CPS	RSD%	RSD% (Required)	RSD% (Flag)
7	55630.90	0.653	5.000	
9	12124.51	1.262	5.000	
24	38416.42	1.182	5.000	
59	56651.42	0.588	5.000	
115	131651.33	0.570	5.000	
140	144749.07	0.633	5.000	
208	94613.54	0.605	5.000	
209	150446.38	0.407	5.000	
238	196966.30	0.557	5.000	

Mass	Rep#1 Count	Rep#2 Count	Rep#3 Count	Rep#4 Count	Rep#5 Count
7	5615	5546	5520	5581	5553
9	1236	1214	1209	1210	1194
24	3916	3837	3843	3812	3800
59	5723	5659	5647	5641	5655
115	13282	13198	13105	13122	13118
140	14543	14525	14328	14442	14536
208	9514	9524	9387	9444	9437
209	14976	15108	15092	14984	15064
238	19752	19772	19765	19684	19511

Integration Time [sec] 0.1

Resolution/Axis



Mass	Peak Height	Axis	Axis (Required)	Axis (Flag)	W-5%	W-5% (Flag)	W-5% (Required)
7	9684.59	7.05	6.90 - 7.10		0.736		0.900
9	2085.15	9.00	8.90 - 9.10		0.735		0.900
24	6267.42	23.95	23.90 - 24.10		0.764		0.900

US EPA Tune Check Report

Mass	Peak Height	Axis	Axis (Required)	Axis (Flag)	W-5%	W-5% (Flag)	W-5% (Required)
59	9716.06	58.90	58.90 - 59.10		0.776		0.900
115	24025.01	114.95	114.90 - 115.10		0.732		0.900
140	27337.36	140.00	139.90 - 140.10		0.728		0.900
208	19223.10	207.95	207.90 - 208.10		0.754		0.900
209	30057.08	208.95	208.90 - 209.10		0.757		0.900
238	39710.38	237.95	237.90 - 238.10		0.767		0.900

Integration Time [sec]	0.1
Acquisition Time [sec]	268.4
Y Axis	Linear

Tune Parameters

Plasma Parameters

Plasma Mode	---	Nebulizer Gas	0.59 L/min	Dilution Gas	0.50 L/min
RF Power	1600 W	Option Gas	---	Auxiliary Gas	0.90 L/min
RF Matching	1.60 V	Nebulizer Pump	0.10 rps	Plasma Gas	15.0 L/min
Sample Depth	8.0 mm	S/C Temp	2 °C		

Lens Parameters

Extract 1	0.0 V	Omega Lens	7.4 V	Deflect	15.4 V
Extract 2	-140.0 V	Cell Entrance	-30 V	Plate Bias	-55 V
Omega Bias	-75 V	Cell Exit	-50 V		

Cell Parameters

Use Gas	Yes	3rd Gas Flow	---	Energy Discrimination	5.0 V
He Flow	0.0 mL/min	OctP Bias	-8.0 V		
H2 Flow	0.0 mL/min	OctP RF	200 V		

QP Parameters

Mass Gain	126	Axis Gain	1.0001	QP Bias	-3.0 V
Mass Offset	126	Axis Offset	0.00		

Hardware Settings

Torch

Torch H	-0.4 mm	Torch V	-0.2 mm

EM

Discriminator	4.2 mV	Analog HV	2261 V	Pulse HV	1468 V

Calibration Blank Report

Sample Name Blank

File Name 010CALB.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:02:34 PM

Sample Type CalBlk

Comment ---

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune Mode	CPS	CPS RSD
Li	7	45	No Gas	200	22.9
B	11	45	No Gas	2287	5.1
As	75	72	He	0	173.2
Mo	95	115	He	2	86.6
Mo	98	115	He	1	173.2

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD
Sc	45	No Gas	1507411	0.8
Sc	45	He	25900	1.0
Ge	72	He	25022	1.4
In	115	He	301272	1.4

AM
8/16/21

Calibration Standard Report

Sample Name 25ppb

File Name 011CALS.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:04:10 PM

Sample Type CalStd

Comment ---

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune Mode	CPS	CPS RSD
Li	7	45	No Gas	240886	1.0
B	11	45	No Gas	30562	2.4
As	75	72	He	2252	3.2
Mo	95	115	He	9629	1.8
Mo	98	115	He	17005	1.2

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1496696	1.7	1507411.38	99.29	
Sc	45	He	26034	1.4	25900.24	100.52	
Ge	72	He	25019	1.0	25022.34	99.99	
In	115	He	301363	0.6	301271.52	100.03	

Initial Calibration Verification (ICV) Report

Sample Name	ICV
File Name	012_ICV.d
Data Path Name	D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time	2021-08-16 4:05:54 PM
Sample Type	ICV
Comment	---
ISTD Ref FileName	010CALB.d
Operator	**ALKLS** **NoUser**

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	% Rec	QC Flag
Li	7	45	No Gas	25.85521	ug/l	0.8	246303	103.42	
B	11	45	No Gas	24.52531	ug/l	2.0	29680	98.1	
As	75	72	He	25.25140	ug/l	2.1	2249	101.01	
Mo	95	115	He	25.12314	ug/l	1.1	19208	100.49	
Mo	98	115	He	25.23660	ug/l	0.9	34078	100.95	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1479746	0.9	1507411.38	98.16	
Sc	45	He	25924	2.5	25900.24	100.09	
Ge	72	He	24742	2.2	25022.34	98.88	
In	115	He	299148	0.4	301271.52	99.3	

Continuing Calibration Verification (CCV) Report

Sample Name CCV

File Name 013_CCV.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:07:31 PM

Sample Type CCV

Comment ---

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Units	Conc. RSD	CPS	% Rec	QC Flag
Li	7	45	No Gas	25.13835	ug/l	0.9	239667	100.55	
B	11	45	No Gas	25.49270	ug/l	2.8	30786	101.97	
As	75	72	He	24.32155	ug/l	2.1	2252	97.29	
Mo	95	115	He	12.61443	ug/l	1.2	9584	100.92	
Mo	98	115	He	12.51224	ug/l	1.2	16790	100.1	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1480840	0.3	1507411.38	98.24	
Sc	45	He	26161	0.6	25900.24	101.01	
Ge	72	He	25717	2.2	25022.34	102.78	
In	115	He	297275	1.1	301271.52	98.67	

Initial Calibration Blank (ICB) Report

Sample Name ICB
File Name 014_ICB.d
Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time 2021-08-16 4:09:07 PM
Sample Type ICB
Comment —
ISTD Ref FileName 010CALB.d
Operator ALKLS
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	0.02624	ug/l	3.6	440	
B	11	45	No Gas	-0.08513	ug/l	N/A	2124	
As	75	72	He	0.02281	ug/l	75.8	2	
Mo	95	115	He	0.00004	ug/l	6435.6	2	
Mo	98	115	He	0.01406	ug/l	30.8	20	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1460524	2.0	1507411.38	96.89	
Sc	45	He	25757	3.4	25900.24	99.45	
Ge	72	He	24531	1.3	25022.34	98.04	
In	115	He	297733	1.1	301271.52	98.83	

Continuing Calibration Blank (CCB) Report

Sample Name CCB
File Name 015_CCB.d
Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time 2021-08-16 4:10:44 PM
Sample Type CCB
Comment ---
ISTD Ref FileName 010CALB.d
Operator ALKLS
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	0.01172	ug/l	68.9	307	
B	11	45	No Gas	-0.41477	ug/l	N/A	1777	
As	75	72	He	0.00373	ug/l	171.3	1	
Mo	95	115	He	-0.00286	ug/l	N/A	0	
Mo	98	115	He	0.00414	ug/l	59.4	7	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1475656	0.8	1507411.38	97.89	
Sc	45	He	25757	0.8	25900.24	99.45	
Ge	72	He	25310	2.5	25022.34	101.15	
In	115	He	297154	0.8	301271.52	98.63	

Low Level Initial Calibration Verification (LLICV) Report

Sample Name LLICVW

File Name 016LICV.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:12:21 PM

Sample Type LLICV

Comment ---

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc.RSD	CPS	% Rec	QC Flag
Li	7	45	No Gas	0.12087	ug/l	3.5	1340	120.87	
B	11	45	No Gas	1.33941	ug/l	10.4	3724	66.97	
As	75	72	He	0.44347	ug/l	19.1	40	88.69	
Mo	95	115	He	0.09014	ug/l	36.4	70	90.14	
Mo	98	115	He	0.11082	ug/l	9.8	149	110.82	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1472853	2.4	1507411.38	97.71	
Sc	45	He	25907	4.3	25900.24	100.03	
Ge	72	He	24909	3.8	25022.34	99.55	
In	115	He	295523	1.7	301271.52	98.09	

Prep Blank (PB) Report

Sample Name KQ2114524-01

File Name 017_PB.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:13:57 PM

Sample Type PB

Comment ---

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	0.00420	ug/l	149.7	233	
B	11	45	No Gas	-0.48811	ug/l	N/A	1677	
As	75	72	He	0.00770	ug/l	3.5	1	
Mo	95	115	He	0.00311	ug/l	166.5	4	
Mo	98	115	He	0.00003	ug/l	5302.0	1	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1460844	0.6	1507411.38	96.91	
Sc	45	He	25206	2.3	25900.24	97.32	
Ge	72	He	24485	2.4	25022.34	97.85	
In	115	He	292443	1.5	301271.52	97.07	

Laboratory Control Sample (LCS) Report

Sample Name KQ2114524-02

File Name 018_LCS.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:15:33 PM

Sample Type LCS

Comment ---

ISTD Ref FileName 010CALB.d

Operator ALKLS NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	ExpValue	% Rec	QC Flag
Li	7	45	No Gas	47.76880	ug/l	0.9	462738	50	95.54	
B	11	45	No Gas	22.73824	ug/l	2.5	28157	25	90.95	
As	75	72	He	46.27768	ug/l	2.2	4208	50	92.56	
Mo	95	115	He	24.51310	ug/l	1.1	18785	25	98.05	
Mo	98	115	He	24.09169	ug/l	1.1	32607	25	96.37	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1505264	0.7	1507411.38	99.86	
Sc	45	He	26124	1.8	25900.24	100.86	
Ge	72	He	25256	1.1	25022.34	100.93	
In	115	He	299834	0.8	301271.52	99.52	

Sample Report

Sample Name K2108799-001

File Name 019SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:17:08 PM

Sample Type Sample

Comment D 20X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	15.09970	ug/l	0.6	145813	
B	11	45	No Gas	62.15782	ug/l	2.0	72733	
As	75	72	He	5.22078	ug/l	5.1	477	
Mo	95	115	He	0.30372	ug/l	9.0	233	
Mo	98	115	He	0.32573	ug/l	0.8	439	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1499051	1.4	1507411.38	99.45	
Sc	45	He	25359	1.4	25900.24	97.91	
Ge	72	He	25336	1.4	25022.34	101.25	
In	115	He	297749	0.5	301271.52	98.83	

Sample Report

Sample Name	KQ2114524-03
File Name	020SMPL.d
Data Path Name	D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time	2021-08-16 4:18:44 PM
Sample Type	Sample
Comment	D 20X
ISTD Ref FileName	010CALB.d
Operator	ALKLS NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	14.92916	ug/l	1.7	144510	
B	11	45	No Gas	62.13830	ug/l	2.7	72860	
As	75	72	He	5.59258	ug/l	1.8	513	
Mo	95	115	He	0.27185	ug/l	22.4	211	
Mo	98	115	He	0.30085	ug/l	11.8	409	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1502992	2.3	1507411.38	99.71	
Sc	45	He	25513	3.5	25900.24	98.5	
Ge	72	He	25473	1.7	25022.34	101.8	
In	115	He	299917	2.4	301271.52	99.55	

Sample Report

Sample Name KQ2114524-06
File Name 021SMPL.d
Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time 2021-08-16 4:20:20 PM
Sample Type Sample
Comment D 20X
ISTD Ref FileName 010CALB.d
Operator **ALKLS** **NoUser**

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	17.05608	ug/l	1.3	162426	
B	11	45	No Gas	61.51974	ug/l	1.9	71011	
As	75	72	He	7.68079	ug/l	1.7	704	
Mo	95	115	He	1.50909	ug/l	7.7	1156	
Mo	98	115	He	1.47864	ug/l	3.7	1998	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1478728	1.2	1507411.38	98.1	
Sc	45	He	26084	4.1	25900.24	100.71	
Ge	72	He	25450	1.0	25022.34	101.71	
In	115	He	299217	0.8	301271.52	99.32	

Sample Report

Sample Name K2108799-002

File Name 022SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:21:56 PM

Sample Type Sample

Comment D 20X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	0.17679	ug/l	7.0	1877	
B	11	45	No Gas	40.34510	ug/l	2.4	47336	
As	75	72	He	0.01168	ug/l	58.4	1	
Mo	95	115	He	0.02612	ug/l	62.5	22	
Mo	98	115	He	0.03695	ug/l	27.4	51	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1478593	1.3	1507411.38	98.09	
Sc	45	He	25894	2.3	25900.24	99.97	
Ge	72	He	24248	2.1	25022.34	96.9	
In	115	He	299659	0.9	301271.52	99.46	

Sample Report

Sample Name	KQ2114524-04
File Name	023SMPL.d
Data Path Name	D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time	2021-08-16 4:23:31 PM
Sample Type	Sample
Comment	D 20X
ISTD Ref FileName	010CALB.d
Operator	**ALKLS** **NoUser**

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	0.18016	ug/l	10.8	1957	
B	11	45	No Gas	40.29117	ug/l	2.9	48446	
As	75	72	He	0.00015	ug/l	4478.1	0	
Mo	95	115	He	0.04258	ug/l	40.9	34	
Mo	98	115	He	0.03502	ug/l	46.6	48	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1514976	1.1	1507411.38	100.5	
Sc	45	He	25657	0.7	25900.24	99.06	
Ge	72	He	24261	2.6	25022.34	96.96	
In	115	He	296105	1.4	301271.52	98.29	

Sample Report

Sample Name KQ2114524-05

File Name 024SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:25:06 PM

Sample Type Sample

Comment D 20X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	2.54827	ug/l	2.0	24648	
B	11	45	No Gas	40.52901	ug/l	1.6	47948	
As	75	72	He	2.39585	ug/l	13.4	212	
Mo	95	115	He	1.28683	ug/l	2.2	989	
Mo	98	115	He	1.22874	ug/l	2.7	1666	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1491302	2.2	1507411.38	98.93	
Sc	45	He	25787	1.7	25900.24	99.56	
Ge	72	He	24558	0.8	25022.34	98.15	
In	115	He	300050	1.2	301271.52	99.59	

Sample Report

Sample Name	K2108799-019
File Name	025SMPL.d
Data Path Name	D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time	2021-08-16 4:26:41 PM
Sample Type	Sample
Comment	D 20X
ISTD Ref FileName	010CALB.d
Operator	**ALKLS** **NoUser**

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	8.72670	ug/l	1.3	82797	
B	11	45	No Gas	80.92367	ug/l	2.1	92251	
As	75	72	He	12.34053	ug/l	1.0	1104	
Mo	95	115	He	10.34131	ug/l	4.2	7831	
Mo	98	115	He	10.20503	ug/l	1.4	13642	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1471448	0.8	1507411.38	97.61	
Sc	45	He	25596	1.4	25900.24	98.83	
Ge	72	He	24842	4.7	25022.34	99.28	
In	115	He	296125	1.6	301271.52	98.29	

Sample Report

Sample Name K2108799-020

File Name 026SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:28:17 PM

Sample Type Sample

Comment D 20X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	0.23270	ug/l	8.0	2434	
B	11	45	No Gas	57.06379	ug/l	1.4	66711	
As	75	72	He	0.01854	ug/l	60.0	2	
Mo	95	115	He	0.00447	ug/l	150.6	6	
Mo	98	115	He	0.00830	ug/l	62.9	12	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1493607	1.4	1507411.38	99.08	
Sc	45	He	25927	2.9	25900.24	100.1	
Ge	72	He	25139	3.1	25022.34	100.47	
In	115	He	297149	0.4	301271.52	98.63	

Continuing Calibration Verification (CCV) Report

Sample Name CCV

File Name 027_CCV.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:29:54 PM

Sample Type CCV

Comment ---

ISTD Ref FileName 010CALB.d

Operator ALKLS NoUser

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Units	Conc. RSD	CPS	% Rec	QC Flag
Li	7	45	No Gas	24.99763	ug/l	2.2	237008	99.99	
B	11	45	No Gas	26.30772	ug/l	2.4	31524	105.23	
As	75	72	He	25.71741	ug/l	2.2	2301	102.87	
Mo	95	115	He	12.40920	ug/l	2.8	9402	99.27	
Mo	98	115	He	12.51234	ug/l	3.5	16741	100.1	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1473089	2.2	1507411.38	97.72	
Sc	45	He	26147	1.8	25900.24	100.95	
Ge	72	He	24849	1.8	25022.34	99.31	
In	115	He	296551	2.4	301271.52	98.43	

Continuing Calibration Blank (CCB) Report

Sample Name CCB

File Name 028_CCB.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:31:30 PM

Sample Type CCB

Comment ---

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	0.03138	ug/l	23.6	493	
B	11	45	No Gas	0.56422	ug/l	19.2	2867	
As	75	72	He	0.02230	ug/l	58.0	2	
Mo	95	115	He	0.00581	ug/l	128.8	7	
Mo	98	115	He	0.01558	ug/l	8.6	22	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1475218	1.1	1507411.38	97.86	
Sc	45	He	26351	2.2	25900.24	101.74	
Ge	72	He	25032	0.6	25022.34	100.04	
In	115	He	299940	0.5	301271.52	99.56	

Sample Report

Sample Name K2108287-003

File Name 029SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:33:07 PM

Sample Type Sample

Comment D 10X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	86.17562	ug/l	1.3	835510	
B	11	45	No Gas	344.73245	ug/l	2.3	394979	
As	75	72	He	0.98227	ug/l	11.0	89	
Mo	95	115	He	361.65208	ug/l	1.5	279578	
Mo	98	115	He	363.62812	ug/l	1.8	496529	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1506880	0.7	1507411.38	99.96	
Sc	45	He	25944	1.9	25900.24	100.17	
Ge	72	He	25059	1.6	25022.34	100.15	
In	115	He	302573	1.9	301271.52	100.43	

Reference Sample Report

Sample Name	K2108799-001
File Name	030_ARF.d
Data Path Name	D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time	2021-08-16 4:34:42 PM
Sample Type	AllRef
Comment	D 5X
ISTD Ref FileName	010CALB.d
Sample QC Pass/Fial	Pass
ISTD QC Pass/Fail	Pass
Operator	**ALKLS** **NoUser**

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	61.94902	ug/l	0.1	601634	
~~B~~	~~11~~	~~45~~	~~No Gas~~	~~266.87720~~	~~ug/l~~	~~1.8~~	~~306790~~	20X am 8/16/21
As	75	72	He	22.99404	ug/l	3.6	2073	
Mo	95	115	He	1.32280	ug/l	8.4	1022	
Mo	98	115	He	1.37905	ug/l	2.9	1879	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1509186	0.3	1507411.38	100.12	
Sc	45	He	26598	0.4	25900.24	102.7	
Ge	72	He	25046	1.9	25022.34	100.09	
In	115	He	301714	0.8	301271.52	100.15	

Sample Report

Sample Name KQ2114524-03

File Name 031SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:36:17 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator ALKLS NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	60.80292	ug/l	1.4	593971	
~~B~~	~~11~~	~~45~~	~~No Gas~~	~~262.43098~~	~~ug/l~~	~~0.8~~	~~303483~~	
As	75	72	He	22.75347	ug/l	2.4	2056	
Mo	95	115	He	1.24667	ug/l	7.3	964	
Mo	98	115	He	1.21985	ug/l	1.1	1665	

20X Gm 8/16/21

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1517966	0.5	1507411.38	100.7	
Sc	45	He	26561	3.1	25900.24	102.55	
Ge	72	He	25093	0.7	25022.34	100.28	
In	115	He	302096	1.6	301271.52	100.27	

Matrix Spike Sample (MS) Report

Sample Name KQ2114524-06

File Name 032_SPK.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:37:53 PM

Sample Type Spike

Comment D 5X

ISTD Ref FileName 010CALB.d

QC Ref File Name 030_
ARF.

Default Text ALKLS
NoUser

QC Analyte Table

Name	Mass	Tune	Conc.	Units	Conc. RSD	CPS	Spk Amt	% Rec	Flag
Li	7	No Gas	68.13355	ug/l	0.7	675497	10	61.85	Spike Failed
~~B~~	~~11~~	~~No Gas~~	~~262.54633~~	~~ug/l~~	~~1.1~~	~~308152~~	~~5~~	~~86.62~~	~~Spike Failed~~ 20X aun 8/16/21
As	75	He	30.76092	ug/l	2.5	2863	10	77.67	
Mo	95	He	6.23078	ug/l	2.2	4706	5	98.16	
Mo	98	He	6.17551	ug/l	1.4	8237	5	95.93	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1540763	0.8	1507411.38	102.21	
Sc	45	He	25987	2.0	25900.24	100.34	
Ge	72	He	25871	4.6	25022.34	103.39	
In	115	He	295466	0.8	301271.52	98.07	

Reference Sample Report

Sample Name	K2108799-002
File Name	033_ARF.d
Data Path Name	D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time	2021-08-16 4:39:29 PM
Sample Type	AllRef
Comment	D 5X
ISTD Ref FileName	010CALB.d
Sample QC Pass/Fial	Pass
ISTD QC Pass/Fail	Pass
Operator	**ALKLS** **NoUser**

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	0.76120	ug/l	0.4	7655	
~~B~~	~~11~~	~~45~~	~~No Gas~~	~~174.20892~~	~~ug/l~~	~~1.2~~	~~202818~~	
As	75	72	He	0.03338	ug/l	52.1	3	
Mo	95	115	He	0.13511	ug/l	7.6	107	
Mo	98	115	He	0.14553	ug/l	25.7	199	

20X am 8/16/21

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1522206	1.6	1507411.38	100.98	
Sc	45	He	26131	1.7	25900.24	100.89	
Ge	72	He	25113	1.5	25022.34	100.36	
In	115	He	302273	2.5	301271.52	100.33	

Sample Report

Sample Name	KQ2114524-04
File Name	034SMPL.d
Data Path Name	D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time	2021-08-16 4:41:05 PM
Sample Type	Sample
Comment	D 5X
ISTD Ref FileName	010CALB.d
Operator	**ALKLS** **NoUser**

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	0.67478	ug/l	1.9	6845	
~~B~~	~~11~~	~~45~~	~~No Gas~~	~~170.45571~~	~~ug/l~~	~~0.7~~	~~199514~~	
As	75	72	He	0.03337	ug/l	40.0	3	
Mo	95	115	He	0.13931	ug/l	18.6	109	
Mo	98	115	He	0.13072	ug/l	12.0	178	

20X am 8/16/21

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1530134	0.9	1507411.38	101.51	
Sc	45	He	25914	3.2	25900.24	100.05	
Ge	72	He	25126	2.0	25022.34	100.41	
In	115	He	299562	0.9	301271.52	99.43	

Matrix Spike Sample (MS) Report

Sample Name	KQ2114524-05
File Name	035_SPK.d
Data Path Name	D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time	2021-08-16 4:42:40 PM
Sample Type	Spike
Comment	D 5X
ISTD Ref FileName	010CALB.d
QC Ref File Name	033_ARF.
Default Text	ALKLS NoUser

QC Analyte Table

Name	Mass	Tune	Conc.	Units	Conc. RSD	CPS	Spk Amt	% Rec	Flag
Li	7	No Gas	10.06776	ug/l	1.1	98144	10	93.07	
~~B~~	~~11~~	~~No Gas~~	~~167.47273~~	~~ug/l~~	~~2.2~~	~~193757~~	~~5~~	~~-134.72~~	~~Spike Failed~~ 20X am 8/16/21
As	75	He	9.24434	ug/l	3.6	852	10	92.11	
Mo	95	He	5.17818	ug/l	3.5	3921	5	100.86	
Mo	98	He	5.17557	ug/l	3.8	6917	5	100.6	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1512266	0.7	1507411.38	100.32	
Sc	45	He	25967	1.7	25900.24	100.26	
Ge	72	He	25600	1.1	25022.34	102.31	
In	115	He	296195	2.4	301271.52	98.31	

Sample Report

Sample Name K2108799-003

File Name 036SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:44:16 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	36.65030	ug/l	0.4	362577	
B	11	45	No Gas	218.51367	ug/l	1.0	256248	
As	75	72	He	3.74282	ug/l	10.3	346	
Mo	95	115	He	0.69541	ug/l	1.5	539	
Mo	98	115	He	0.69532	ug/l	8.8	949	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1536985	1.0	1507411.38	101.96	
Sc	45	He	26725	1.3	25900.24	103.18	
Ge	72	He	25640	0.8	25022.34	102.47	
In	115	He	302025	2.1	301271.52	100.25	

Sample Report

Sample Name K2108799-004

File Name 037SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:45:51 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	18.23568	ug/l	2.8	177933	
B	11	45	No Gas	220.85642	ug/l	2.2	255285	
As	75	72	He	1.78940	ug/l	6.6	166	
Mo	95	115	He	0.42131	ug/l	8.6	333	
Mo	98	115	He	0.41087	ug/l	6.2	571	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1515161	1.3	1507411.38	100.51	
Sc	45	He	26067	3.8	25900.24	100.64	
Ge	72	He	25710	0.4	25022.34	102.75	
In	115	He	307178	2.2	301271.52	101.96	

Sample Report

Sample Name K2108799-005

File Name 038SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:47:27 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator ALKLS
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	23.34129	ug/l	0.6	235478	
B	11	45	No Gas	237.63086	ug/l	0.9	283868	
As	75	72	He	0.02193	ug/l	78.1	2	
Mo	95	115	He	0.03709	ug/l	18.1	31	
Mo	98	115	He	0.04035	ug/l	26.0	57	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1566853	0.5	1507411.38	103.94	
Sc	45	He	25997	1.8	25900.24	100.37	
Ge	72	He	25450	2.1	25022.34	101.71	
In	115	He	304858	0.6	301271.52	101.19	

Continuing Calibration Verification (CCV) Report

Sample Name CCV

File Name 039_CCV.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:49:04 PM

Sample Type CCV

Comment ---

ISTD Ref FileName 010CALB.d

Operator ALKLS NoUser

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Units	Conc. RSD	CPS	% Rec	QC Flag
Li	7	45	No Gas	24.94303	ug/l	0.6	243552	99.77	
B	11	45	No Gas	32.46690	ug/l	0.7	39530	129.87	CCV Failed
As	75	72	He	25.17298	ug/l	3.2	2318	100.69	
Mo	95	115	He	12.37127	ug/l	4.1	9567	98.97	
Mo	98	115	He	12.26912	ug/l	0.9	16765	98.15	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1516688	1.4	1507411.38	100.62	
Sc	45	He	26097	0.5	25900.24	100.76	
Ge	72	He	25577	1.5	25022.34	102.22	
In	115	He	302714	2.1	301271.52	100.48	

Continuing Calibration Blank (CCB) Report

Sample Name CCB

File Name 040_CCB.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:53:48 PM

Sample Type CCB

Comment —

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	0.01148	ug/l	63.6	313	
B	11	45	No Gas	1.34229	ug/l	15.7	3837	
As	75	72	He	0.01512	ug/l	44.3	2	
Mo	95	115	He	-0.00148	ug/l	N/A	1	
Mo	98	115	He	0.00082	ug/l	348.3	2	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1516079	1.7	1507411.38	100.58	
Sc	45	He	26211	2.5	25900.24	101.2	
Ge	72	He	24759	1.8	25022.34	98.95	
In	115	He	304245	2.6	301271.52	100.99	

Sample Report

Sample Name K2108799-006

File Name 041SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:55:25 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	35.40566	ug/l	0.7	349152	
B	11	45	No Gas	222.78739	ug/l	0.4	260382	
As	75	72	He	2.63259	ug/l	6.4	253	
Mo	95	115	He	0.71769	ug/l	10.8	562	
Mo	98	115	He	0.74655	ug/l	7.7	1030	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1532162	1.7	1507411.38	101.64	
Sc	45	He	26715	2.0	25900.24	103.15	
Ge	72	He	26692	0.2	25022.34	106.67	
In	115	He	305492	1.2	301271.52	101.4	

Sample Report

Sample Name	K2108799-007
File Name	042SMPL.d
Data Path Name	D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time	2021-08-16 4:57:00 PM
Sample Type	Sample
Comment	D 5X
ISTD Ref FileName	010CALB.d
Operator	**ALKLS** **NoUser**

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	28.75286	ug/l	1.5	281330	
B	11	45	No Gas	251.76879	ug/l	1.4	291621	
As	75	72	He	3.43853	ug/l	4.2	314	
Mo	95	115	He	0.63680	ug/l	5.4	488	
Mo	98	115	He	0.72398	ug/l	9.3	977	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1520135	1.8	1507411.38	100.84	
Sc	45	He	26101	2.8	25900.24	100.77	
Ge	72	He	25366	0.3	25022.34	101.37	
In	115	He	298444	0.6	301271.52	99.06	

Sample Report

Sample Name K2108799-008

File Name 043SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 4:58:36 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	61.72400	ug/l	1.0	598516	
B	11	45	No Gas	266.95061	ug/l	0.7	306406	
As	75	72	He	22.99745	ug/l	5.2	2151	
Mo	95	115	He	1.24267	ug/l	10.5	962	
Mo	98	115	He	1.21348	ug/l	3.2	1658	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1506846	0.5	1507411.38	99.96	
Sc	45	He	26762	0.2	25900.24	103.33	
Ge	72	He	25988	2.1	25022.34	103.86	
In	115	He	302448	0.6	301271.52	100.39	

Sample Report

Sample Name K2108799-009

File Name 044SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:00:12 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	50.44804	ug/l	1.2	490235	
B	11	45	No Gas	261.56950	ug/l	0.5	300898	
As	75	72	He	0.04277	ug/l	28.2	4	
Mo	95	115	He	0.07449	ug/l	25.1	60	
Mo	98	115	He	0.08210	ug/l	17.1	113	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1509994	0.1	1507411.38	100.17	
Sc	45	He	26468	3.5	25900.24	102.19	
Ge	72	He	25894	1.4	25022.34	103.48	
In	115	He	302936	1.3	301271.52	100.55	

Sample Report

Sample Name K2108799-010

File Name 045SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:01:47 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator **ALKLS** **NoUser**

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	46.59458	ug/l	0.6	451424	
B	11	45	No Gas	261.14622	ug/l	2.8	299509	
As	75	72	He	3.74786	ug/l	2.6	346	
Mo	95	115	He	1.03778	ug/l	5.4	803	
Mo	98	115	He	1.04071	ug/l	2.4	1420	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1505373	0.5	1507411.38	99.86	
Sc	45	He	26468	1.5	25900.24	102.19	
Ge	72	He	25613	1.1	25022.34	102.36	
In	115	He	302050	0.7	301271.52	100.26	

Sample Report

Sample Name K2108799-011

File Name 046SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:03:23 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	39.93468	ug/l	1.1	389010	
B	11	45	No Gas	258.40891	ug/l	1.2	297989	
As	75	72	He	7.49745	ug/l	2.0	692	
Mo	95	115	He	0.96921	ug/l	3.9	754	
Mo	98	115	He	0.95275	ug/l	4.2	1308	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1513621	1.3	1507411.38	100.41	
Sc	45	He	26258	1.9	25900.24	101.38	
Ge	72	He	25613	1.1	25022.34	102.36	
In	115	He	303855	2.1	301271.52	100.86	

Sample Report

Sample Name K2108799-012

File Name 047SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:04:57 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	51.46246	ug/l	2.4	505031	
B	11	45	No Gas	265.11263	ug/l	1.2	308060	
As	75	72	He	0.03628	ug/l	70.0	4	
Mo	95	115	He	0.15269	ug/l	2.6	120	
Mo	98	115	He	0.18005	ug/l	19.4	247	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1525329	2.3	1507411.38	101.19	
Sc	45	He	26635	3.2	25900.24	102.84	
Ge	72	He	25677	2.8	25022.34	102.62	
In	115	He	301877	0.7	301271.52	100.2	

Sample Report

Sample Name	K2108799-013
File Name	048SMPL.d
Data Path Name	D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time	2021-08-16 5:06:33 PM
Sample Type	Sample
Comment	D 5X
ISTD Ref FileName	010CALB.d
Operator	**ALKLS** **NoUser**

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	48.62703	ug/l	1.4	470298	
B	11	45	No Gas	266.35131	ug/l	1.3	304903	
As	75	72	He	5.52377	ug/l	6.7	504	
Mo	95	115	He	1.01422	ug/l	2.0	778	
Mo	98	115	He	1.03064	ug/l	1.4	1393	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1503017	1.6	1507411.38	99.71	
Sc	45	He	25890	1.4	25900.24	99.96	
Ge	72	He	25340	1.2	25022.34	101.27	
In	115	He	299280	0.6	301271.52	99.34	

Sample Report

Sample Name K2108799-014

File Name 049SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:08:07 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	36.24140	ug/l	0.8	354625	
B	11	45	No Gas	264.66313	ug/l	0.4	306485	
As	75	72	He	5.83463	ug/l	4.7	534	
Mo	95	115	He	0.94843	ug/l	3.8	731	
Mo	98	115	He	0.90771	ug/l	4.1	1233	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1520186	0.5	1507411.38	100.85	
Sc	45	He	26174	1.1	25900.24	101.06	
Ge	72	He	25396	1.4	25022.34	101.5	
In	115	He	300846	1.1	301271.52	99.86	

Sample Report

Sample Name	K2108799-015
File Name	050SMPL.d
Data Path Name	D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time	2021-08-16 5:09:43 PM
Sample Type	Sample
Comment	D 5X
ISTD Ref FileName	010CALB.d
Operator	ALKLS NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	61.64124	ug/l	0.2	598669	
B	11	45	No Gas	268.43010	ug/l	0.4	308592	
As	75	72	He	23.41732	ug/l	2.0	2063	
Mo	95	115	He	1.19862	ug/l	4.8	919	
Mo	98	115	He	1.20894	ug/l	1.1	1635	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1509253	1.7	1507411.38	100.12	
Sc	45	He	25994	2.1	25900.24	100.36	
Ge	72	He	24475	1.0	25022.34	97.81	
In	115	He	299323	0.5	301271.52	99.35	

Continuing Calibration Verification (CCV) Report

Sample Name CCV

File Name 051_CCV.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:11:19 PM

Sample Type CCV

Comment ---

ISTD Ref FileName 010CALB.d

Operator ALKLS NoUser

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Units	Conc. RSD	CPS	% Rec	QC Flag
Li	7	45	No Gas	25.26829	ug/l	1.3	237788	101.07	
B	11	45	No Gas	34.50836	ug/l	1.5	40366	138.03	
As	75	72	He	24.96393	ug/l	1.6	2241	99.86	
Mo	95	115	He	12.47408	ug/l	1.7	9634	99.79	
Mo	98	115	He	12.44102	ug/l	0.6	16972	99.53	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1461912	1.9	1507411.38	96.98	
Sc	45	He	26301	1.2	25900.24	101.55	
Ge	72	He	24936	1.4	25022.34	99.65	
In	115	He	302201	0.7	301271.52	100.31	

Continuing Calibration Blank (CCB) Report

Sample Name CCB
File Name 052_CCB.d
Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time 2021-08-16 5:12:55 PM
Sample Type CCB
Comment —
ISTD Ref FileName 010CALB.d
Operator **ALKLS NoUser**

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	0.06239	ug/l	13.9	793	
B	11	45	No Gas	4.87014	ug/l	5.6	7725	
As	75	72	He	0.01460	ug/l	113.1	2	
Mo	95	115	He	0.00149	ug/l	293.6	3	
Mo	98	115	He	0.00820	ug/l	69.2	12	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1485781	0.4	1507411.38	98.57	
Sc	45	He	26238	0.3	25900.24	101.3	
Ge	72	He	24979	3.3	25022.34	99.83	
In	115	He	299616	0.7	301271.52	99.45	

Sample Report

Sample Name K2108799-016

File Name 053SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:14:30 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator ALKLS
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	57.12758	ug/l	1.1	555392	
B	11	45	No Gas	263.12358	ug/l	0.3	302845	
As	75	72	He	0.05533	ug/l	31.6	5	
Mo	95	115	He	0.41205	ug/l	8.4	321	
Mo	98	115	He	0.44634	ug/l	13.2	611	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1510819	1.3	1507411.38	100.23	
Sc	45	He	26785	2.0	25900.24	103.42	
Ge	72	He	25163	1.1	25022.34	100.56	
In	115	He	303055	1.1	301271.52	100.59	

Sample Report

Sample Name K2108799-017

File Name 054SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:16:06 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	49.65825	ug/l	2.0	483380	
B	11	45	No Gas	261.75493	ug/l	2.2	301628	
As	75	72	He	3.87391	ug/l	7.9	354	
Mo	95	115	He	1.02049	ug/l	3.0	770	
Mo	98	115	He	1.07001	ug/l	3.1	1423	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1513057	3.1	1507411.38	100.37	
Sc	45	He	25399	2.9	25900.24	98.07	
Ge	72	He	25343	1.5	25022.34	101.28	
In	115	He	294466	1.1	301271.52	97.74	

Sample Report

Sample Name K2108799-018

File Name 055SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:17:41 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	46.62130	ug/l	1.0	450418	
B	11	45	No Gas	266.79638	ug/l	3.4	305107	
As	75	72	He	10.09782	ug/l	5.0	911	
Mo	95	115	He	1.07610	ug/l	2.1	830	
Mo	98	115	He	1.13289	ug/l	5.9	1541	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1501174	1.1	1507411.38	99.59	
Sc	45	He	26321	0.4	25900.24	101.62	
Ge	72	He	25049	0.2	25022.34	100.11	
In	115	He	301083	1.2	301271.52	99.94	

Sample Report

Sample Name K2108799-019

File Name 056SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:19:16 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator ALKLS
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	35.31506	ug/l	1.3	339314	
~~B~~	~~11~~	~~45~~	~~No Gas~~	~~341.97661~~	~~ug/l~~	~~0.3~~	~~388181~~	
As	75	72	He	50.72730	ug/l	3.4	4490	
Mo	95	115	He	42.18676	ug/l	1.1	31656	
Mo	98	115	He	41.61817	ug/l	1.0	55161	

20X awn 8/16/21

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1492640	0.6	1507411.38	99.02	
Sc	45	He	25212	2.1	25900.24	97.34	
Ge	72	He	24592	2.0	25022.34	98.28	
In	115	He	293636	0.6	301271.52	97.47	

Sample Report

Sample Name K2108799-020
File Name 057SMPL.d
Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time 2021-08-16 5:20:51 PM
Sample Type Sample
Comment D 5X
ISTD Ref FileName 010CALB.d
Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	1.06008	ug/l	7.7	10070	
~~B~~	~~11~~	~~45~~	~~No Gas~~	~~244.83857~~	~~ug/l~~	~~1.0~~	~~270459~~	
As	75	72	He	0.04471	ug/l	15.7	4	
Mo	95	115	He	0.02787	ug/l	54.3	23	
Mo	98	115	He	0.03813	ug/l	19.8	52	

20X am 8/16/21

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1449347	1.2	1507411.38	96.15	
Sc	45	He	26074	1.4	25900.24	100.67	
Ge	72	He	24922	2.1	25022.34	99.6	
In	115	He	296933	0.3	301271.52	98.56	

Continuing Calibration Verification (CCV) Report

Sample Name CCV

File Name 058_CCV.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:22:28 PM

Sample Type CCV

Comment ---

ISTD Ref FileName 010CALB.d

Operator ALKLS NoUser

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Units	Conc. RSD	CPS	% Rec	QC Flag
Li	7	45	No Gas	24.76251	ug/l	2.2	235109	99.05	
B	11	45	No Gas	34.45294	ug/l	4.1	40640	137.81	
As	75	72	He	24.93659	ug/l	1.1	2160	99.75	
Mo	95	115	He	12.50634	ug/l	3.9	9191	100.05	
Mo	98	115	He	12.70309	ug/l	0.9	16488	101.62	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1475260	2.6	1507411.38	97.87	
Sc	45	He	25176	0.4	25900.24	97.2	
Ge	72	He	24057	1.9	25022.34	96.14	
In	115	He	287524	0.2	301271.52	95.44	

Continuing Calibration Blank (CCB) Report

Sample Name CCB
File Name 059_CCB.d
Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time 2021-08-16 5:24:04 PM
Sample Type CCB
Comment ---
ISTD Ref FileName 010CALB.d
Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	0.04630	ug/l	10.5	643	
B	11	45	No Gas	4.66599	ug/l	6.7	7529	
As	75	72	He	0.01838	ug/l	101.8	2	
Mo	95	115	He	0.01501	ug/l	29.5	13	
Mo	98	115	He	0.01268	ug/l	23.7	18	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1493153	2.2	1507411.38	99.05	
Sc	45	He	25453	1.0	25900.24	98.27	
Ge	72	He	24989	1.6	25022.34	99.87	
In	115	He	291740	0.7	301271.52	96.84	

Prep Blank (PB) Report

Sample Name KQ2111985-01

File Name 060_PB.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:25:41 PM

Sample Type PB

Comment ---

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	0.02174	ug/l	8.0	400	
B	11	45	No Gas	3.17726	ug/l	4.1	5755	PB Failed
As	75	72	He	0.00817	ug/l	145.4	1	
Mo	95	115	He	0.00445	ug/l	203.5	6	
Mo	98	115	He	0.00251	ug/l	230.4	4	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1468617	1.7	1507411.38	97.43	
Sc	45	He	25262	1.1	25900.24	97.54	
Ge	72	He	23880	2.4	25022.34	95.44	
In	115	He	294544	1.6	301271.52	97.77	

Laboratory Control Sample (LCS) Report

Sample Name KQ2111985-02

File Name 061_LCS.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:27:17 PM

Sample Type LCS

Comment ---

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	ExpValue	% Rec	QC Flag
Li	7	45	No Gas	48.40405	ug/l	2.1	457794	50	96.81	
B	11	45	No Gas	2.48667	ug/l	5.2	4994	25	9.95	LCS Failed
As	75	72	He	48.18268	ug/l	0.7	4337	50	96.37	
Mo	95	115	He	24.37373	ug/l	2.6	18567	25	97.49	
Mo	98	115	He	24.12009	ug/l	3.3	32447	25	96.48	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1469927	1.7	1507411.38	97.51	
Sc	45	He	26047	2.8	25900.24	100.57	
Ge	72	He	24996	1.6	25022.34	99.89	
In	115	He	298196	3.1	301271.52	98.98	

Reference Sample Report

Sample Name	K2107414-001
File Name	062_ARF.d
Data Path Name	D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time	2021-08-16 5:28:53 PM
Sample Type	AllRef
Comment	D 5X
ISTD Ref FileName	010CALB.d
Sample QC Pass/Fial	Pass
ISTD QC Pass/Fail	Pass
Operator	**ALKLS** **NoUser**

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	13.42883	ug/l	1.7	127210	
B	11	45	No Gas	102.45614	ug/l	0.9	116121	
As	75	72	He	0.09500	ug/l	27.6	9	
Mo	95	115	He	1.60830	ug/l	2.0	1226	
Mo	98	115	He	1.66365	ug/l	4.7	2236	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1470329	0.6	1507411.38	97.54	
Sc	45	He	26408	3.2	25900.24	101.96	
Ge	72	He	24505	4.2	25022.34	97.93	
In	115	He	297664	1.1	301271.52	98.8	

Sample Report

Sample Name KQ2111985-03

File Name 063SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:30:28 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator ALKLS
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	13.57946	ug/l	0.4	128339	
B	11	45	No Gas	104.47845	ug/l	1.4	118108	
As	75	72	He	0.07010	ug/l	65.9	7	
Mo	95	115	He	1.64370	ug/l	6.0	1263	
Mo	98	115	He	1.63145	ug/l	2.0	2214	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1466968	1.0	1507411.38	97.32	
Sc	45	He	26932	1.2	25900.24	103.98	
Ge	72	He	25179	0.8	25022.34	100.63	
In	115	He	300385	1.2	301271.52	99.71	

Matrix Spike Sample (MS) Report

Sample Name KQ2111985-04

File Name 064_SPK.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:32:03 PM

Sample Type Spike

Comment D 5X

ISTD Ref FileName 010CALB.d

QC Ref File Name 062_
ARF.

Default Text ALKLS
NoUser

QC Analyte Table

Name	Mass	Tune	Conc.	Units	Conc. RSD	CPS	Spk Amt	% Rec	Flag
Li	7	No Gas	22.63612	ug/l	1.3	217345	10	92.07	
B	11	No Gas	101.51740	ug/l	2.7	116703	5	-18.77	Spike Failed
As	75	He	9.94765	ug/l	3.9	919	10	98.53	
Mo	95	He	6.90677	ug/l	1.8	5245	5	105.97	
Mo	98	He	6.62489	ug/l	1.7	8885	5	99.22	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1491403	1.9	1507411.38	98.94	
Sc	45	He	26338	2.0	25900.24	101.69	
Ge	72	He	25677	3.9	25022.34	102.62	
In	115	He	297072	1.4	301271.52	98.61	

Reference Sample Report

Sample Name K2107414-002

File Name 065_ARF.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:33:37 PM

Sample Type AllRef

Comment D 5X

ISTD Ref FileName 010CALB.d

Sample QC Pass/Fial Pass

ISTD QC Pass/Fail Pass

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	9.20662	ug/l	2.5	89027	
B	11	45	No Gas	102.31743	ug/l	0.7	118292	
As	75	72	He	0.76746	ug/l	5.4	71	
Mo	95	115	He	1.92067	ug/l	1.2	1487	
Mo	98	115	He	2.03755	ug/l	3.7	2783	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1499768	0.5	1507411.38	99.49	
Sc	45	He	25576	1.5	25900.24	98.75	
Ge	72	He	25694	2.0	25022.34	102.68	
In	115	He	302486	0.9	301271.52	100.4	

Sample Report

Sample Name KQ2111985-05

File Name 066SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:35:13 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	9.06254	ug/l	0.8	90609	
B	11	45	No Gas	102.99172	ug/l	1.4	123111	
As	75	72	He	0.69352	ug/l	18.2	63	
Mo	95	115	He	1.96586	ug/l	5.7	1522	
Mo	98	115	He	2.01224	ug/l	1.1	2749	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1550711	1.2	1507411.38	102.87	
Sc	45	He	26097	3.7	25900.24	100.76	
Ge	72	He	25133	5.6	25022.34	100.44	
In	115	He	302560	0.5	301271.52	100.43	

Matrix Spike Sample (MS) Report

Sample Name KQ2111985-06

File Name 067_SPK.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:36:47 PM

Sample Type Spike

Comment D 5X

ISTD Ref FileName 010CALB.d

QC Ref File Name 065_
ARF.

Default Text ALKLS
NoUser

QC Analyte Table

Name	Mass	Tune	Conc.	Units	Conc. RSD	CPS	Spk Amt	% Rec	Flag
Li	7	No Gas	18.85142	ug/l	0.6	185288	10	96.45	
B	11	No Gas	98.74786	ug/l	2.5	116253	5	-71.39	Spike Failed
As	75	He	10.67037	ug/l	1.9	971	10	99.03	
Mo	95	He	7.23493	ug/l	3.0	5596	5	106.29	
Mo	98	He	7.24319	ug/l	0.9	9891	5	104.11	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1526321	1.8	1507411.38	101.25	
Sc	45	He	26378	2.1	25900.24	101.84	
Ge	72	He	25269	2.5	25022.34	100.99	
In	115	He	302494	1.0	301271.52	100.41	

Sample Report

Sample Name K2107414-003

File Name 068SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:38:22 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator ALKLS NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	19.87495	ug/l	0.5	192290	
B	11	45	No Gas	107.04709	ug/l	0.5	123871	
As	75	72	He	93.30451	ug/l	1.2	8264	
Mo	95	115	He	1.32557	ug/l	11.0	1017	
Mo	98	115	He	1.34257	ug/l	10.3	1816	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1502435	0.5	1507411.38	99.67	
Sc	45	He	25984	3.5	25900.24	100.32	
Ge	72	He	24602	0.8	25022.34	98.32	
In	115	He	299520	1.3	301271.52	99.42	

Sample Report

Sample Name K2107414-004

File Name 069SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:39:57 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	1.43326	ug/l	4.2	13797	
B	11	45	No Gas	103.01936	ug/l	1.7	117140	
As	75	72	He	0.04419	ug/l	41.4	4	
Mo	95	115	He	0.35179	ug/l	12.7	273	
Mo	98	115	He	0.33932	ug/l	3.6	463	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1475084	1.2	1507411.38	97.86	
Sc	45	He	26207	0.1	25900.24	101.19	
Ge	72	He	25360	3.3	25022.34	101.35	
In	115	He	301830	1.0	301271.52	100.19	

Continuing Calibration Verification (CCV) Report

Sample Name CCV
File Name 070_CCV.d
Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time 2021-08-16 5:41:33 PM
Sample Type CCV
Comment ---
ISTD Ref FileName 010CALB.d
Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Units	Conc. RSD	CPS	% Rec	QC Flag
Li	7	45	No Gas	25.40395	ug/l	0.4	238739	101.62	
B	11	45	No Gas	29.91908	ug/l	2.6	35240	119.68	
As	75	72	He	24.42729	ug/l	1.9	2239	97.71	
Mo	95	115	He	12.50186	ug/l	1.5	9497	100.01	
Mo	98	115	He	12.44037	ug/l	0.5	16687	99.52	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1459691	1.2	1507411.38	96.83	
Sc	45	He	25366	0.4	25900.24	97.94	
Ge	72	He	25453	1.1	25022.34	101.72	
In	115	He	297128	2.2	301271.52	98.62	

Continuing Calibration Blank (CCB) Report

Sample Name CCB

File Name 071_CCB.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:43:09 PM

Sample Type CCB

Comment ---

ISTD Ref FileName 010CALB.d

Operator ALKLS
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	0.03365	ug/l	20.3	510	
B	11	45	No Gas	2.48116	ug/l	6.2	4961	
As	75	72	He	0.02226	ug/l	28.0	2	
Mo	95	115	He	0.00155	ug/l	283.2	3	
Mo	98	115	He	0.00661	ug/l	134.2	10	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1462308	0.8	1507411.38	97.01	
Sc	45	He	25860	3.0	25900.24	99.85	
Ge	72	He	24989	1.8	25022.34	99.87	
In	115	He	296196	1.3	301271.52	98.32	

Sample Report

Sample Name K2107414-005

File Name 072SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:44:46 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	9.69198	ug/l	1.8	93075	
B	11	45	No Gas	102.29925	ug/l	1.9	117478	
As	75	72	He	1.00872	ug/l	14.9	90	
Mo	95	115	He	1.79922	ug/l	1.9	1386	
Mo	98	115	He	1.73930	ug/l	4.1	2364	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1489820	0.9	1507411.38	98.83	
Sc	45	He	25867	2.0	25900.24	99.87	
Ge	72	He	24755	3.7	25022.34	98.93	
In	115	He	300896	0.2	301271.52	99.88	

Sample Report

Sample Name K2107414-006
File Name 073SMPL.d
Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time 2021-08-16 5:46:21 PM
Sample Type Sample
Comment D 5X
ISTD Ref FileName 010CALB.d
Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	14.50613	ug/l	1.7	141744	
B	11	45	No Gas	104.08946	ug/l	1.0	121676	
As	75	72	He	0.05594	ug/l	23.7	5	
Mo	95	115	He	1.67972	ug/l	4.8	1286	
Mo	98	115	He	1.76517	ug/l	2.4	2384	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1517131	2.1	1507411.38	100.64	
Sc	45	He	25329	2.5	25900.24	97.8	
Ge	72	He	24886	1.2	25022.34	99.45	
In	115	He	299052	0.8	301271.52	99.26	

Sample Report

Sample Name K2107414-007

File Name 074SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:47:56 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	11.26212	ug/l	1.2	107606	
B	11	45	No Gas	103.99517	ug/l	2.0	118817	
As	75	72	He	0.77605	ug/l	3.1	71	
Mo	95	115	He	1.88467	ug/l	5.1	1440	
Mo	98	115	He	1.92372	ug/l	6.7	2594	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1482480	0.7	1507411.38	98.35	
Sc	45	He	26184	1.9	25900.24	101.1	
Ge	72	He	25173	1.4	25022.34	100.6	
In	115	He	298653	1.0	301271.52	99.13	

Sample Report

Sample Name	K2107414-008
File Name	075SMPL.d
Data Path Name	D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time	2021-08-16 5:49:32 PM
Sample Type	Sample
Comment	D 5X
ISTD Ref FileName	010CALB.d
Operator	**ALKLS** **NoUser**

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	19.11163	ug/l	1.8	184675	
B	11	45	No Gas	105.81301	ug/l	0.6	122342	
As	75	72	He	87.28221	ug/l	4.5	7724	
Mo	95	115	He	1.32841	ug/l	6.9	1007	
Mo	98	115	He	1.29406	ug/l	2.5	1729	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1500911	2.9	1507411.38	99.57	
Sc	45	He	26217	2.4	25900.24	101.22	
Ge	72	He	24605	3.5	25022.34	98.33	
In	115	He	295797	1.1	301271.52	98.18	

Sample Report

Sample Name K2107414-009

File Name 076SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:51:08 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	4.37575	ug/l	2.6	41669	
B	11	45	No Gas	110.92137	ug/l	0.6	125807	
As	75	72	He	0.09815	ug/l	22.2	9	
Mo	95	115	He	1.23365	ug/l	1.2	954	
Mo	98	115	He	1.32217	ug/l	3.0	1805	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1473491	1.1	1507411.38	97.75	
Sc	45	He	25870	2.0	25900.24	99.88	
Ge	72	He	24645	2.5	25022.34	98.49	
In	115	He	302080	1.7	301271.52	100.27	

Sample Report

Sample Name K2107414-010

File Name 077SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:52:43 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator ALKLS NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	14.41485	ug/l	1.8	138251	
B	11	45	No Gas	107.26524	ug/l	2.8	122994	
As	75	72	He	4.36917	ug/l	0.9	396	
Mo	95	115	He	1.46600	ug/l	4.2	1126	
Mo	98	115	He	1.45992	ug/l	4.5	1977	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1488676	0.6	1507411.38	98.76	
Sc	45	He	25700	1.7	25900.24	99.23	
Ge	72	He	25176	1.2	25022.34	100.61	
In	115	He	299835	1.2	301271.52	99.52	

Sample Report

Sample Name K2107414-011

File Name 078SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:54:19 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	17.39975	ug/l	1.7	167826	
B	11	45	No Gas	108.26168	ug/l	1.0	124849	
As	75	72	He	0.56684	ug/l	7.6	50	
Mo	95	115	He	1.56115	ug/l	4.4	1181	
Mo	98	115	He	1.47908	ug/l	2.7	1975	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1497656	0.7	1507411.38	99.35	
Sc	45	He	25857	2.9	25900.24	99.83	
Ge	72	He	24505	2.7	25022.34	97.93	
In	115	He	295698	2.1	301271.52	98.15	

Sample Report

Sample Name K2107414-012
File Name 079SMPL.d
Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time 2021-08-16 5:55:54 PM
Sample Type Sample
Comment D 5X
ISTD Ref FileName 010CALB.d
Operator ALKLS
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	14.76431	ug/l	1.1	143171	
B	11	45	No Gas	104.95788	ug/l	1.2	121751	
As	75	72	He	6.81230	ug/l	3.7	601	
Mo	95	115	He	1.49398	ug/l	4.5	1136	
Mo	98	115	He	1.46043	ug/l	4.2	1957	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1505344	1.7	1507411.38	99.86	
Sc	45	He	25363	2.1	25900.24	97.92	
Ge	72	He	24515	2.4	25022.34	97.97	
In	115	He	296725	2.2	301271.52	98.49	

Sample Report

Sample Name K2107414-013

File Name 080SMPL.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 5:57:30 PM

Sample Type Sample

Comment D 5X

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	19.52104	ug/l	1.2	186294	
B	11	45	No Gas	107.49865	ug/l	1.7	122684	
As	75	72	He	88.34249	ug/l	1.0	7601	
Mo	95	115	He	1.21193	ug/l	2.2	914	
Mo	98	115	He	1.28759	ug/l	9.2	1711	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1482071	1.2	1507411.38	98.32	
Sc	45	He	25737	2.7	25900.24	99.37	
Ge	72	He	23897	0.7	25022.34	95.5	
In	115	He	294677	2.4	301271.52	97.81	

Sample Report

Sample Name	K2107414-014
File Name	081SMPL.d
Data Path Name	D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time	2021-08-16 5:59:07 PM
Sample Type	Sample
Comment	D 5X
ISTD Ref FileName	010CALB.d
Operator	**ALKLS** **NoUser**

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	7.58450	ug/l	2.7	72444	
B	11	45	No Gas	102.84749	ug/l	3.2	117381	
As	75	72	He	0.04164	ug/l	24.8	4	
Mo	95	115	He	1.77990	ug/l	5.5	1362	
Mo	98	115	He	1.83881	ug/l	4.8	2484	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1480975	0.8	1507411.38	98.25	
Sc	45	He	25980	3.6	25900.24	100.31	
Ge	72	He	24461	2.9	25022.34	97.76	
In	115	He	299064	0.4	301271.52	99.27	

Continuing Calibration Verification (CCV) Report

Sample Name CCV

File Name 082_CCV.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 6:00:43 PM

Sample Type CCV

Comment —

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Units	Conc. RSD	CPS	% Rec	QC Flag
Li	7	45	No Gas	24.79012	ug/l	1.4	231415	99.16	
B	11	45	No Gas	28.96383	ug/l	0.8	33949	115.86	
As	75	72	He	24.87403	ug/l	5.0	2219	99.5	
Mo	95	115	He	12.58015	ug/l	1.3	9400	100.64	
Mo	98	115	He	12.47452	ug/l	1.6	16461	99.8	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1449902	0.6	1507411.38	96.18	
Sc	45	He	24845	2.8	25900.24	95.93	
Ge	72	He	24782	1.2	25022.34	99.04	
In	115	He	292318	0.8	301271.52	97.03	

Continuing Calibration Blank (CCB) Report

Sample Name CCB

File Name 083_CCB.d

Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b

Acq Time 2021-08-16 6:02:18 PM

Sample Type CCB

Comment ---

ISTD Ref FileName 010CALB.d

Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	0.01995	ug/l	24.6	377	
B	11	45	No Gas	2.21232	ug/l	7.4	4601	
As	75	72	He	0.04219	ug/l	48.0	4	
Mo	95	115	He	0.00459	ug/l	149.9	6	
Mo	98	115	He	0.00668	ug/l	36.2	10	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1442756	1.3	1507411.38	95.71	
Sc	45	He	25483	1.7	25900.24	98.39	
Ge	72	He	24294	0.8	25022.34	97.09	
In	115	He	294097	1.6	301271.52	97.62	

Sample Report

Sample Name	K2107414-015
File Name	084SMPL.d
Data Path Name	D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time	2021-08-16 6:03:54 PM
Sample Type	Sample
Comment	D 5X
ISTD Ref FileName	010CALB.d
Operator	**ALKLS** **NoUser**

QC Analyte Table

Name	Mass	ISTD	Tune	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	7.48622	ug/l	2.0	71750	
B	11	45	No Gas	100.23247	ug/l	0.7	114845	
As	75	72	He	0.03407	ug/l	17.3	3	
Mo	95	115	He	1.80352	ug/l	0.1	1356	
Mo	98	115	He	1.86348	ug/l	2.1	2471	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1485789	0.3	1507411.38	98.57	
Sc	45	He	25630	2.0	25900.24	98.96	
Ge	72	He	24515	2.9	25022.34	97.97	
In	115	He	293677	0.7	301271.52	97.48	

Continuing Calibration Verification (CCV) Report

Sample Name	CCV
File Name	085_CCV.d
Data Path Name	D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time	2021-08-16 6:05:30 PM
Sample Type	CCV
Comment	---
ISTD Ref FileName	010CALB.d
Operator	**ALKLS** **NoUser**

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Units	Conc. RSD	CPS	% Rec	QC Flag
Li	7	45	No Gas	25.03825	ug/l	0.8	234259	100.15	
B	11	45	No Gas	27.81726	ug/l	0.9	32767	111.27	
As	75	72	He	25.77511	ug/l	2.7	2254	103.1	
Mo	95	115	He	12.60549	ug/l	2.8	9560	100.84	
Mo	98	115	He	12.49357	ug/l	0.4	16737	99.95	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1453322	1.7	1507411.38	96.41	
Sc	45	He	24969	3.1	25900.24	96.4	
Ge	72	He	24291	1.6	25022.34	97.08	
In	115	He	296762	0.9	301271.52	98.5	

Continuing Calibration Blank (CCB) Report

Sample Name CCB
File Name 086_CCB.d
Data Path Name D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\081621B.b
Acq Time 2021-08-16 6:07:06 PM
Sample Type CCB
Comment ---
ISTD Ref FileName 010CALB.d
Operator **ALKLS**
NoUser

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Units	Conc. RSD	CPS	QC Flag
Li	7	45	No Gas	0.02292	ug/l	8.2	403	
B	11	45	No Gas	1.52991	ug/l	19.1	3854	
As	75	72	He	0.01933	ug/l	1.1	2	
Mo	95	115	He	0.00303	ug/l	84.1	4	
Mo	98	115	He	0.00251	ug/l	152.5	4	

QC ISTD Table

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	QC Flag
Sc	45	No Gas	1440894	0.6	1507411.38	95.59	
Sc	45	He	25520	3.2	25900.24	98.53	
Ge	72	He	24178	0.9	25022.34	96.62	
In	115	He	295071	0.2	301271.52	97.94	

August 09, 2021

Service Request No:K2108801

Masa Kanematsu
Anchor QEA, LLC
6720 SW Macadam Avenue
Suite 125
Portland, OR 97219

Laboratory Results for: Gorgas

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 **K2108801.**

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

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: Anchor QEA, LLC
Project: Gorgas
Sample Matrix: Water

Service Request: K2108801
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 II level requested by the client.

Sample Receipt:

Sixteen 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 ____________________ Date 08/09/2021

SAMPLE DETECTION SUMMARY

CLIENT ID: GGS-COL-4-1	Lab ID: K2108801-001					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	66.3		0.5	2.5	ug/L	200.8
Lithium, Dissolved	112		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	136		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-6-1	Lab ID: K2108801-002					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	75.8		0.5	2.5	ug/L	200.8
Lithium, Dissolved	100		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	145		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-2-2	Lab ID: K2108801-003					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Lithium, Dissolved	43.0		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	0.32	J	0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-4-2	Lab ID: K2108801-004					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	61.5		0.5	2.5	ug/L	200.8
Boron, Dissolved	1500		10	40	ug/L	200.8
Lithium, Dissolved	112		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	139		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-6-2	Lab ID: K2108801-005					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	110		0.5	2.5	ug/L	200.8
Boron, Dissolved	1500		10	40	ug/L	200.8
Lithium, Dissolved	129		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	180		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-INF-MW-7-3	Lab ID: K2108801-006					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	249		0.5	2.5	ug/L	200.8
Boron, Dissolved	1610		10	40	ug/L	200.8
Lithium, Dissolved	183		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	205		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-2-3	Lab ID: K2108801-007					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Boron, Dissolved	1590		10	40	ug/L	200.8
Lithium, Dissolved	121		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	42.3		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-4-3	Lab ID: K2108801-008					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	44.3		0.5	2.5	ug/L	200.8

SAMPLE DETECTION SUMMARY

CLIENT ID: GGS-COL-4-3			Lab ID: K2108801-008			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Boron, Dissolved	1580		10	40	ug/L	200.8
Lithium, Dissolved	118		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	153		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-6-3			Lab ID: K2108801-009			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	33.0		0.5	2.5	ug/L	200.8
Boron, Dissolved	1580		10	40	ug/L	200.8
Lithium, Dissolved	87.0		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	145		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-2-4			Lab ID: K2108801-010			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Boron, Dissolved	1650		10	40	ug/L	200.8
Lithium, Dissolved	129		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	57.7		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-4-4			Lab ID: K2108801-011			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	44.5		0.5	2.5	ug/L	200.8
Boron, Dissolved	1610		10	40	ug/L	200.8
Lithium, Dissolved	115		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	148		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-6-4			Lab ID: K2108801-012			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	142		0.5	2.5	ug/L	200.8
Boron, Dissolved	1620		10	40	ug/L	200.8
Lithium, Dissolved	143		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	189		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-INF-MW-7-5			Lab ID: K2108801-013			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	237		0.5	2.5	ug/L	200.8
Boron, Dissolved	1640		10	40	ug/L	200.8
Lithium, Dissolved	182		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	205		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-2-5			Lab ID: K2108801-014			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Boron, Dissolved	1620		10	40	ug/L	200.8
Lithium, Dissolved	158		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	116		0.15	0.50	ug/L	200.8

SAMPLE DETECTION SUMMARY

CLIENT ID: GGS-COL-4-5	Lab ID: K2108801-015					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	100		0.5	2.5	ug/L	200.8
Boron, Dissolved	1540		10	40	ug/L	200.8
Lithium, Dissolved	142		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	181		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-6-5	Lab ID: K2108801-016					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	100		0.5	2.5	ug/L	200.8
Boron, Dissolved	1560		10	40	ug/L	200.8
Lithium, Dissolved	122		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	176		0.15	0.50	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:** K2108801
Project: Gorgas/201114-01.01 task 2

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K2108801-001	GGS-COL-4-1	7/26/2021	1440
K2108801-002	GGS-COL-6-1	7/26/2021	1440
K2108801-003	GGS-COL-2-2	7/26/2021	1830
K2108801-004	GGS-COL-4-2	7/26/2021	1830
K2108801-005	GGS-COL-6-2	7/26/2021	1830
K2108801-006	GGS-COL-INF-MW-7-3	7/27/2021	1030
K2108801-007	GGS-COL-2-3	7/27/2021	1030
K2108801-008	GGS-COL-4-3	7/27/2021	1030
K2108801-009	GGS-COL-6-3	7/27/2021	1030
K2108801-010	GGS-COL-2-4	7/27/2021	1630
K2108801-011	GGS-COL-4-4	7/27/2021	1630
K2108801-012	GGS-COL-6-4	7/27/2021	1630
K2108801-013	GGS-COL-INF-MW-7-5	7/28/2021	1420
K2108801-014	GGS-COL-2-5	7/28/2021	1420
K2108801-015	GGS-COL-4-5	7/28/2021	1420
K2108801-016	GGS-COL-6-5	7/28/2021	1420

KZ108801

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number: 503-972-5019	
Date:	7/29/2021
Project Name:	Gorgas
Project Number:	201114-01.01 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	As, Li, Mo (dissolved, Method 200.8)	Boron (dissolved, Method 200.8)	Comments/Preservation
	16	GGS-COL-1-5	7/28/2021	14:20	Water	1	X		HNO_3 preserved, filtered
	17	GGS-COL-3-5	7/28/2021	14:20	Water	1	X		HNO_3 preserved, filtered
	18	GGS-COL-5-5	7/28/2021	14:20	Water	1	X		HNO_3 preserved, filtered
	19	GGS-COL-INF-MW-7-1	7/26/2021	14:40	Water	1	X	X	HNO_3 preserved, filtered
	~~20~~	~~GGS-COL-2-1~~	~~7/26/2021~~	~~14:40~~	~~Water~~	~~1~~	X	X	HNO_3 preserved, filtered
1	21	~~GGS-COL-4-1~~	7/26/2021	14:40	Water	1	X	X	HNO_3 preserved, filtered
2	22	~~GGS-COL-6-1~~	7/26/2021	14:40	Water	1	X	X	HNO_3 preserved, filtered
3	23	~~GGS-COL-2-2~~	7/26/2021	18:30	Water	1	X	X	HNO_3 preserved, filtered
4	24	~~GGS-COL-4-2~~	7/26/2021	18:30	Water	1	X	X	HNO_3 preserved, filtered
5	25	GGS-COL-6-2	7/26/2021	18:30	Water	1	X	X	HNO_3 preserved, filtered
6	26	GGS-COL-INF-MW-7-3	7/27/2021	10:30	Water	1	X	X	HNO_3 preserved, filtered
7	27	GGS-COL-2-3	7/27/2021	10:30	Water	1	X	X	HNO_3 preserved, filtered
8	28	GGS-COL-4-3	7/27/2021	10:30	Water	1	X	X	HNO_3 preserved, filtered
9	29	GGS-COL-6-3	7/27/2021	10:30	Water	1	X	X	HNO_3 preserved, filtered
10	30	GGS-COL-2-4	7/27/2021	16:30	Water	1	X	X	HNO_3 preserved, filtered

Notes: **Please analyze all analytes with standard TAT on this page. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**

Desired reporting limits : As (<2 ug/L), B (<10 ug/L), and Mo (<1 ug/L). For Lithium, please use Method 200.8 for better detection limit if possible. Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	[signature] 7/29/21 1125	
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
[signature]	7/29/2021 9:00		
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 2 of 3

K2108801

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number:	503-972-5019
Date:	7/29/2021
Project Name:	Gorgas
Project Number:	201114-01.01 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	As, Li, Mo (dissolved, Method 200.8)	Boron (dissolved, Method 200.8)	Comments/Preservation
31	GGS-COL-4-4	7/27/2021	16:30	Water	1	X	X	HNO_3 preserved, filtered
32	GGS-COL-6-4	7/27/2021	16:30	Water	1	X	X	HNO_3 preserved, filtered
33	GGS-COL-INF-MW-7-5	7/28/2021	14:20	Water	1	X	X	HNO_3 preserved, filtered
34	GGS-COL-2-5	7/28/2021	14:20	Water	1	X	X	HNO_3 preserved, filtered
35	GGS-COL-4-5	7/28/2021	14:20	Water	1	X	X	HNO_3 preserved, filtered
36	GGS-COL-6-5	7/28/2021	14:20	Water	1	X	X	HNO_3 preserved, filtered
37								
38								
39								
40								
41								
42								
43								
44								
45								

Notes: **Please analyze all analytes with standard TAT on this page. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L), B (<10 ug/L), and Mo (<1 ug/L). For Lithium, please use Method 200.8 for better detection limit if possible. Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA		
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
[signature]	7/29/2021 9:00	[signature]	7/29/21 1125

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 3

K2108801

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number: 503-972-5019	
Date:	7/29/2021
Project Name:	Gorgas
Project Number:	201114-01.01 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	As, Li, Mo (dissolved, Method 200.8)	Boron (dissolved, Method 200.8)	Comments/Preservation
1	GGS-COL-INF-MW-6D-1	7/26/2021	14:40	Water	1	X		HNO_3 preserved, filtered
2	GGS-COL-1-1	7/26/2021	14:40	Water	1	X		HNO_3 preserved, filtered
3	GGS-COL-3-1	7/26/2021	14:40	Water	1	X		HNO_3 preserved, filtered
4	GGS-COL-5-1	7/26/2021	14:40	Water	1	X		HNO_3 preserved, filtered
5	GGS-COL-1-2	7/26/2021	18:30	Water	1	X		HNO_3 preserved, filtered
6	GGS-COL-3-2	7/26/2021	18:30	Water	1	X		HNO_3 preserved, filtered
7	GGS-COL-5-2	7/26/2021	18:30	Water	1	X		HNO_3 preserved, filtered
8	GGS-COL-INF-MW-6D-3	7/27/2021	10:30	Water	1	X		HNO_3 preserved, filtered
9	GGS-COL-1-3	7/27/2021	10:30	Water	1	X		HNO_3 preserved, filtered
10	GGS-COL-3-3	7/27/2021	10:30	Water	1	X		HNO_3 preserved, filtered
11	GGS-COL-5-3	7/27/2021	10:30	Water	1	X		HNO_3 preserved, filtered
12	GGS-COL-1-4	7/27/2021	16:30	Water	1	X		HNO_3 preserved, filtered
13	GGS-COL-3-4	7/27/2021	16:30	Water	1	X		HNO_3 preserved, filtered
14	GGS-COL-5-4	7/27/2021	16:30	Water	1	X		HNO_3 preserved, filtered
15	GGS-COL-INF-MW-6D-5	7/28/2021	14:20	Water	1	X		HNO_3 preserved, filtered

Notes: **Please analyze all analytes with standard TAT on this page. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L), B (<10 ug/L), and Mo (<1 ug/L). For Lithium, please use Method 200.8 for better detection limit if possible. Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	[signature]	7/29/21 1125
Signature/Print Name: [signature]	Date/Time: 7/29/2021 9:00	Signature/Print Name:	Date/Time:

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 3

PM

Cooler Receipt and Preservation Form

Client Anchor Service Request K21 08801

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-~~17~~ 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

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
Project: Gorgas/201114-01.01 task 2
Service Request: K2108801

Sample Name: GGS-COL-4-1
Lab Code: K2108801-001
Sample Matrix: Water
Date Collected: 07/26/21
Date Received: 07/29/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: GGS-COL-6-1
Lab Code: K2108801-002
Sample Matrix: Water
Date Collected: 07/26/21
Date Received: 07/29/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: GGS-COL-2-2
Lab Code: K2108801-003
Sample Matrix: Water
Date Collected: 07/26/21
Date Received: 07/29/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: GGS-COL-4-2
Lab Code: K2108801-004
Sample Matrix: Water
Date Collected: 07/26/21
Date Received: 07/29/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: GGS-COL-6-2
Lab Code: K2108801-005
Sample Matrix: Water
Date Collected: 07/26/21
Date Received: 07/29/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Client: Anchor QEA, LLC **Service Request:** K2108801
Project: Gorgas/201114-01.01 task 2

Sample Name: GGS-COL-INF-MW-7-3 **Date Collected:** 07/27/21
Lab Code: K2108801-006 **Date Received:** 07/29/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: GGS-COL-2-3 **Date Collected:** 07/27/21
Lab Code: K2108801-007 **Date Received:** 07/29/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: GGS-COL-4-3 **Date Collected:** 07/27/21
Lab Code: K2108801-008 **Date Received:** 07/29/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: GGS-COL-6-3 **Date Collected:** 07/27/21
Lab Code: K2108801-009 **Date Received:** 07/29/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: GGS-COL-2-4 **Date Collected:** 07/27/21
Lab Code: K2108801-010 **Date Received:** 07/29/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Analyst Summary report

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 task 2
Service Request: K2108801

Sample Name: GGS-COL-4-4
Lab Code: K2108801-011
Sample Matrix: Water
Date Collected: 07/27/21
Date Received: 07/29/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: GGS-COL-6-4
Lab Code: K2108801-012
Sample Matrix: Water
Date Collected: 07/27/21
Date Received: 07/29/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: GGS-COL-INF-MW-7-5
Lab Code: K2108801-013
Sample Matrix: Water
Date Collected: 07/28/21
Date Received: 07/29/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: GGS-COL-2-5
Lab Code: K2108801-014
Sample Matrix: Water
Date Collected: 07/28/21
Date Received: 07/29/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Sample Name: GGS-COL-4-5
Lab Code: K2108801-015
Sample Matrix: Water
Date Collected: 07/28/21
Date Received: 07/29/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	EMCALLISTER

Analyst Summary report

Client:	Anchor QEA, LLC	**Service Request:**	K2108801
Project:	Gorgas/201114-01.01 task 2		

Sample Name:	GGS-COL-6-5	**Date Collected:**	07/28/21
Lab Code:	K2108801-016	**Date Received:**	07/29/21
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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ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2108801
Project:	Gorgas/201114-01.01 task 2		**Date Collected:**	07/26/21 14:40
Sample Matrix:	Water		**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-4-1		**Basis:**	NA
Lab Code:	K2108801-001			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**66.3**	ug/L	2.5	0.5	5	08/06/21 17:48	08/04/21	
Lithium	200.8	**112**	ug/L	0.50	0.50	5	08/06/21 17:48	08/04/21	
Molybdenum	200.8	**136**	ug/L	0.50	0.15	5	08/06/21 17:48	08/04/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108801
Project:	Gorgas/201114-01.01 task 2		**Date Collected:**	07/26/21 14:40
Sample Matrix:	Water		**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-6-1		**Basis:**	NA
Lab Code:	K2108801-002			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**75.8**	ug/L	2.5	0.5	5	08/06/21 17:55	08/04/21	
Lithium	200.8	**100**	ug/L	0.50	0.50	5	08/06/21 17:55	08/04/21	
Molybdenum	200.8	**145**	ug/L	0.50	0.15	5	08/06/21 17:55	08/04/21	

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Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2108801
Project:	Gorgas/201114-01.01 task 2		**Date Collected:**	07/26/21 18:30
Sample Matrix:	Water		**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-2-2		**Basis:**	NA
Lab Code:	K2108801-003			

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	08/06/21 18:07	08/04/21	
Lithium	200.8	**43.0**	ug/L	0.50	0.50	5	08/06/21 18:07	08/04/21	
Molybdenum	200.8	**0.32 J**	ug/L	0.50	0.15	5	08/06/21 18:07	08/04/21	

Client: Anchor QEA, LLC
Service Request: K2108801
Project: Gorgas/201114-01.01 task 2
Date Collected: 07/26/21 18:30
Sample Matrix: Water
Date Received: 07/29/21 11:25

Sample Name: GGS-COL-4-2
Basis: NA
Lab Code: K2108801-004

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**61.5**	ug/L	2.5	0.5	5	08/06/21 18:09	08/04/21	
Boron	200.8	**1500**	ug/L	40	10	20	08/06/21 15:45	08/04/21	
Lithium	200.8	**112**	ug/L	0.50	0.50	5	08/06/21 18:09	08/04/21	
Molybdenum	200.8	**139**	ug/L	0.50	0.15	5	08/06/21 18:09	08/04/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108801
Project:	Gorgas/201114-01.01 task 2		**Date Collected:**	07/26/21 18:30
Sample Matrix:	Water		**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-6-2		**Basis:**	NA
Lab Code:	K2108801-005			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**110**	ug/L	2.5	0.5	5	08/06/21 18:12	08/04/21	
Boron	200.8	**1500**	ug/L	40	10	20	08/06/21 16:04	08/04/21	
Lithium	200.8	**129**	ug/L	0.50	0.50	5	08/06/21 18:12	08/04/21	
Molybdenum	200.8	**180**	ug/L	0.50	0.15	5	08/06/21 18:12	08/04/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108801
Project:	Gorgas/201114-01.01 task 2	**Date Collected:**	07/27/21 10:30
Sample Matrix:	Water	**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-INF-MW-7-3	**Basis:**	NA
Lab Code:	K2108801-006		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**249**	ug/L	2.5	0.5	5	08/06/21 18:14	08/04/21	
Boron	200.8	**1610**	ug/L	40	10	20	08/06/21 16:06	08/04/21	
Lithium	200.8	**183**	ug/L	0.50	0.50	5	08/06/21 18:14	08/04/21	
Molybdenum	200.8	**205**	ug/L	0.50	0.15	5	08/06/21 18:14	08/04/21	

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 task 2
Sample Matrix: Water

Service Request: K2108801
Date Collected: 07/27/21 10:30
Date Received: 07/29/21 11:25

Sample Name: GGS-COL-2-3
Lab Code: K2108801-007

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	2.5	0.5	5	08/06/21 18:16	08/04/21	
Boron	200.8	**1590**	ug/L	40	10	20	08/06/21 16:08	08/04/21	
Lithium	200.8	**121**	ug/L	0.50	0.50	5	08/06/21 18:16	08/04/21	
Molybdenum	200.8	**42.3**	ug/L	0.50	0.15	5	08/06/21 18:16	08/04/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108801
Project:	Gorgas/201114-01.01 task 2		**Date Collected:**	07/27/21 10:30
Sample Matrix:	Water		**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-4-3		**Basis:**	NA
Lab Code:	K2108801-008			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**44.3**	ug/L	2.5	0.5	5	08/06/21 18:18	08/04/21	
Boron	200.8	**1580**	ug/L	40	10	20	08/06/21 16:11	08/04/21	
Lithium	200.8	**118**	ug/L	0.50	0.50	5	08/06/21 18:18	08/04/21	
Molybdenum	200.8	**153**	ug/L	0.50	0.15	5	08/06/21 18:18	08/04/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108801
Project:	Gorgas/201114-01.01 task 2	**Date Collected:**	07/27/21 10:30
Sample Matrix:	Water	**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-6-3	**Basis:**	NA
Lab Code:	K2108801-009		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**33.0**	ug/L	2.5	0.5	5	08/06/21 18:21	08/04/21	
Boron	200.8	**1580**	ug/L	40	10	20	08/06/21 16:13	08/04/21	
Lithium	200.8	**87.0**	ug/L	0.50	0.50	5	08/06/21 18:21	08/04/21	
Molybdenum	200.8	**145**	ug/L	0.50	0.15	5	08/06/21 18:21	08/04/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108801
Project:	Gorgas/201114-01.01 task 2		**Date Collected:**	07/27/21 16:30
Sample Matrix:	Water		**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-2-4		**Basis:**	NA
Lab Code:	K2108801-010			

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	08/06/21 18:23	08/04/21	
Boron	200.8	**1650**	ug/L	40	10	20	08/06/21 16:15	08/04/21	
Lithium	200.8	**129**	ug/L	0.50	0.50	5	08/06/21 18:23	08/04/21	
Molybdenum	200.8	**57.7**	ug/L	0.50	0.15	5	08/06/21 18:23	08/04/21	

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108801
Project:	Gorgas/201114-01.01 task 2	**Date Collected:**	07/27/21 16:30
Sample Matrix:	Water	**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-4-4	**Basis:**	NA
Lab Code:	K2108801-011		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**44.5**	ug/L	2.5	0.5	5	08/06/21 18:30	08/04/21	
Boron	200.8	**1610**	ug/L	40	10	20	08/06/21 16:18	08/04/21	
Lithium	200.8	**115**	ug/L	0.50	0.50	5	08/06/21 18:30	08/04/21	
Molybdenum	200.8	**148**	ug/L	0.50	0.15	5	08/06/21 18:30	08/04/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108801
Project:	Gorgas/201114-01.01 task 2		**Date Collected:**	07/27/21 16:30
Sample Matrix:	Water		**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-6-4		**Basis:**	NA
Lab Code:	K2108801-012			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**142**	ug/L	2.5	0.5	5	08/06/21 18:32	08/04/21	
Boron	200.8	**1620**	ug/L	40	10	20	08/06/21 16:20	08/04/21	
Lithium	200.8	**143**	ug/L	0.50	0.50	5	08/06/21 18:32	08/04/21	
Molybdenum	200.8	**189**	ug/L	0.50	0.15	5	08/06/21 18:32	08/04/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2108801
Project:	Gorgas/201114-01.01 task 2		**Date Collected:**	07/28/21 14:20
Sample Matrix:	Water		**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-INF-MW-7-5		**Basis:**	NA
Lab Code:	K2108801-013			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**237**	ug/L	2.5	0.5	5	08/06/21 18:35	08/04/21	
Boron	200.8	**1640**	ug/L	40	10	20	08/06/21 16:22	08/04/21	
Lithium	200.8	**182**	ug/L	0.50	0.50	5	08/06/21 18:35	08/04/21	
Molybdenum	200.8	**205**	ug/L	0.50	0.15	5	08/06/21 18:35	08/04/21	

Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2108801
Project:	Gorgas/201114-01.01 task 2		**Date Collected:**	07/28/21 14:20
Sample Matrix:	Water		**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-2-5		**Basis:**	NA
Lab Code:	K2108801-014			

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	08/06/21 18:37	08/04/21	
Boron	200.8	**1620**	ug/L	40	10	20	08/06/21 16:25	08/04/21	
Lithium	200.8	**158**	ug/L	0.50	0.50	5	08/06/21 18:37	08/04/21	
Molybdenum	200.8	**116**	ug/L	0.50	0.15	5	08/06/21 18:37	08/04/21	

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Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2108801
Project:	Gorgas/201114-01.01 task 2		**Date Collected:**	07/28/21 14:20
Sample Matrix:	Water		**Date Received:**	07/29/21 11:25
Sample Name:	GGS-COL-4-5		**Basis:**	NA
Lab Code:	K2108801-015			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**100**	ug/L	2.5	0.5	5	08/06/21 18:39	08/04/21	
Boron	200.8	**1540**	ug/L	40	10	20	08/06/21 16:53	08/04/21	
Lithium	200.8	**142**	ug/L	0.50	0.50	5	08/06/21 18:39	08/04/21	
Molybdenum	200.8	**181**	ug/L	0.50	0.15	5	08/06/21 18:39	08/04/21	

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Analytical Report

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 task 2
Sample Matrix: Water

Service Request: K2108801
Date Collected: 07/28/21 14:20
Date Received: 07/29/21 11:25

Sample Name: GGS-COL-6-5
Lab Code: K2108801-016

Basis: NA

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**100**	ug/L	2.5	0.5	5	08/06/21 18:42	08/04/21	
Boron	200.8	**1560**	ug/L	40	10	20	08/06/21 16:55	08/04/21	
Lithium	200.8	**122**	ug/L	0.50	0.50	5	08/06/21 18:42	08/04/21	
Molybdenum	200.8	**176**	ug/L	0.50	0.15	5	08/06/21 18:42	08/04/21	

QC Summary Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Metals

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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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108801
Project:	Gorgas/201114-01.01 task 2	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	KQ2114527-01		

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	08/06/21 15:24	08/04/21	
Boron	200.8	ND U	ug/L	2.0	0.5	1	08/06/21 15:24	08/04/21	
Lithium	200.8	ND U	ug/L	0.10	0.10	1	08/06/21 15:24	08/04/21	
Molybdenum	200.8	ND U	ug/L	0.10	0.03	1	08/06/21 15:24	08/04/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2108801
Project:	Gorgas/201114-01.01 task 2	**Date Collected:**	07/26/21
Sample Matrix:	Water	**Date Received:**	07/29/21
		Date Analyzed:	08/6/21
		Date Extracted:	08/4/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	GGS-COL-4-1	**Units:**	ug/L
Lab Code:	K2108801-001	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2114527-04

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	66.3	111	50.0	89	70-130
Boron	1310	1390	25	313 #	70-130
Lithium	112	162	50.0	100	70-130
Molybdenum	136	161	25.0	98 #	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:**	K2108801
Project:	Gorgas/201114-01.01 task 2	**Date Collected:**	07/26/21
Sample Matrix:	Water	**Date Received:**	07/29/21
		Date Analyzed:	08/6/21
		Date Extracted:	08/4/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	GGS-COL-6-1	**Units:**	ug/L
Lab Code:	K2108801-002	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2114527-06

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	75.8	123	50.0	93	70-130
Boron	1480	1490	25	30 #	70-130
Lithium	100	155	50.0	110	70-130
Molybdenum	145	172	25.0	108 #	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:**	K2108801
Project	Gorgas/201114-01.01 task 2		**Date Collected:**	07/26/21
Sample Matrix:	Water		**Date Received:**	07/29/21
			Date Analyzed:	08/06/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	GGS-COL-4-1		**Units:**	ug/L
Lab Code:	K2108801-001		**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2114527-03 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	66.3	66.3	66.3	<1	20
Boron	200.8	40	10	1310	1340	1330	2	20
Lithium	200.8	0.50	0.50	112	114	113	2	20
Molybdenum	200.8	0.50	0.15	136	135	136	<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.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108801
Project	Gorgas/201114-01.01 task 2	**Date Collected:**	07/26/21
Sample Matrix:	Water	**Date Received:**	07/29/21
		Date Analyzed:	08/06/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	GGS-COL-6-1	**Units:**	ug/L
Lab Code:	K2108801-002	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2114527-05 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	75.8	72.3	74.1	5	20
Boron	200.8	40	10	1480	1480	1480	<1	20
Lithium	200.8	0.50	0.50	100	99.8	99.9	<1	20
Molybdenum	200.8	0.50	0.15	145	143	144	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.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2108801
Project:	Gorgas/201114-01.01 task 2	**Date Analyzed:**	08/06/21
Sample Matrix:	Water		

Lab Control Sample Summary
Dissolved Metals

Units: ug/L
Basis: NA

Lab Control Sample
KQ2114527-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	200.8	48.6	50.0	97	85-115
Boron	200.8	22.9	25.0	92	85-115
Lithium	200.8	51.5	50.0	103	85-115
Molybdenum	200.8	26.3	25.0	105	85-115

September 10, 2021 Service Request No:K2109361

Masa Kanematsu
Anchor QEA, LLC
6720 SW Macadam Avenue
Suite 125
Portland, OR 97219

Laboratory Results for: Gorgas

Dear Masa,

Enclosed are the results of the sample(s) submitted to our laboratory August 11, 2021
For your reference, these analyses have been assigned our service request number **K2109361.**

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

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

Client:	Anchor QEA, LLC	**Service Request:**	K2109361
Project:	Gorgas	**Date Received:**	08/11/2021
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:

Fifteen water samples were received for analysis at ALS Environmental on 08/11/2021. 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 09/10/2021

SAMPLE DETECTION SUMMARY

CLIENT ID: GGS-COL-5-9 — **Lab ID: K2109361-001**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	63.9		0.5	2.5	ug/L	200.8
Lithium, Dissolved	261		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	6.87		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-INF-MW-6D-10 — **Lab ID: K2109361-002**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	116		0.5	2.5	ug/L	200.8
Lithium, Dissolved	324		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	6.59		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-1-10 — **Lab ID: K2109361-003**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	73.5		0.5	2.5	ug/L	200.8
Lithium, Dissolved	327		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	6.68		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-3-10 — **Lab ID: K2109361-004**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	53.2		0.5	2.5	ug/L	200.8
Lithium, Dissolved	305		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	7.61		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-5-10 — **Lab ID: K2109361-005**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	68.2		0.5	2.5	ug/L	200.8
Lithium, Dissolved	256		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	6.75		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-INF-MW-6D-11 — **Lab ID: K2109361-006**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	119		0.5	2.5	ug/L	200.8
Lithium, Dissolved	333		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	8.44		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-1-11 — **Lab ID: K2109361-007**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	73.2		0.5	2.5	ug/L	200.8
Lithium, Dissolved	326		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	7.24		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-3-11 — **Lab ID: K2109361-008**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	62.8		0.5	2.5	ug/L	200.8
Lithium, Dissolved	316		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	7.15		0.15	0.50	ug/L	200.8

SAMPLE DETECTION SUMMARY

CLIENT ID: GGS-COL-3-11	Lab ID: K2109361-008					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**

CLIENT ID: GGS-COL-5-11	Lab ID: K2109361-009					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	60.7		0.5	2.5	ug/L	200.8
Lithium, Dissolved	250		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	7.20		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-INF-MW-6D-12	Lab ID: K2109361-010					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	122		0.5	2.5	ug/L	200.8
Lithium, Dissolved	335		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	6.36		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-1-12	Lab ID: K2109361-011					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	76.3		0.5	2.5	ug/L	200.8
Lithium, Dissolved	327		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	7.08		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-3-12	Lab ID: K2109361-012					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	68.9		0.5	2.5	ug/L	200.8
Lithium, Dissolved	312		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	6.73		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-5-12	Lab ID: K2109361-013					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	76.2		0.5	2.5	ug/L	200.8
Lithium, Dissolved	274		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	6.81		0.15	0.50	ug/L	200.8

CLIENT ID: GGS-COL-INF-MW-7-6	Lab ID: K2109361-014					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	248		2	10	ug/L	200.8
Boron, Dissolved	1620		10	40	ug/L	200.8
Lithium, Dissolved	174		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	215		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-2-6	Lab ID: K2109361-015					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	2.9		0.5	2.5	ug/L	200.8
Boron, Dissolved	1590		10	40	ug/L	200.8
Lithium, Dissolved	158		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	189		0.6	2.0	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

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K2109361-001	GGS-COL-5-9	8/2/2021	0821
K2109361-002	GGS-COL-INF-MW-6D-10	8/4/2021	1420
K2109361-003	GGS-COL-1-10	8/4/2021	1420
K2109361-004	GGS-COL-3-10	8/4/2021	1420
K2109361-005	GGS-COL-5-10	8/4/2021	1420
K2109361-006	GGS-COL-INF-MW-6D-11	8/6/2021	1313
K2109361-007	GGS-COL-1-11	8/6/2021	1313
K2109361-008	GGS-COL-3-11	8/6/2021	1313
K2109361-009	GGS-COL-5-11	8/6/2021	1313
K2109361-010	GGS-COL-INF-MW-6D-12	8/9/2021	0830
K2109361-011	GGS-COL-1-12	8/9/2021	0830
K2109361-012	GGS-COL-3-12	8/9/2021	0830
K2109361-013	GGS-COL-5-12	8/9/2021	0830
K2109361-014	GGS-COL-INF-MW-7-6	7/29/2021	1245
K2109361-015	GGS-COL-2-6	7/29/2021	1245

K2109361

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number:	503-972-5019
Date:	8/11/2021
Project Name:	Gorgas
Project Number:	201114-01.01 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	As, Li, Mo (dissolved, Method 200.8)	Boron (dissolved, Method 200.8)	Comments/Preservation
16	GGS-COL-5-9	8/2/2021	8:21	Water	1	X		HNO_3 preserved, filtered
17	GGS-COL-INF-MW-6D-10	8/4/2021	14:20	Water	1	X		HNO_3 preserved, filtered
18	GGS-COL-1-10	8/4/2021	14:20	Water	1	X		HNO_3 preserved, filtered
19	GGS-COL-3-10	8/4/2021	14:20	Water	1	X		HNO_3 preserved, filtered
20	GGS-COL-5-10	8/4/2021	14:20	Water	1	X		HNO_3 preserved, filtered
21	GGS-COL-INF-MW-6D-11	8/6/2021	13:13	Water	1	X		HNO_3 preserved, filtered
22	GGS-COL-1-11	8/6/2021	13:13	Water	1	X		HNO_3 preserved, filtered
23	GGS-COL-3-11	8/6/2021	13:13	Water	1	X		HNO_3 preserved, filtered
24	GGS-COL-5-11	8/6/2021	13:13	Water	1	X		HNO_3 preserved, filtered
25	GGS-COL-INF-MW-6D-12	8/9/2021	8:30	Water	1	X		HNO_3 preserved, filtered
26	GGS-COL-1-12	8/9/2021	8:30	Water	1	X		HNO_3 preserved, filtered
27	GGS-COL-3-12	8/9/2021	8:30	Water	1	X		HNO_3 preserved, filtered
28	GGS-COL-5-12	8/9/2021	8:30	Water	1	X		HNO_3 preserved, filtered
29	GGS-COL-INF-MW-7-6	7/29/2021	12:45	Water	1	X	X	HNO_3 preserved, filtered
30	GGS-COL-2-6	7/29/2021	12:45	Water	1	X	X	HNO_3 preserved, filtered

Notes: **Please analyze all analytes with** standard TAT **on this page. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**

Desired reporting limits : As (<2 ug/L), B (<10 ug/L), and Mo (<1 ug/L). For Lithium, please use Method 200.8 for better detection limit if possible. Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA		ALS
Signature/Print Name:	**Date/Time:**	**Signature/Print Name:**	**Date/Time:**
	8/11/2021 9:00	B Buchanan	8/11/21 1750
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 2 of 4

PM MH

Cooler Receipt and Preservation Form

Client Anchor QEA Service Request K21 09306

Received: 8/11/21 Opened: 8/11/21 By: BR Unloaded: 8/11/21 By: BR

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
8.6	—	1803		—	—		
13.6	—			—			

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: 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: Gorgas/201114-01.01 Task 02
Service Request: K2109361

Sample Name: GGS-COL-5-9
Lab Code: K2109361-001
Sample Matrix: Water
Date Collected: 08/2/21
Date Received: 08/11/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-INF-MW-6D-10
Lab Code: K2109361-002
Sample Matrix: Water
Date Collected: 08/4/21
Date Received: 08/11/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-1-10
Lab Code: K2109361-003
Sample Matrix: Water
Date Collected: 08/4/21
Date Received: 08/11/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-3-10
Lab Code: K2109361-004
Sample Matrix: Water
Date Collected: 08/4/21
Date Received: 08/11/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-5-10
Lab Code: K2109361-005
Sample Matrix: Water
Date Collected: 08/4/21
Date Received: 08/11/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Client: Anchor QEA, LLC **Service Request:** K2109361
Project: Gorgas/201114-01.01 Task 02

Sample Name: GGS-COL-INF-MW-6D-11 **Date Collected:** 08/6/21
Lab Code: K2109361-006 **Date Received:** 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-1-11 **Date Collected:** 08/6/21
Lab Code: K2109361-007 **Date Received:** 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-3-11 **Date Collected:** 08/6/21
Lab Code: K2109361-008 **Date Received:** 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-5-11 **Date Collected:** 08/6/21
Lab Code: K2109361-009 **Date Received:** 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-INF-MW-6D-12 **Date Collected:** 08/9/21
Lab Code: K2109361-010 **Date Received:** 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Client: Anchor QEA, LLC
Service Request: K2109361
Project: Gorgas/201114-01.01 Task 02

Sample Name: GGS-COL-1-12
Date Collected: 08/9/21
Lab Code: K2109361-011
Date Received: 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-3-12
Date Collected: 08/9/21
Lab Code: K2109361-012
Date Received: 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-5-12
Date Collected: 08/9/21
Lab Code: K2109361-013
Date Received: 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-INF-MW-7-6
Date Collected: 07/29/21
Lab Code: K2109361-014
Date Received: 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-2-6
Date Collected: 07/29/21
Lab Code: K2109361-015
Date Received: 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Results

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1317 South 13th Avenue, Kelso, WA 98626
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1317 South 13th Avenue, Kelso, WA 98626
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Client:	Anchor QEA, LLC		**Service Request:**	K2109361
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	08/02/21 08:21
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-5-9		**Basis:**	NA
Lab Code:	K2109361-001			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**63.9**	ug/L	2.5	0.5	5	09/08/21 14:26	08/20/21	
Lithium	200.8	**261**	ug/L	0.50	0.50	5	09/08/21 14:26	08/20/21	
Molybdenum	200.8	**6.87**	ug/L	0.50	0.15	5	09/08/21 14:26	08/20/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2109361
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	08/04/21 14:20
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-INF-MW-6D-10		**Basis:**	NA
Lab Code:	K2109361-002			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**116**	ug/L	2.5	0.5	5	09/08/21 14:32	08/20/21	
Lithium	200.8	**324**	ug/L	0.50	0.50	5	09/08/21 14:32	08/20/21	
Molybdenum	200.8	**6.59**	ug/L	0.50	0.15	5	09/08/21 14:32	08/20/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109361
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	08/04/21 14:20
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-1-10	**Basis:**	NA
Lab Code:	K2109361-003		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**73.5**	ug/L	2.5	0.5	5	09/08/21 14:37	08/20/21	
Lithium	200.8	**327**	ug/L	0.50	0.50	5	09/08/21 14:37	08/20/21	
Molybdenum	200.8	**6.68**	ug/L	0.50	0.15	5	09/08/21 14:37	08/20/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2109361
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	08/04/21 14:20
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-3-10	**Basis:**	NA
Lab Code:	K2109361-004		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**53.2**	ug/L	2.5	0.5	5	09/08/21 14:39	08/20/21	
Lithium	200.8	**305**	ug/L	0.50	0.50	5	09/08/21 14:39	08/20/21	
Molybdenum	200.8	**7.61**	ug/L	0.50	0.15	5	09/08/21 14:39	08/20/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109361
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	08/04/21 14:20
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-5-10	**Basis:**	NA
Lab Code:	K2109361-005		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**68.2**	ug/L	2.5	0.5	5	09/08/21 14:41	08/20/21	
Lithium	200.8	**256**	ug/L	0.50	0.50	5	09/08/21 14:41	08/20/21	
Molybdenum	200.8	**6.75**	ug/L	0.50	0.15	5	09/08/21 14:41	08/20/21	

Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2109361
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	08/06/21 13:13
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-INF-MW-6D-11		**Basis:**	NA
Lab Code:	K2109361-006			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**119**	ug/L	2.5	0.5	5	09/08/21 14:43	08/20/21	
Lithium	200.8	**333**	ug/L	0.50	0.50	5	09/08/21 14:43	08/20/21	
Molybdenum	200.8	**8.44**	ug/L	0.50	0.15	5	09/08/21 14:43	08/20/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2109361
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	08/06/21 13:13
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-1-11	**Basis:**	NA
Lab Code:	K2109361-007		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**73.2**	ug/L	2.5	0.5	5	09/08/21 14:48	08/20/21	
Lithium	200.8	**326**	ug/L	0.50	0.50	5	09/08/21 14:48	08/20/21	
Molybdenum	200.8	**7.24**	ug/L	0.50	0.15	5	09/08/21 14:48	08/20/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2109361
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	08/06/21 13:13
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-3-11		**Basis:**	NA
Lab Code:	K2109361-008			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**62.8**	ug/L	2.5	0.5	5	09/08/21 14:50	08/20/21	
Lithium	200.8	**316**	ug/L	0.50	0.50	5	09/08/21 14:50	08/20/21	
Molybdenum	200.8	**7.15**	ug/L	0.50	0.15	5	09/08/21 14:50	08/20/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109361
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	08/06/21 13:13
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-5-11	**Basis:**	NA
Lab Code:	K2109361-009		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**60.7**	ug/L	2.5	0.5	5	09/08/21 14:52	08/20/21	
Lithium	200.8	**250**	ug/L	0.50	0.50	5	09/08/21 14:52	08/20/21	
Molybdenum	200.8	**7.20**	ug/L	0.50	0.15	5	09/08/21 14:52	08/20/21	

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109361
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	08/09/21 08:30
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-INF-MW-6D-12	**Basis:**	NA
Lab Code:	K2109361-010		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**122**	ug/L	2.5	0.5	5	09/08/21 14:54	08/20/21	
Lithium	200.8	**335**	ug/L	0.50	0.50	5	09/08/21 14:54	08/20/21	
Molybdenum	200.8	**6.36**	ug/L	0.50	0.15	5	09/08/21 14:54	08/20/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2109361
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	08/09/21 08:30
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-1-12		**Basis:**	NA
Lab Code:	K2109361-011			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**76.3**	ug/L	2.5	0.5	5	09/08/21 14:56	08/20/21	
Lithium	200.8	**327**	ug/L	0.50	0.50	5	09/08/21 14:56	08/20/21	
Molybdenum	200.8	**7.08**	ug/L	0.50	0.15	5	09/08/21 14:56	08/20/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2109361
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	08/09/21 08:30
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-3-12		**Basis:**	NA
Lab Code:	K2109361-012			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**68.9**	ug/L	2.5	0.5	5	09/08/21 14:57	08/20/21	
Lithium	200.8	**312**	ug/L	0.50	0.50	5	09/08/21 14:57	08/20/21	
Molybdenum	200.8	**6.73**	ug/L	0.50	0.15	5	09/08/21 14:57	08/20/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109361
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	08/09/21 08:30
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-5-12	**Basis:**	NA
Lab Code:	K2109361-013		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**76.2**	ug/L	2.5	0.5	5	09/08/21 14:59	08/20/21	
Lithium	200.8	**274**	ug/L	0.50	0.50	5	09/08/21 14:59	08/20/21	
Molybdenum	200.8	**6.81**	ug/L	0.50	0.15	5	09/08/21 14:59	08/20/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109361
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/29/21 12:45
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-INF-MW-7-6	**Basis:**	NA
Lab Code:	K2109361-014		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**248**	ug/L	10	2	20	09/08/21 11:45	08/20/21	
Boron	200.8	**1620**	ug/L	40	10	20	09/08/21 11:45	08/20/21	
Lithium	200.8	**174**	ug/L	2.0	2.0	20	09/08/21 11:45	08/20/21	
Molybdenum	200.8	**215**	ug/L	2.0	0.6	20	09/08/21 11:45	08/20/21	

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 Task 02
Sample Matrix: Water

Service Request: K2109361
Date Collected: 07/29/21 12:45
Date Received: 08/11/21 17:50

Sample Name: GGS-COL-2-6
Lab Code: K2109361-015

Basis: NA

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	09/08/21 15:03	08/20/21	
Boron	200.8	**1590**	ug/L	40	10	20	09/08/21 11:47	08/20/21	
Lithium	200.8	**158**	ug/L	2.0	2.0	20	09/08/21 11:47	08/20/21	
Molybdenum	200.8	**189**	ug/L	2.0	0.6	20	09/08/21 11:47	08/20/21	

QC Summary 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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ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109361
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	KQ2115665-01		

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	09/08/21 11:32	08/20/21	
Boron	200.8	ND U	ug/L	2.0	0.5	1	09/08/21 11:32	08/20/21	
Lithium	200.8	ND U	ug/L	0.10	0.10	1	09/08/21 11:32	08/20/21	
Molybdenum	200.8	ND U	ug/L	0.10	0.03	1	09/08/21 11:32	08/20/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2109361
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	08/02/21
Sample Matrix:	Water	**Date Received:**	08/11/21
		Date Analyzed:	09/8/21
		Date Extracted:	08/20/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	GGS-COL-5-9	**Units:**	ug/L
Lab Code:	K2109361-001	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2115665-04

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	63.9	116	50.0	105	70-130
Boron	1240	1310	25	260 #	70-130
Lithium	261	315	50.0	108 #	70-130
Molybdenum	6.87	35.3	25.0	114	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:**	K2109361
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	08/04/21
Sample Matrix:	Water	**Date Received:**	08/11/21
		Date Analyzed:	09/8/21
		Date Extracted:	08/20/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	GGS-COL-INF-MW-6D-10	**Units:**	ug/L
Lab Code:	K2109361-002	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2115665-06

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	116	167	50.0	102	70-130
Boron	1300	1300	25	10 #	70-130
Lithium	324	387	50.0	126 #	70-130
Molybdenum	6.59	34.1	25.0	110	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:**	K2109361
Project	Gorgas/201114-01.01 Task 02	**Date Collected:**	08/02/21
Sample Matrix:	Water	**Date Received:**	08/11/21
		Date Analyzed:	09/08/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	GGS-COL-5-9	**Units:**	ug/L
Lab Code:	K2109361-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2115665-03 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	63.9	62.2	63.1	3	20
Boron	200.8	40	10	1240	1300	1270	5	20
Lithium	200.8	0.50	0.50	261	259	260	<1	20
Molybdenum	200.8	0.50	0.15	6.87	6.64	6.76	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.

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QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109361
Project	Gorgas/201114-01.01 Task 02	**Date Collected:**	08/04/21
Sample Matrix:	Water	**Date Received:**	08/11/21
		Date Analyzed:	09/08/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	GGS-COL-INF-MW-6D-10	**Units:**	ug/L
Lab Code:	K2109361-002	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2115665-05 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	116	118	117	2	20
Boron	200.8	40	10	1300	1260	1280	3	20
Lithium	200.8	0.50	0.50	324	325	325	<1	20
Molybdenum	200.8	0.50	0.15	6.59	6.20	6.40	6	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: Gorgas/201114-01.01 Task 02
Sample Matrix: Water

Service Request: K2109361
Date Analyzed: 09/08/21

Lab Control Sample Summary
Dissolved Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2115665-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	200.8	47.6	50.0	95	85-115
Boron	200.8	23.6	25.0	94	85-115
Lithium	200.8	49.5	50.0	99	85-115
Molybdenum	200.8	26.0	25.0	104	85-115

September 10, 2021 Service Request No:K2109362

Masa Kanematsu
Anchor QEA, LLC
6720 SW Macadam Avenue
Suite 125
Portland, OR 97219

Laboratory Results for: Gorgas

Dear Masa,

Enclosed are the results of the sample(s) submitted to our laboratory August 11, 2021
For your reference, these analyses have been assigned our service request number **K2109362.**

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

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: Anchor QEA, LLC
Project: Gorgas
Sample Matrix: Water

Service Request: K2109362
Date Received: 08/11/2021

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:

Eleven water samples were received for analysis at ALS Environmental on 08/11/2021. 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 Noel D. Dai (signature)　　Date 09/10/2021

SAMPLE DETECTION SUMMARY

CLIENT ID: GGS-COL-2-10	Lab ID: K2109362-001					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	127		2	10	ug/L	200.8
Boron, Dissolved	1560		10	40	ug/L	200.8
Lithium, Dissolved	164		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	215		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-4-10	Lab ID: K2109362-002					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	151		2	10	ug/L	200.8
Boron, Dissolved	1640		10	40	ug/L	200.8
Lithium, Dissolved	155		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	212		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-6-10	Lab ID: K2109362-003					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	214		2	10	ug/L	200.8
Boron, Dissolved	1620		10	40	ug/L	200.8
Lithium, Dissolved	151		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	205		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-INF-MW-7-11	Lab ID: K2109362-004					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	249		2	10	ug/L	200.8
Boron, Dissolved	1600		10	40	ug/L	200.8
Lithium, Dissolved	173		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	212		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-2-11	Lab ID: K2109362-005					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	148		2	10	ug/L	200.8
Boron, Dissolved	1660		10	40	ug/L	200.8
Lithium, Dissolved	168		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	220		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-4-11	Lab ID: K2109362-006					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	144		2	10	ug/L	200.8
Boron, Dissolved	1630		10	40	ug/L	200.8
Lithium, Dissolved	156		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	218		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-6-11	Lab ID: K2109362-007					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	211		2	10	ug/L	200.8
Boron, Dissolved	1650		10	40	ug/L	200.8

SAMPLE DETECTION SUMMARY

CLIENT ID: GGS-COL-6-11	Lab ID: K2109362-007					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Lithium, Dissolved	149		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	211		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-INF-MW-7-12	Lab ID: K2109362-008					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	246		2	10	ug/L	200.8
Boron, Dissolved	1640		10	40	ug/L	200.8
Lithium, Dissolved	175		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	213		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-2-12	Lab ID: K2109362-009					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	155		2	10	ug/L	200.8
Boron, Dissolved	1660		10	40	ug/L	200.8
Lithium, Dissolved	169		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	224		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-4-12	Lab ID: K2109362-010					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	123		2	10	ug/L	200.8
Boron, Dissolved	1670		10	40	ug/L	200.8
Lithium, Dissolved	158		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	218		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-6-12	Lab ID: K2109362-011					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	126		2	10	ug/L	200.8
Boron, Dissolved	1680		10	40	ug/L	200.8
Lithium, Dissolved	159		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	224		0.6	2.0	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

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K2109362-001	GGS-COL-2-10	8/4/2021	1420
K2109362-002	GGS-COL-4-10	8/4/2021	1420
K2109362-003	GGS-COL-6-10	8/4/2021	1420
K2109362-004	GGS-COL-INF-MW-7-11	8/6/2021	1313
K2109362-005	GGS-COL-2-11	8/6/2021	1313
K2109362-006	GGS-COL-4-11	8/6/2021	1313
K2109362-007	GGS-COL-6-11	8/6/2021	1313
K2109362-008	GGS-COL-INF-MW-7-12	8/9/2021	0830
K2109362-009	GGS-COL-2-12	8/9/2021	0830
K2109362-010	GGS-COL-4-12	8/9/2021	0830
K2109362-011	GGS-COL-6-12	8/9/2021	0830

K2109862

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number:	503-972-5019
Date:	8/11/2021
Project Name:	Gorgas
Project Number:	201114-01.01 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	As, Li, Mo (dissolved, Method 200.8)	Boron (dissolved, Method 200.8)	Comments/Preservation
46	GGS-COL-2-10	8/4/2021	14:20	Water	1	X	X	HNO_3 preserved, filtered
47	GGS-COL-4-10	8/4/2021	14:20	Water	1	X	X	HNO_3 preserved, filtered
48	GGS-COL-6-10	8/4/2021	14:20	Water	1	X	X	HNO_3 preserved, filtered
49	GGS-COL-INF-MW-7-11	8/6/2021	13:13	Water	1	X	X	HNO_3 preserved, filtered
50	GGS-COL-2-11	8/6/2021	13:13	Water	1	X	X	HNO_3 preserved, filtered
51	GGS-COL-4-11	8/6/2021	13:13	Water	1	X	X	HNO_3 preserved, filtered
52	GGS-COL-6-11	8/6/2021	13:13	Water	1	X	X	HNO_3 preserved, filtered
53	GGS-COL-INF-MW-7-12	8/9/2021	8:30	Water	1	X	X	HNO_3 preserved, filtered
54	GGS-COL-2-12	8/9/2021	8:30	Water	1	X	X	HNO_3 preserved, filtered
55	GGS-COL-4-12	8/9/2021	8:30	Water	1	X	X	HNO_3 preserved, filtered
56	GGS-COL-6-12	8/9/2021	8:30	Water	1	X	X	HNO_3 preserved, filtered
57								
58								
59								
60								

Notes: **Please analyze all analytes with** standard TAT **on this page. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**

Desired reporting limits : As (<2 ug/L), B (<10 ug/L), and Mo (<1 ug/L). For Lithium, please use Method 200.8 for better detection limit if possible. Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA		ALS
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
	8/11/2021 9:00	B Kuchman	8/11/21 1750
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 4

PM MH

Cooler Receipt and Preservation Form

Client Anchor QEA   Service Request K21 09362

Received: 8/11/21 Opened: 8/11/21 By: BR Unloaded: 8/11/21 By: BR

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
8.6	—	IR05		—	—		
13.6	—	↓		—	—		

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: 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
Service Request: K2109362
Project: Gorgas/201114-01.01 Task 02

Sample Name: GGS-COL-2-10
Date Collected: 08/4/21
Lab Code: K2109362-001
Date Received: 08/11/21
Sample Matrix: Water

Analysis Method	**Extracted/Digested By**	**Analyzed By**
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-4-10
Date Collected: 08/4/21
Lab Code: K2109362-002
Date Received: 08/11/21
Sample Matrix: Water

Analysis Method	**Extracted/Digested By**	**Analyzed By**
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-6-10
Date Collected: 08/4/21
Lab Code: K2109362-003
Date Received: 08/11/21
Sample Matrix: Water

Analysis Method	**Extracted/Digested By**	**Analyzed By**
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-INF-MW-7-11
Date Collected: 08/6/21
Lab Code: K2109362-004
Date Received: 08/11/21
Sample Matrix: Water

Analysis Method	**Extracted/Digested By**	**Analyzed By**
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-2-11
Date Collected: 08/6/21
Lab Code: K2109362-005
Date Received: 08/11/21
Sample Matrix: Water

Analysis Method	**Extracted/Digested By**	**Analyzed By**
200.8	ABOYER	RMOORE

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 Task 02
Service Request: K2109362

Sample Name: GGS-COL-4-11
Lab Code: K2109362-006
Sample Matrix: Water
Date Collected: 08/6/21
Date Received: 08/11/21

Analysis Method	**Extracted/Digested By**	**Analyzed By**
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-6-11
Lab Code: K2109362-007
Sample Matrix: Water
Date Collected: 08/6/21
Date Received: 08/11/21

Analysis Method	**Extracted/Digested By**	**Analyzed By**
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-INF-MW-7-12
Lab Code: K2109362-008
Sample Matrix: Water
Date Collected: 08/9/21
Date Received: 08/11/21

Analysis Method	**Extracted/Digested By**	**Analyzed By**
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-2-12
Lab Code: K2109362-009
Sample Matrix: Water
Date Collected: 08/9/21
Date Received: 08/11/21

Analysis Method	**Extracted/Digested By**	**Analyzed By**
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-4-12
Lab Code: K2109362-010
Sample Matrix: Water
Date Collected: 08/9/21
Date Received: 08/11/21

Analysis Method	**Extracted/Digested By**	**Analyzed By**
200.8	ABOYER	RMOORE

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 Task 02
Service Request: K2109362

Sample Name: GGS-COL-6-12
Lab Code: K2109362-011
Sample Matrix: Water
Date Collected: 08/9/21
Date Received: 08/11/21

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Results

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Metals

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2109362
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	08/04/21 14:20
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-2-10		**Basis:**	NA
Lab Code:	K2109362-001			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**127**	ug/L	10	2	20	09/08/21 11:57	08/24/21	
Boron	200.8	**1560**	ug/L	40	10	20	09/08/21 11:57	08/24/21	
Lithium	200.8	**164**	ug/L	2.0	2.0	20	09/08/21 11:57	08/24/21	
Molybdenum	200.8	**215**	ug/L	2.0	0.6	20	09/08/21 11:57	08/24/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2109362
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	08/04/21 14:20
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-4-10		**Basis:**	NA
Lab Code:	K2109362-002			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**151**	ug/L	10	2	20	09/08/21 12:01	08/24/21	
Boron	200.8	**1640**	ug/L	40	10	20	09/08/21 12:01	08/24/21	
Lithium	200.8	**155**	ug/L	2.0	2.0	20	09/08/21 12:01	08/24/21	
Molybdenum	200.8	**212**	ug/L	2.0	0.6	20	09/08/21 12:01	08/24/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2109362
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	08/04/21 14:20
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-6-10	**Basis:**	NA
Lab Code:	K2109362-003		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**214**	ug/L	10	2	20	09/08/21 12:06	08/24/21	
Boron	200.8	**1620**	ug/L	40	10	20	09/08/21 12:06	08/24/21	
Lithium	200.8	**151**	ug/L	2.0	2.0	20	09/08/21 12:06	08/24/21	
Molybdenum	200.8	**205**	ug/L	2.0	0.6	20	09/08/21 12:06	08/24/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109362
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	08/06/21 13:13
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-INF-MW-7-11	**Basis:**	NA
Lab Code:	K2109362-004		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**249**	ug/L	10	2	20	09/08/21 12:16	08/24/21	
Boron	200.8	**1600**	ug/L	40	10	20	09/08/21 12:16	08/24/21	
Lithium	200.8	**173**	ug/L	2.0	2.0	20	09/08/21 12:16	08/24/21	
Molybdenum	200.8	**212**	ug/L	2.0	0.6	20	09/08/21 12:16	08/24/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2109362
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	08/06/21 13:13
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-2-11		**Basis:**	NA
Lab Code:	K2109362-005			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**148**	ug/L	10	2	20	09/08/21 12:18	08/24/21	
Boron	200.8	**1660**	ug/L	40	10	20	09/08/21 12:18	08/24/21	
Lithium	200.8	**168**	ug/L	2.0	2.0	20	09/08/21 12:18	08/24/21	
Molybdenum	200.8	**220**	ug/L	2.0	0.6	20	09/08/21 12:18	08/24/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2109362
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	08/06/21 13:13
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-4-11		**Basis:**	NA
Lab Code:	K2109362-006			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**144**	ug/L	10	2	20	09/08/21 12:19	08/24/21	
Boron	200.8	**1630**	ug/L	40	10	20	09/08/21 12:19	08/24/21	
Lithium	200.8	**156**	ug/L	2.0	2.0	20	09/08/21 12:19	08/24/21	
Molybdenum	200.8	**218**	ug/L	2.0	0.6	20	09/08/21 12:19	08/24/21	

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109362
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	08/06/21 13:13
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-6-11	**Basis:**	NA
Lab Code:	K2109362-007		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**211**	ug/L	10	2	20	09/08/21 12:21	08/24/21	
Boron	200.8	**1650**	ug/L	40	10	20	09/08/21 12:21	08/24/21	
Lithium	200.8	**149**	ug/L	2.0	2.0	20	09/08/21 12:21	08/24/21	
Molybdenum	200.8	**211**	ug/L	2.0	0.6	20	09/08/21 12:21	08/24/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2109362
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	08/09/21 08:30
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-INF-MW-7-12		**Basis:**	NA
Lab Code:	K2109362-008			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**246**	ug/L	10	2	20	09/08/21 12:22	08/24/21	
Boron	200.8	**1640**	ug/L	40	10	20	09/08/21 12:22	08/24/21	
Lithium	200.8	**175**	ug/L	2.0	2.0	20	09/08/21 12:22	08/24/21	
Molybdenum	200.8	**213**	ug/L	2.0	0.6	20	09/08/21 12:22	08/24/21	

Client: Anchor QEA, LLC
Service Request: K2109362
Project: Gorgas/201114-01.01 Task 02
Date Collected: 08/09/21 08:30
Sample Matrix: Water
Date Received: 08/11/21 17:50

Sample Name: GGS-COL-2-12
Basis: NA
Lab Code: K2109362-009

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**155**	ug/L	10	2	20	09/08/21 12:24	08/24/21	
Boron	200.8	**1660**	ug/L	40	10	20	09/08/21 12:24	08/24/21	
Lithium	200.8	**169**	ug/L	2.0	2.0	20	09/08/21 12:24	08/24/21	
Molybdenum	200.8	**224**	ug/L	2.0	0.6	20	09/08/21 12:24	08/24/21	

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 Task 02
Sample Matrix: Water

Service Request: K2109362
Date Collected: 08/09/21 08:30
Date Received: 08/11/21 17:50

Sample Name: GGS-COL-4-12
Lab Code: K2109362-010

Basis: NA

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**123**	ug/L	10	2	20	09/08/21 12:26	08/24/21	
Boron	200.8	**1670**	ug/L	40	10	20	09/08/21 12:26	08/24/21	
Lithium	200.8	**158**	ug/L	2.0	2.0	20	09/08/21 12:26	08/24/21	
Molybdenum	200.8	**218**	ug/L	2.0	0.6	20	09/08/21 12:26	08/24/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109362
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	08/09/21 08:30
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-6-12	**Basis:**	NA
Lab Code:	K2109362-011		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**126**	ug/L	10	2	20	09/08/21 12:27	08/24/21	
Boron	200.8	**1680**	ug/L	40	10	20	09/08/21 12:27	08/24/21	
Lithium	200.8	**159**	ug/L	2.0	2.0	20	09/08/21 12:27	08/24/21	
Molybdenum	200.8	**224**	ug/L	2.0	0.6	20	09/08/21 12:27	08/24/21	

QC Summary Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Metals

ALS Environmental—Kelso Laboratory
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:**	K2109362
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	NA
Sample Matrix:	Water		**Date Received:**	NA
Sample Name:	Method Blank		**Basis:**	NA
Lab Code:	KQ2115635-01			

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	09/08/21 11:53	08/24/21	
Boron	200.8	**0.9 J**	ug/L	2.0	0.5	1	09/08/21 11:53	08/24/21	
Lithium	200.8	ND U	ug/L	0.10	0.10	1	09/08/21 11:53	08/24/21	
Molybdenum	200.8	ND U	ug/L	0.10	0.03	1	09/08/21 11:53	08/24/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2109362
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	08/04/21
Sample Matrix:	Water	**Date Received:**	08/11/21
		Date Analyzed:	09/8/21
		Date Extracted:	08/24/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	GGS-COL-2-10	**Units:**	ug/L
Lab Code:	K2109362-001	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2115635-04

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	127	179	50	104	70-130
Boron	1560	1640	25	315 #	70-130
Lithium	164	219	50.0	109	70-130
Molybdenum	215	245	25.0	119 #	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:**	K2109362
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	08/04/21
Sample Matrix:	Water	**Date Received:**	08/11/21
		Date Analyzed:	09/8/21
		Date Extracted:	08/24/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	GGS-COL-4-10	**Units:**	ug/L
Lab Code:	K2109362-002	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2115635-06

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	151	203	50	104	70-130
Boron	1640	1630	25	-46 #	70-130
Lithium	155	203	50.0	96	70-130
Molybdenum	212	239	25.0	106 #	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.

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QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109362
Project	Gorgas/201114-01.01 Task 02	**Date Collected:**	08/04/21
Sample Matrix:	Water	**Date Received:**	08/11/21
		Date Analyzed:	09/08/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	GGS-COL-2-10	**Units:**	ug/L
Lab Code:	K2109362-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2115635-03 Result	Average	RPD	RPD Limit
Arsenic	200.8	10	2	127	130	129	2	20
Boron	200.8	40	10	1560	1600	1580	3	20
Lithium	200.8	2.0	2.0	164	166	165	1	20
Molybdenum	200.8	2.0	0.6	215	219	217	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.

QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109362
Project	Gorgas/201114-01.01 Task 02	**Date Collected:**	08/04/21
Sample Matrix:	Water	**Date Received:**	08/11/21
		Date Analyzed:	09/08/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	GGS-COL-4-10	**Units:**	ug/L
Lab Code:	K2109362-002	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2115635-05 Result	Average	RPD	RPD Limit
Arsenic	200.8	10	2	151	155	153	3	20
Boron	200.8	40	10	1640	1600	1620	2	20
Lithium	200.8	2.0	2.0	155	153	154	1	20
Molybdenum	200.8	2.0	0.6	212	215	214	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.

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 Task 02
Sample Matrix: Water

Service Request: K2109362
Date Analyzed: 09/08/21

Lab Control Sample Summary
Dissolved Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2115635-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	200.8	49.3	50.0	99	85-115
Boron	200.8	24.9	25.0	100	85-115
Lithium	200.8	50.5	50.0	101	85-115
Molybdenum	200.8	26.4	25.0	105	85-115

September 10, 2021

Service Request No:K2109364

Masa Kanematsu
Anchor QEA, LLC
6720 SW Macadam Avenue
Suite 125
Portland, OR 97219

Laboratory Results for: Gorgas

Dear Masa,

Enclosed are the results of the sample(s) submitted to our laboratory August 11, 2021
For your reference, these analyses have been assigned our service request number **K2109364.**

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

Client: Anchor QEA, LLC
Project: Gorgas
Sample Matrix: Water

Service Request: K2109364
Date Received: 08/11/2021

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:

Fifteen water samples were received for analysis at ALS Environmental on 08/11/2021. 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 09/10/2021

SAMPLE DETECTION SUMMARY

CLIENT ID: GGS-COL-4-6			Lab ID: K2109364-001			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	130		2	10	ug/L	200.8
Boron, Dissolved	1580		10	40	ug/L	200.8
Lithium, Dissolved	143		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	190		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-6-6			Lab ID: K2109364-002			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	162		2	10	ug/L	200.8
Boron, Dissolved	1610		10	40	ug/L	200.8
Lithium, Dissolved	135		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	200		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-INF-MW-7-7			Lab ID: K2109364-003			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	250		2	10	ug/L	200.8
Boron, Dissolved	1640		10	40	ug/L	200.8
Lithium, Dissolved	175		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	211		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-2-7			Lab ID: K2109364-004			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	37.8		0.5	2.5	ug/L	200.8
Boron, Dissolved	1590		10	40	ug/L	200.8
Lithium, Dissolved	161		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	201		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-4-7			Lab ID: K2109364-005			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	51.2		0.5	2.5	ug/L	200.8
Boron, Dissolved	1580		10	40	ug/L	200.8
Lithium, Dissolved	119		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	187		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-6-7			Lab ID: K2109364-006			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	190		2	10	ug/L	200.8
Boron, Dissolved	1680		10	40	ug/L	200.8
Lithium, Dissolved	142		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	202		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-INF-MW-7-8			Lab ID: K2109364-007			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	249		2	10	ug/L	200.8
Boron, Dissolved	1610		10	40	ug/L	200.8

SAMPLE DETECTION SUMMARY

CLIENT ID: GGS-COL-INF-MW-7-8 — **Lab ID: K2109364-007**

Analyte	Results	Flag	MDL	MRL	Units	Method
Lithium, Dissolved	177		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	214		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-2-8 — **Lab ID: K2109364-008**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	84.3		0.5	2.5	ug/L	200.8
Boron, Dissolved	1640		10	40	ug/L	200.8
Lithium, Dissolved	167		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	209		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-4-8 — **Lab ID: K2109364-009**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	104		2	10	ug/L	200.8
Boron, Dissolved	1630		10	40	ug/L	200.8
Lithium, Dissolved	139		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	201		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-6-8 — **Lab ID: K2109364-010**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	198		2	10	ug/L	200.8
Boron, Dissolved	1630		10	40	ug/L	200.8
Lithium, Dissolved	143		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	196		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-INF-MW-7-9 — **Lab ID: K2109364-011**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	245		2	10	ug/L	200.8
Boron, Dissolved	1650		10	40	ug/L	200.8
Lithium, Dissolved	176		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	211		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-2-9 — **Lab ID: K2109364-012**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	119		2	10	ug/L	200.8
Boron, Dissolved	1670		10	40	ug/L	200.8
Lithium, Dissolved	171		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	216		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-4-9 — **Lab ID: K2109364-013**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	105		2	10	ug/L	200.8
Boron, Dissolved	1650		10	40	ug/L	200.8
Lithium, Dissolved	147		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	219		0.6	2.0	ug/L	200.8

SAMPLE DETECTION SUMMARY

CLIENT ID: GGS-COL-6-9	Lab ID: K2109364-014					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	226		2	10	ug/L	200.8
Boron, Dissolved	1710		10	40	ug/L	200.8
Lithium, Dissolved	162		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	214		0.6	2.0	ug/L	200.8

CLIENT ID: GGS-COL-INF-MW-7-10	Lab ID: K2109364-015					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	253		2	10	ug/L	200.8
Boron, Dissolved	1650		10	40	ug/L	200.8
Lithium, Dissolved	179		2.0	2.0	ug/L	200.8
Molybdenum, Dissolved	216		0.6	2.0	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

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K2109364-001	GGS-COL-4-6	7/29/2021	1245
K2109364-002	GGS-COL-6-6	7/29/2021	1245
K2109364-003	GGS-COL-INF-MW-7-7	7/30/2021	0954
K2109364-004	GGS-COL-2-7	7/30/2021	0954
K2109364-005	GGS-COL-4-7	7/30/2021	0954
K2109364-006	GGS-COL-6-7	7/30/2021	0954
K2109364-007	GGS-COL-INF-MW-7-8	7/31/2021	1302
K2109364-008	GGS-COL-2-8	7/31/2021	1302
K2109364-009	GGS-COL-4-8	7/31/2021	1302
K2109364-010	GGS-COL-6-8	7/31/2021	1302
K2109364-011	GGS-COL-INF-MW-7-9	8/2/2021	0821
K2109364-012	GGS-COL-2-9	8/2/2021	0821
K2109364-013	GGS-COL-4-9	8/2/2021	0821
K2109364-014	GGS-COL-6-9	8/2/2021	0821
K2109364-015	GGS-COL-INF-MW-7-10	8/4/2021	1420

K2109364

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number: 503-972-5019	
Date:	8/11/2021
Project Name:	Gorgas
Project Number:	201114-01.01 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	As, Li, Mo (dissolved, Method 200.8)	Boron (dissolved, Method 200.8)	Comments/Preservation
31	GGS-COL-4-6	7/29/2021	12:45	Water	1	X	X	HNO_3 preserved, filtered
32	GGS-COL-6-6	7/29/2021	12:45	Water	1	X	X	HNO_3 preserved, filtered
33	GGS-COL-INF-MW-7-7	7/30/2021	9:54	Water	1	X	X	HNO_3 preserved, filtered
34	GGS-COL-2-7	7/30/2021	9:54	Water	1	X	X	HNO_3 preserved, filtered
35	GGS-COL-4-7	7/30/2021	9:54	Water	1	X	X	HNO_3 preserved, filtered
36	GGS-COL-6-7	7/30/2021	9:54	Water	1	X	X	HNO_3 preserved, filtered
37	GGS-COL-INF-MW-7-8	7/31/2021	13:02	Water	1	X	X	HNO_3 preserved, filtered
38	GGS-COL-2-8	7/31/2021	13:02	Water	1	X	X	HNO_3 preserved, filtered
39	GGS-COL-4-8	7/31/2021	13:02	Water	1	X	X	HNO_3 preserved, filtered
40	GGS-COL-6-8	7/31/2021	13:02	Water	1	X	X	HNO_3 preserved, filtered
41	GGS-COL-INF-MW-7-9	8/2/2021	8:21	Water	1	X	X	HNO_3 preserved, filtered
42	GGS-COL-2-9	8/2/2021	8:21	Water	1	X	X	HNO_3 preserved, filtered
43	GGS-COL-4-9	8/2/2021	8:21	Water	1	X	X	HNO_3 preserved, filtered
44	GGS-COL-6-9	8/2/2021	8:21	Water	1	X	X	HNO_3 preserved, filtered
45	GGS-COL-INF-MW-7-10	8/4/2021	14:20	Water	1	X	X	HNO_3 preserved, filtered

Notes: **Please analyze all analytes with standard TAT on this page. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L), B (<10 ug/L), and Mo (<1 ug/L). For Lithium, please use Method 200.8 for better detection limit if possible. Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA	[signature]	ALS
Signature/Print Name: [signature]	Date/Time: 8/11/2021 9:00	Signature/Print Name: B Bowman	Date/Time: 8/11/21 1750
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 4

PM MH

Cooler Receipt and Preservation Form

Client Anchor QEA Service Request K21 09344

Received: 8/11/21 Opened: 8/11/21 By: BR Unloaded: 8/11/21 By: BR

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
8.6	—	1803		—	—		
13.6	—	↓		—	—		

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: 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	**Service Request:**	K2109364
Project:	Gorgas/201114-01.01 Task-02		

Sample Name:	GGS-COL-4-6	**Date Collected:**	07/29/21
Lab Code:	K2109364-001	**Date Received:**	08/11/21
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name:	GGS-COL-6-6	**Date Collected:**	07/29/21
Lab Code:	K2109364-002	**Date Received:**	08/11/21
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name:	GGS-COL-INF-MW-7-7	**Date Collected:**	07/30/21
Lab Code:	K2109364-003	**Date Received:**	08/11/21
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name:	GGS-COL-2-7	**Date Collected:**	07/30/21
Lab Code:	K2109364-004	**Date Received:**	08/11/21
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name:	GGS-COL-4-7	**Date Collected:**	07/30/21
Lab Code:	K2109364-005	**Date Received:**	08/11/21
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Client: Anchor QEA, LLC **Service Request:** K2109364
Project: Gorgas/201114-01.01 Task-02

Sample Name: GGS-COL-6-7 **Date Collected:** 07/30/21
Lab Code: K2109364-006 **Date Received:** 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-INF-MW-7-8 **Date Collected:** 07/31/21
Lab Code: K2109364-007 **Date Received:** 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-2-8 **Date Collected:** 07/31/21
Lab Code: K2109364-008 **Date Received:** 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-4-8 **Date Collected:** 07/31/21
Lab Code: K2109364-009 **Date Received:** 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-6-8 **Date Collected:** 07/31/21
Lab Code: K2109364-010 **Date Received:** 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Client: Anchor QEA, LLC **Service Request:** K2109364
Project: Gorgas/201114-01.01 Task-02

Sample Name: GGS-COL-INF-MW-7-9 **Date Collected:** 08/2/21
Lab Code: K2109364-011 **Date Received:** 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-2-9 **Date Collected:** 08/2/21
Lab Code: K2109364-012 **Date Received:** 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-4-9 **Date Collected:** 08/2/21
Lab Code: K2109364-013 **Date Received:** 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-6-9 **Date Collected:** 08/2/21
Lab Code: K2109364-014 **Date Received:** 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-INF-MW-7-10 **Date Collected:** 08/4/21
Lab Code: K2109364-015 **Date Received:** 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Results

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Metals

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:**	K2109364
Project:	Gorgas/201114-01.01 Task-02	**Date Collected:**	07/29/21 12:45
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-4-6	**Basis:**	NA
Lab Code:	K2109364-001		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**130**	ug/L	10	2	20	09/08/21 12:37	08/24/21	
Boron	200.8	**1580**	ug/L	40	10	20	09/08/21 12:37	08/24/21	
Lithium	200.8	**143**	ug/L	2.0	2.0	20	09/08/21 12:37	08/24/21	
Molybdenum	200.8	**190**	ug/L	2.0	0.6	20	09/08/21 12:37	08/24/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2109364
Project:	Gorgas/201114-01.01 Task-02		**Date Collected:**	07/29/21 12:45
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-6-6		**Basis:**	NA
Lab Code:	K2109364-002			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**162**	ug/L	10	2	20	09/08/21 12:43	08/24/21	
Boron	200.8	**1610**	ug/L	40	10	20	09/08/21 12:43	08/24/21	
Lithium	200.8	**135**	ug/L	2.0	2.0	20	09/08/21 12:43	08/24/21	
Molybdenum	200.8	**200**	ug/L	2.0	0.6	20	09/08/21 12:43	08/24/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2109364
Project:	Gorgas/201114-01.01 Task-02		**Date Collected:**	07/30/21 09:54
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-INF-MW-7-7		**Basis:**	NA
Lab Code:	K2109364-003			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**250**	ug/L	10	2	20	09/08/21 12:50	08/24/21	
Boron	200.8	**1640**	ug/L	40	10	20	09/08/21 12:50	08/24/21	
Lithium	200.8	**175**	ug/L	2.0	2.0	20	09/08/21 12:50	08/24/21	
Molybdenum	200.8	**211**	ug/L	2.0	0.6	20	09/08/21 12:50	08/24/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2109364
Project:	Gorgas/201114-01.01 Task-02		**Date Collected:**	07/30/21 09:54
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-2-7		**Basis:**	NA
Lab Code:	K2109364-004			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**37.8**	ug/L	2.5	0.5	5	09/08/21 15:09	08/24/21	
Boron	200.8	**1590**	ug/L	40	10	20	09/08/21 12:52	08/24/21	
Lithium	200.8	**161**	ug/L	2.0	2.0	20	09/08/21 12:52	08/24/21	
Molybdenum	200.8	**201**	ug/L	2.0	0.6	20	09/08/21 12:52	08/24/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2109364
Project:	Gorgas/201114-01.01 Task-02	**Date Collected:**	07/30/21 09:54
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-4-7	**Basis:**	NA
Lab Code:	K2109364-005		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**51.2**	ug/L	2.5	0.5	5	09/08/21 15:10	08/24/21	
Boron	200.8	**1580**	ug/L	40	10	20	09/08/21 13:39	08/24/21	
Lithium	200.8	**119**	ug/L	2.0	2.0	20	09/08/21 13:39	08/24/21	
Molybdenum	200.8	**187**	ug/L	2.0	0.6	20	09/08/21 13:39	08/24/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2109364
Project:	Gorgas/201114-01.01 Task-02	**Date Collected:**	07/30/21 09:54
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-6-7	**Basis:**	NA
Lab Code:	K2109364-006		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**190**	ug/L	10	2	20	09/08/21 13:41	08/24/21	
Boron	200.8	**1680**	ug/L	40	10	20	09/08/21 13:41	08/24/21	
Lithium	200.8	**142**	ug/L	2.0	2.0	20	09/08/21 13:41	08/24/21	
Molybdenum	200.8	**202**	ug/L	2.0	0.6	20	09/08/21 13:41	08/24/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2109364
Project:	Gorgas/201114-01.01 Task-02		**Date Collected:**	07/31/21 13:02
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-INF-MW-7-8		**Basis:**	NA
Lab Code:	K2109364-007			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**249**	ug/L	10	2	20	09/08/21 13:44	08/24/21	
Boron	200.8	**1610**	ug/L	40	10	20	09/08/21 13:44	08/24/21	
Lithium	200.8	**177**	ug/L	2.0	2.0	20	09/08/21 13:44	08/24/21	
Molybdenum	200.8	**214**	ug/L	2.0	0.6	20	09/08/21 13:44	08/24/21	

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dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109364
Project:	Gorgas/201114-01.01 Task-02	**Date Collected:**	07/31/21 13:02
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-2-8	**Basis:**	NA
Lab Code:	K2109364-008		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**84.3**	ug/L	2.5	0.5	5	09/08/21 15:12	08/24/21	
Boron	200.8	**1640**	ug/L	40	10	20	09/08/21 13:46	08/24/21	
Lithium	200.8	**167**	ug/L	2.0	2.0	20	09/08/21 13:46	08/24/21	
Molybdenum	200.8	**209**	ug/L	2.0	0.6	20	09/08/21 13:46	08/24/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2109364
Project:	Gorgas/201114-01.01 Task-02		**Date Collected:**	07/31/21 13:02
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-4-8		**Basis:**	NA
Lab Code:	K2109364-009			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**104**	ug/L	10	2	20	09/08/21 13:48	08/24/21	
Boron	200.8	**1630**	ug/L	40	10	20	09/08/21 13:48	08/24/21	
Lithium	200.8	**139**	ug/L	2.0	2.0	20	09/08/21 13:48	08/24/21	
Molybdenum	200.8	**201**	ug/L	2.0	0.6	20	09/08/21 13:48	08/24/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2109364
Project:	Gorgas/201114-01.01 Task-02	**Date Collected:**	07/31/21 13:02
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-6-8	**Basis:**	NA
Lab Code:	K2109364-010		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**198**	ug/L	10	2	20	09/08/21 13:50	08/24/21	
Boron	200.8	**1630**	ug/L	40	10	20	09/08/21 13:50	08/24/21	
Lithium	200.8	**143**	ug/L	2.0	2.0	20	09/08/21 13:50	08/24/21	
Molybdenum	200.8	**196**	ug/L	2.0	0.6	20	09/08/21 13:50	08/24/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109364
Project:	Gorgas/201114-01.01 Task-02	**Date Collected:**	08/02/21 08:21
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-INF-MW-7-9	**Basis:**	NA
Lab Code:	K2109364-011		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**245**	ug/L	10	2	20	09/08/21 13:52	08/24/21	
Boron	200.8	**1650**	ug/L	40	10	20	09/08/21 13:52	08/24/21	
Lithium	200.8	**176**	ug/L	2.0	2.0	20	09/08/21 13:52	08/24/21	
Molybdenum	200.8	**211**	ug/L	2.0	0.6	20	09/08/21 13:52	08/24/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2109364
Project:	Gorgas/201114-01.01 Task-02		**Date Collected:**	08/02/21 08:21
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-2-9		**Basis:**	NA
Lab Code:	K2109364-012			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**119**	ug/L	10	2	20	09/08/21 13:54	08/24/21	
Boron	200.8	**1670**	ug/L	40	10	20	09/08/21 13:54	08/24/21	
Lithium	200.8	**171**	ug/L	2.0	2.0	20	09/08/21 13:54	08/24/21	
Molybdenum	200.8	**216**	ug/L	2.0	0.6	20	09/08/21 13:54	08/24/21	

ALS Group USA, Corp.
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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109364
Project:	Gorgas/201114-01.01 Task-02	**Date Collected:**	08/02/21 08:21
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-4-9	**Basis:**	NA
Lab Code:	K2109364-013		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**105**	ug/L	10	2	20	09/08/21 13:56	08/24/21	
Boron	200.8	**1650**	ug/L	40	10	20	09/08/21 13:56	08/24/21	
Lithium	200.8	**147**	ug/L	2.0	2.0	20	09/08/21 13:56	08/24/21	
Molybdenum	200.8	**219**	ug/L	2.0	0.6	20	09/08/21 13:56	08/24/21	

ALS Group USA, Corp.
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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109364
Project:	Gorgas/201114-01.01 Task-02	**Date Collected:**	08/02/21 08:21
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-6-9	**Basis:**	NA
Lab Code:	K2109364-014		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**226**	ug/L	10	2	20	09/08/21 13:58	08/24/21	
Boron	200.8	**1710**	ug/L	40	10	20	09/08/21 13:58	08/24/21	
Lithium	200.8	**162**	ug/L	2.0	2.0	20	09/08/21 13:58	08/24/21	
Molybdenum	200.8	**214**	ug/L	2.0	0.6	20	09/08/21 13:58	08/24/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2109364
Project:	Gorgas/201114-01.01 Task-02		**Date Collected:**	08/04/21 14:20
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-INF-MW-7-10		**Basis:**	NA
Lab Code:	K2109364-015			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**253**	ug/L	10	2	20	09/08/21 14:13	08/24/21	
Boron	200.8	**1650**	ug/L	40	10	20	09/08/21 14:13	08/24/21	
Lithium	200.8	**179**	ug/L	2.0	2.0	20	09/08/21 14:13	08/24/21	
Molybdenum	200.8	**216**	ug/L	2.0	0.6	20	09/08/21 14:13	08/24/21	

QC Summary Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
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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

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109364
Project:	Gorgas/201114-01.01 Task-02	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	KQ2115660-01		

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	09/08/21 12:34	08/24/21	
Boron	200.8	**1.2**	**J**	ug/L	2.0	0.5	1	09/08/21 12:34	08/24/21	
Lithium	200.8	ND	U	ug/L	0.10	0.10	1	09/08/21 12:34	08/24/21	
Molybdenum	200.8	ND	U	ug/L	0.10	0.03	1	09/08/21 12:34	08/24/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2109364
Project:	Gorgas/201114-01.01 Task-02	**Date Collected:**	07/29/21
Sample Matrix:	Water	**Date Received:**	08/11/21
		Date Analyzed:	09/8/21
		Date Extracted:	08/24/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	GGS-COL-4-6	**Units:**	ug/L
Lab Code:	K2109364-001	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2115660-04

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	130	180	50	100	70-130
Boron	1580	1630	25	204 #	70-130
Lithium	143	192	50.0	97	70-130
Molybdenum	190	219	25.0	114 #	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:**	K2109364
Project:	Gorgas/201114-01.01 Task-02	**Date Collected:**	07/29/21
Sample Matrix:	Water	**Date Received:**	08/11/21
		Date Analyzed:	09/8/21
		Date Extracted:	08/24/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	GGS-COL-6-6	**Units:**	ug/L
Lab Code:	K2109364-002	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2115660-06

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	162	210	50	97	70-130
Boron	1610	1610	25	4 #	70-130
Lithium	135	185	50.0	99	70-130
Molybdenum	200	222	25.0	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.

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QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109364
Project	Gorgas/201114-01.01 Task-02	**Date Collected:**	07/29/21
Sample Matrix:	Water	**Date Received:**	08/11/21
		Date Analyzed:	09/08/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	GGS-COL-4-6	**Units:**	ug/L
Lab Code:	K2109364-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2115660-03 Result	Average	RPD	RPD Limit
Arsenic	200.8	10	2	130	131	131	<1	20
Boron	200.8	40	10	1580	1580	1580	<1	20
Lithium	200.8	2.0	2.0	143	142	143	<1	20
Molybdenum	200.8	2.0	0.6	190	195	193	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.

ALS Group USA, Corp.
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QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109364
Project	Gorgas/201114-01.01 Task-02	**Date Collected:**	07/29/21
Sample Matrix:	Water	**Date Received:**	08/11/21
		Date Analyzed:	09/08/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	GGS-COL-6-6	**Units:**	ug/L
Lab Code:	K2109364-002	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2115660-05 Result	Average	RPD	RPD Limit
Arsenic	200.8	10	2	162	161	162	<1	20
Boron	200.8	40	10	1610	1590	1600	1	20
Lithium	200.8	2.0	2.0	135	136	136	<1	20
Molybdenum	200.8	2.0	0.6	200	197	199	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.

Printed 9/10/2021 10:29:03 AM

Superset Reference:21-0000602658 rev 00

Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 Task-02
Sample Matrix: Water

Service Request: K2109364
Date Analyzed: 09/08/21

Lab Control Sample Summary
Dissolved Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2115660-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	200.8	50.1	50.0	100	85-115
Boron	200.8	25.8	25.0	103	85-115
Lithium	200.8	51.6	50.0	103	85-115
Molybdenum	200.8	26.6	25.0	107	85-115

August 30, 2021 Service Request No:K2109365

Masa Kanematsu
Anchor QEA, LLC
6720 SW Macadam Avenue
Suite 125
Portland, OR 97219

Laboratory Results for: Gorgas

Dear Masa,

Enclosed are the results of the sample(s) submitted to our laboratory August 11, 2021
For your reference, these analyses have been assigned our service request number **K2109365.**

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

Narrative Documents

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
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ALS Environmental

Client: Anchor QEA, LLC
Project: Gorgas
Sample Matrix: Water

Service Request: K2109365
Date Received: 08/11/2021

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:

Fifteen water samples were received for analysis at ALS Environmental on 08/11/2021. 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 08/30/2021

ALS Environmental

SAMPLE DETECTION SUMMARY

CLIENT ID: GGS-COL-INF-MW-6D-6 — **Lab ID: K2109365-001**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	112		0.5	2.5	ug/L	200.8
Lithium, Dissolved	285		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	6.6		0.2	1.5	ug/L	200.8

CLIENT ID: GGS-COL-1-6 — **Lab ID: K2109365-002**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	4.2		0.5	2.5	ug/L	200.8
Lithium, Dissolved	273		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	4.8		0.2	1.5	ug/L	200.8

CLIENT ID: GGS-COL-3-6 — **Lab ID: K2109365-003**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	27.7		0.5	2.5	ug/L	200.8
Lithium, Dissolved	236		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	6.0		0.2	1.5	ug/L	200.8

CLIENT ID: GGS-COL-5-6 — **Lab ID: K2109365-004**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	32.3		0.5	2.5	ug/L	200.8
Lithium, Dissolved	188		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	5.9		0.2	1.5	ug/L	200.8

CLIENT ID: GGS-COL-INF-MW-6D-7 — **Lab ID: K2109365-005**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	114		0.5	2.5	ug/L	200.8
Lithium, Dissolved	285		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	6.3		0.2	1.5	ug/L	200.8

CLIENT ID: GGS-COL-1-7 — **Lab ID: K2109365-006**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	13.2		0.5	2.5	ug/L	200.8
Lithium, Dissolved	268		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	4.8		0.2	1.5	ug/L	200.8

CLIENT ID: GGS-COL-3-7 — **Lab ID: K2109365-007**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	19.1		0.5	2.5	ug/L	200.8
Lithium, Dissolved	246		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	6.5		0.2	1.5	ug/L	200.8

CLIENT ID: GGS-COL-5-7 — **Lab ID: K2109365-008**

Analyte	Results	Flag	MDL	MRL	Units	Method
Arsenic, Dissolved	44.4		0.5	2.5	ug/L	200.8
Lithium, Dissolved	201		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	6.1		0.2	1.5	ug/L	200.8

SAMPLE DETECTION SUMMARY

CLIENT ID: GGS-COL-5-7	Lab ID: K2109365-008					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**

CLIENT ID: GGS-COL-INF-MW-6D-8	Lab ID: K2109365-009					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	112		0.5	2.5	ug/L	200.8
Lithium, Dissolved	281		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	6.1		0.2	1.5	ug/L	200.8

CLIENT ID: GGS-COL-1-8	Lab ID: K2109365-010					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	29.7		0.5	2.5	ug/L	200.8
Lithium, Dissolved	275		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	5.5		0.2	1.5	ug/L	200.8

CLIENT ID: GGS-COL-3-8	Lab ID: K2109365-011					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	31.5		0.5	2.5	ug/L	200.8
Lithium, Dissolved	255		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	6.6		0.2	1.5	ug/L	200.8

CLIENT ID: GGS-COL-5-8	Lab ID: K2109365-012					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	46.0		0.5	2.5	ug/L	200.8
Lithium, Dissolved	199		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	6.2		0.2	1.5	ug/L	200.8

CLIENT ID: GGS-COL-INF-MW-6D-9	Lab ID: K2109365-013					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	111		0.5	2.5	ug/L	200.8
Lithium, Dissolved	285		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	6.1		0.2	1.5	ug/L	200.8

CLIENT ID: GGS-COL-1-9	Lab ID: K2109365-014					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	50.3		0.5	2.5	ug/L	200.8
Lithium, Dissolved	277		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	6.0		0.2	1.5	ug/L	200.8

CLIENT ID: GGS-COL-3-9	Lab ID: K2109365-015					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Arsenic, Dissolved	39.1		0.5	2.5	ug/L	200.8
Lithium, Dissolved	262		0.50	0.50	ug/L	200.8
Molybdenum, Dissolved	7.1		0.2	1.5	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:** K2109365
Project: Gorgas/201114-01.01 Task 02

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K2109365-001	GGS-COL-INF-MW-6D-6	7/29/2021	1245
K2109365-002	GGS-COL-1-6	7/29/2021	1245
K2109365-003	GGS-COL-3-6	7/29/2021	1245
K2109365-004	GGS-COL-5-6	7/29/2021	1245
K2109365-005	GGS-COL-INF-MW-6D-7	7/30/2021	0954
K2109365-006	GGS-COL-1-7	7/30/2021	0954
K2109365-007	GGS-COL-3-7	7/30/2021	0954
K2109365-008	GGS-COL-5-7	7/30/2021	0954
K2109365-009	GGS-COL-INF-MW-6D-8	7/31/2021	1302
K2109365-010	GGS-COL-1-8	7/31/2021	1302
K2109365-011	GGS-COL-3-8	7/31/2021	1302
K2109365-012	GGS-COL-5-8	7/31/2021	1302
K2109365-013	GGS-COL-INF-MW-6D-9	8/2/2021	0821
K2109365-014	GGS-COL-1-9	8/2/2021	0821
K2109365-015	GGS-COL-3-9	8/2/2021	0821

K2109365

Chain of Custody Record & Laboratory Analysis Request

Laboratory Number: 503-972-5019	
Date:	8/11/2021
Project Name:	Gorgas
Project Number:	201114-01.01 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	As, Li, Mo (dissolved, Method 200.8)	Boron (dissolved, Method 200.8)	Comments/Preservation
1	GGS-COL-INF-MW-6D-6	7/29/2021	12:45	Water	1	X		HNO_3 preserved, filtered
2	GGS-COL-1-6	7/29/2021	12:45	Water	1	X		HNO_3 preserved, filtered
3	GGS-COL-3-6	7/29/2021	12:45	Water	1	X		HNO_3 preserved, filtered
4	GGS-COL-5-6	7/29/2021	12:45	Water	1	X		HNO_3 preserved, filtered
5	GGS-COL-INF-MW-6D-7	7/30/2021	9:54	Water	1	X		HNO_3 preserved, filtered
6	GGS-COL-1-7	7/30/2021	9:54	Water	1	X		HNO_3 preserved, filtered
7	GGS-COL-3-7	7/30/2021	9:54	Water	1	X		HNO_3 preserved, filtered
8	GGS-COL-5-7	7/30/2021	9:54	Water	1	X		HNO_3 preserved, filtered
9	GGS-COL-INF-MW-6D-8	7/31/2021	13:02	Water	1	X		HNO_3 preserved, filtered
10	GGS-COL-1-8	7/31/2021	13:02	Water	1	X		HNO_3 preserved, filtered
11	GGS-COL-3-8	7/31/2021	13:02	Water	1	X		HNO_3 preserved, filtered
12	GGS-COL-5-8	7/31/2021	13:02	Water	1	X		HNO_3 preserved, filtered
13	GGS-COL-INF-MW-6D-9	8/2/2021	8:21	Water	1	X		HNO_3 preserved, filtered
14	GGS-COL-1-9	8/2/2021	8:21	Water	1	X		HNO_3 preserved, filtered
15	GGS-COL-3-9	8/2/2021	8:21	Water	1	X		HNO_3 preserved, filtered

Notes: **Please analyze all analytes with standard TAT on this page. Please analyze with Method 200.8 (ICP-MS) for better detection limit.**
Desired reporting limits : As (<2 ug/L), B (<10 ug/L), and Mo (<1 ug/L). For Lithium, please use Method 200.8 for better detection limit if possible. Report requirement: Type II (PDF & csv files)

Relinquished by:	Company:	Received by:	Company:
Masa Kanematsu	Anchor QEA		ALS
Signature/Print Name:	Date/Time:	Signature/Print Name:	Date/Time:
	8/11/2021 9:00	B Kuhman	8/11/21 1750

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 4

PM MH

Cooler Receipt and Preservation Form

Client Anchor QEA Service Request K21 09315

Received: 8/11/21 Opened: 8/11/21 By: BR Unloaded: 8/11/21 By: BR

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
8.6	—	1R07		—	—		
13.6	—			—	—		

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: 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
Service Request: K2109365
Project: Gorgas/201114-01.01 Task 02

Sample Name: GGS-COL-INF-MW-6D-6
Date Collected: 07/29/21
Lab Code: K2109365-001
Date Received: 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-1-6
Date Collected: 07/29/21
Lab Code: K2109365-002
Date Received: 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-3-6
Date Collected: 07/29/21
Lab Code: K2109365-003
Date Received: 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-5-6
Date Collected: 07/29/21
Lab Code: K2109365-004
Date Received: 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-INF-MW-6D-7
Date Collected: 07/30/21
Lab Code: K2109365-005
Date Received: 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Client: Anchor QEA, LLC **Service Request:** K2109365
Project: Gorgas/201114-01.01 Task 02

Sample Name: GGS-COL-1-7 **Date Collected:** 07/30/21
Lab Code: K2109365-006 **Date Received:** 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-3-7 **Date Collected:** 07/30/21
Lab Code: K2109365-007 **Date Received:** 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-5-7 **Date Collected:** 07/30/21
Lab Code: K2109365-008 **Date Received:** 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-INF-MW-6D-8 **Date Collected:** 07/31/21
Lab Code: K2109365-009 **Date Received:** 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-1-8 **Date Collected:** 07/31/21
Lab Code: K2109365-010 **Date Received:** 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Analyst Summary report

Client: Anchor QEA, LLC
Service Request: K2109365
Project: Gorgas/201114-01.01 Task 02

Sample Name: GGS-COL-3-8
Date Collected: 07/31/21
Lab Code: K2109365-011
Date Received: 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-5-8
Date Collected: 07/31/21
Lab Code: K2109365-012
Date Received: 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-INF-MW-6D-9
Date Collected: 08/2/21
Lab Code: K2109365-013
Date Received: 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-1-9
Date Collected: 08/2/21
Lab Code: K2109365-014
Date Received: 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Name: GGS-COL-3-9
Date Collected: 08/2/21
Lab Code: K2109365-015
Date Received: 08/11/21
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.8	ABOYER	RMOORE

Sample Results

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Metals

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:**	K2109365
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	07/29/21 12:45
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-INF-MW-6D-6		**Basis:**	NA
Lab Code:	K2109365-001			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**112**	ug/L	2.5	0.5	5	08/27/21 23:06	08/24/21	
Lithium	200.8	**285**	ug/L	0.50	0.50	5	08/27/21 23:06	08/24/21	
Molybdenum	200.8	**6.6**	ug/L	1.5	0.2	5	08/27/21 23:06	08/24/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2109365
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	07/29/21 12:45
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-1-6		**Basis:**	NA
Lab Code:	K2109365-002			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**4.2**	ug/L	2.5	0.5	5	08/27/21 23:10	08/24/21	
Lithium	200.8	**273**	ug/L	0.50	0.50	5	08/27/21 23:10	08/24/21	
Molybdenum	200.8	**4.8**	ug/L	1.5	0.2	5	08/27/21 23:10	08/24/21	

Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2109365
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	07/29/21 12:45
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-3-6		**Basis:**	NA
Lab Code:	K2109365-003			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**27.7**	ug/L	2.5	0.5	5	08/27/21 23:15	08/24/21	
Lithium	200.8	**236**	ug/L	0.50	0.50	5	08/27/21 23:15	08/24/21	
Molybdenum	200.8	**6.0**	ug/L	1.5	0.2	5	08/27/21 23:15	08/24/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109365
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/29/21 12:45
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-5-6	**Basis:**	NA
Lab Code:	K2109365-004		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**32.3**	ug/L	2.5	0.5	5	08/27/21 23:16	08/24/21	
Lithium	200.8	**188**	ug/L	0.50	0.50	5	08/27/21 23:16	08/24/21	
Molybdenum	200.8	**5.9**	ug/L	1.5	0.2	5	08/27/21 23:16	08/24/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109365
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/30/21 09:54
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-INF-MW-6D-7	**Basis:**	NA
Lab Code:	K2109365-005		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**114**	ug/L	2.5	0.5	5	08/27/21 23:21	08/24/21	
Lithium	200.8	**285**	ug/L	0.50	0.50	5	08/27/21 23:21	08/24/21	
Molybdenum	200.8	**6.3**	ug/L	1.5	0.2	5	08/27/21 23:21	08/24/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2109365
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	07/30/21 09:54
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-1-7		**Basis:**	NA
Lab Code:	K2109365-006			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**13.2**	ug/L	2.5	0.5	5	08/27/21 23:23	08/24/21	
Lithium	200.8	**268**	ug/L	0.50	0.50	5	08/27/21 23:23	08/24/21	
Molybdenum	200.8	**4.8**	ug/L	1.5	0.2	5	08/27/21 23:23	08/24/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109365
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/30/21 09:54
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-3-7	**Basis:**	NA
Lab Code:	K2109365-007		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**19.1**	ug/L	2.5	0.5	5	08/27/21 23:24	08/24/21	
Lithium	200.8	**246**	ug/L	0.50	0.50	5	08/27/21 23:24	08/24/21	
Molybdenum	200.8	**6.5**	ug/L	1.5	0.2	5	08/27/21 23:24	08/24/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2109365
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	07/30/21 09:54
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-5-7		**Basis:**	NA
Lab Code:	K2109365-008			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**44.4**	ug/L	2.5	0.5	5	08/27/21 23:26	08/24/21	
Lithium	200.8	**201**	ug/L	0.50	0.50	5	08/27/21 23:26	08/24/21	
Molybdenum	200.8	**6.1**	ug/L	1.5	0.2	5	08/27/21 23:26	08/24/21	

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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109365
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/31/21 13:02
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-INF-MW-6D-8	**Basis:**	NA
Lab Code:	K2109365-009		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**112**	ug/L	2.5	0.5	5	08/27/21 23:27	08/24/21	
Lithium	200.8	**281**	ug/L	0.50	0.50	5	08/27/21 23:27	08/24/21	
Molybdenum	200.8	**6.1**	ug/L	1.5	0.2	5	08/27/21 23:27	08/24/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2109365
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	07/31/21 13:02
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-1-8		**Basis:**	NA
Lab Code:	K2109365-010			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**29.7**	ug/L	2.5	0.5	5	08/27/21 23:29	08/24/21	
Lithium	200.8	**275**	ug/L	0.50	0.50	5	08/27/21 23:29	08/24/21	
Molybdenum	200.8	**5.5**	ug/L	1.5	0.2	5	08/27/21 23:29	08/24/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2109365
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	07/31/21 13:02
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-3-8		**Basis:**	NA
Lab Code:	K2109365-011			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**31.5**	ug/L	2.5	0.5	5	08/27/21 23:30	08/24/21	
Lithium	200.8	**255**	ug/L	0.50	0.50	5	08/27/21 23:30	08/24/21	
Molybdenum	200.8	**6.6**	ug/L	1.5	0.2	5	08/27/21 23:30	08/24/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2109365
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/31/21 13:02
Sample Matrix:	Water	**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-5-8	**Basis:**	NA
Lab Code:	K2109365-012		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**46.0**	ug/L	2.5	0.5	5	08/27/21 23:32	08/24/21	
Lithium	200.8	**199**	ug/L	0.50	0.50	5	08/27/21 23:32	08/24/21	
Molybdenum	200.8	**6.2**	ug/L	1.5	0.2	5	08/27/21 23:32	08/24/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2109365
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	08/02/21 08:21
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-INF-MW-6D-9		**Basis:**	NA
Lab Code:	K2109365-013			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**111**	ug/L	2.5	0.5	5	08/27/21 23:34	08/24/21	
Lithium	200.8	**285**	ug/L	0.50	0.50	5	08/27/21 23:34	08/24/21	
Molybdenum	200.8	**6.1**	ug/L	1.5	0.2	5	08/27/21 23:34	08/24/21	

Client:	Anchor QEA, LLC		**Service Request:**	K2109365
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	08/02/21 08:21
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-1-9		**Basis:**	NA
Lab Code:	K2109365-014			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**50.3**	ug/L	2.5	0.5	5	08/27/21 23:35	08/24/21	
Lithium	200.8	**277**	ug/L	0.50	0.50	5	08/27/21 23:35	08/24/21	
Molybdenum	200.8	**6.0**	ug/L	1.5	0.2	5	08/27/21 23:35	08/24/21	

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Analytical Report

Client:	Anchor QEA, LLC		**Service Request:**	K2109365
Project:	Gorgas/201114-01.01 Task 02		**Date Collected:**	08/02/21 08:21
Sample Matrix:	Water		**Date Received:**	08/11/21 17:50
Sample Name:	GGS-COL-3-9		**Basis:**	NA
Lab Code:	K2109365-015			

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	200.8	**39.1**	ug/L	2.5	0.5	5	08/27/21 23:40	08/24/21	
Lithium	200.8	**262**	ug/L	0.50	0.50	5	08/27/21 23:40	08/24/21	
Molybdenum	200.8	**7.1**	ug/L	1.5	0.2	5	08/27/21 23:40	08/24/21	

QC Summary Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Metals

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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Analytical Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109365
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	KQ2115659-01		

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	08/27/21 23:02	08/24/21	
Lithium	200.8	ND U	ug/L	0.10	0.10	1	08/27/21 23:02	08/24/21	
Molybdenum	200.8	**0.09 J**	ug/L	0.30	0.03	1	08/27/21 23:02	08/24/21	

Client:	Anchor QEA, LLC	**Service Request:**	K2109365
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/29/21
Sample Matrix:	Water	**Date Received:**	08/11/21
		Date Analyzed:	08/27/21
		Date Extracted:	08/24/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	GGS-COL-INF-MW-6D-6	**Units:**	ug/L
Lab Code:	K2109365-001	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2115659-04

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	112	156	50.0	87	70-130
Lithium	285	326	50.0	82 #	70-130
Molybdenum	6.6	32.6	25.0	104	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:**	K2109365
Project:	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/29/21
Sample Matrix:	Water	**Date Received:**	08/11/21
		Date Analyzed:	08/27/21
		Date Extracted:	08/24/21

Matrix Spike Summary
Dissolved Metals

Sample Name:	GGS-COL-1-6	**Units:**	ug/L
Lab Code:	K2109365-002	**Basis:**	NA
Analysis Method:	200.8		
Prep Method:	EPA CLP ILM04.0		

Matrix Spike
KQ2115659-06

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	4.2	54.6	50.0	101	70-130
Lithium	273	317	50.0	88 #	70-130
Molybdenum	4.8	32.4	25.0	111	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:**	K2109365
Project	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/29/21
Sample Matrix:	Water	**Date Received:**	08/11/21
		Date Analyzed:	08/27/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	GGS-COL-INF-MW-6D-6	**Units:**	ug/L
Lab Code:	K2109365-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2115659-03 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	112	115	114	3	20
Lithium	200.8	0.50	0.50	285	287	286	<1	20
Molybdenum	200.8	1.5	0.2	6.6	6.6	6.6	<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:21-0000601600 rev 00

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QA/QC Report

Client:	Anchor QEA, LLC	**Service Request:**	K2109365
Project	Gorgas/201114-01.01 Task 02	**Date Collected:**	07/29/21
Sample Matrix:	Water	**Date Received:**	08/11/21
		Date Analyzed:	08/27/21

Replicate Sample Summary
Dissolved Metals

Sample Name:	GGS-COL-1-6	**Units:**	ug/L
Lab Code:	K2109365-002	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2115659-05 Result	Average	RPD	RPD Limit
Arsenic	200.8	2.5	0.5	4.2	4.5	4.4	7	20
Lithium	200.8	0.50	0.50	273	277	275	1	20
Molybdenum	200.8	1.5	0.2	4.8	4.7	4.8	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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Client: Anchor QEA, LLC
Project: Gorgas/201114-01.01 Task 02
Sample Matrix: Water

Service Request: K2109365
Date Analyzed: 08/27/21

Lab Control Sample Summary
Dissolved Metals

Units: ug/L
Basis: NA

Lab Control Sample
KQ2115659-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Arsenic	200.8	48.6	50.0	97	85-115
Lithium	200.8	47.6	50.0	95	85-115
Molybdenum	200.8	27.4	25.0	110	85-115

Sample ID	Boring ID	Depth (feet)	Description	Mineralogy	Scanning Electron Microscope (SEM)	Organic Material	Texture/Structure			
							Matrix:	Fractures	Pores	Other
GS-AP-MW-17V 17-18	GS-AP-MW-17V	17.0-18.0	Mudrock, laminated & burrowed, detrital clay matrix and silt-size detrital grains are most abundant constituents	Detrital grains include quartz, feldspar, mica, and rock fragments	Plate 4: SEM focuses on area adjacent to induced fracture; framework grains in area dominated by micas and chlorite; ; SEM indicates no fracture-filling cement observed; poor thin section preparation shattered many grains	None described	Matrix is detrital clay, stained with iron oxide	Open fractures probably induced; "irregular" fractures are possibly rootlet structures and are partly filled with iron oxide	Visible pores are very rare	Laminae are rich in detrital clays or silt; some clay-rich laminae are stained with iron oxide; laminae locally disrupted by silt-rich burrows
GS-AP-MW-17V 74-75	GS-AP-MW-17V	74.0-75.0	Sandy mudrock, with clay rich laminae and detrital sand/silt-size grains widely scattered in matrix	Clay matrix with quartz, feldspar, mica, and rock fragments widely scattered in matrix; authigenic minerals such as pyrite are rare to minor and unevenly distributed	Plate 20: Fractures are locally filled with blocky and bladed gypsum; gypsum is dominant fracture-filling cement, but cement is not prevalent; other minerals embedded in the gypsum cement include titanium oxide and probably jarosite - minor presence of sodium suggests some degree of cation substitution for potassium; other material exposed to the open fracture is mainly illitic clay	Organic fragments irregularly distributed and party replaced by authigenic pyrite	Detrital clay matrix is most abundant constituent with detrital quartz, feldspar, mica, and rock fragments widely scattered in matrix; SEM indicates illitic clay	Open microfractures are enhanced by sampling, but discoloration of adjacent rock and localized gypsum within the microfractures suggest narrower microfractures existed before sampling	No pores visible	Clay-rich laminae, burrows, and bioturbation are locally observed

Sample ID	Boring ID	Depth (feet)	Description	Mineralogy	Scanning Electron Microscope (SEM)	Organic Material	Texture/Structure			
							Matrix:	Fractures	Pores	Other
GS-AP-MW-17V 85-85.3	GS-AP-MW-17V	85.0-85.3	Sandstone, carbonate-cemented, lower fine-grained (average 0.159 mm), well sorted	Quartz and metamorphic rock fragments are most abundant framework grains followed by moderate feldspars and minor carbonate-replaced grains, igneous rock fragments, and argillaceous rock fragments. Organic fragments, mica, and chlorite grains are rare to minor	Plate 22: SEM indicates calcite-cemented sandstone with quartz, albite, and metamorphic and argillaceous rock fragments; scattered high-density crystals are predominantly pyrite	Organic fragments rare to minor; SEM induced fractures associated with elongate organic matter	Carbonate (calcite) is the predominant pore-filling cement; locally replaces framework grains; other pore-filling constituents (authigenic pyrite, quartz overgrowths, and titanium oxides) are rare to minor; SEM - intergranular spaces filled with calcite cement	Open fractures paralell to the bedding are probably induced; SEM - no fracture-filling cements are observed	Visible pores are very rare; micropores are the principal pore type; no intergranular pores present	thin section was not stained for the identification of detailed carbonate mineral species (calcite, ferroan calcite, and ferroan dolomite)
GS-AP-MW-7V 172.3-172.5	GS-AP-MW-7V	172.3-172.5	Argillaceous siltstone (average grain size 0.055 mm)	Quartz, metamorphic fragments, and argillaceous rock fragments are principal detrital grains, followed by moderate feldspars, moderate mica, rare to minor siderite-replaced grains, and igneous rock fragments; organic fragments and chlorite grains are rare to minor in abundance	Plate 24: Fractures in this argillaceous siltstone tend to develop along elongate organic matter; locally filled with gypsum; gypsum cement is often bounded by microfractures, suggesting fractures enhanced by handling	Organic fragments are rare to minor	Detrital clay matrix is predominant pore-filling constituent and locally concentrated into laminae; other pore-filling minerals are rare to minor and include authigenic pyrite and titanium oxides	Open microfractures associated with dessicated organic material are partly filled with gypsum; some micropores enhanced my sampling	No pores visible; micropores are principal pore type	Faint laminae and burrows are widespread; many laminae disrupted by burrows

Sample ID	Boring ID	Depth (feet)	Description	Mineralogy	Scanning Electron Microscope (SEM)	Organic Material	Texture/Structure			
							Matrix:	Fractures	Pores	Other
GS-AP-MW-7V 187-187.4	GS-AP-MW-7V	187.0-187.4	Sandstone, upper fine-grained (0.235 mm), well sorted with granule- to pebble-sized rip-up clasts, framework grains are tightly compacted	Quartz and metamorphic rock fragments are most abundant framework grains followed by moderate feldspars and igneous fragments, minor argillaeous fragments and siderite-replaced grains; organic fragments, mica, chart, heavy minerals, and chlorite grains are rare to minor in abundance	Plate 25: SEM confims framework grains are dominated by quartz, K-feldspar, and argillaceous and metamorphic rock fragments; traces of high-density crystals exposed to fracture are probably natural barite, rare pyrite also noted - they appear native to host rock, not formed after the fracture; an aggregate of fine-grained chlorite crystals noted, surrounded by quartz grains in all directions. The fine-grained nature suggests it is authigenic, not detrital	Organic fragments are rare to minor	Pore-filling constituents are minor to moderate and consist of authigenic illitic and chloritic clays, authigenic pyrite, quartz overgrowths, and titanium oxides; SEM confirms illitic clay	Open fractures are probably induced	Visible pores are rare to minor and consist of intergranular, secondary intergranular, and moldic	Styolites locally occur
GS-AP-MW-7V 26-27	GS-AP-MW-7V	26.0-27.0	Laminated mudrock, alternating clay-rich and silt-rich laminae, detrital clay matrix and silt-size detrital grains are most abundant constituents	Detrital grains include quartz, feldspars, mica, rock fragments, and organic fragments	Plate 10: SEM focuses on induced fractures; no open pores observed; phyllosilicate grains and clay matrix dominate make-up of fracture walls; minor high density cements between grains are probably iron-oxide or titanium oxide	Organic fragments partly replaced by authigenic pyrite	Detrital clay matrix, locally replaced by siderite	Open fractures are induced	No pores visible; micropores are principal pore type	Burrows locally observed
GS-MW-07 48.5-57	GS-MW-07	48.5-57.0	Mudrock, detrital clay matrix is predominant constituent with detrital silt/sand	Detrital silt/sand consist of quartz, feldspar, and matrix grains widely scattered in the matrix; authigenic minerals are rare to minor and include kaolinite and pyrite; siderite nodules are locally present and are partly oxidized. Authigenic kaolinite is mostly associated with siderite nodules, while authigenic pyriste mainly replaces organic fragments	Plate 18: SEM - Natural fractures in the sample tend to develop along elongate organic fragments; organic matter often replaced by pyrite; pyrite crystals range from submicron to ~10 microns; minor gypsym present in fractures; detrital grains and illitic clay matrix dominant material of fracture walls	Organic fragments partly replaced by authigenic pyrite	detrital clay matrix is predominant constituent; quartz, feldspar, and matrix grains widely scattered in the matrix; SEM indicates illitic clay	Fractures are induced and locally filled with gypsum	No pores visible	None described

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Thin Section Petrography

Anchor QEA, LLC
SoCo Fractured Rock MNA Project
Alabama, USA
Proprietary - Anchor QEA

RAPIDZOOM
(Images & Captions generated from RAPIDZoom™)

Houston ATC Job File No.: 202103975

October 2021

Core Laboratories, Inc.
Houston Advanced Technology Center
6316 Windfern Road
Houston, Texas 77040

Thin Section Analysis

Sample Depth (ft): **17.00**
Sample ID: GS-AP-MW-17V

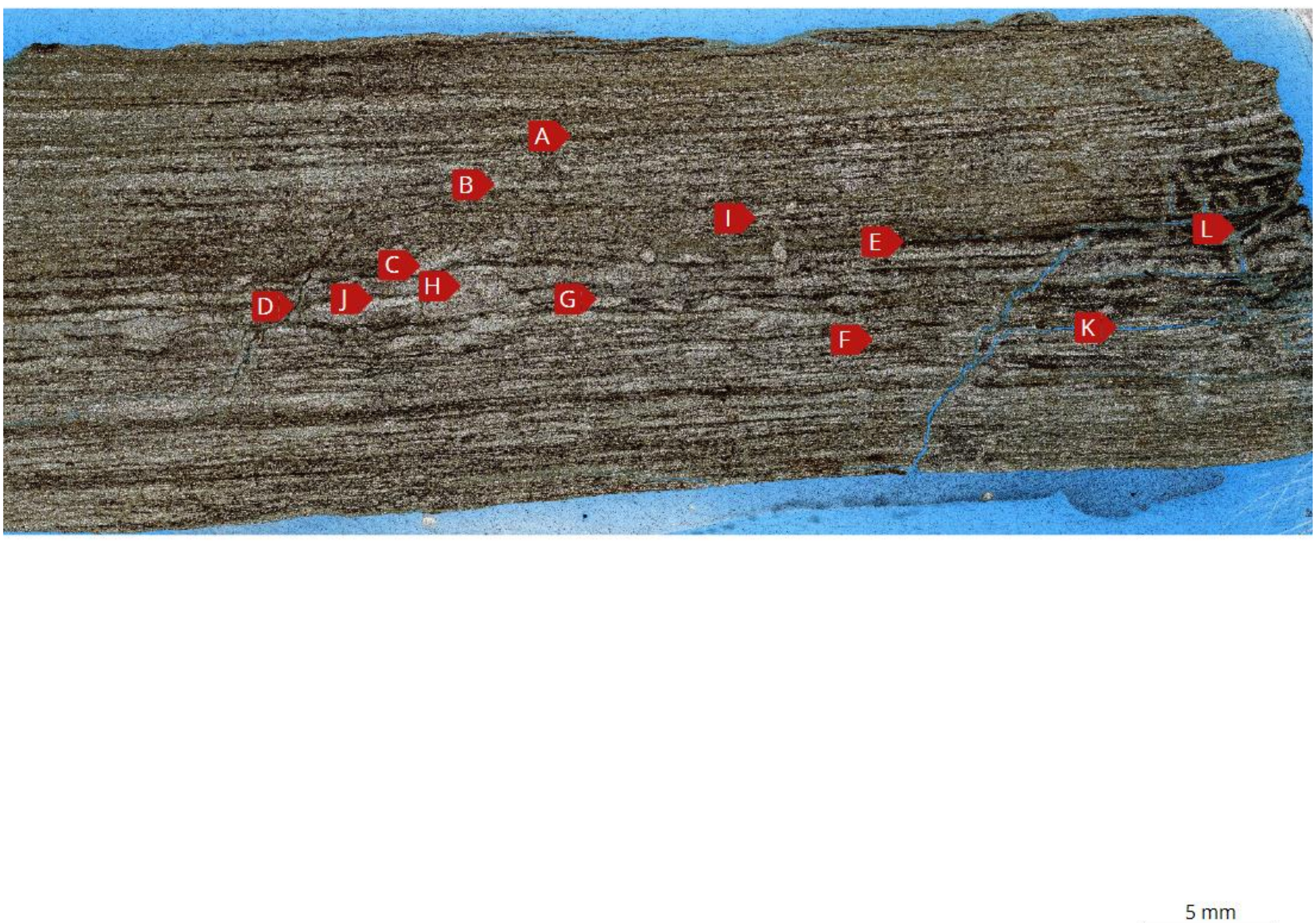


Image Note: Plane Light, Depth = Measured sample depth

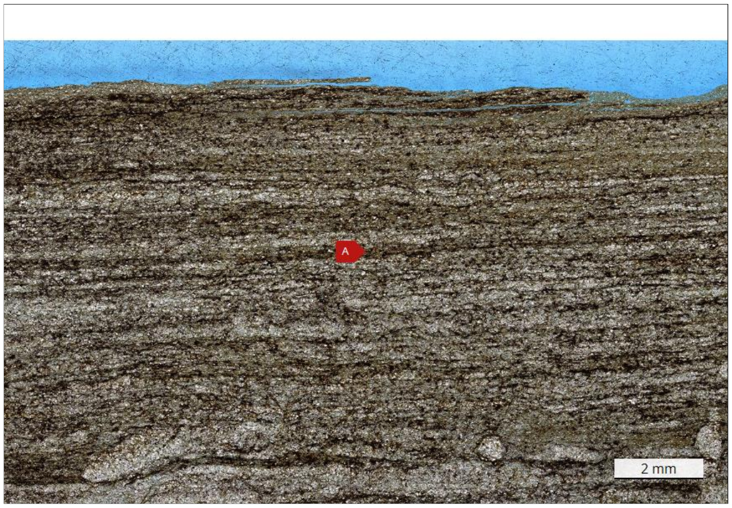
Anchor QEA, LLC

SoCo Fractured Rock MNA Project

Alabama, USA

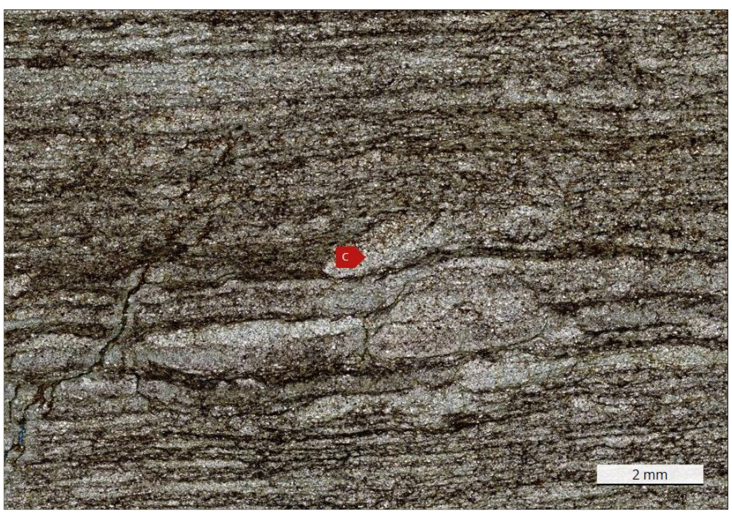
Proprietary - Anchor QEA

Depth: 17.00 - Sample ID: GS-AP-MW-17V



A - Clay-rich lamina; stained with iron oxides

B - Silt-rich lamina



C - Silt-rich burrow

D - Irregular 'fractures' are possibly rootlet structures and are partly filled with iron oxides

Image Description: This mudrock is laminated and burrowed. Laminae (A & B) are rich in detrital clays or silt grains, while some clay-rich laminae are stained with iron oxides (possibly hematite). Laminae are locally disrupted by silt-rich burrows (C). Irregular 'fractures' (D) are possibly rootlet structures, and are partly filled with iron oxides. In general, detrital clay matrix (E & F) and silt-size detrital grains are the most abundant constituents. The detrital clay matrix is mostly stained with iron oxides (E). Detrital grains include quartz (G), feldspar (H), mica (I), and rock fragments. Visible pores (J) are very rare. Open fractures (K) are probably induced.

Anchor QEA, LLC

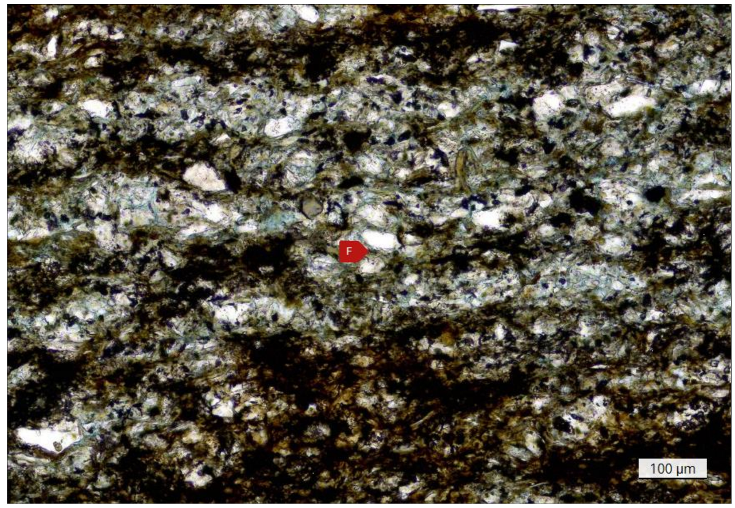
SoCo Fractured Rock MNA Project

Alabama, USA

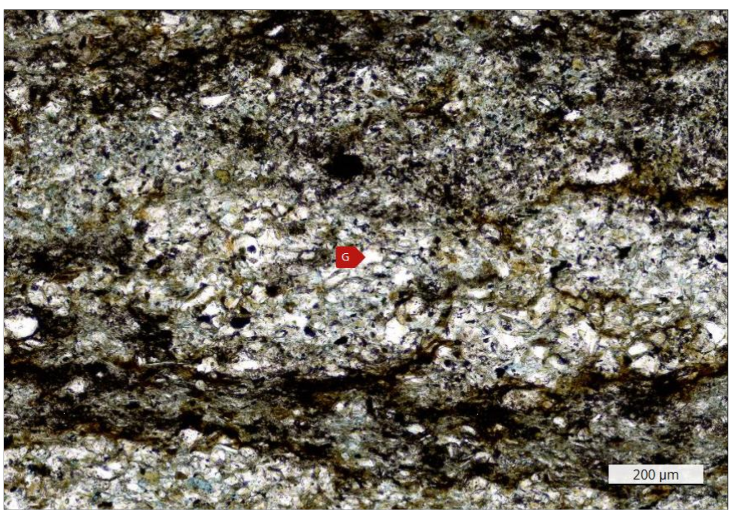
Proprietary - Anchor QEA

Depth: 17.00 - Sample ID: GS-AP-MW-17V

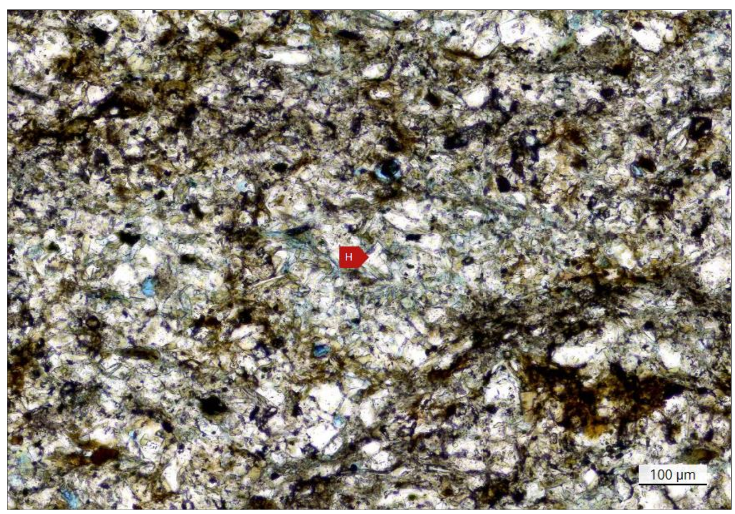
E - Detrital clay matrix; stained with iron oxides



F - Detrital clay matrix filling intergranular areas



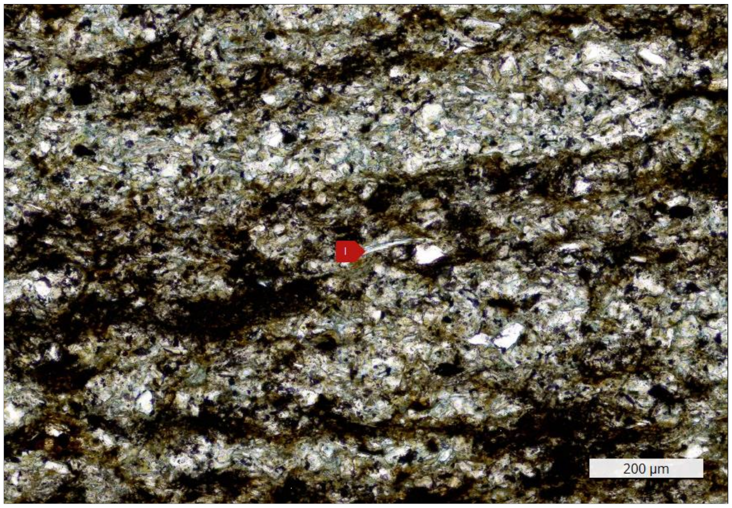
G - Silt-size detrital quartz grain



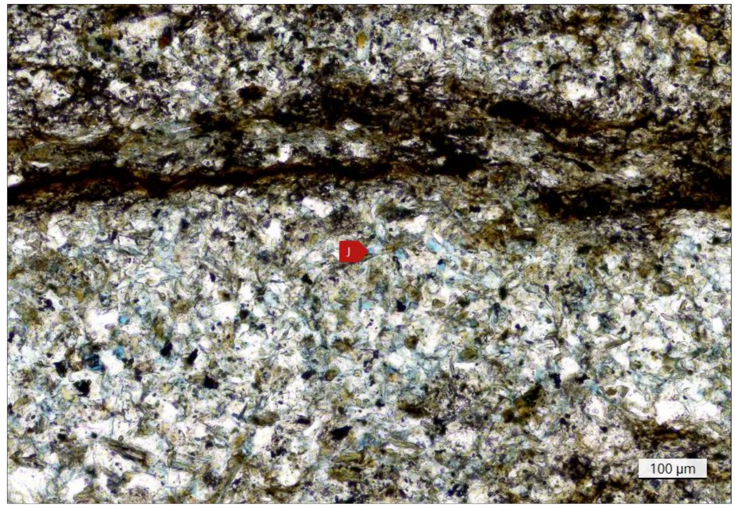
H - Detrital feldspar grain

Image Description: This mudrock is laminated and burrowed. Laminae (A & B) are rich in detrital clays or silt grains, while some clay-rich laminae are stained with iron oxides (possibly hematite). Laminae are locally disrupted by silt-rich burrows (C). Irregular 'fractures' (D) are possibly rootlet structures, and are partly filled with iron oxides. In general, detrital clay matrix (E & F) and silt-size detrital grains are the most abundant constituents. The detrital clay matrix is mostly stained with iron oxides (E). Detrital grains include quartz (G), feldspar (H), mica (I), and rock fragments. Visible pores (J) are very rare. Open fractures (K) are probably induced.

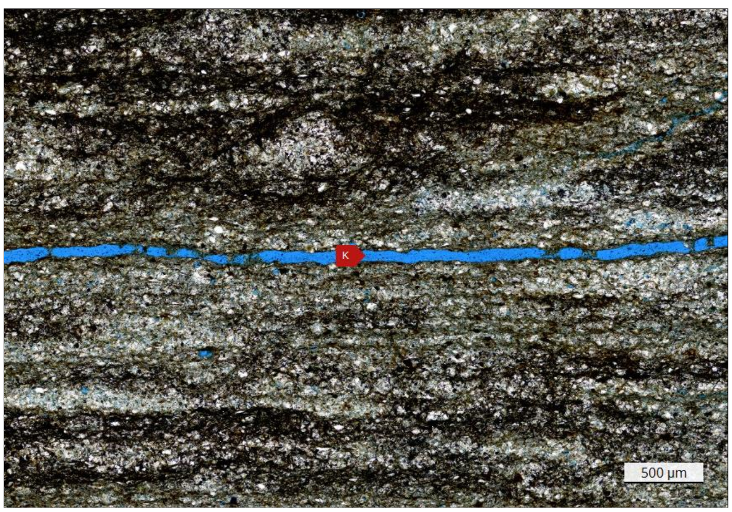
Depth: 17.00 - Sample ID: GS-AP-MW-17V



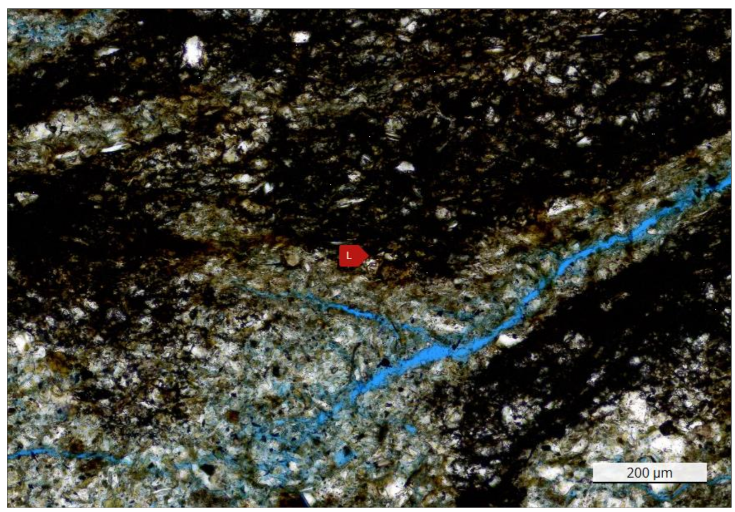
I - Detrital muscovite mica grain



J - Intergranular pore



K - Induced fracture



L - Area with dark material is investigated in SEM

Image Description: This mudrock is laminated and burrowed. Laminae (A & B) are rich in detrital clays or silt grains, while some clay-rich laminae are stained with iron oxides (possibly hematite). Laminae are locally disrupted by silt-rich burrows (C). Irregular 'fractures' (D) are possibly rootlet structures, and are partly filled with iron oxides. In general, detrital clay matrix (E & F) and silt-size detrital grains are the most abundant constituents. The detrital clay matrix is mostly stained with iron oxides (E). Detrital grains include quartz (G), feldspar (H), mica (I), and rock fragments. Visible pores (J) are very rare. Open fractures (K) are probably induced.

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SoCo Fractured Rock MNA Project

Alabama, USA
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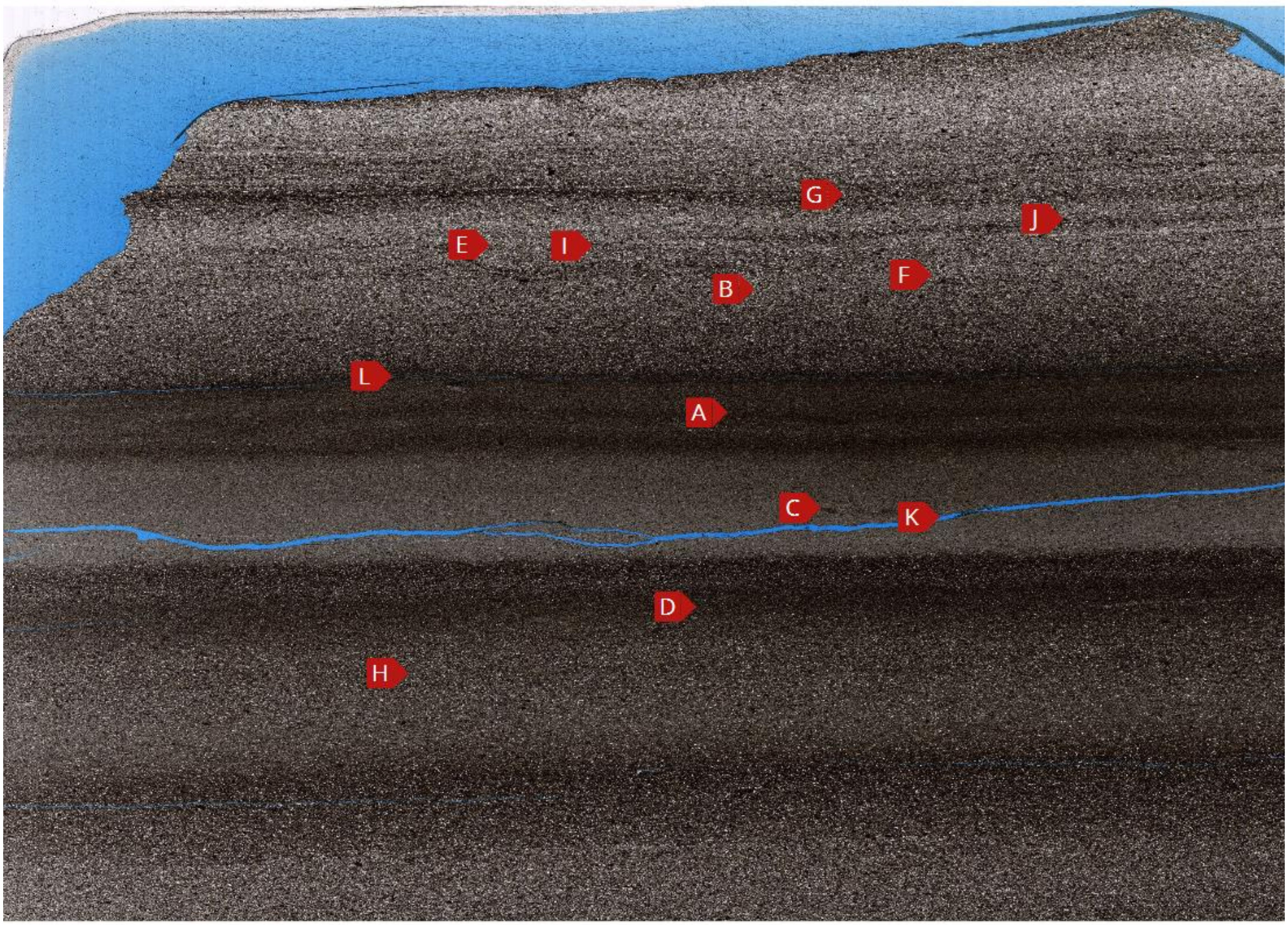
Thin Section Analysis

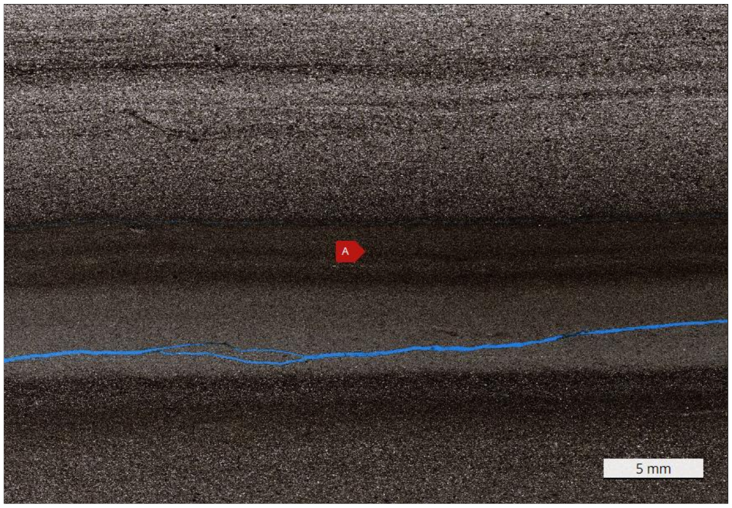
Sample Depth (ft): **26.00**
Sample ID: GS-AP-MW-7V



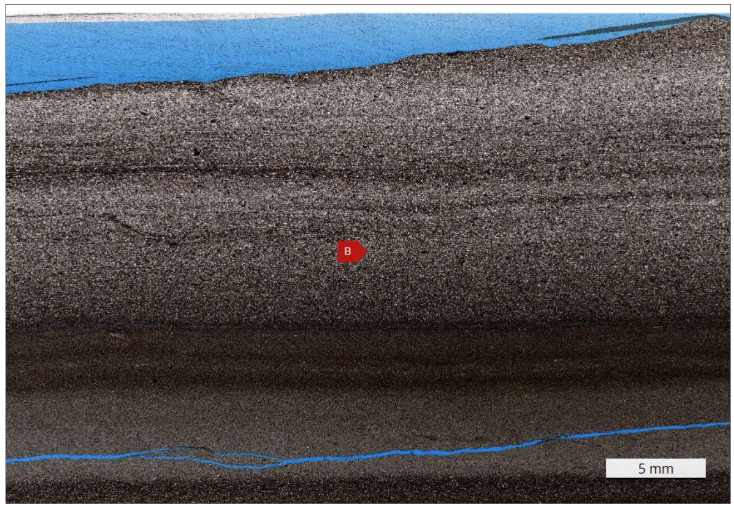
5 mm

Image Note: Plane Light, Depth = Measured sample depth

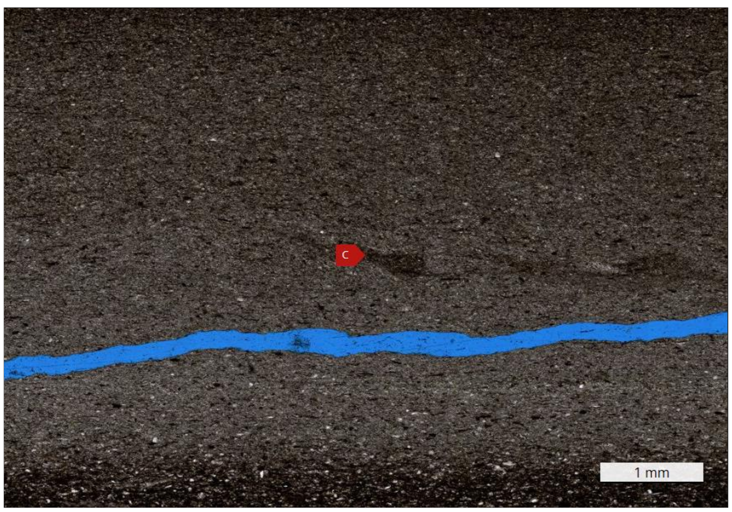
Depth: 26.00 - Sample ID: GS-AP-MW-7V



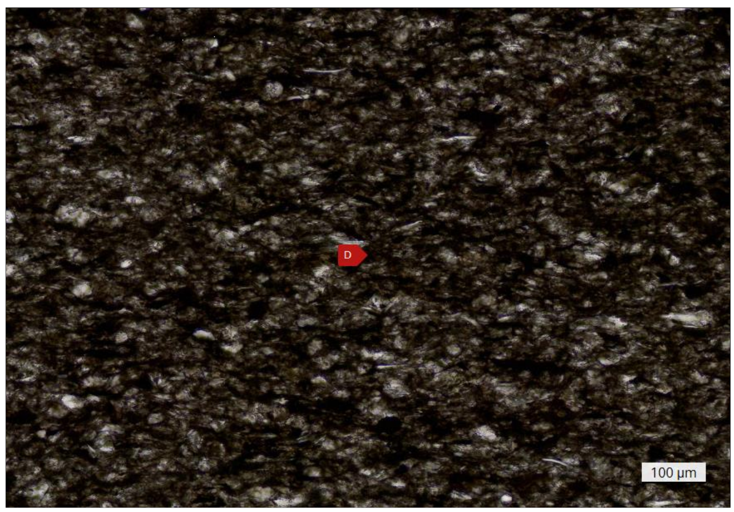
A - Clay-rich lamina; relatively dark-colored



B - Silt-rich lamina; relatively light-colored



C - Burrow



D - Detrital clay matrix is the most abundant constituent in the clay-rich laminae

Image Description: This mudrock is laminated. Clay-rich laminae (A) alternate with silt-rich laminae (B). Burrows (C) are locally observed. Overall, detrital clay matrix (D & E) and silt-size detrital grains are the most abundant constituents. The grains include quartz (F), feldspars (G), mica (H), rock fragments (I), and organic fragments (J). Organic fragments are partly replaced by authigenic pyrite. Detrital clay matrix is locally replaced by siderite. No pores are visible; micropores are the principal pore type. Open fractures (K & L) are induced.

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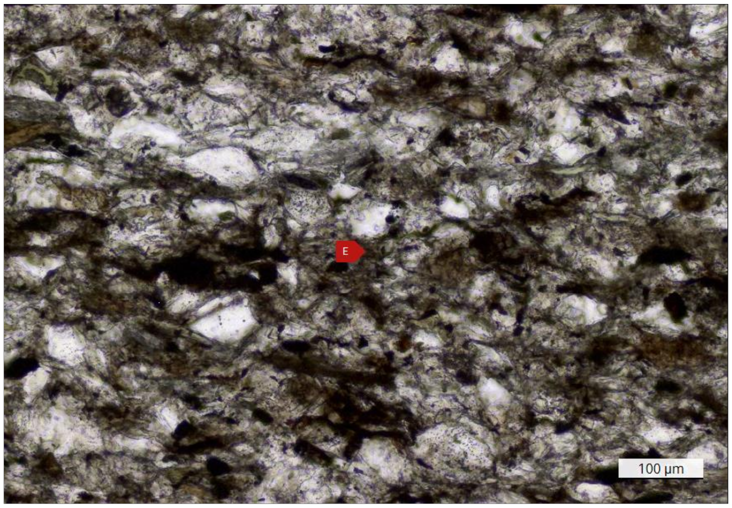
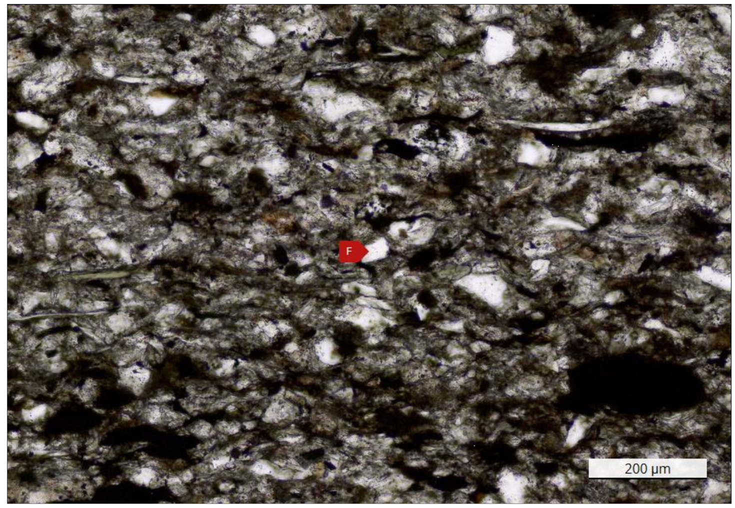
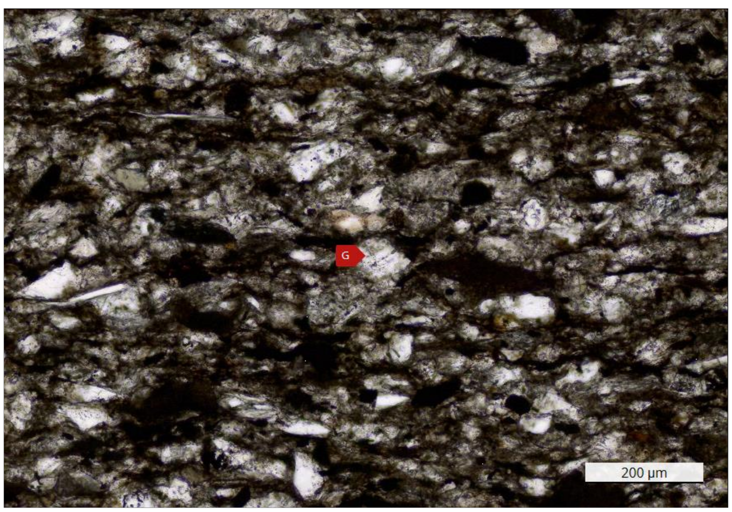
Depth: 26.00 - Sample ID: GS-AP-MW-7V



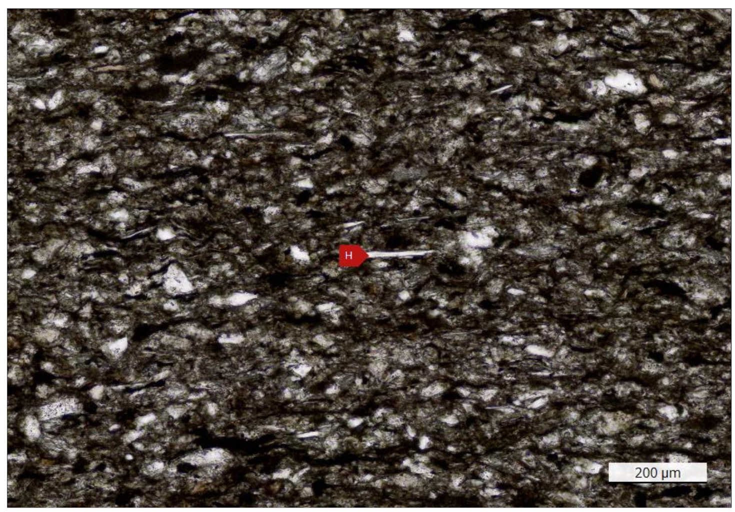
E - Detrital clay matrix fills intergranular areas in the silt-rich laminae



F - Silt-size detrital quartz grain



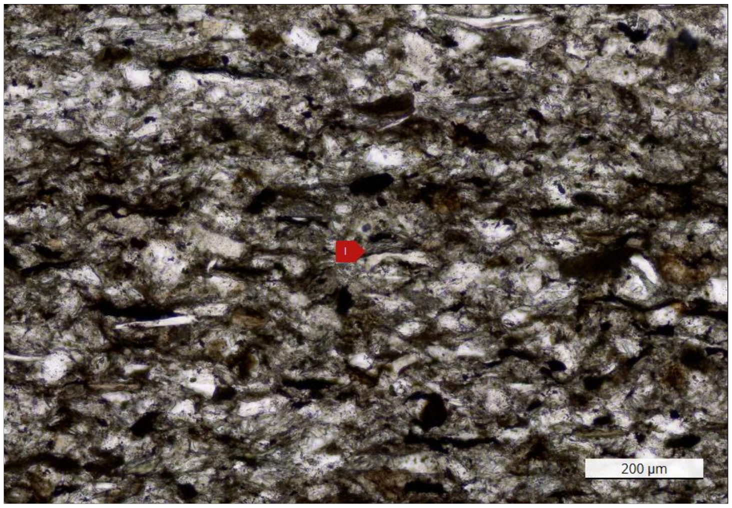
G - Detrital plagioclase feldspar grain



H - Muscovite mica grain

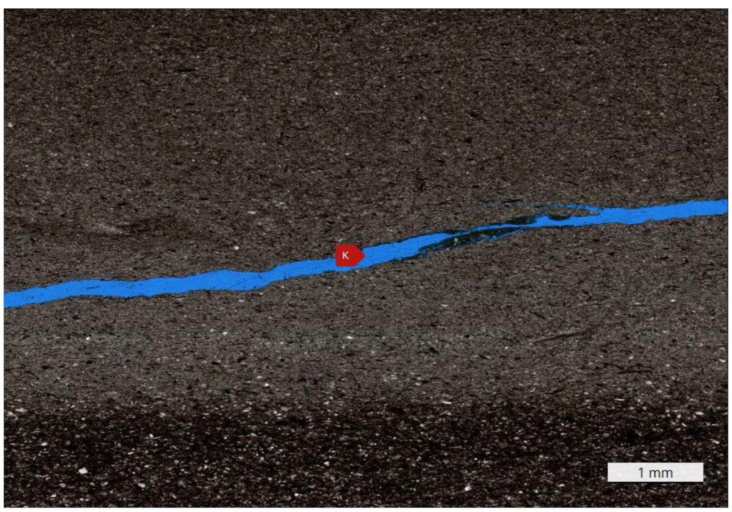
Image Description: This mudrock is laminated. Clay-rich laminae (A) alternate with silt-rich laminae (B). Burrows (C) are locally observed. Overall, detrital clay matrix (D & E) and silt-size detrital grains are the most abundant constituents. The grains include quartz (F), feldspars (G), mica (H), rock fragments (I), and organic fragments (J). Organic fragments are partly replaced by authigenic pyrite. Detrital clay matrix is locally replaced by siderite. No pores are visible; micropores are the principal pore type. Open fractures (K & L) are induced.

Depth: 26.00 - Sample ID: GS-AP-MW-7V

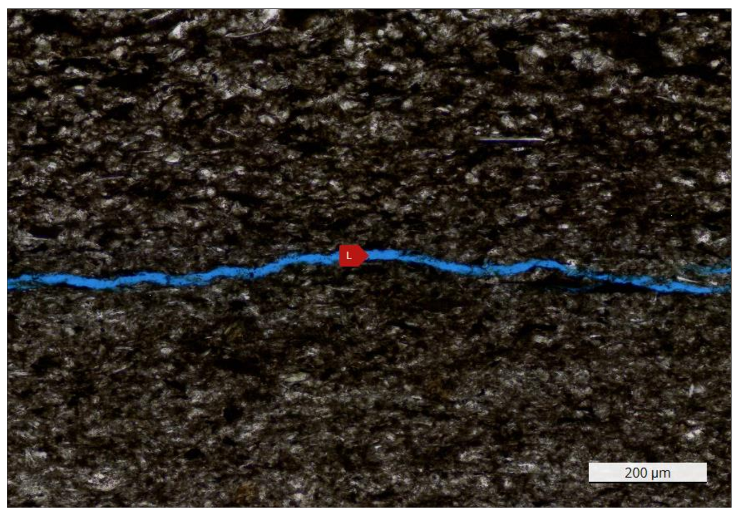


I - Metamorphic rock fragment

J - Elongate organic fragment partly replaced by authigenic pyrite



K - Induced fracture locally filled with rock flour (dark-colored material on the right) associated with sample drilling or trimming



L - Induced fracture parallel to bedding laminae

Image Description: This mudrock is laminated. Clay-rich laminae (A) alternate with silt-rich laminae (B). Burrows (C) are locally observed. Overall, detrital clay matrix (D & E) and silt-size detrital grains are the most abundant constituents. The grains include quartz (F), feldspars (G), mica (H), rock fragments (I), and organic fragments (J). Organic fragments are partly replaced by authigenic pyrite. Detrital clay matrix is locally replaced by siderite. No pores are visible; micropores are the principal pore type. Open fractures (K & L) are induced.

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Alabama, USA

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Thin Section Analysis

Sample Depth (ft):	**48.50**
Sample ID:	GS-MW-07

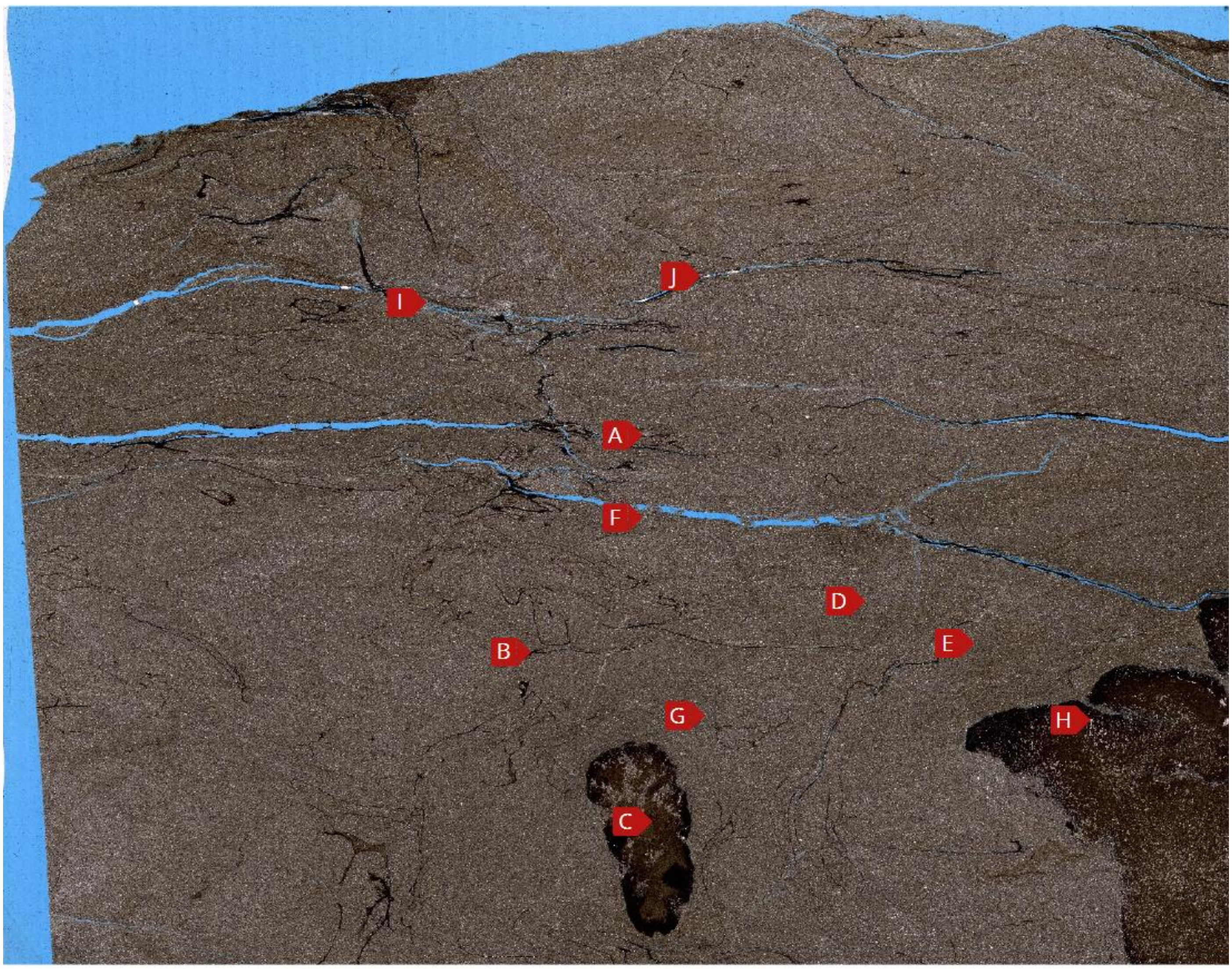

Image Note: Plane Light, Depth = Measured sample depth

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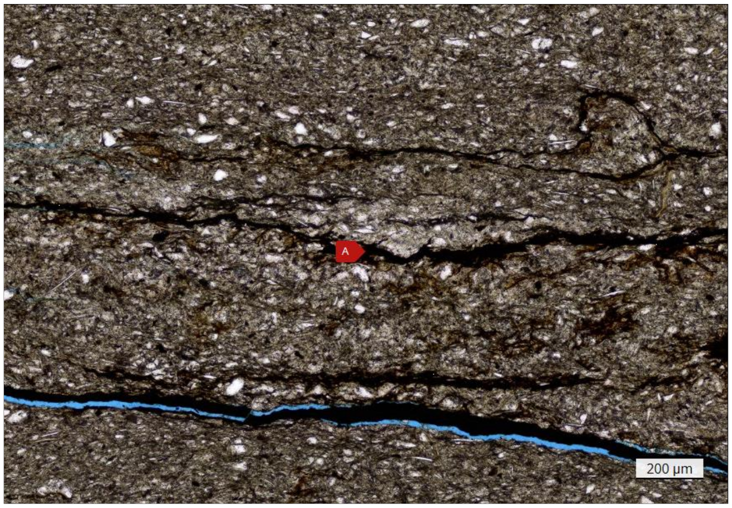
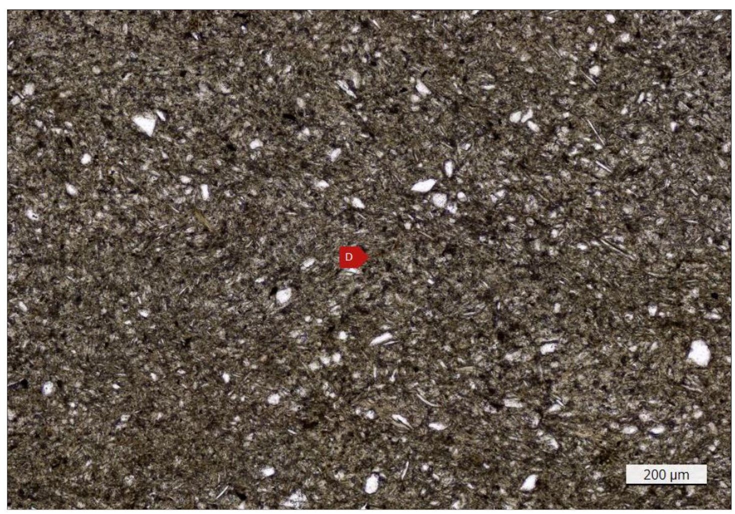
Depth: 48.50 - Sample ID: GS-MW-07



A - Organic fragments partly replaced by authigenic pyrite

B - Organic fragments partly replaced by authigenic pyrite

C - Siderite nodule (dark brown); partially oxidized and locally intermixed with mudrock (grayish)



D - Detrital clay matrix

Image Description: This is mudrock. Organic fragments (A & B) are irregularly distributed and deformed by compaction. Siderite nodules (C) are locally present and are partly oxidized. Detrital clay matrix (D) is the predominant constituent; silt/sand-size detrital quartz (E), feldspar (F), and mica (G) grains are widely scattered in the matrix. Authigenic minerals are rare to minor and include kaolinite and pyrite. Authigenic kaolinite (H) is mostly associated with siderite nodules, while authigenic pyrite (A & B) mainly replaces organic fragments. No pores are visible. Fractures are induced and locally filled with gypsum.

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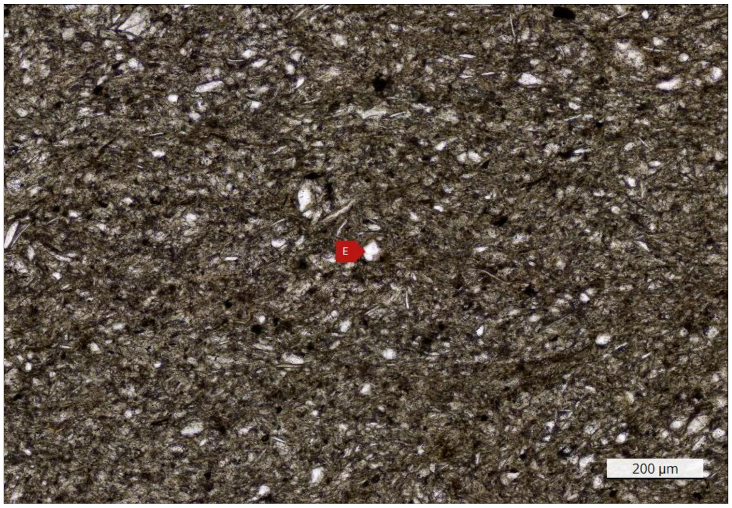
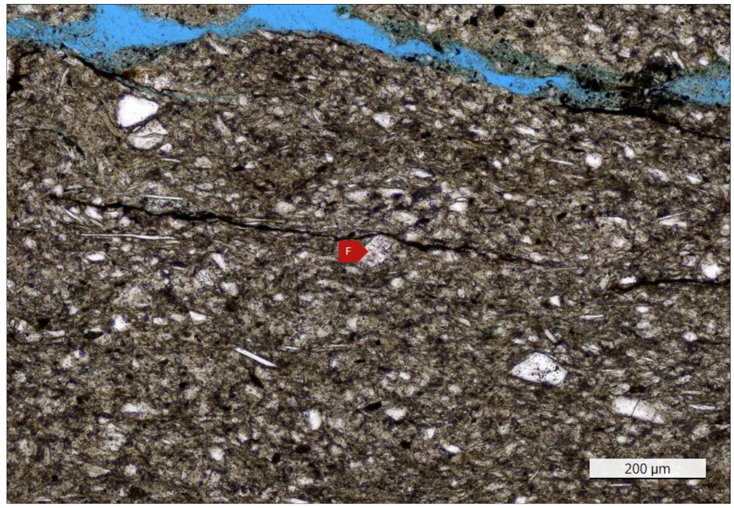
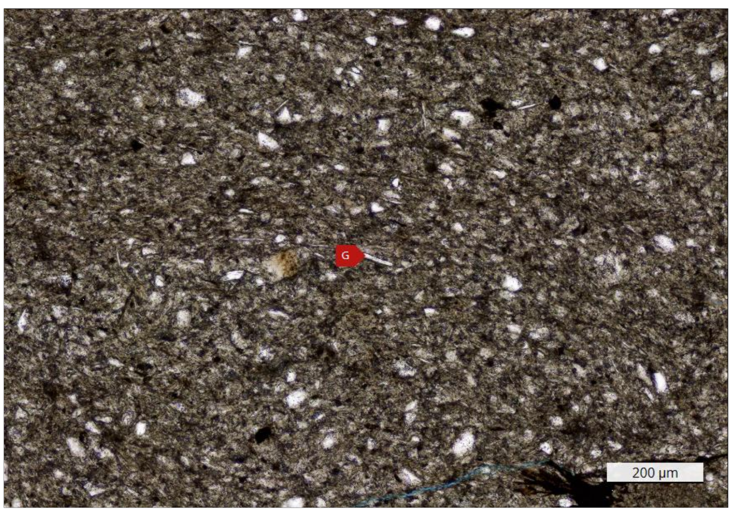
Depth: 48.50 - Sample ID: GS-MW-07



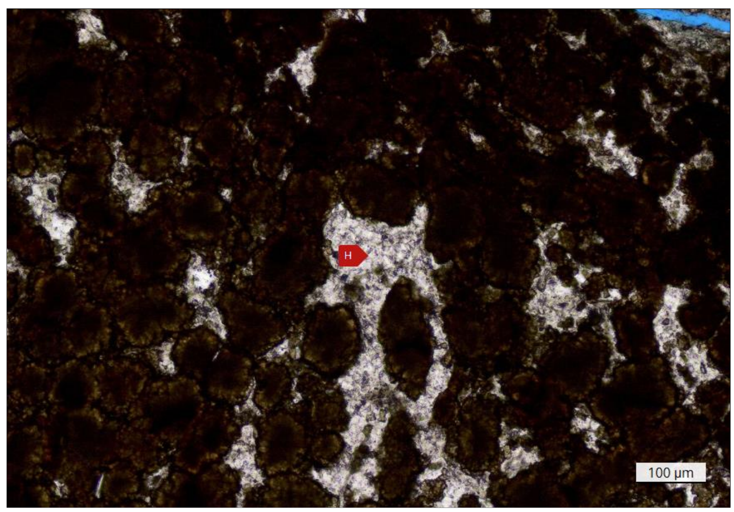
E - Silt-size detrital quartz grain



F - Detrital feldspar grain



G - Detrital muscovite mica grain



H - Authigenic kaolinite (white) filling intercrystal areas between siderite spheres (dark brown)

Image Description: This is mudrock. Organic fragments (A & B) are irregularly distributed and deformed by compaction. Siderite nodules (C) are locally present and are partly oxidized. Detrital clay matrix (D) is the predominant constituent; silt/sand-size detrital quartz (E), feldspar (F), and mica (G) grains are widely scattered in the matrix. Authigenic minerals are rare to minor and include kaolinite and pyrite. Authigenic kaolinite (H) is mostly associated with siderite nodules, while authigenic pyrite (A & B) mainly replaces organic fragments. No pores are visible. Fractures are induced and locally filled with gypsum.

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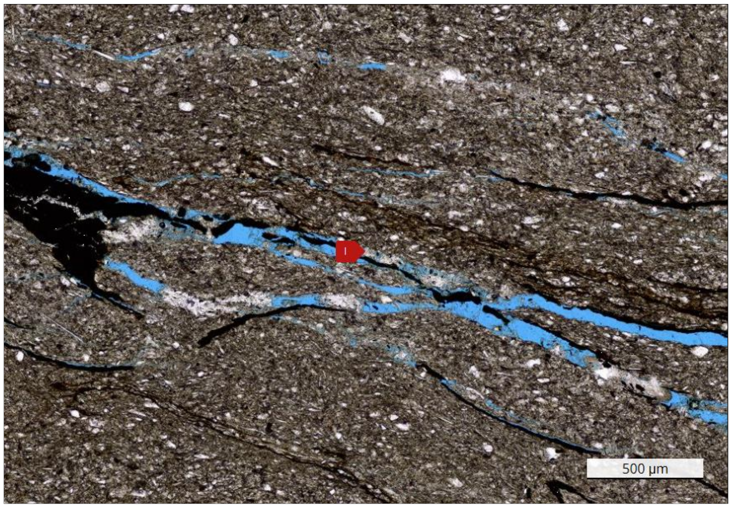
Depth: 48.50 - Sample ID: GS-MW-07



I - Gypsum filling an induced fracture

J - Induced fracture; the white area on the right is an air bubble associated with blue epoxy impregnation

Image Description: This is mudrock. Organic fragments (A & B) are irregularly distributed and deformed by compaction. Siderite nodules (C) are locally present and are partly oxidized. Detrital clay matrix (D) is the predominant constituent; silt/sand-size detrital quartz (E), feldspar (F), and mica (G) grains are widely scattered in the matrix. Authigenic minerals are rare to minor and include kaolinite and pyrite. Authigenic kaolinite (H) is mostly associated with siderite nodules, while authigenic pyrite (A & B) mainly replaces organic fragments. No pores are visible. Fractures are induced and locally filled with gypsum.

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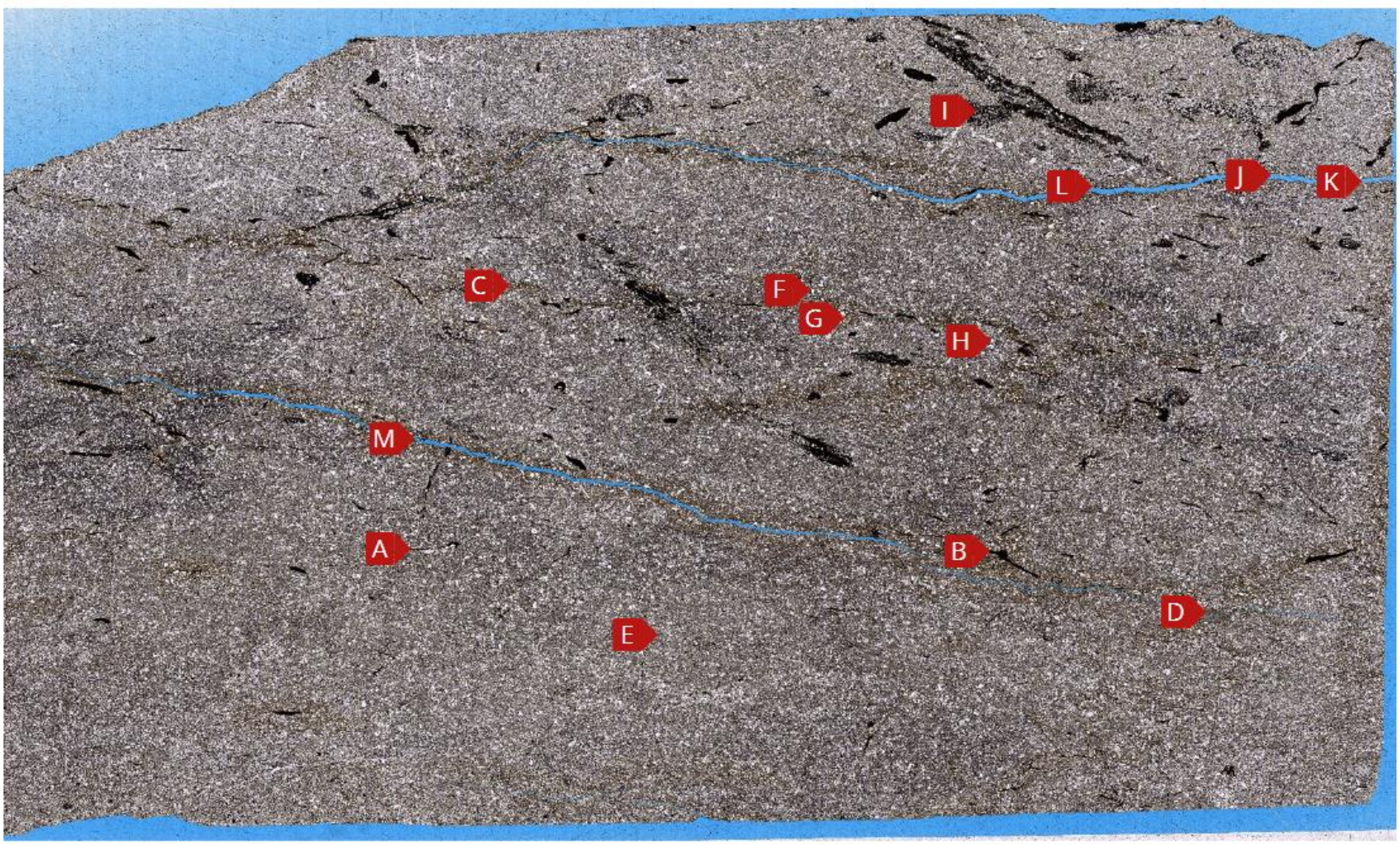
Thin Section Analysis

Sample Depth (ft):	**74.00**
Sample ID:	GS-AP-MW-17V



5 mm

Image Note: Plane Light, Depth = Measured sample depth

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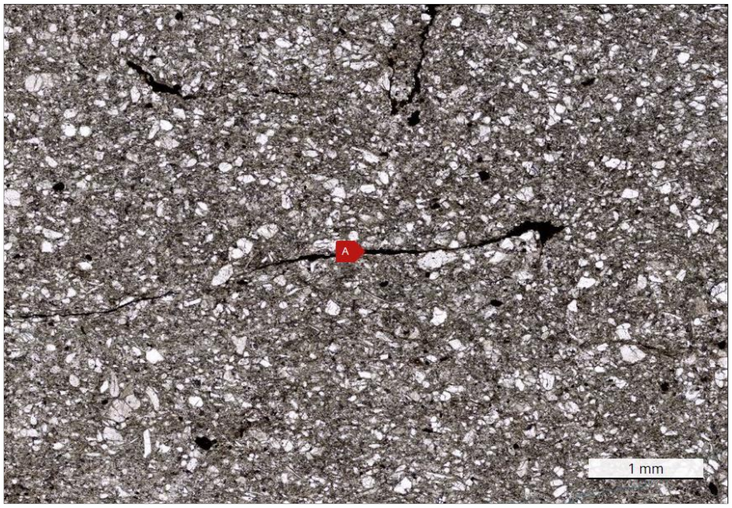
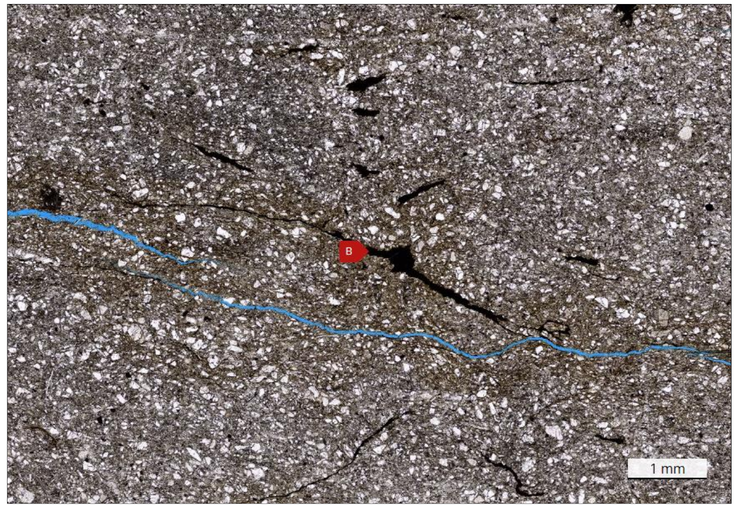
Proprietary - Anchor QEA

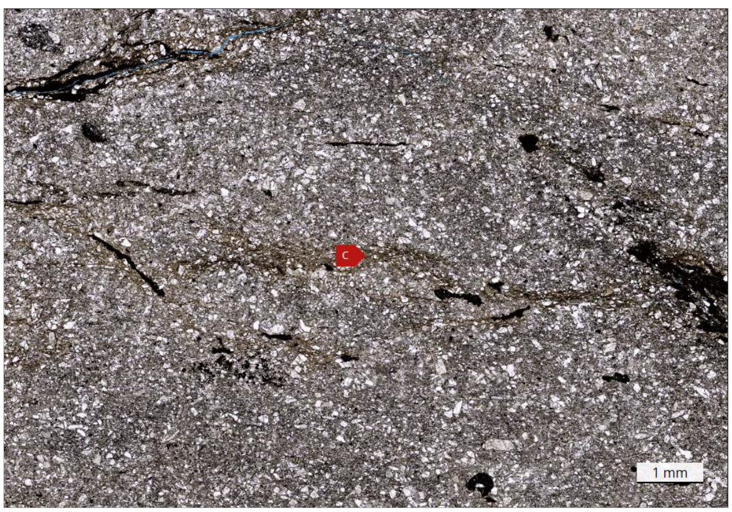
Depth: 74.00 - Sample ID: GS-AP-MW-17V



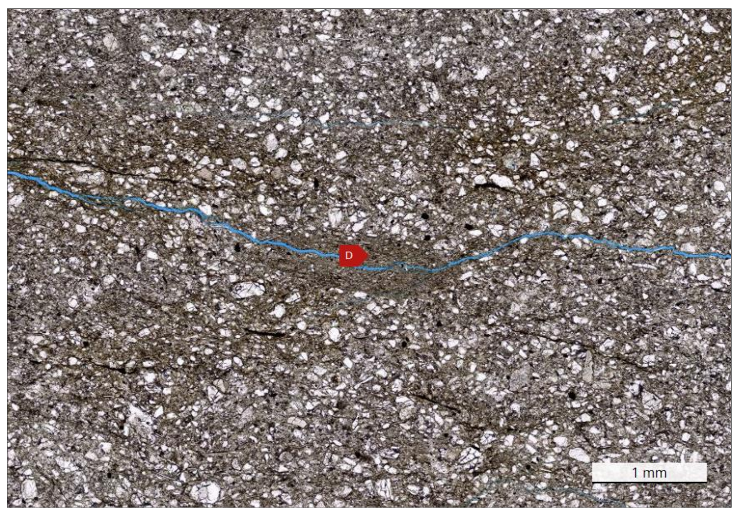
A - Organic fragment partly replaced by authigenic pyrite



B - Organic fragment partly replaced by authigenic pyrite



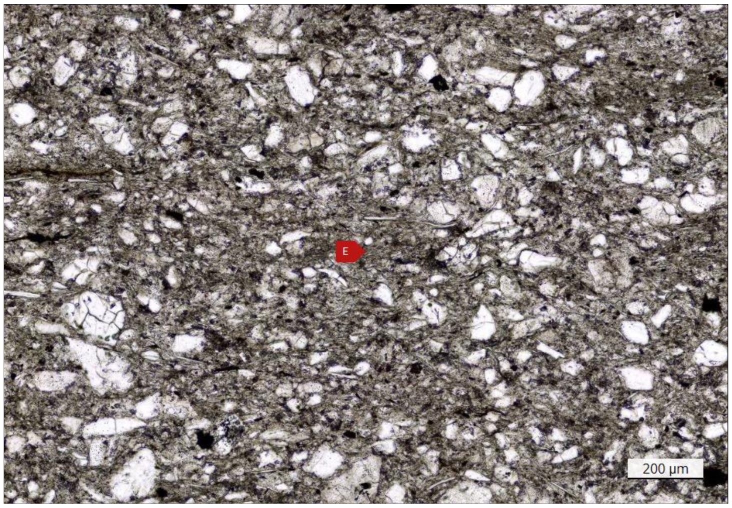
C - Clay-rich lamina



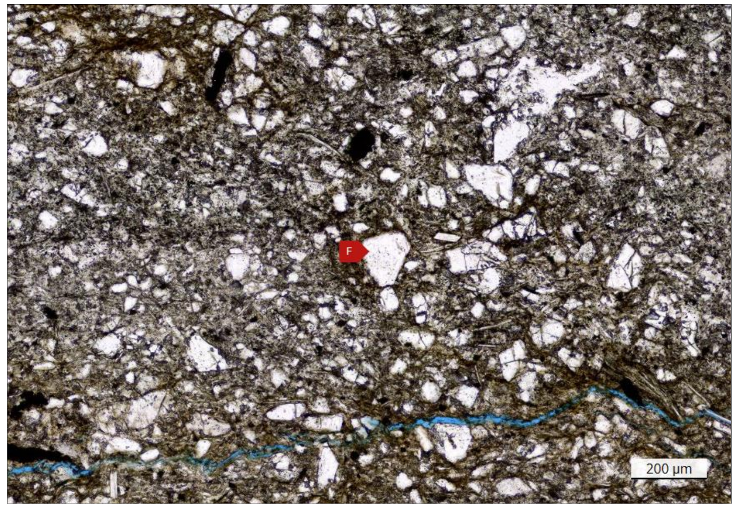
D - Clay-rich burrow

Image Description: This is sandy mudrock. Organic fragments (A & B) are irregularly distributed and are partly replaced by authigenic pyrite. Clay-rich laminae (C), burrows (D), and bioturbation are locally observed. Detrital clay matrix (E) is the most abundant constituent; with sand/silt-size detrital quartz (F), feldspar (G), mica (H), and rock fragments widely scattered in the matrix. Authigenic minerals, such as pyrite (I), are rare to minor and unevenly distributed. No pores are visible. Open microfractures (J & M) are are enhanced by sampling, but discoloration of adjacent rock and localized gypsum within the microfractures (K & L) suggests narrower microfractures existed before sampling.

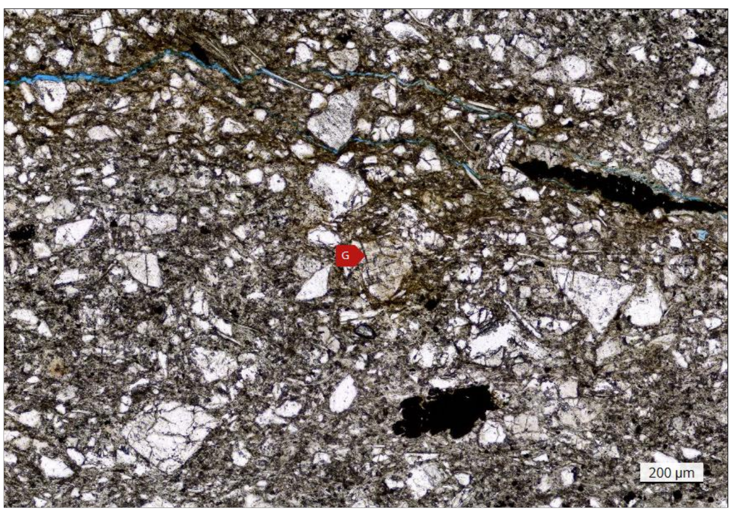
Depth: 74.00 - Sample ID: GS-AP-MW-17V



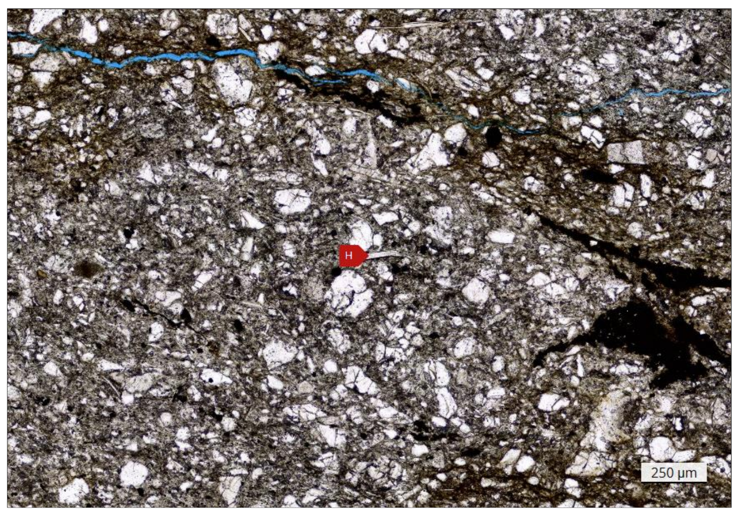
E - Detrital clay matrix



F - Sand-size detrital quartz grain



G - Sand-size detrital feldspar grain



H - Detrital muscovite mica grain

Image Description: This is sandy mudrock. Organic fragments (A & B) are irregularly distributed and are partly replaced by authigenic pyrite. Clay-rich laminae (C), burrows (D), and bioturbation are locally observed. Detrital clay matrix (E) is the most abundant constituent; with sand/silt-size detrital quartz (F), feldspar (G), mica (H), and rock fragments widely scattered in the matrix. Authigenic minerals, such as pyrite (I), are rare to minor and unevenly distributed. No pores are visible. Open microfractures (J & M) are are enhanced by sampling, but discoloration of adjacent rock and localized gypsum within the microfractures (K & L) suggests narrower microfractures existed before sampling.

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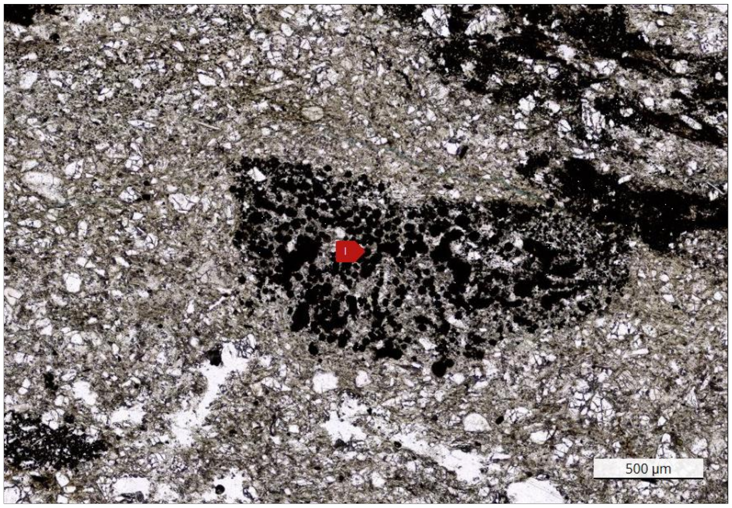
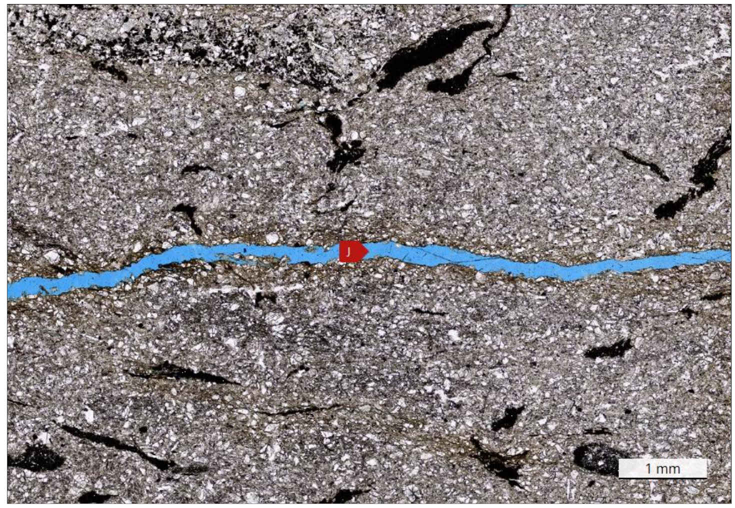
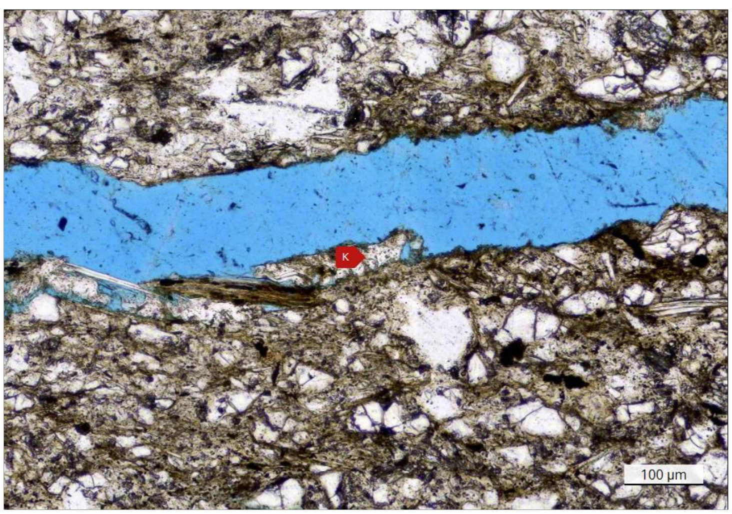
Depth: 74.00 - Sample ID: GS-AP-MW-17V



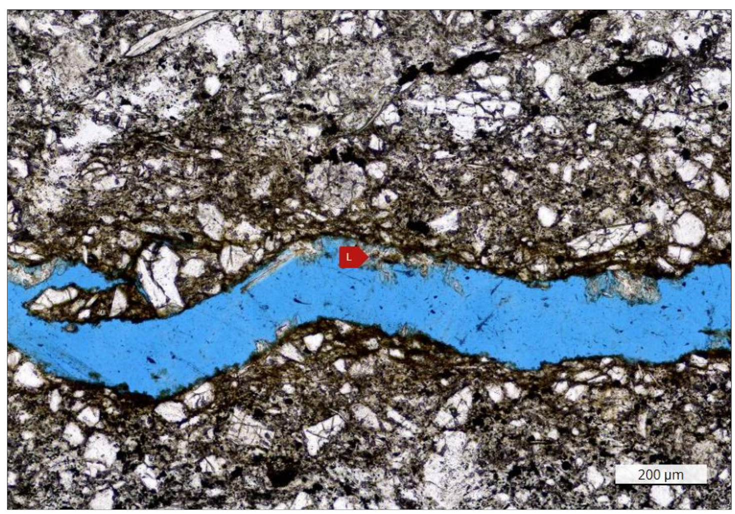
I - Authigenic pyrite is locally concentrated



J - Sampling-enhanced microfracture



K - Gypsum lining microfracture that was was originally narrower before sampling



L - Gypsum lining microfracture that was originally narrower before sampling

Image Description: This is sandy mudrock. Organic fragments (A & B) are irregularly distributed and are partly replaced by authigenic pyrite. Clay-rich laminae (C), burrows (D), and bioturbation are locally observed. Detrital clay matrix (E) is the most abundant constituent; with sand/silt-size detrital quartz (F), feldspar (G), mica (H), and rock fragments widely scattered in the matrix. Authigenic minerals, such as pyrite (I), are rare to minor and unevenly distributed. No pores are visible. Open microfractures (J & M) are enhanced by sampling, but discoloration of adjacent rock and localized gypsum within the microfractures (K & L) suggests narrower microfractures existed before sampling.

Depth: 74.00 - Sample ID: GS-AP-MW-17V

M - Sampling-enhanced microfracture - discoloration of rock adjacent to fracture walls and a few gypsum crystals suggest a narrower natural microfracture existed

Image Description: This is sandy mudrock. Organic fragments (A & B) are irregularly distributed and are partly replaced by authigenic pyrite. Clay-rich laminae (C), burrows (D), and bioturbation are locally observed. Detrital clay matrix (E) is the most abundant constituent; with sand/silt-size detrital quartz (F), feldspar (G), mica (H), and rock fragments widely scattered in the matrix. Authigenic minerals, such as pyrite (I), are rare to minor and unevenly distributed. No pores are visible. Open microfractures (J & M) are are enhanced by sampling, but discoloration of adjacent rock and localized gypsum within the microfractures (K & L) suggests narrower microfractures existed before sampling.

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Thin Section Analysis

Sample Depth (ft): **85.00**
Sample ID: GS-AP-MW-17V

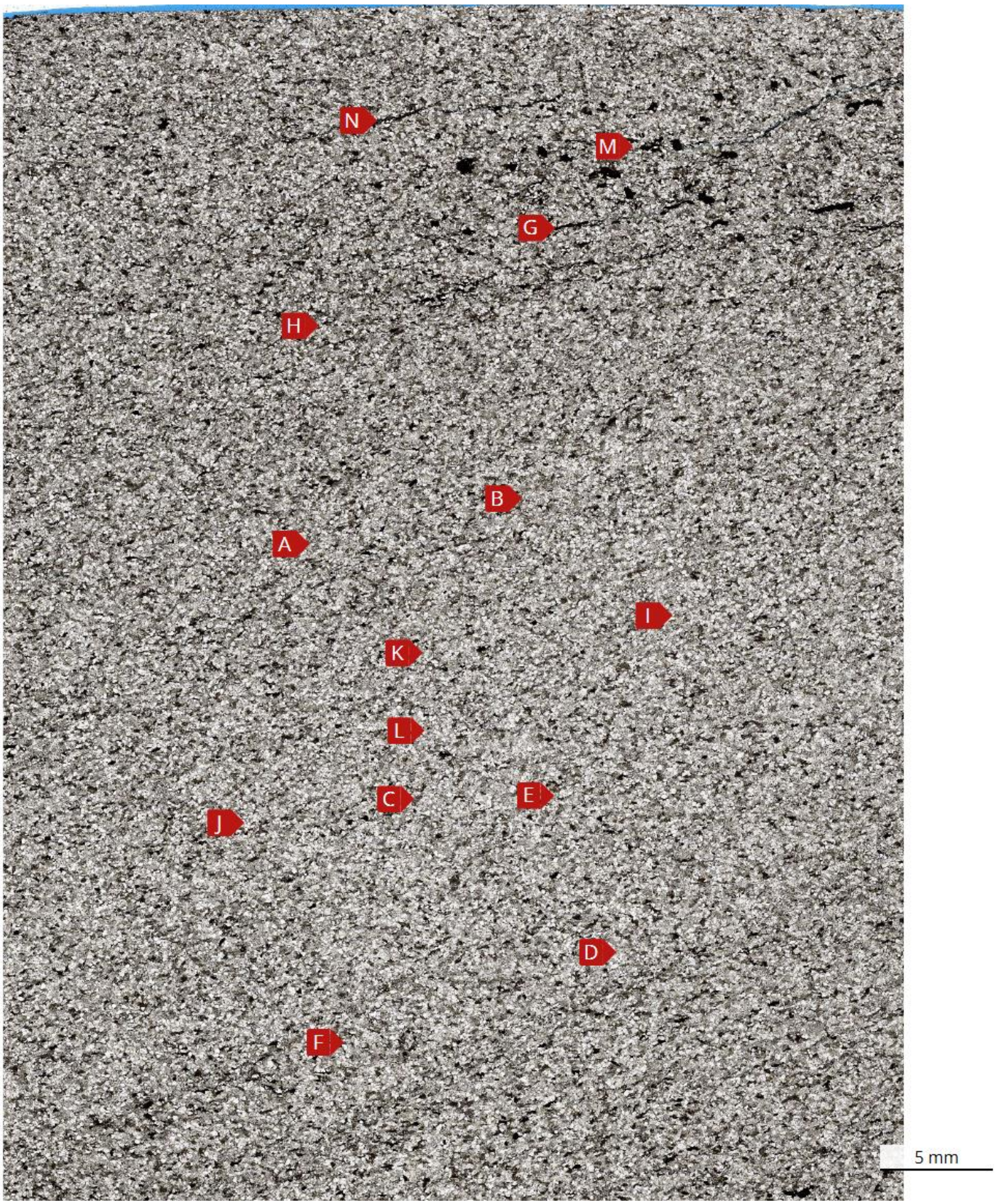

Image Note: Plane Light, Depth = Measured sample depth

RAPIDZoom Report Created - 20-Oct-2021

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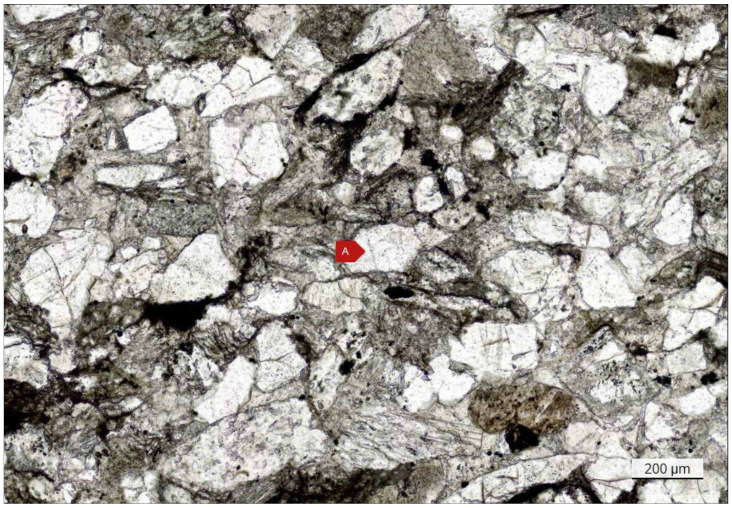
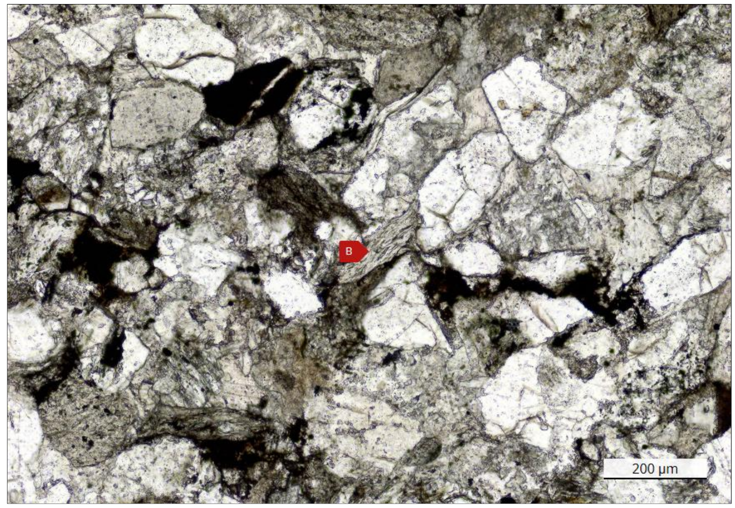
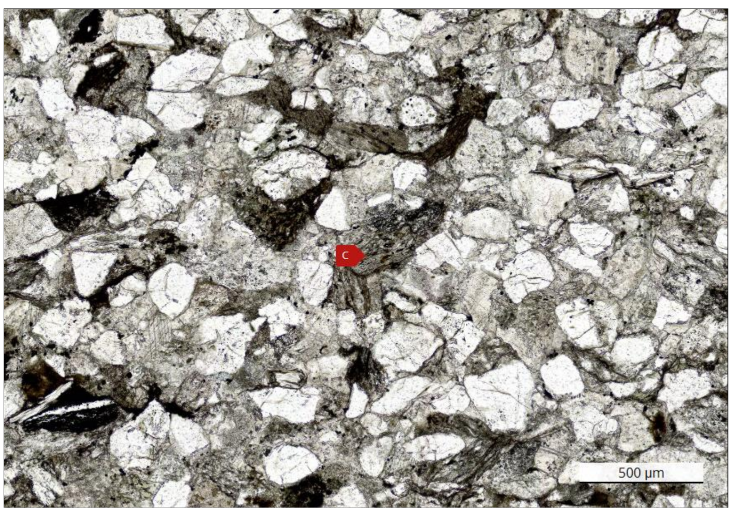
Depth: 85.00 - Sample ID: GS-AP-MW-17V



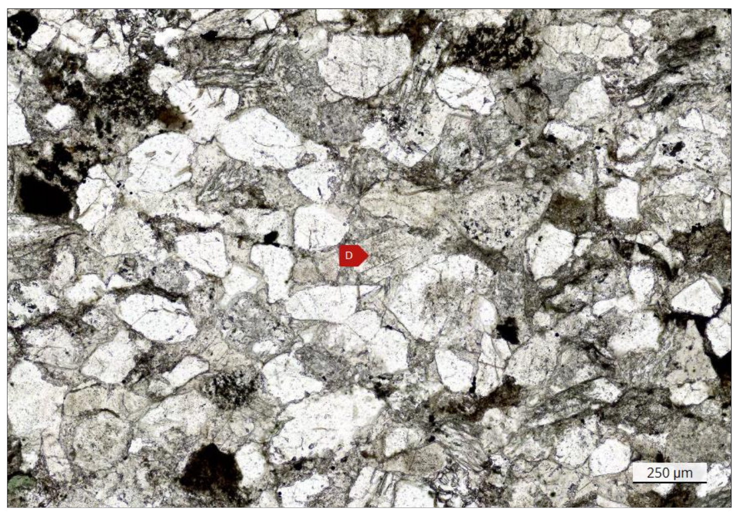
A - Detrital quartz grain



B - Metamorphic rock fragments (schist)



C - Metamorphic rock fragments (schist)



D - Detrital feldspar grain

Image Description: This rock is carbonate-cemented sandstone, which is lower fine-grained (average 0.159 mm) and well sorted. Quartz (A) and metamorphic rock fragments (B & C) are the most abundant framework grains, followed by moderate feldspars (D) and minor carbonate-replaced grains (E), igneous rock fragments, and argillaceous rock fragments (F). Organic fragments (G), mica (H) and chlorite grains are rare to minor in abundance. Carbonate (I & J) is the predominant pore-filling cement and mostly calcite, and it locally replaces framework grains as well. Note that carbonate in this polished thin section was not stained for the identification of detailed mineral species (i.e., calcite, ferroan calcite and ferroan dolomite). Other pore-filing constituents are rare to minor and include authigenic pyrite (K), quartz overgrowths (L), and titanium oxides. Visible pores are very rare; micropores are the principal pore type. Open fractures (M & N) parallel to the bedding are probably induced artificially.

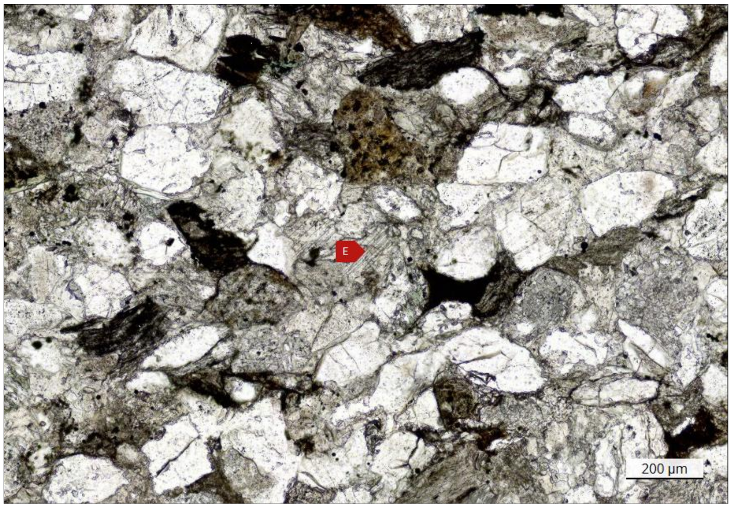
Anchor QEA, LLC

SoCo Fractured Rock MNA Project

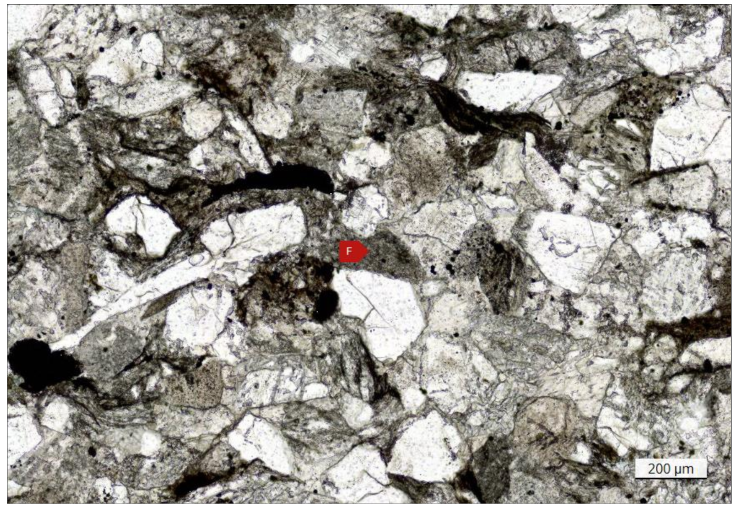
Alabama, USA

Proprietary - Anchor QEA

Depth: 85.00 - Sample ID: GS-AP-MW-17V



E - Carbonate-replaced grain



F - Argillaceous rock fragment

G - Elongate organic fragment; partly replaced by pyrite

H - Detrital muscovite mica grain; slightly deformed due to compaction

Image Description: This rock is carbonate-cemented sandstone, which is lower fine-grained (average 0.159 mm) and well sorted. Quartz (A) and metamorphic rock fragments (B & C) are the most abundant framework grains, followed by moderate feldspars (D) and minor carbonate-replaced grains (E), igneous rock fragments, and argillaceous rock fragments (F). Organic fragments (G), mica (H) and chlorite grains are rare to minor in abundance. Carbonate (I & J) is the predominant pore-filling cement and mostly calcite, and it locally replaces framework grains as well. Note that carbonate in this polished thin section was not stained for the identification of detailed mineral species (i.e., calcite, ferroan calcite and ferroan dolomite). Other pore-filing constituents are rare to minor and include authigenic pyrite (K), quartz overgrowths (L), and titanium oxides. Visible pores are very rare; micropores are the principal pore type. Open fractures (M & N) parallel to the bedding are probably induced artificially.

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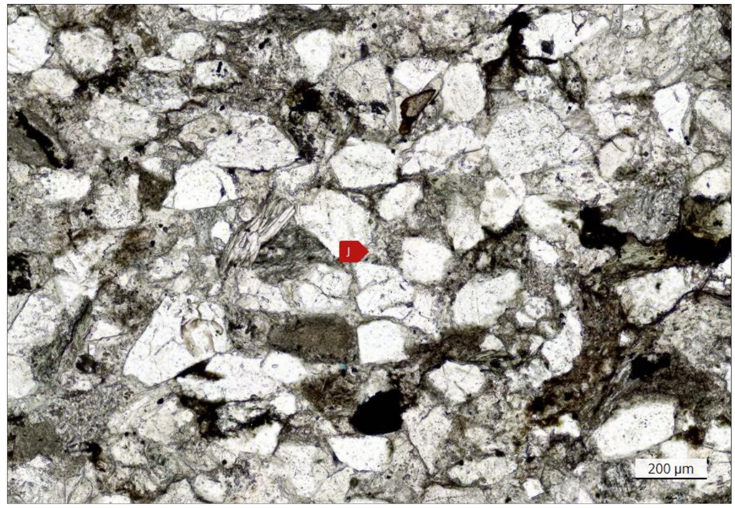
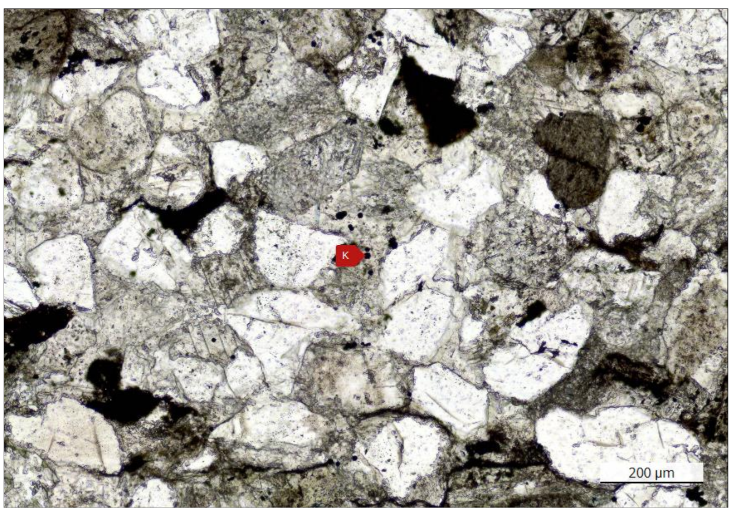
Depth: 85.00 - Sample ID: GS-AP-MW-17V

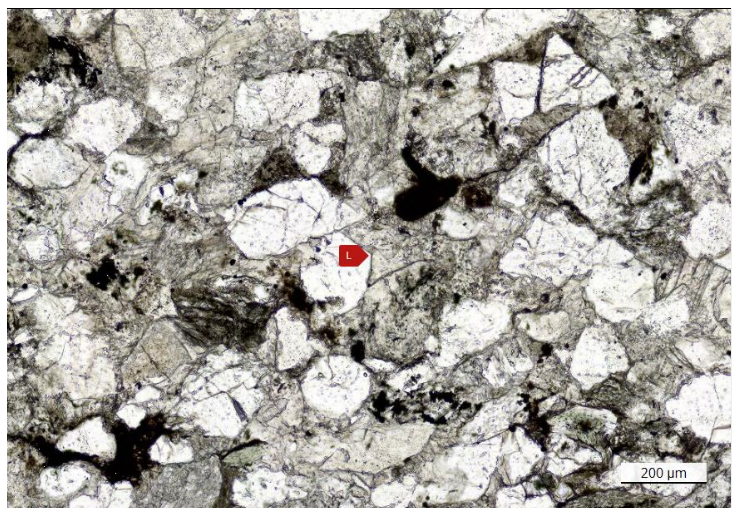
I - Carbonate cement filling intergranular areas



J - Carbonate cement filling intergranular areas



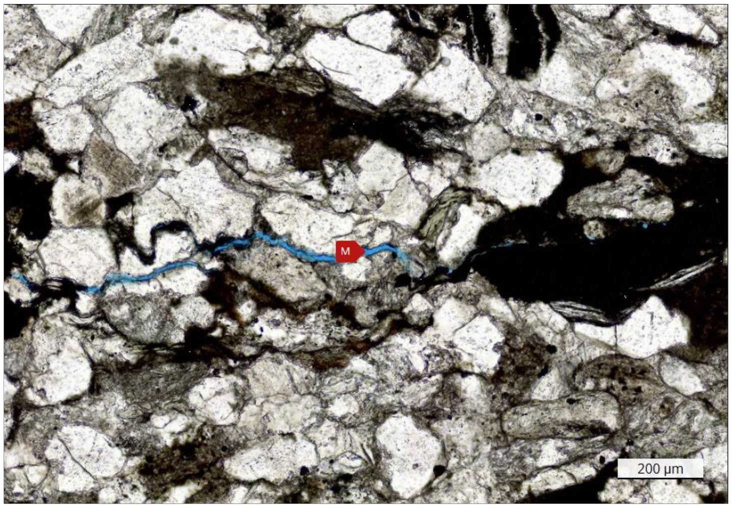
K - Authigenic pyrite



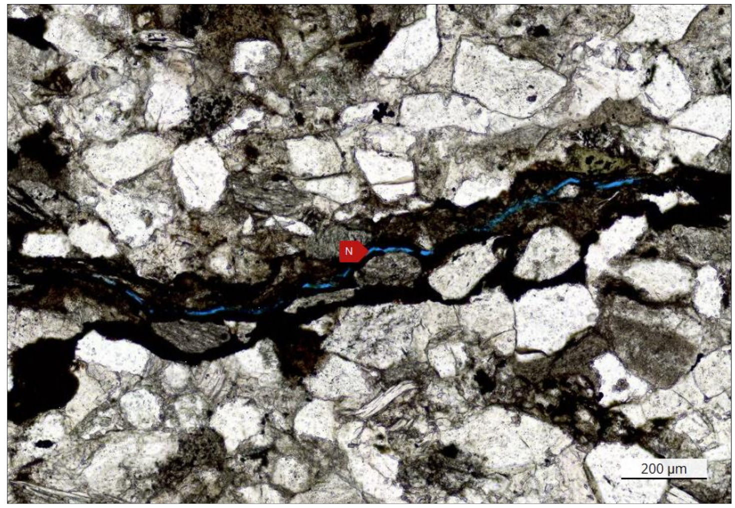
L - Quartz overgrowths; covered by carbonate cement (right)

Image Description: This rock is carbonate-cemented sandstone, which is lower fine-grained (average 0.159 mm) and well sorted. Quartz (A) and metamorphic rock fragments (B & C) are the most abundant framework grains, followed by moderate feldspars (D) and minor carbonate-replaced grains (E), igneous rock fragments, and argillaceous rock fragments (F). Organic fragments (G), mica (H) and chlorite grains are rare to minor in abundance. Carbonate (I & J) is the predominant pore-filling cement and mostly calcite, and it locally replaces framework grains as well. Note that carbonate in this polished thin section was not stained for the identification of detailed mineral species (i.e., calcite, ferroan calcite and ferroan dolomite). Other pore-filing constituents are rare to minor and include authigenic pyrite (K), quartz overgrowths (L), and titanium oxides. Visible pores are very rare; micropores are the principal pore type. Open fractures (M & N) parallel to the bedding are probably induced artificially.

Depth: 85.00 - Sample ID: GS-AP-MW-17V



M - Induced fracture



N - Induced fracture associated with organic fragments

Image Description: This rock is carbonate-cemented sandstone, which is lower fine-grained (average 0.159 mm) and well sorted. Quartz (A) and metamorphic rock fragments (B & C) are the most abundant framework grains, followed by moderate feldspars (D) and minor carbonate-replaced grains (E), igneous rock fragments, and argillaceous rock fragments (F). Organic fragments (G), mica (H) and chlorite grains are rare to minor in abundance. Carbonate (I & J) is the predominant pore-filling cement and mostly calcite, and it locally replaces framework grains as well. Note that carbonate in this polished thin section was not stained for the identification of detailed mineral species (i.e., calcite, ferroan calcite and ferroan dolomite). Other pore-filling constituents are rare to minor and include authigenic pyrite (K), quartz overgrowths (L), and titanium oxides. Visible pores are very rare; micropores are the principal pore type. Open fractures (M & N) parallel to the bedding are probably induced artificially.

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Alabama, USA
Proprietary - Anchor QEA

Thin Section Analysis

Sample Depth (ft):	**172.30**
Sample ID:	GS-AP-MW-7V

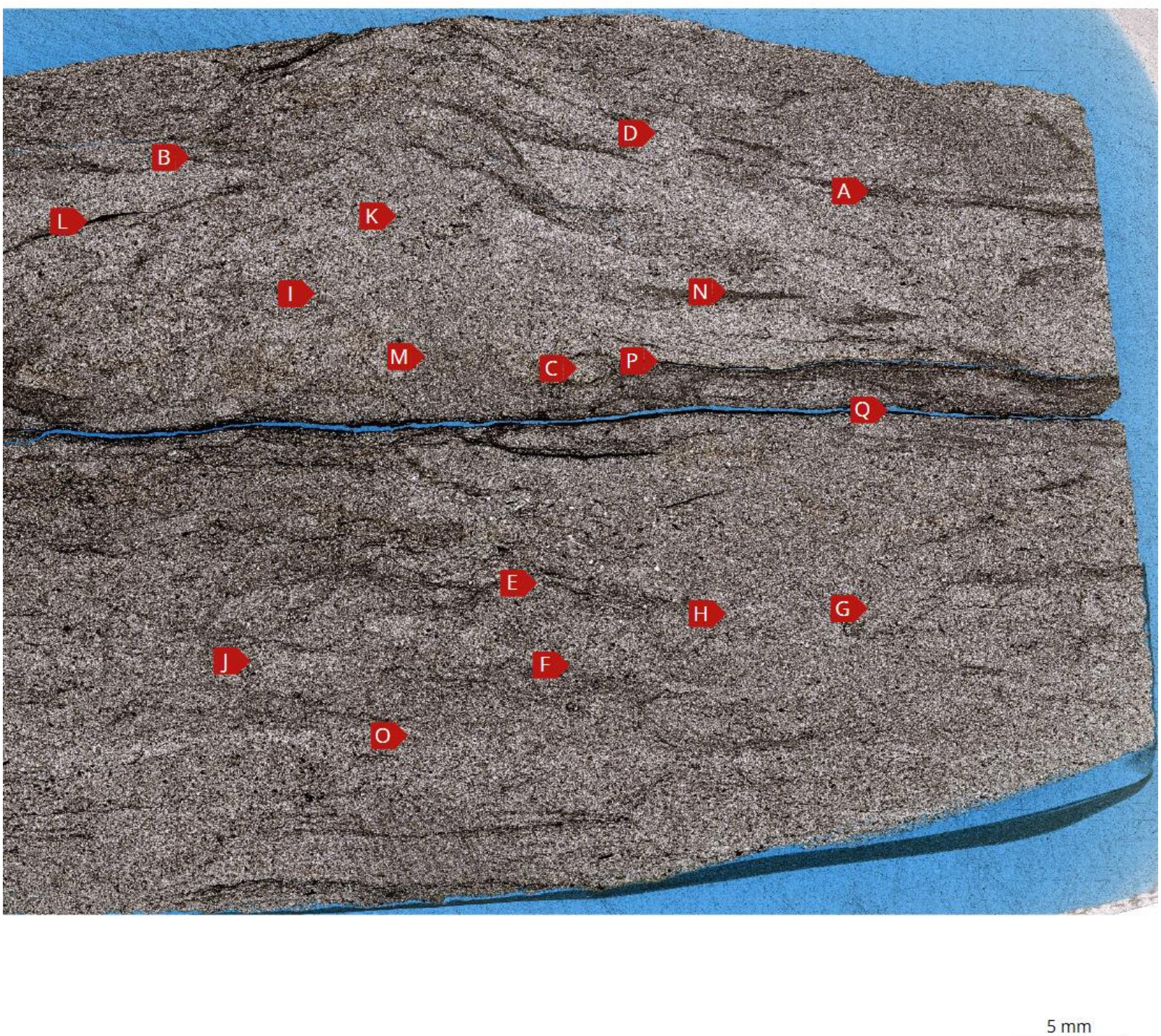
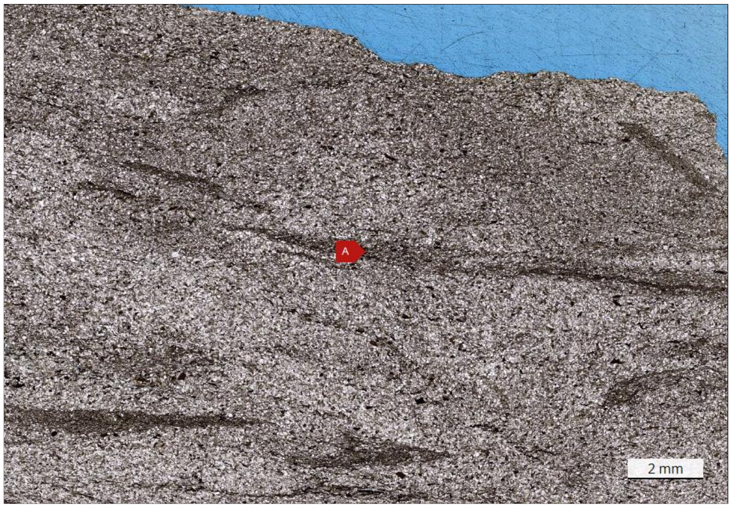


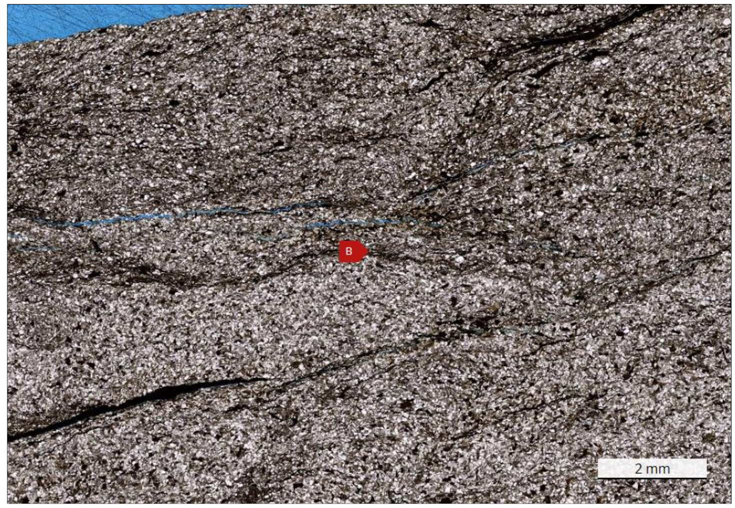
Image Note: Plane Light, Depth = Measured sample depth

RAPIDZoom Report Created - 20-Oct-2021

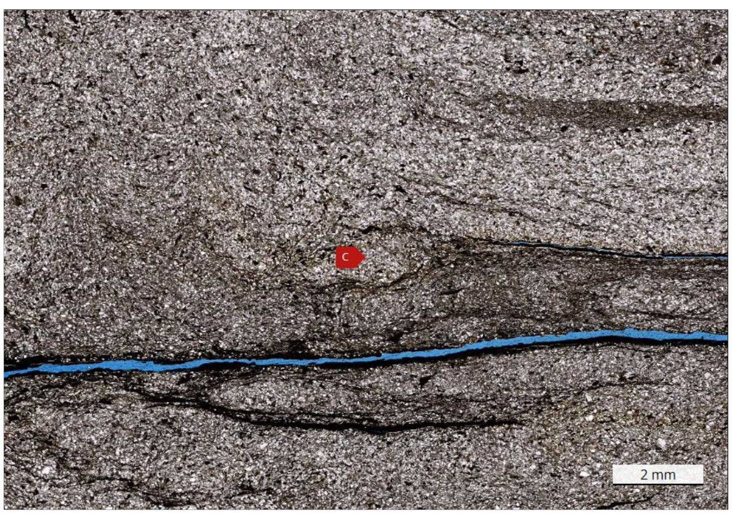
Depth: 172.30 - Sample ID: GS-AP-MW-7V



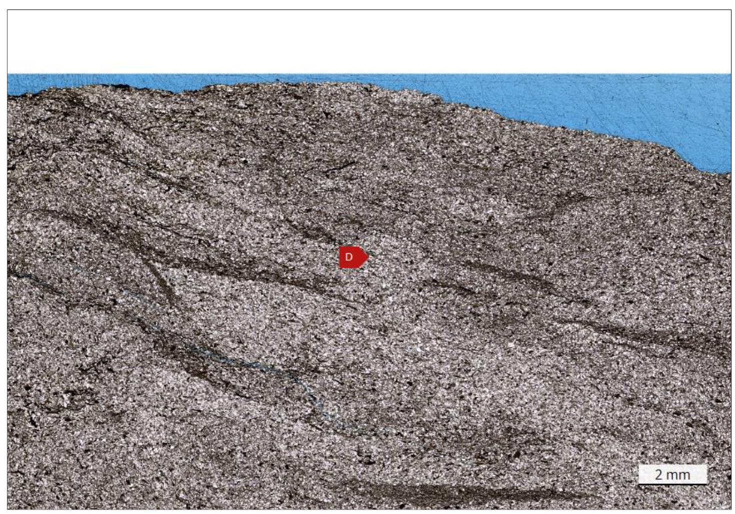
A - Clay-rich lamina, locally disrupted by burrows



B - Clay-rich lamina; wavy and locally disrupted by burrows



C - Sand/silt-rich burrow



D - Sand/silt-rich burrow; disrupting clay-rich laminae

Image Description: Faint laminae (A & B) and burrows (C & D) are widespread in this argillaceous siltstone (average grain size 0.055 mm), and many laminae are disrupted by burrows. Quartz (E), metamorphic fragments (F) and argillaceous rock fragments (G) are the principal detrital grains, followed by moderate feldspars (H), moderate mica (I & J), rare to minor siderite-replaced grains (K) and igneous rock fragments. Organic fragments (L) and chlorite grains are rare to minor in abundance. Detrital clay matrix (M & N) is the predominant pore-filling constituent and locally concentrated into laminae; other pore-fillings minerals are rare to minor and include authigenic pyrite (O) and titanium oxides. No pores are visible in this sample; micropores are the principal pore type. Open microfractures (P & Q; some enhanced by sampling) associated with desiccated organic material are partly filled with gypsum.

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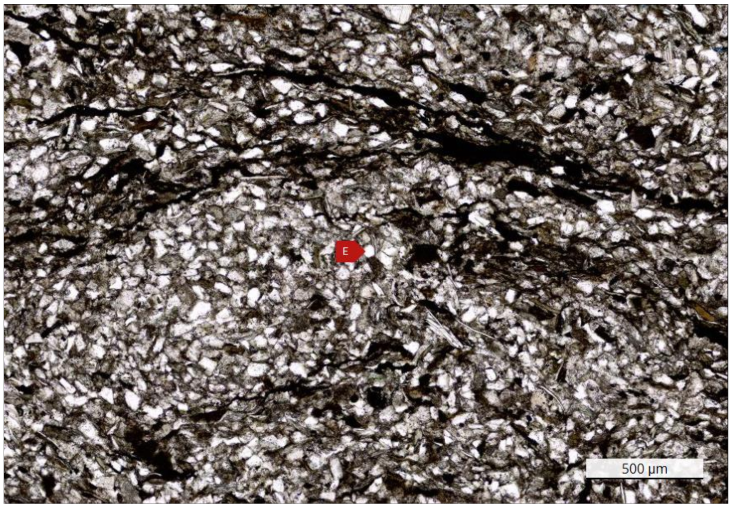
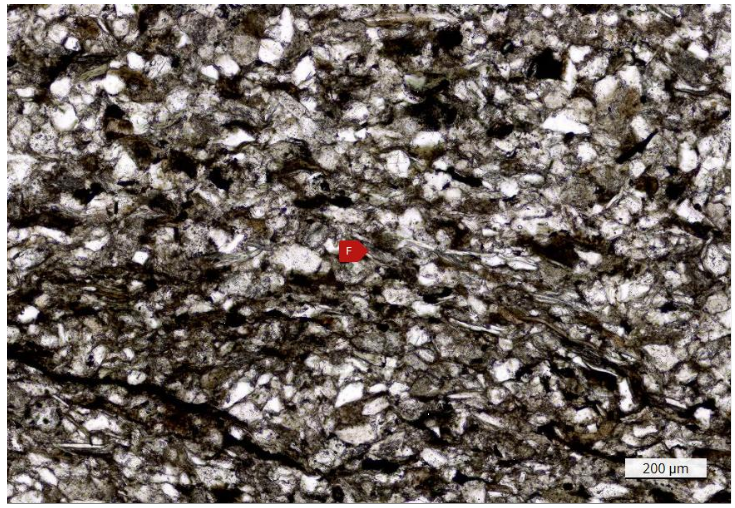
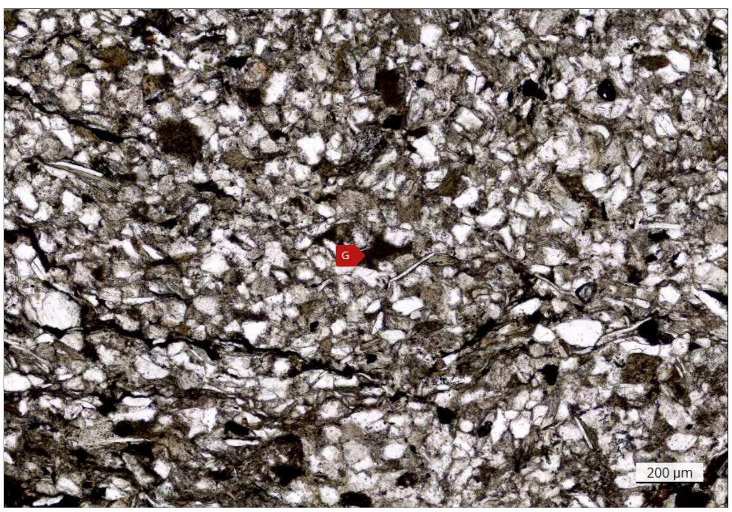
Depth: 172.30 - Sample ID: GS-AP-MW-7V



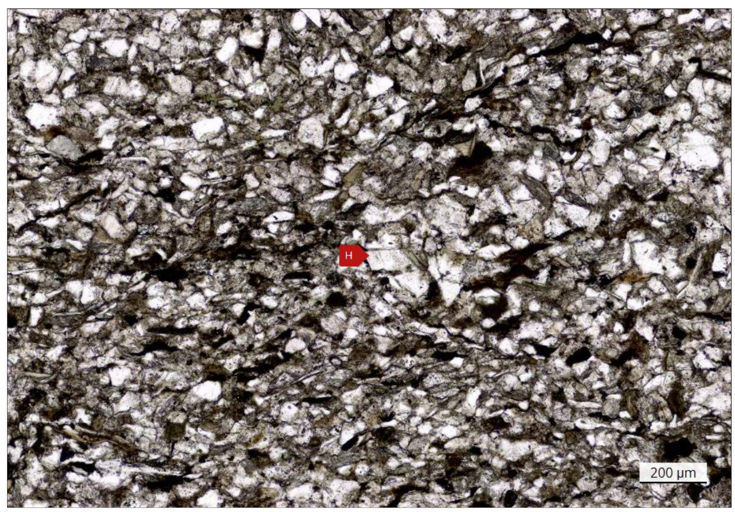
E - Silt-size detrital quartz grain



F - Metamorphic rock fragment



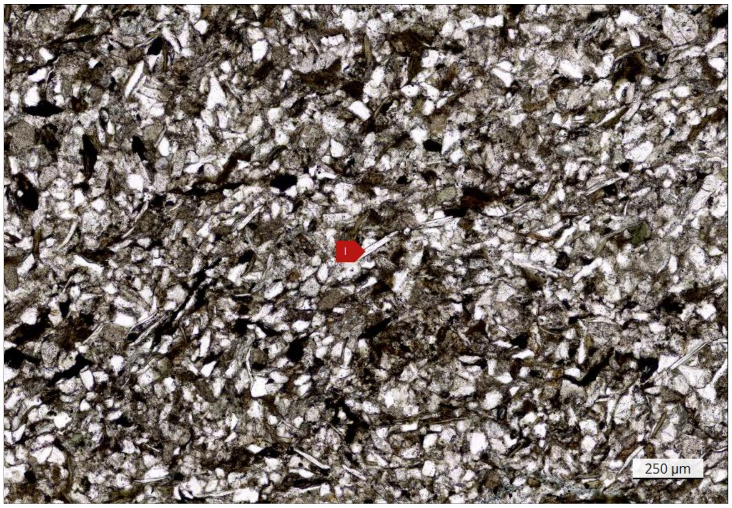
G - Argillaceous rock fragment; deformed due to compaction



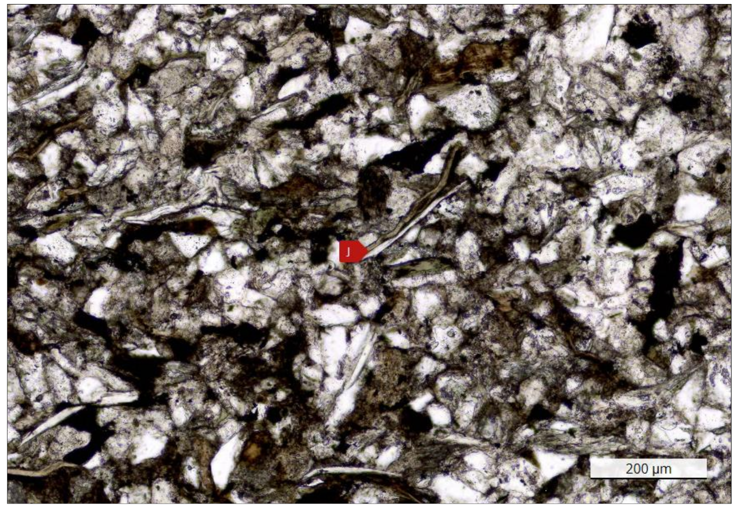
H - Detrital feldspar grain

Image Description: Faint laminae (A & B) and burrows (C & D) are widespread in this argillaceous siltstone (average grain size 0.055 mm), and many laminae are disrupted by burrows. Quartz (E), metamorphic fragments (F) and argillaceous rock fragments (G) are the principal detrital grains, followed by moderate feldspars (H), moderate mica (I & J), rare to minor siderite-replaced grains (K) and igneous rock fragments. Organic fragments (L) and chlorite grains are rare to minor in abundance. Detrital clay matrix (M & N) is the predominant pore-filling constituent and locally concentrated into laminae; other pore-fillings minerals are rare to minor and include authigenic pyrite (O) and titanium oxides. No pores are visible in this sample; micropores are the principal pore type. Open microfractures (P & Q; some enhanced by sampling) associated with desiccated organic material are partly filled with gypsum.

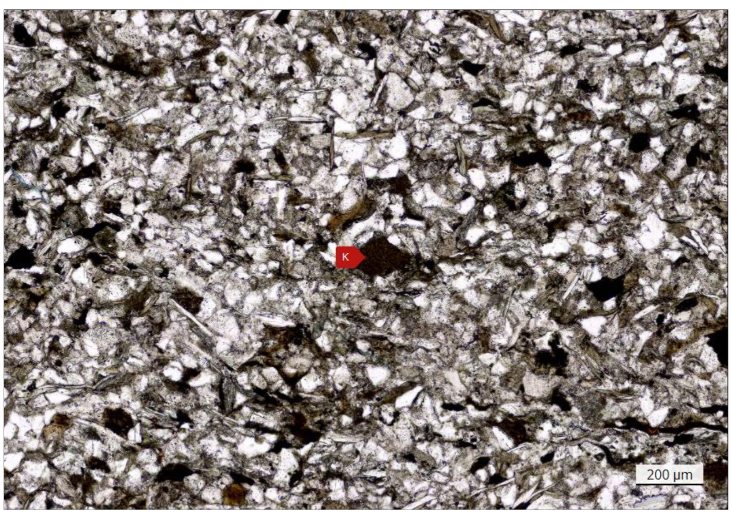
Depth: 172.30 - Sample ID: GS-AP-MW-7V



I - Muscovite mica grain



J - Biotite mica grain (greenish, above) and muscovite mica grain (whitish, below)

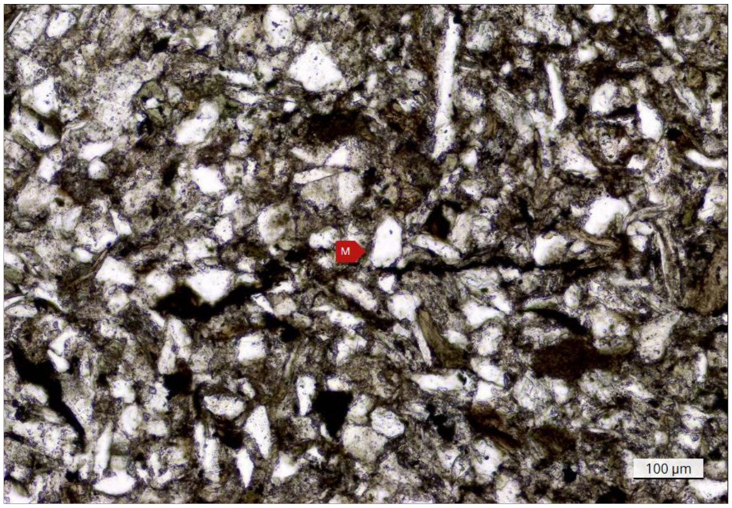


K - Siderite-replaced grain

L - Elongate organic fragment; partly replaced by authigenic pyrite

Image Description: Faint laminae (A & B) and burrows (C & D) are widespread in this argillaceous siltstone (average grain size 0.055 mm), and many laminae are disrupted by burrows. Quartz (E), metamorphic fragments (F) and argillaceous rock fragments (G) are the principal detrital grains, followed by moderate feldspars (H), moderate mica (I & J), rare to minor siderite-replaced grains (K) and igneous rock fragments. Organic fragments (L) and chlorite grains are rare to minor in abundance. Detrital clay matrix (M & N) is the predominant pore-filling constituent and locally concentrated into laminae; other pore-fillings minerals are rare to minor and include authigenic pyrite (O) and titanium oxides. No pores are visible in this sample; micropores are the principal pore type. Open microfractures (P & Q; some enhanced by sampling) associated with desiccated organic material are partly filled with gypsum.

Depth: 172.30 - Sample ID: GS-AP-MW-7V



M - Detrital clay matrix filling intergranular areas

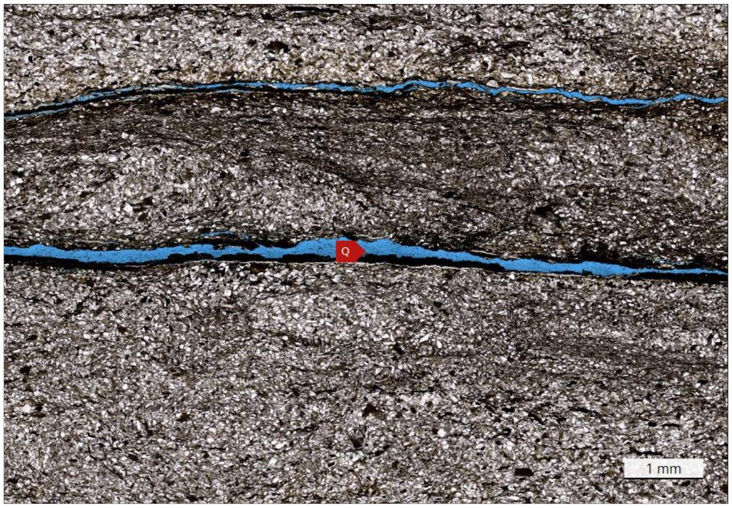
N - Detrital clay matrix; forming clay-rich laminae

O - Authigenic pyrite

P - Desiccation crack along organic material locally filled with gypsum (white)

Image Description: Faint laminae (A & B) and burrows (C & D) are widespread in this argillaceous siltstone (average grain size 0.055 mm), and many laminae are disrupted by burrows. Quartz (E), metamorphic fragments (F) and argillaceous rock fragments (G) are the principal detrital grains, followed by moderate feldspars (H), moderate mica (I & J), rare to minor siderite-replaced grains (K) and igneous rock fragments. Organic fragments (L) and chlorite grains are rare to minor in abundance. Detrital clay matrix (M & N) is the predominant pore-filling constituent and locally concentrated into laminae; other pore-fillings minerals are rare to minor and include authigenic pyrite (O) and titanium oxides. No pores are visible in this sample; micropores are the principal pore type. Open microfractures (P & Q; some enhanced by sampling) associated with desiccated organic material are partly filled with gypsum.

Depth: 172.30 - Sample ID: GS-AP-MW-7V



Q - Sampling-enhanced fracture along organic stringers, with some gypsum (white lines) along edges

Image Description: Faint laminae (A & B) and burrows (C & D) are widespread in this argillaceous siltstone (average grain size 0.055 mm), and many laminae are disrupted by burrows. Quartz (E), metamorphic fragments (F) and argillaceous rock fragments (G) are the principal detrital grains, followed by moderate feldspars (H), moderate mica (I & J), rare to minor siderite-replaced grains (K) and igneous rock fragments. Organic fragments (L) and chlorite grains are rare to minor in abundance. Detrital clay matrix (M & N) is the predominant pore-filling constituent and locally concentrated into laminae; other pore-fillings minerals are rare to minor and include authigenic pyrite (O) and titanium oxides. No pores are visible in this sample; micropores are the principal pore type. Open microfractures (P & Q; some enhanced by sampling) associated with desiccated organic material are partly filled with gypsum.

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Thin Section Analysis

Sample Depth (ft): **187.00**
Sample ID: GS-AP-MW-7V

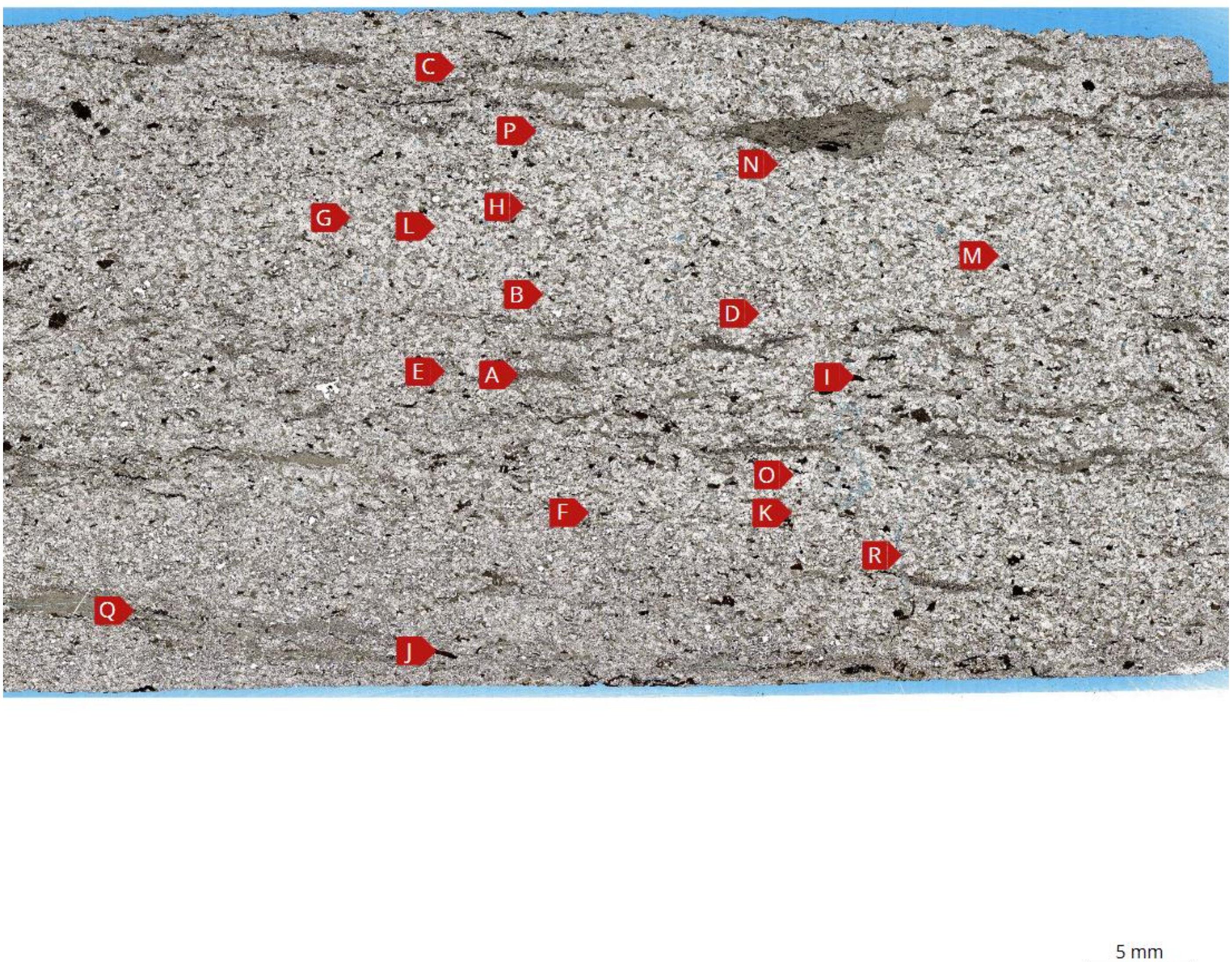

Image Note: Plane Light, Depth = Measured sample depth

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Alabama, USA

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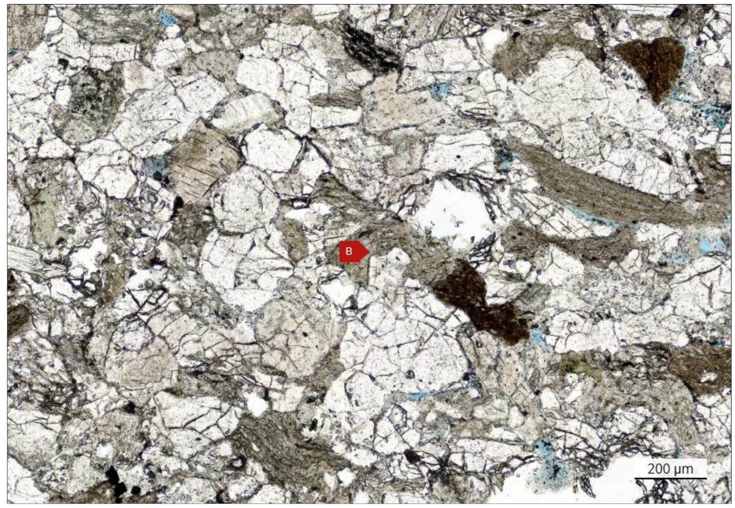
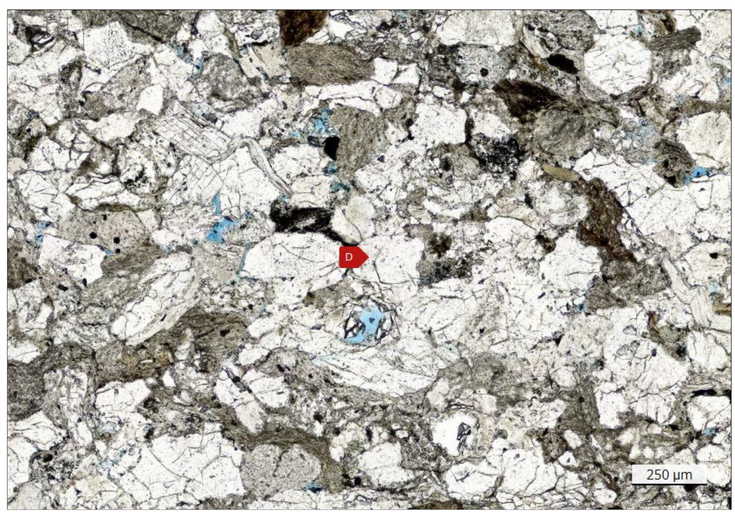
Depth: 187.00 - Sample ID: GS-AP-MW-7V

A - Granule-size rip-up clast; slightly deformed due to compaction



B - Rock fragment showing concave-convex grain contacts with adjacent quartz grain (white)

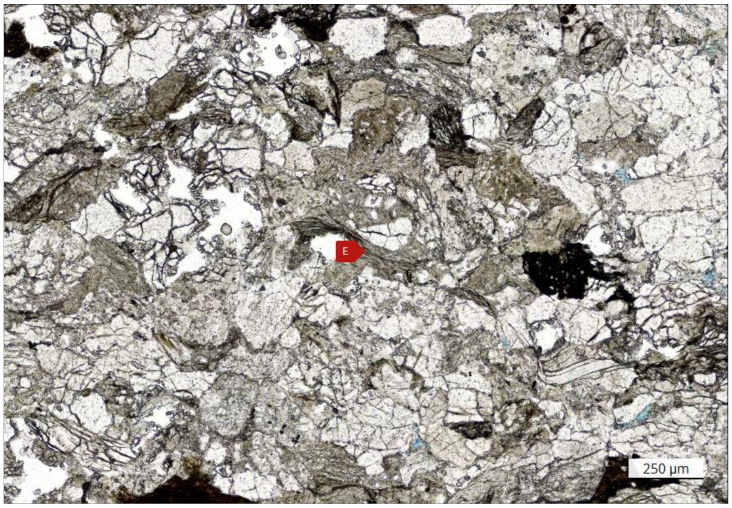
C - Stylolite highlighted by the concentration of clay, organic matter and other insolubles



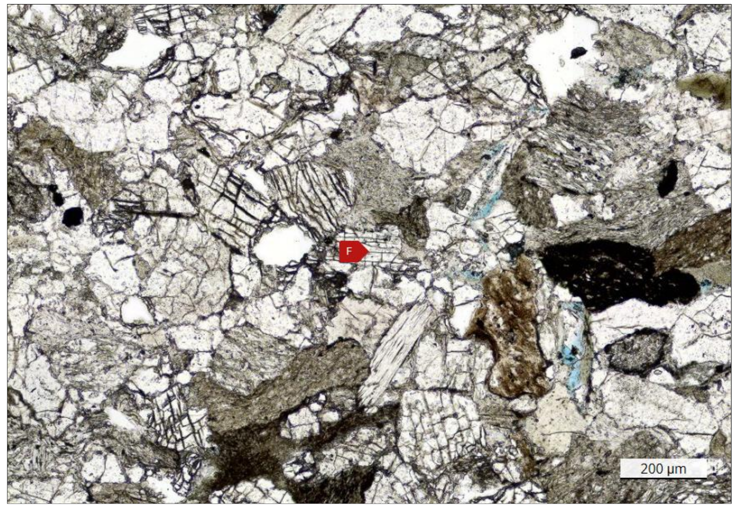
D - Detrital quartz grain

Image Description: This sandstone is upper fine-grained (average 0.235 mm) and well sorted. However, rip-up clasts (A) are mostly granule- to pebble-sized. Framework grains are tightly compacted, as indicated by the dominance of planar and concave-convex (B) grain contacts as well as the local occurrence of stylolites (C). Quartz (D) and metamorphic rock fragments (E) are the most abundant framework grains, followed by moderate feldspars (F) and igneous fragments (G), and minor argillaceous fragments (H) and siderite-replaced grains (I). Organic fragments (J), mica (K), chert, heavy minerals, and chlorite grains (L) are rare to minor in abundance. Pore-filling constituents are minor to moderate and consist of authigenic illitic and chloritic clays (M), authigenic pyrite (N), quartz overgrowths, and titanium oxides. Visible pores are rare to minor and consist of intergranular (O), secondary intragranular (P) and moldic pores in this sample. Open fractures (Q & R) are probably induced artificially.

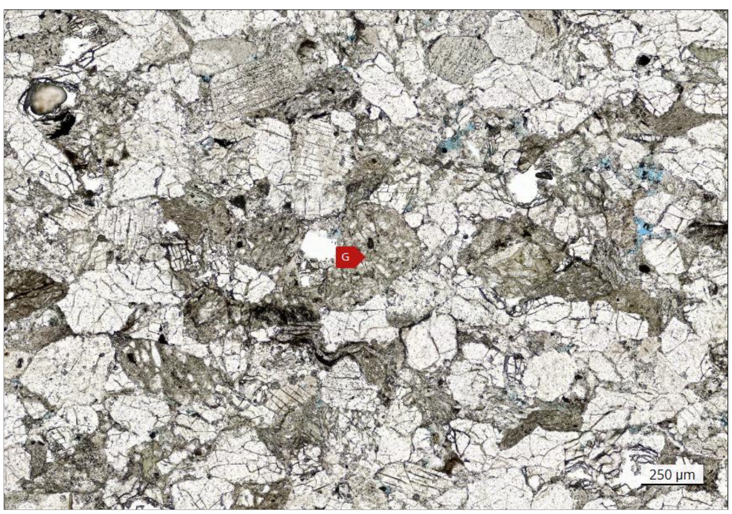
Depth: 187.00 - Sample ID: GS-AP-MW-7V



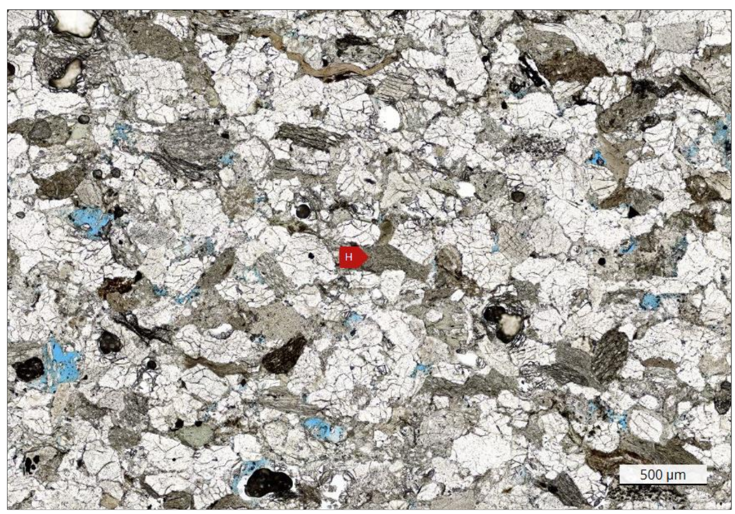
E - Metamorphic rock fragment; deformed due to grain compaction



F - Detrital feldspar grain; showing cleavages



G - Altered igneous rock fragment



H - Argillaceous rock fragment; deformed by compaction

Image Description: This sandstone is upper fine-grained (average 0.235 mm) and well sorted. However, rip-up clasts (A) are mostly granule- to pebble-sized. Framework grains are tightly compacted, as indicated by the dominance of planar and concave-convex (B) grain contacts as well as the local occurrence of stylolites (C). Quartz (D) and metamorphic rock fragments (E) are the most abundant framework grains, followed by moderate feldspars (F) and igneous fragments (G), and minor argillaceous fragments (H) and siderite-replaced grains (I). Organic fragments (J), mica (K), chert, heavy minerals, and chlorite grains (L) are rare to minor in abundance. Pore-filling constituents are minor to moderate and consist of authigenic illitic and chloritic clays (M), authigenic pyrite (N), quartz overgrowths, and titanium oxides. Visible pores are rare to minor and consist of intergranular (O), secondary intragranular (P) and moldic pores in this sample. Open fractures (Q & R) are probably induced artificially.

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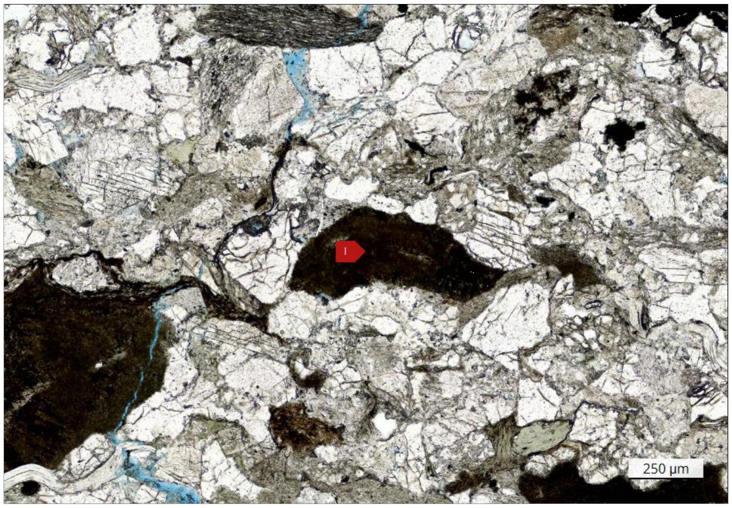
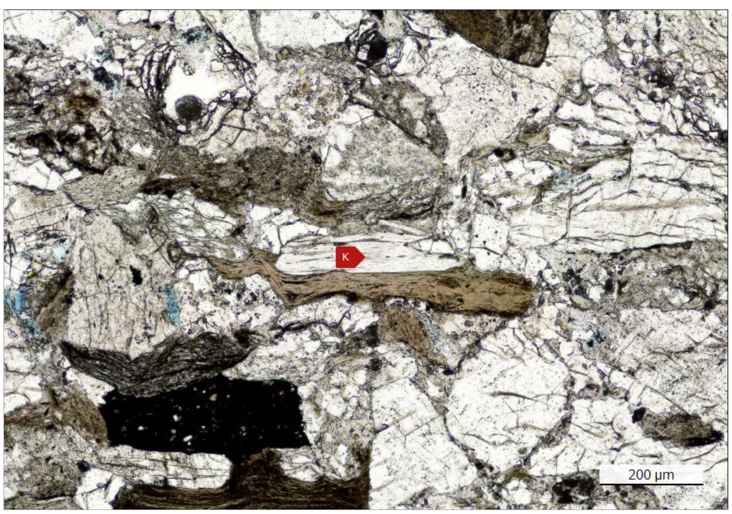
Depth: 187.00 - Sample ID: GS-AP-MW-7V

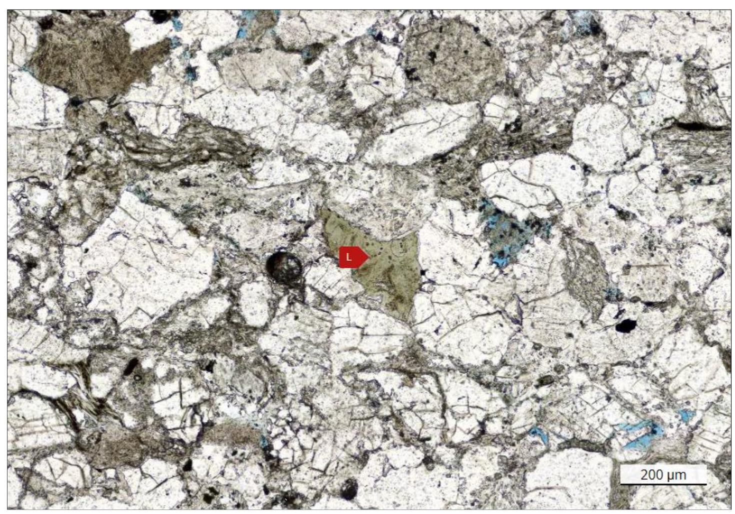


I - Siderite-replaced grain

J - Organic fragment



K - Muscovite (white) and biotite (below, brownish) mica grains



L - Chlorite grain; partly deformed due to compaction

Image Description: This sandstone is upper fine-grained (average 0.235 mm) and well sorted. However, rip-up clasts (A) are mostly granule- to pebble-sized. Framework grains are tightly compacted, as indicated by the dominance of planar and concave-convex (B) grain contacts as well as the local occurrence of stylolites (C). Quartz (D) and metamorphic rock fragments (E) are the most abundant framework grains, followed by moderate feldspars (F) and igneous fragments (G), and minor argillaceous fragments (H) and siderite-replaced grains (I). Organic fragments (J), mica (K), chert, heavy minerals, and chlorite grains (L) are rare to minor in abundance. Pore-filling constituents are minor to moderate and consist of authigenic illitic and chloritic clays (M), authigenic pyrite (N), quartz overgrowths, and titanium oxides. Visible pores are rare to minor and consist of intergranular (O), secondary intragranular (P) and moldic pores in this sample. Open fractures (Q & R) are probably induced artificially.

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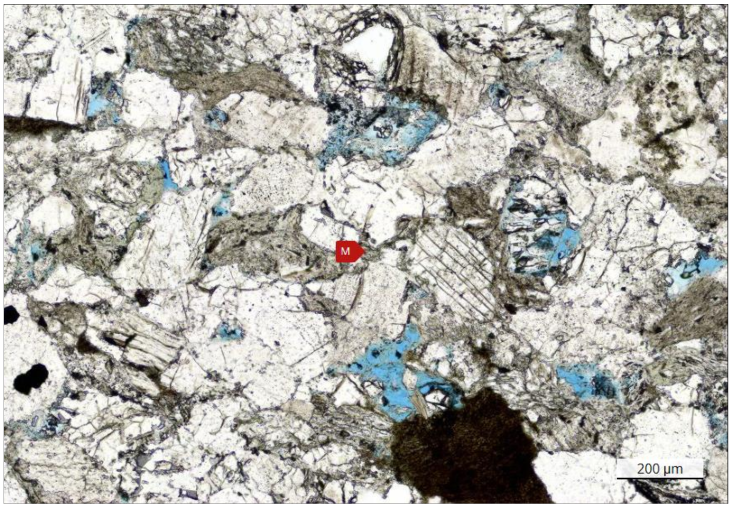
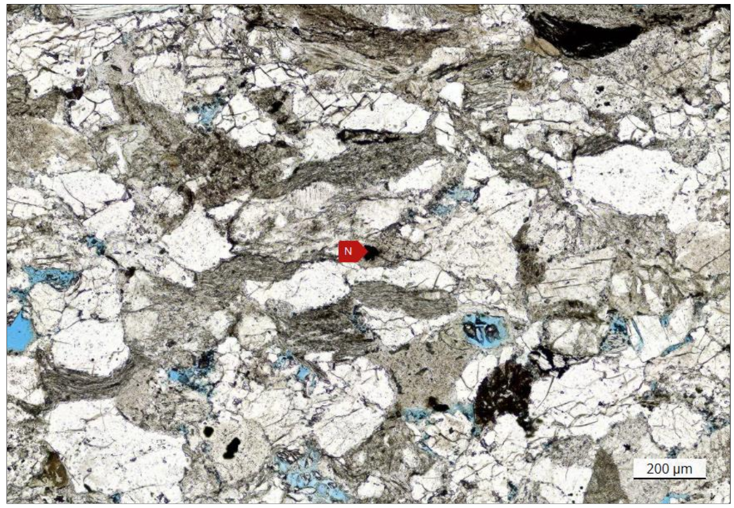
Proprietary - Anchor QEA

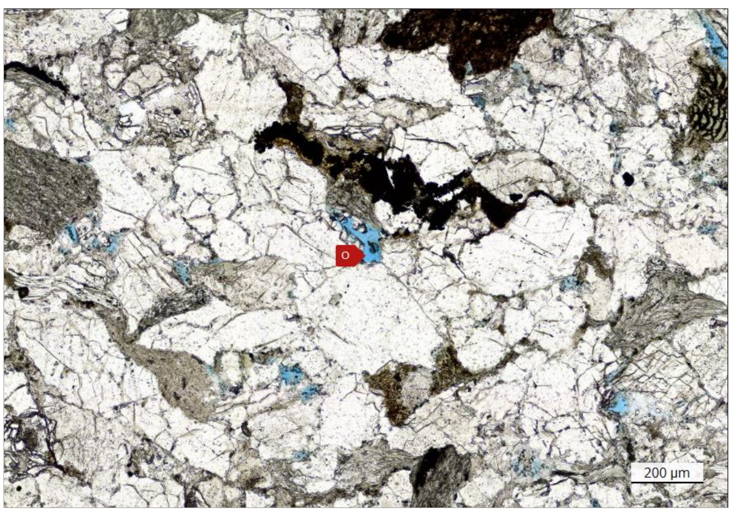
Depth: 187.00 - Sample ID: GS-AP-MW-7V



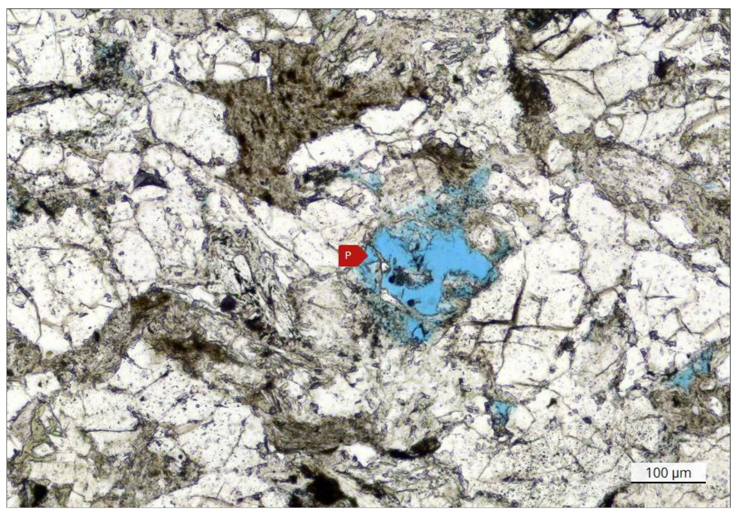
M - Authigenic illitic and chloritic clays; filling intergranular areas



N - Authigenic pyrite



O - Intergranular pore



P - Secondary intragranular pore

Image Description: This sandstone is upper fine-grained (average 0.235 mm) and well sorted. However, rip-up clasts (A) are mostly granule- to pebble-sized. Framework grains are tightly compacted, as indicated by the dominance of planar and concave-convex (B) grain contacts as well as the local occurrence of stylolites (C). Quartz (D) and metamorphic rock fragments (E) are the most abundant framework grains, followed by moderate feldspars (F) and igneous fragments (G), and minor argillaceous fragments (H) and siderite-replaced grains (I). Organic fragments (J), mica (K), chert, heavy minerals, and chlorite grains (L) are rare to minor in abundance. Pore-filling constituents are minor to moderate and consist of authigenic illitic and chloritic clays (M), authigenic pyrite (N), quartz overgrowths, and titanium oxides. Visible pores are rare to minor and consist of intergranular (O), secondary intragranular (P) and moldic pores in this sample. Open fractures (Q & R) are probably induced artificially.

Depth: 187.00 - Sample ID: GS-AP-MW-7V

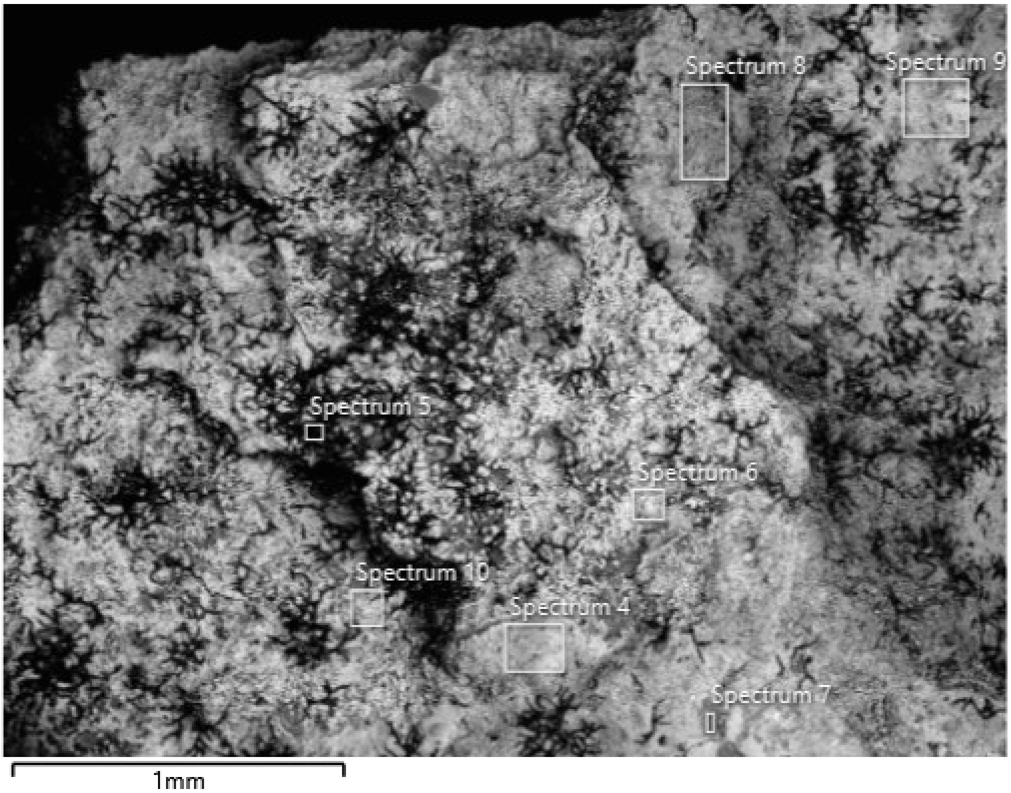
Q - Induced fracture

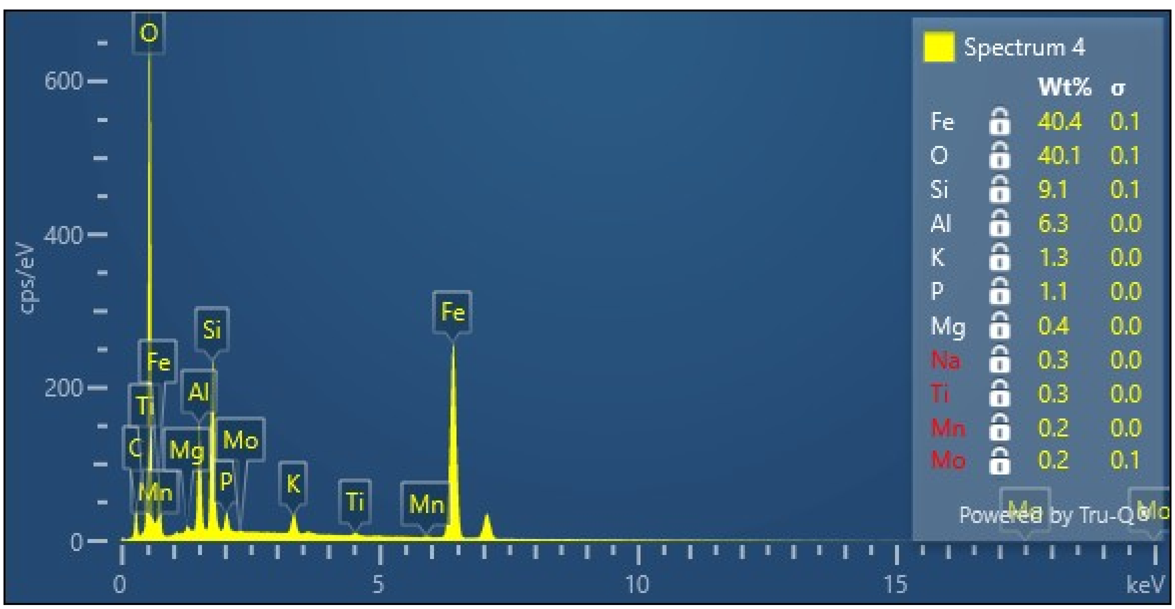
R - Induced fracture

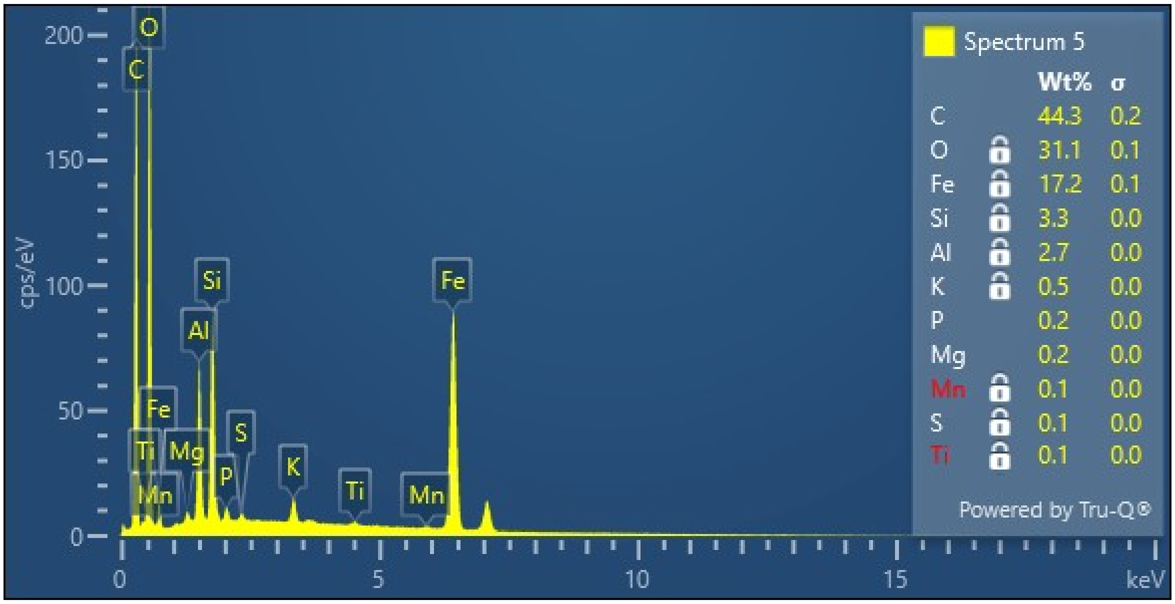
Image Description: This sandstone is upper fine-grained (average 0.235 mm) and well sorted. However, rip-up clasts (A) are mostly granule- to pebble-sized. Framework grains are tightly compacted, as indicated by the dominance of planar and concave-convex (B) grain contacts as well as the local occurrence of stylolites (C). Quartz (D) and metamorphic rock fragments (E) are the most abundant framework grains, followed by moderate feldspars (F) and igneous fragments (G), and minor argillaceous fragments (H) and siderite-replaced grains (I). Organic fragments (J), mica (K), chert, heavy minerals, and chlorite grains (L) are rare to minor in abundance. Pore-filling constituents are minor to moderate and consist of authigenic illitic and chloritic clays (M), authigenic pyrite (N), quartz overgrowths, and titanium oxides. Visible pores are rare to minor and consist of intergranular (O), secondary intragranular (P) and moldic pores in this sample. Open fractures (Q & R) are probably induced artificially.

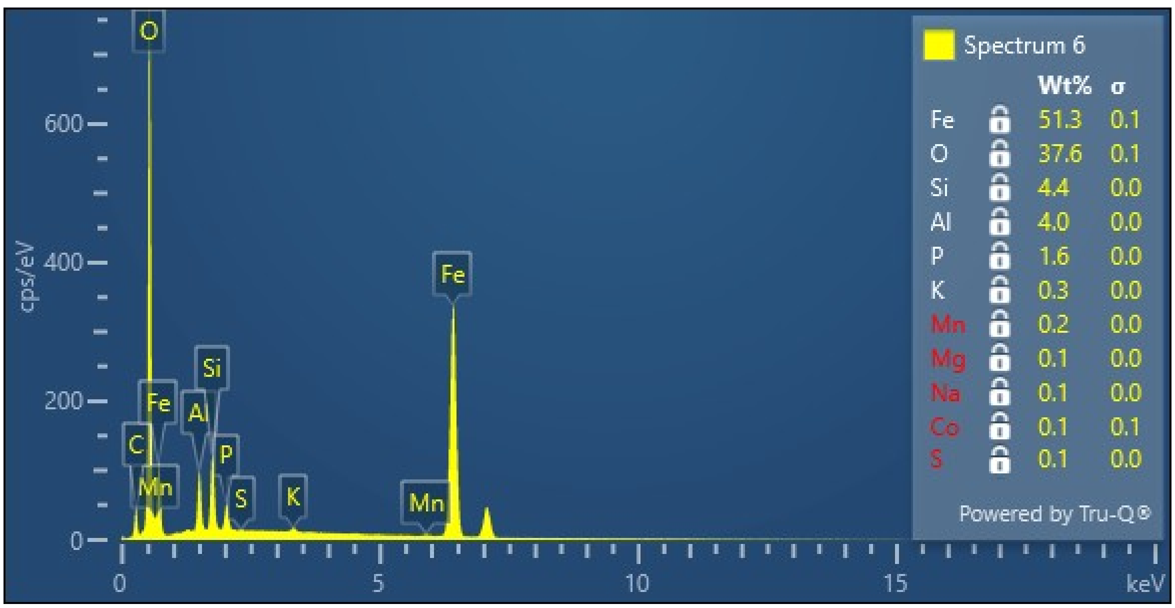
Site 1

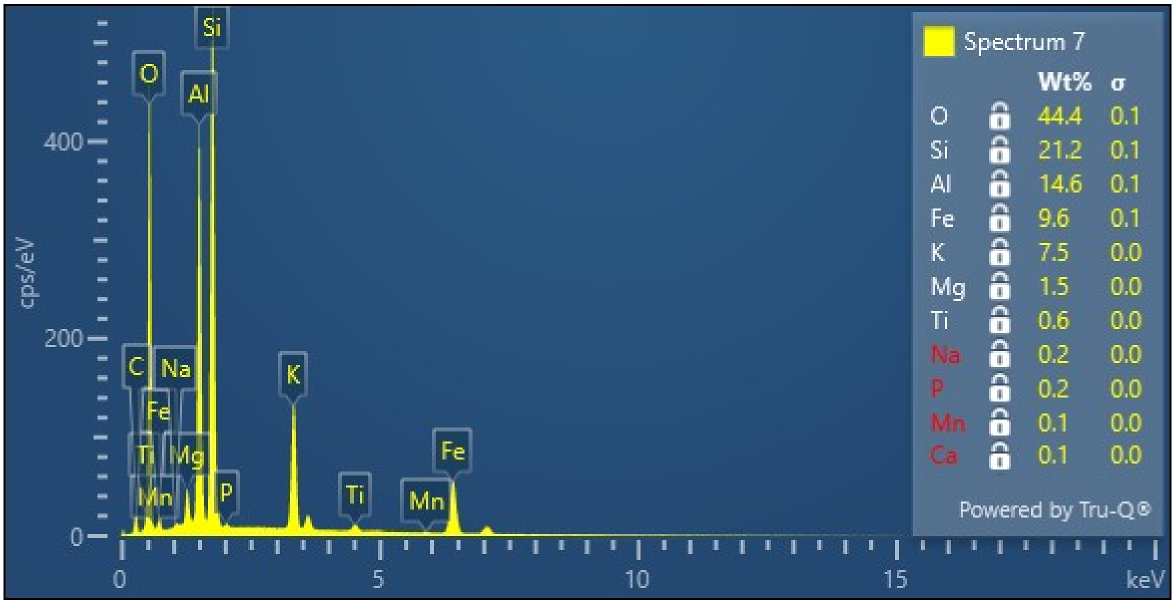
GC-1 Site1 overview 100x

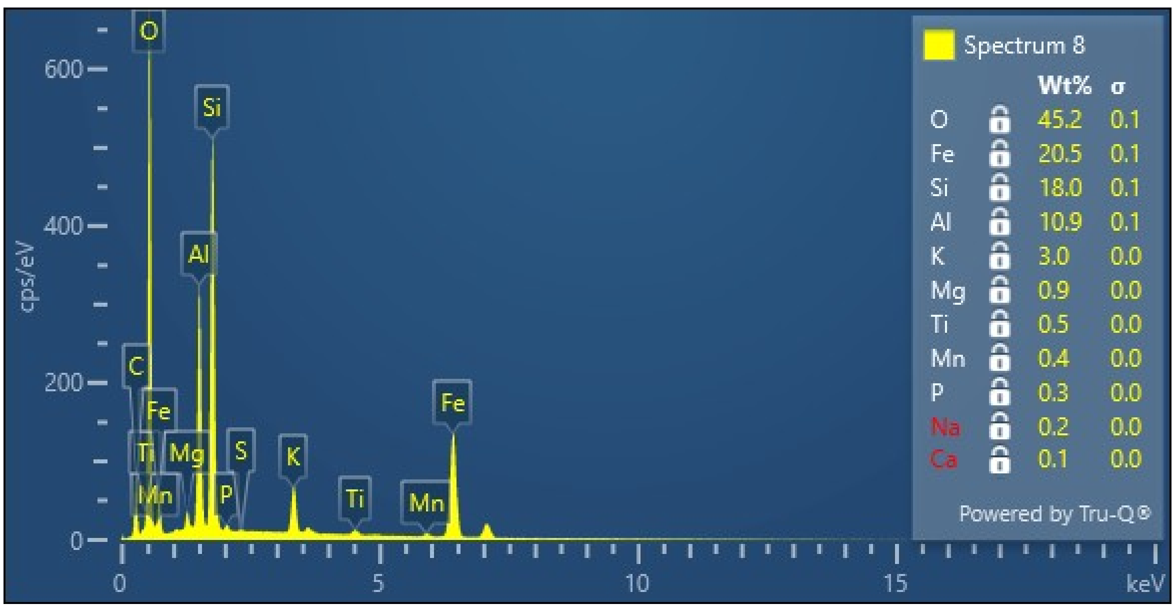


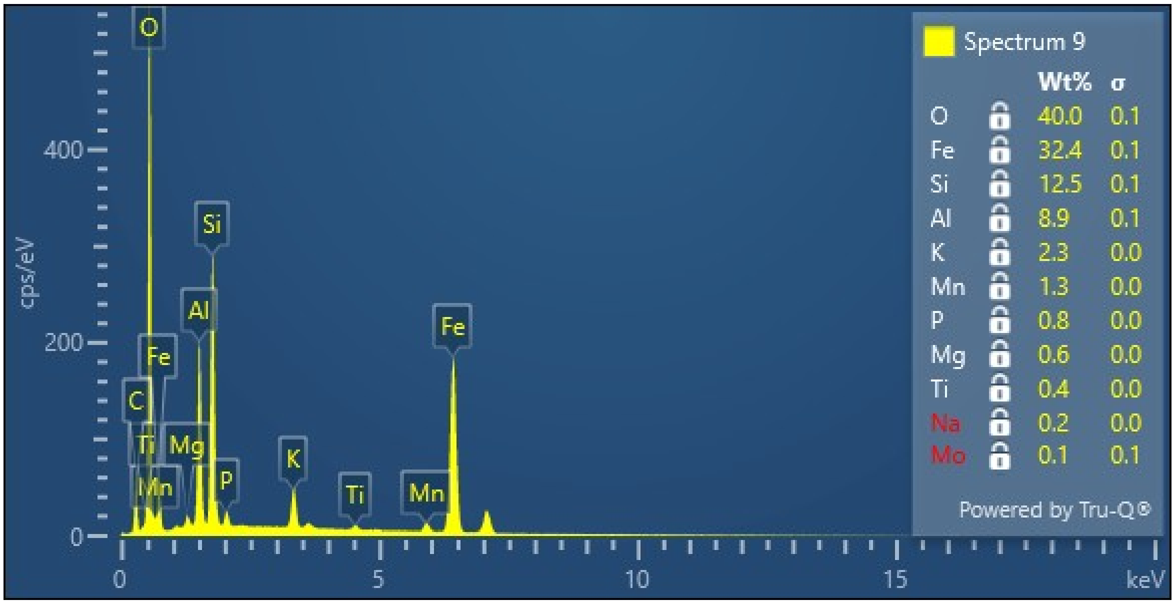


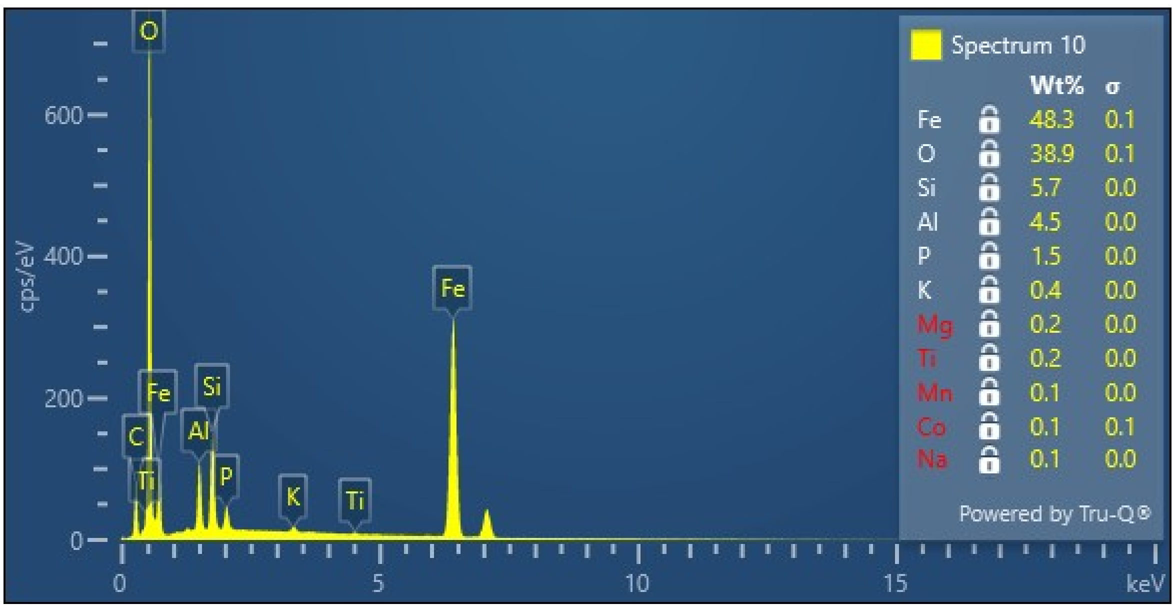

Spectrum 5
Wt% σ
C 44.3 0.2
O 31.1 0.1
Fe 17.2 0.1
Si 3.3 0.0
Al 2.7 0.0
K 0.5 0.0
P 0.2 0.0
Mg 0.2 0.0
Mn 0.1 0.0
S 0.1 0.0
Ti 0.1 0.0
Powered by Tru-Q®
cps/eV
0 50 100 150 200
0 5 10 15 keV
O C Si Al Fe Fe Ti Mg S P K Ti Mn Mn


Spectrum 6
Wt% σ
Fe 51.3 0.1
O 37.6 0.1
Si 4.4 0.0
Al 4.0 0.0
P 1.6 0.0
K 0.3 0.0
Mn 0.2 0.0
Mg 0.1 0.0
Na 0.1 0.0
Co 0.1 0.1
S 0.1 0.0
Powered by Tru-Q®
cps/eV
0 200 400 600
0 5 10 15 keV
O Fe Si Fe Al C P Mn S K Mn


Spectrum 7
Wt% σ
O 44.4 0.1
Si 21.2 0.1
Al 14.6 0.1
Fe 9.6 0.1
K 7.5 0.0
Mg 1.5 0.0
Ti 0.6 0.0
Na 0.2 0.0
P 0.2 0.0
Mn 0.1 0.0
Ca 0.1 0.0
Powered by Tru-Q®
cps/eV
keV
Si
O
Al
C
Na
Fe
Ti
Mg
Mn
P
K
Ti
Mn
Fe

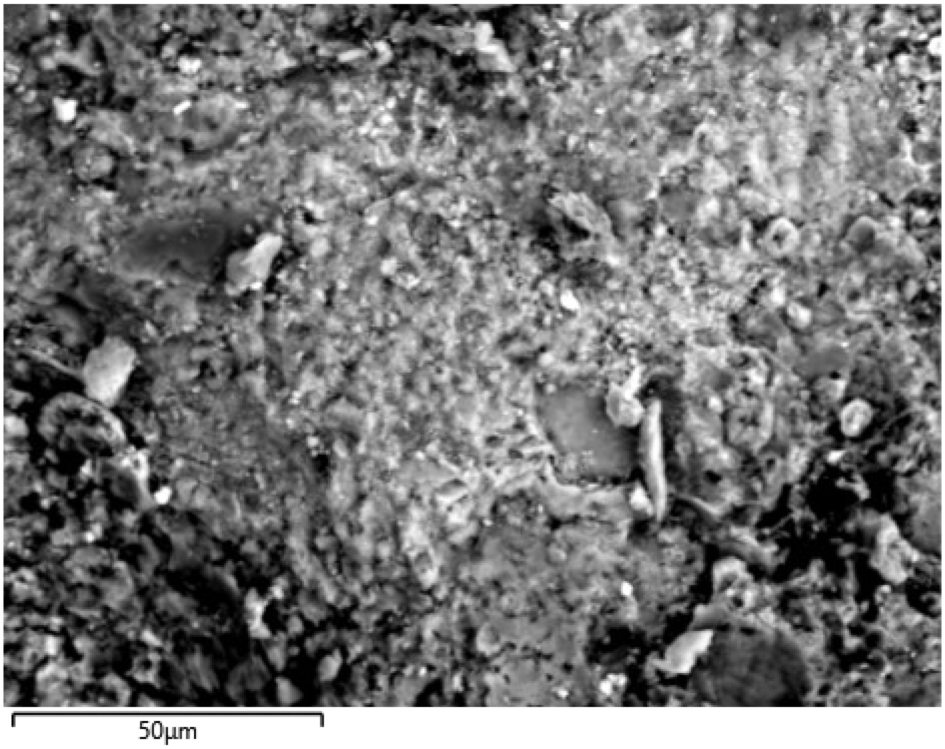

Spectrum 8
Wt% σ
O 45.2 0.1
Fe 20.5 0.1
Si 18.0 0.1
Al 10.9 0.1
K 3.0 0.0
Mg 0.9 0.0
Ti 0.5 0.0
Mn 0.4 0.0
P 0.3 0.0
Na 0.2 0.0
Ca 0.1 0.0
Powered by Tru-Q®
cps/eV
keV
O
Si
Al
C
Fe
Ti
Mg
S
K
Mn
P
Ti
Mn
Fe


Spectrum 9
Wt% σ
O 40.0 0.1
Fe 32.4 0.1
Si 12.5 0.1
Al 8.9 0.1
K 2.3 0.0
Mn 1.3 0.0
P 0.8 0.0
Mg 0.6 0.0
Ti 0.4 0.0
Na 0.2 0.0
Mo 0.1 0.1
Powered by Tru-Q®
cps/eV
400
200
0
5
10
15
keV
O
Si
Al
Fe
C
Ti
Mg
Mn
P
K

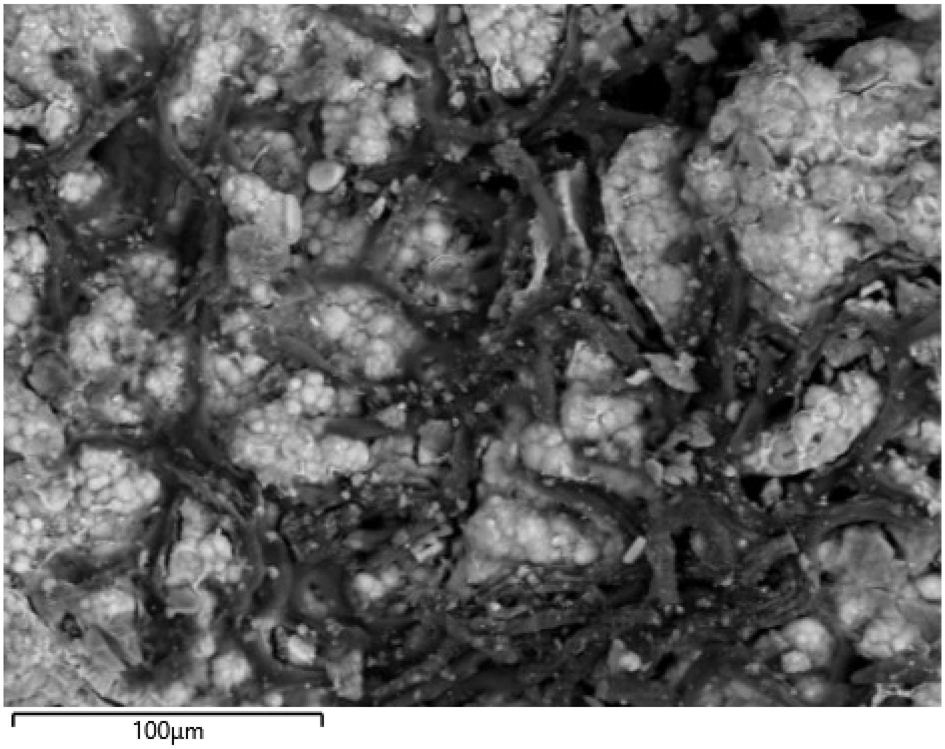

Spectrum 10
Wt% σ
Fe 48.3 0.1
O 38.9 0.1
Si 5.7 0.0
Al 4.5 0.0
P 1.5 0.0
K 0.4 0.0
Mg 0.2 0.0
Ti 0.2 0.0
Mn 0.1 0.0
Co 0.1 0.1
Na 0.1 0.0
Powered by Tru-Q®
cps/eV
600
400
200
0
5
10
15
keV
O
Fe
Si
Al
C
Ti
P
K

Detail images

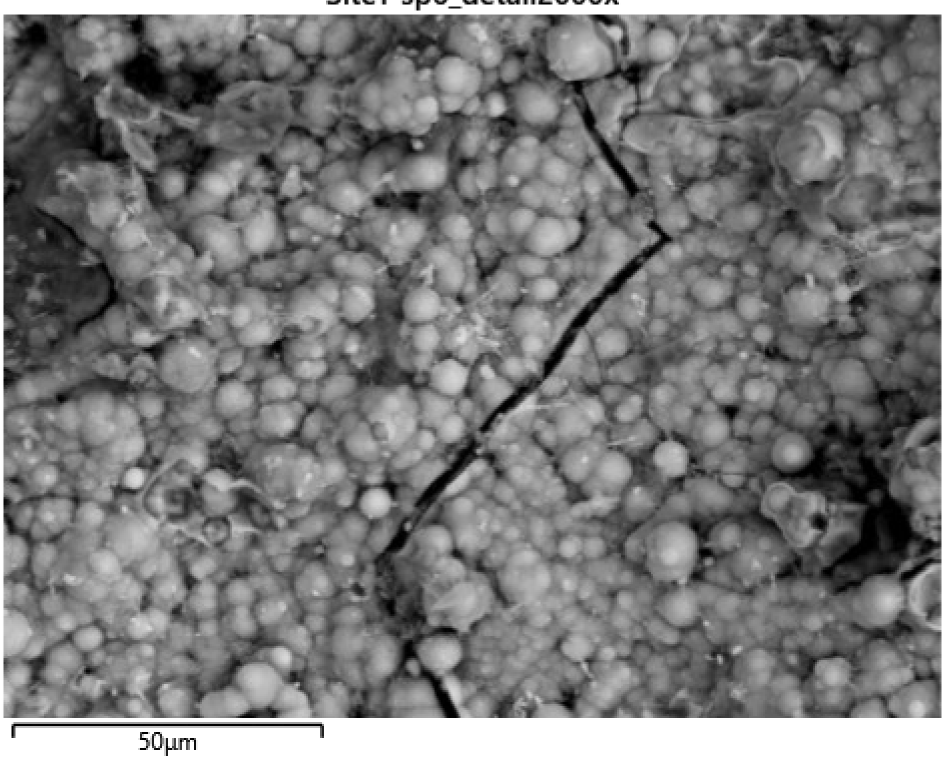
Site1-sp4_detail2000x



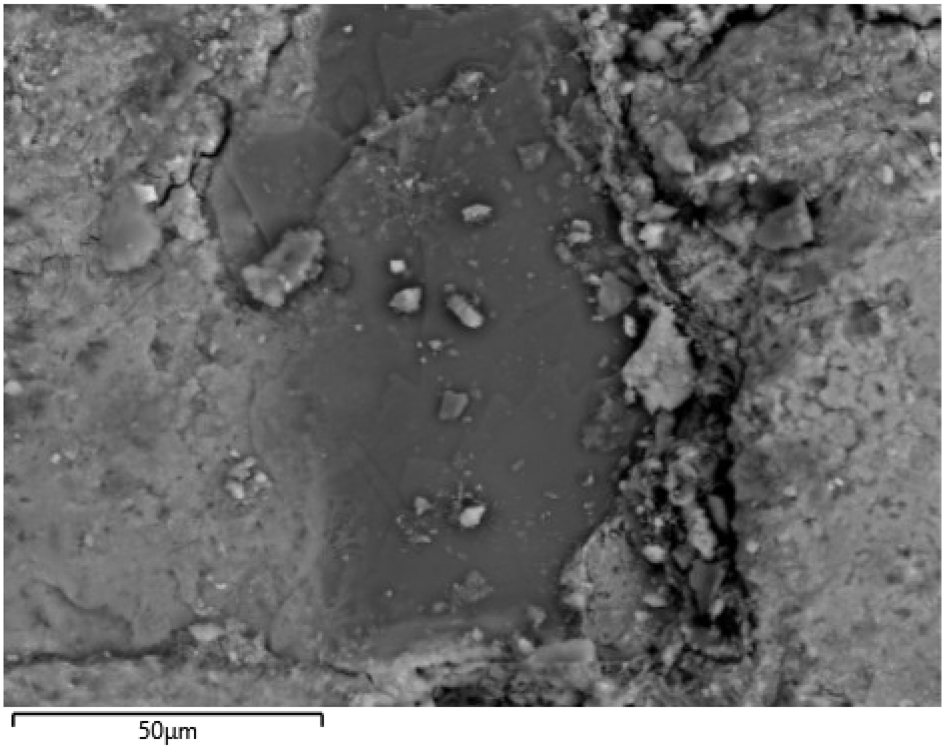
Site1-sp5_detail1000x



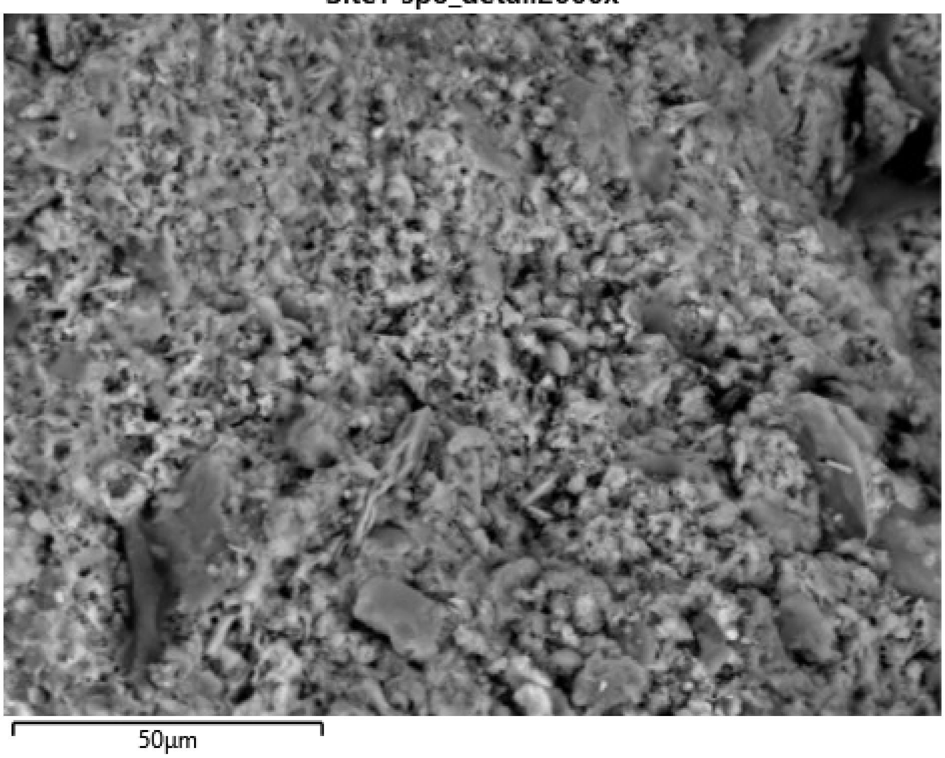
Site1-sp6_detail2000x



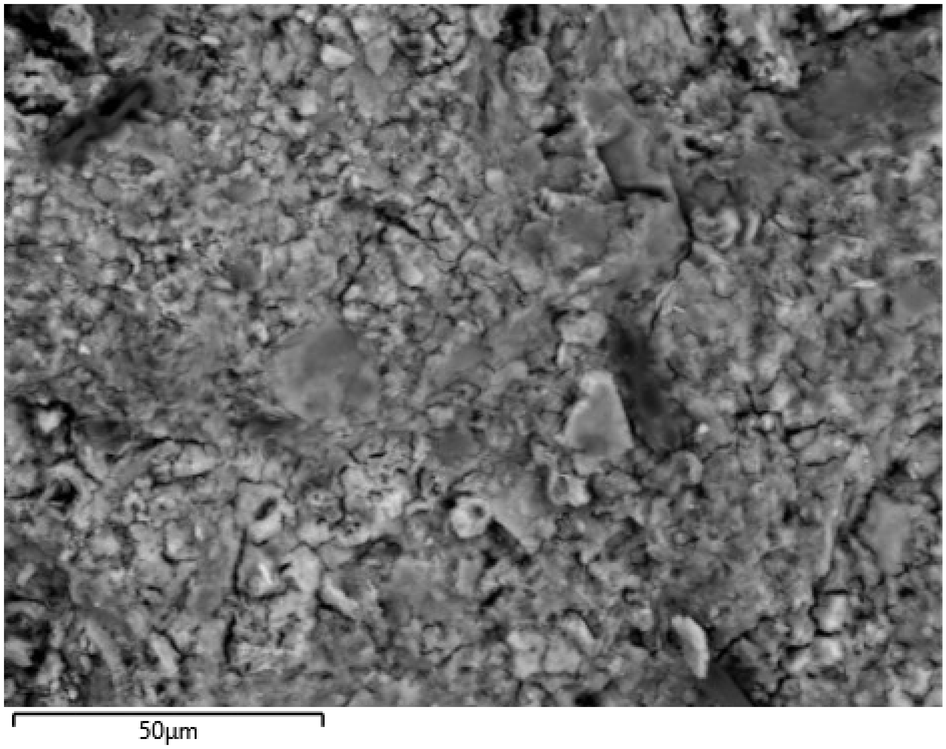
Site1-sp7_detail2000x



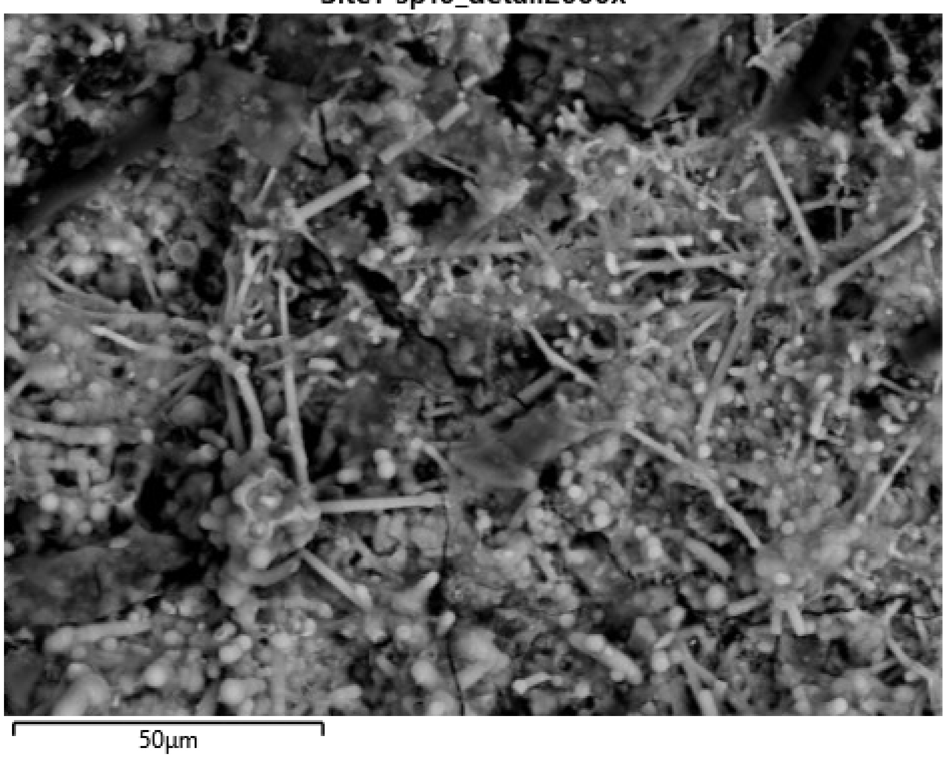
Site1-sp8_detail2000x



Site1-sp9_detail2000x

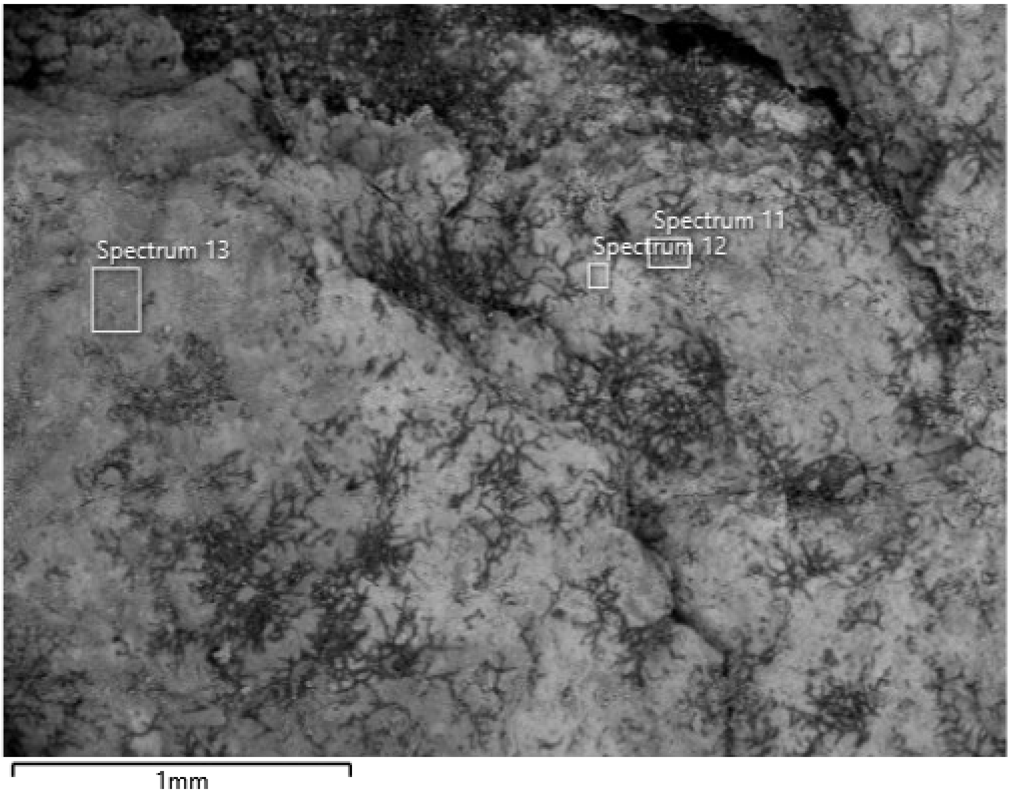


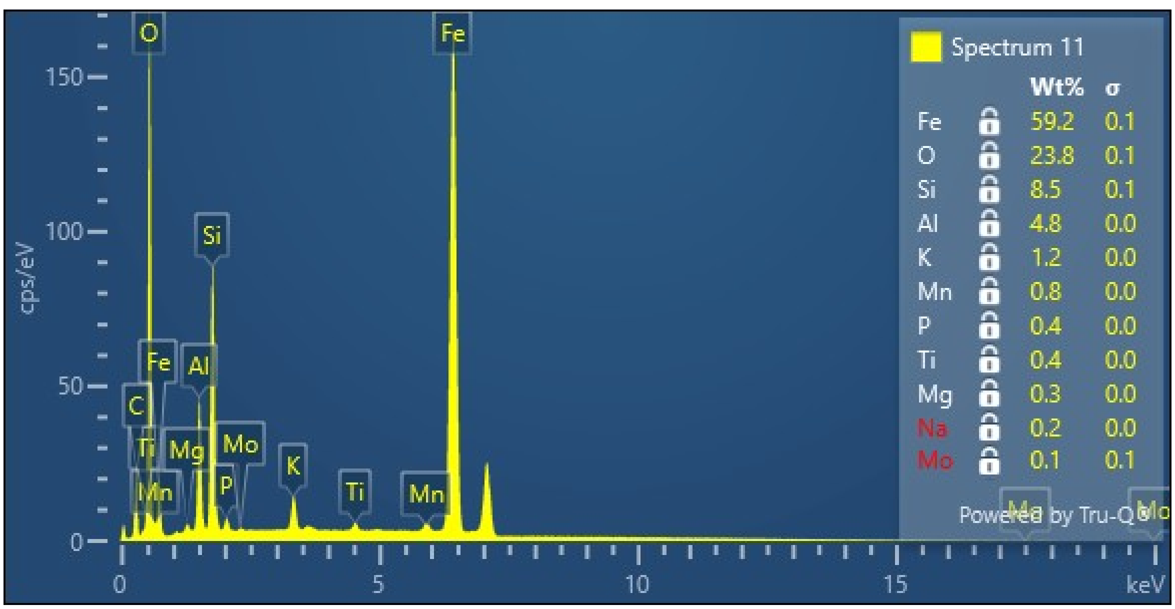
Site1-sp10_detail2000x

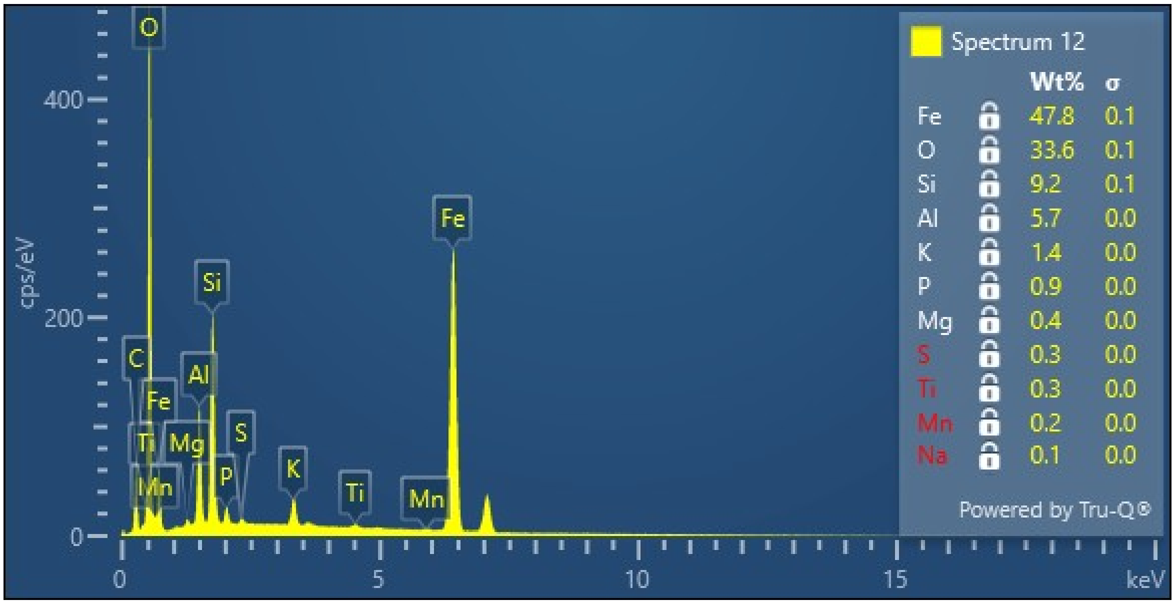


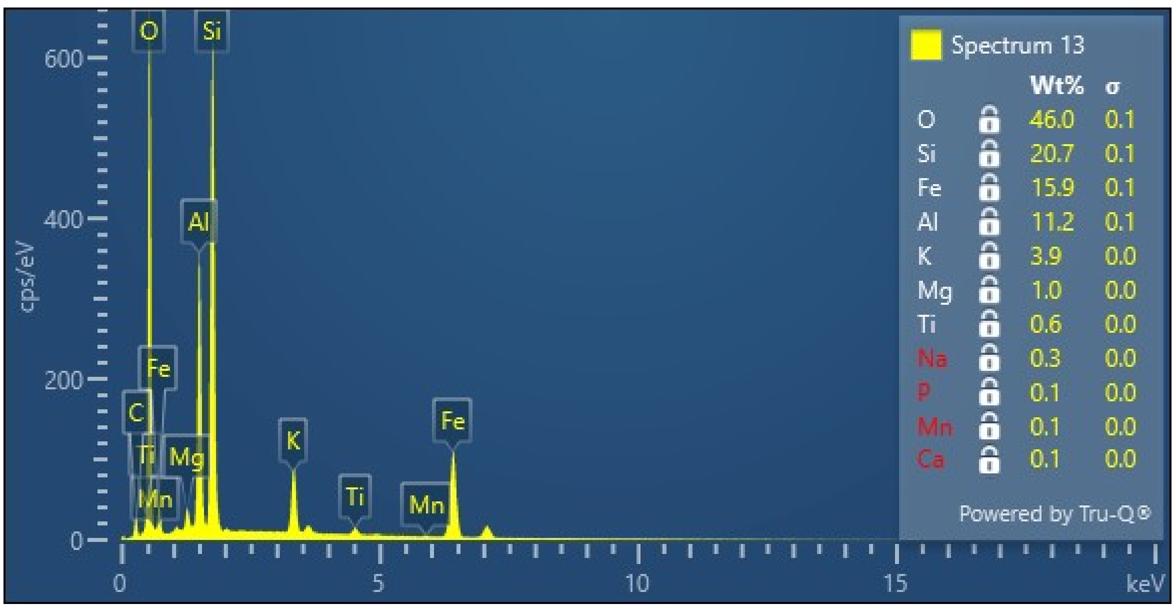
Site 2

GC-1 Site2 overview 100x









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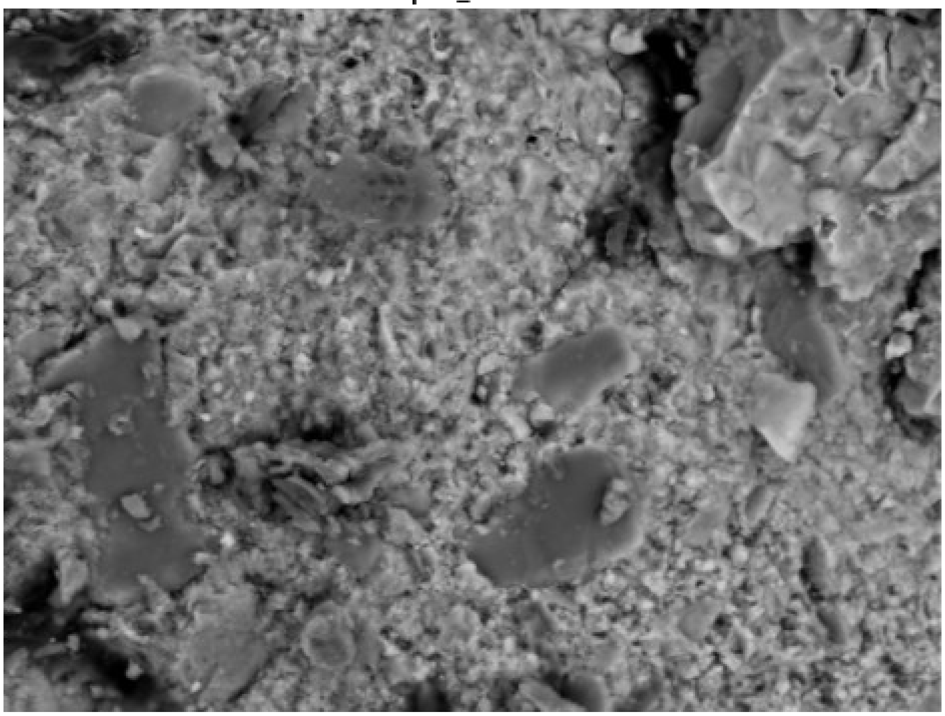
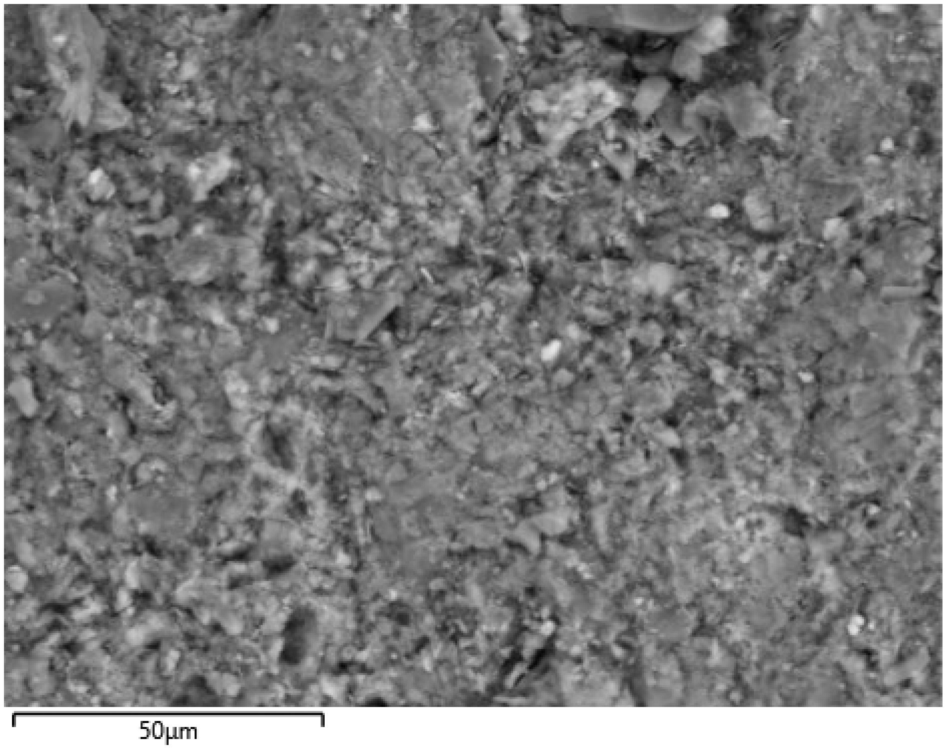
Site 2 detail images

Site2-sp12_detail2000x



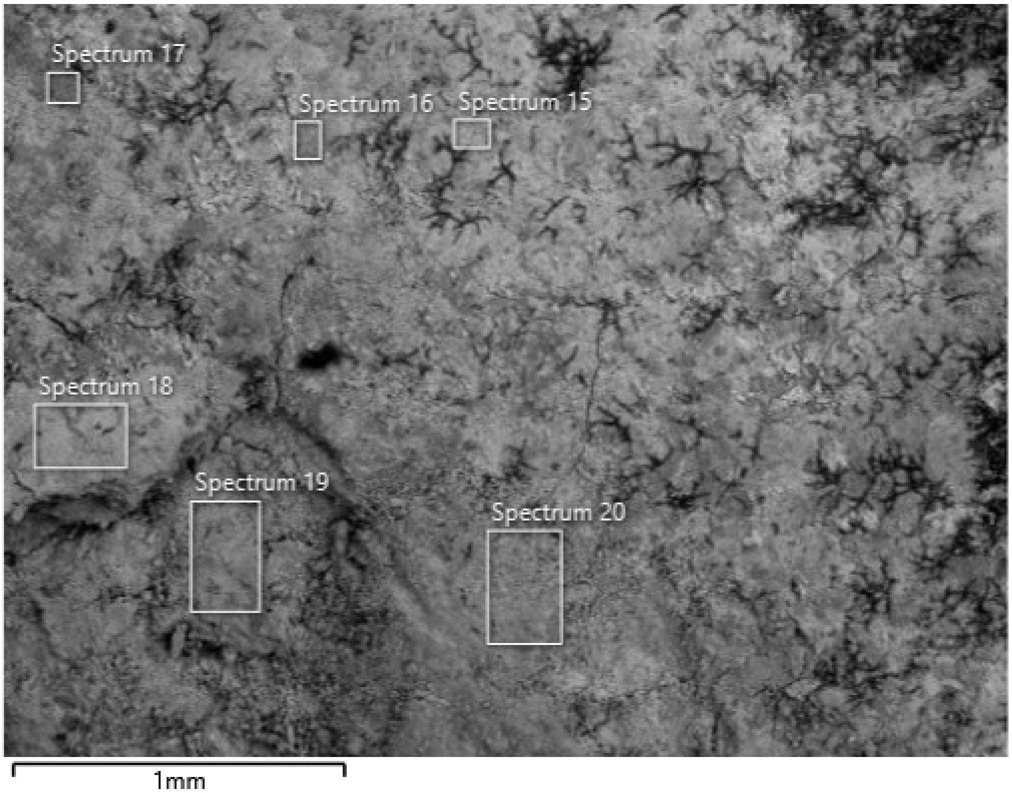
50µm

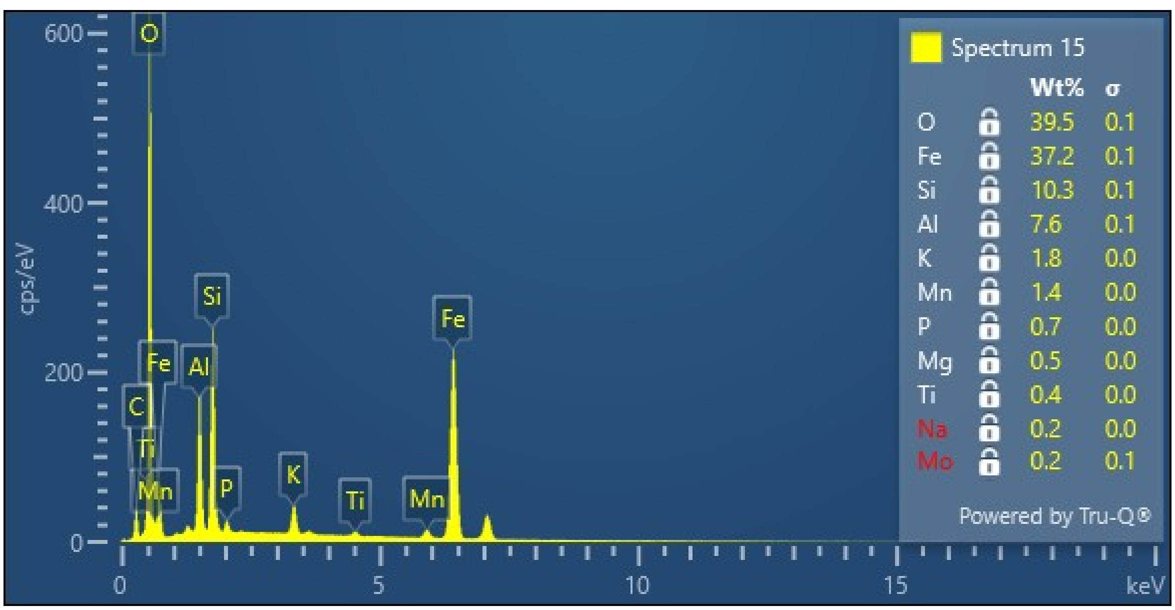
Site2-sp13_detail2000x



Site 3

GC-1 Site3 overview 100x





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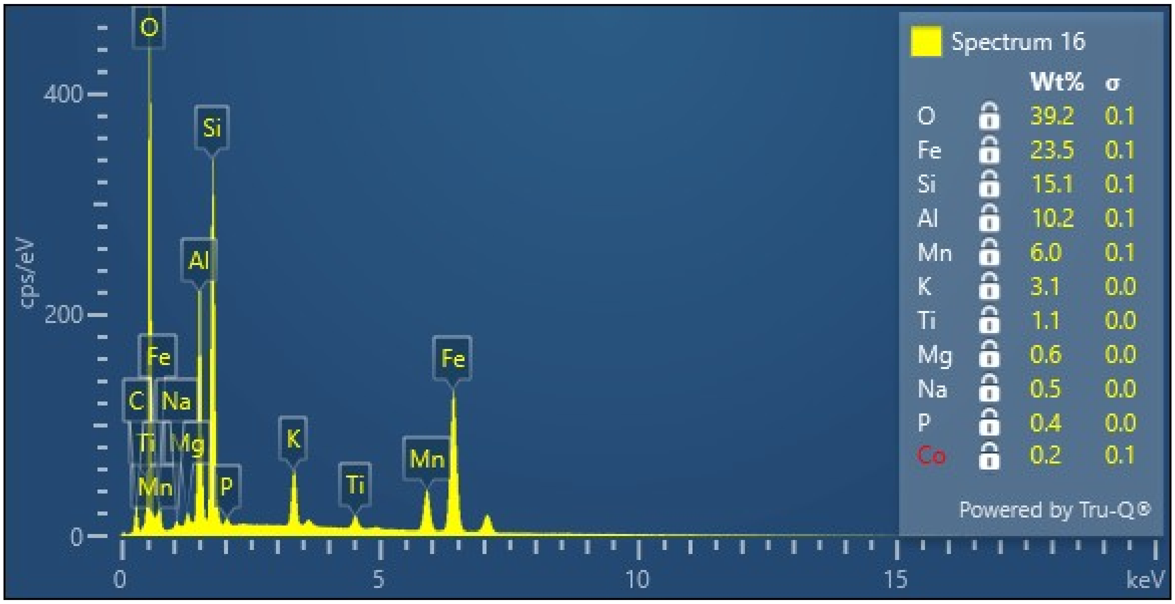

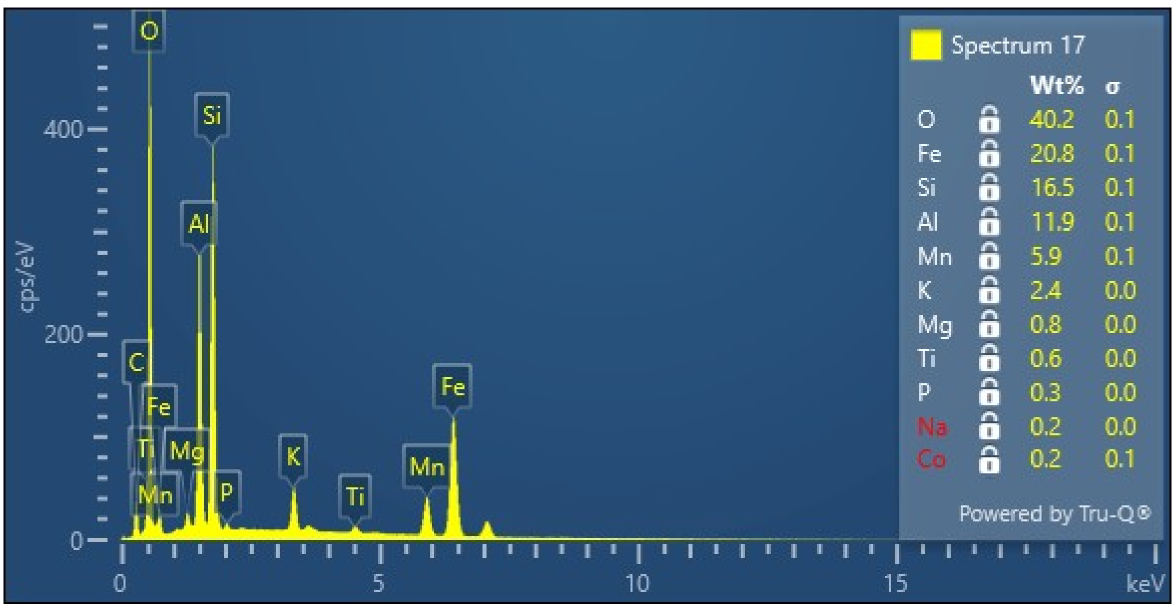

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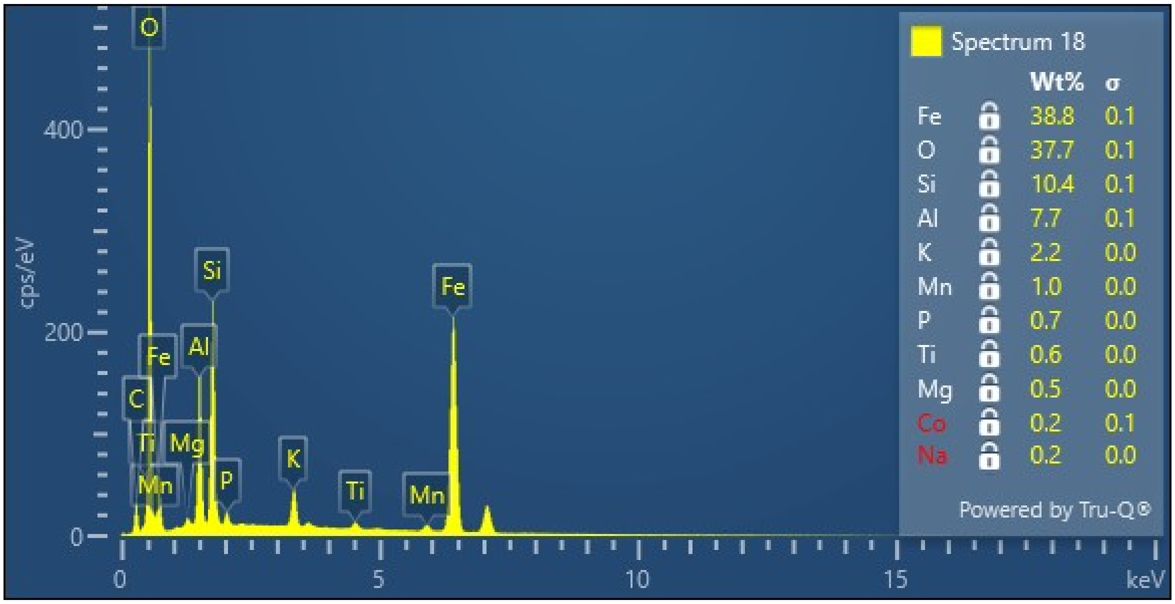

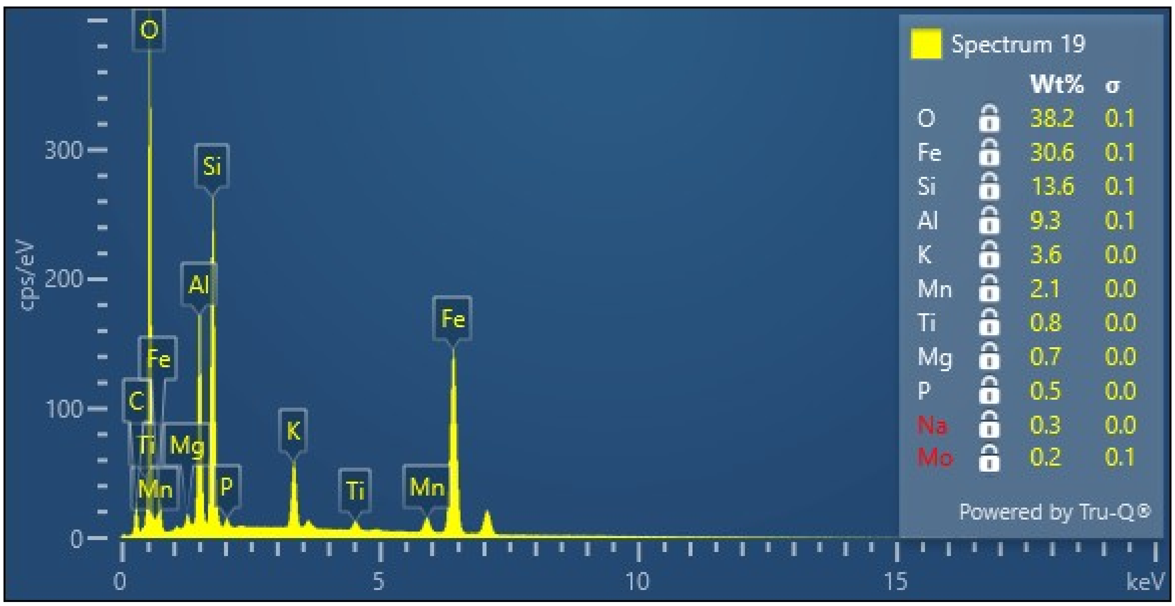

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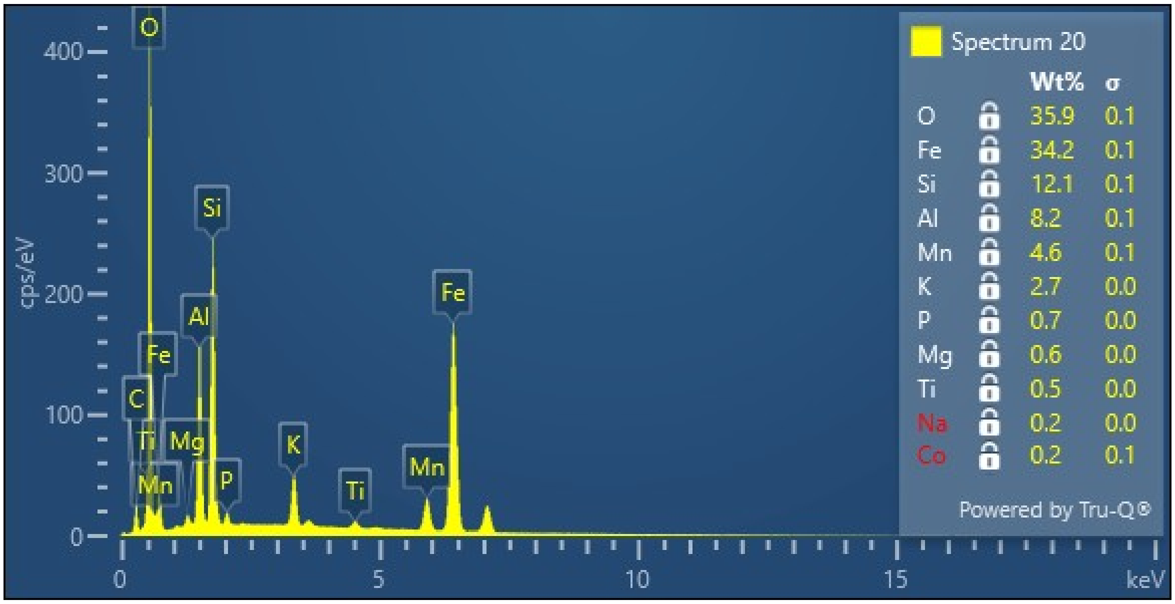
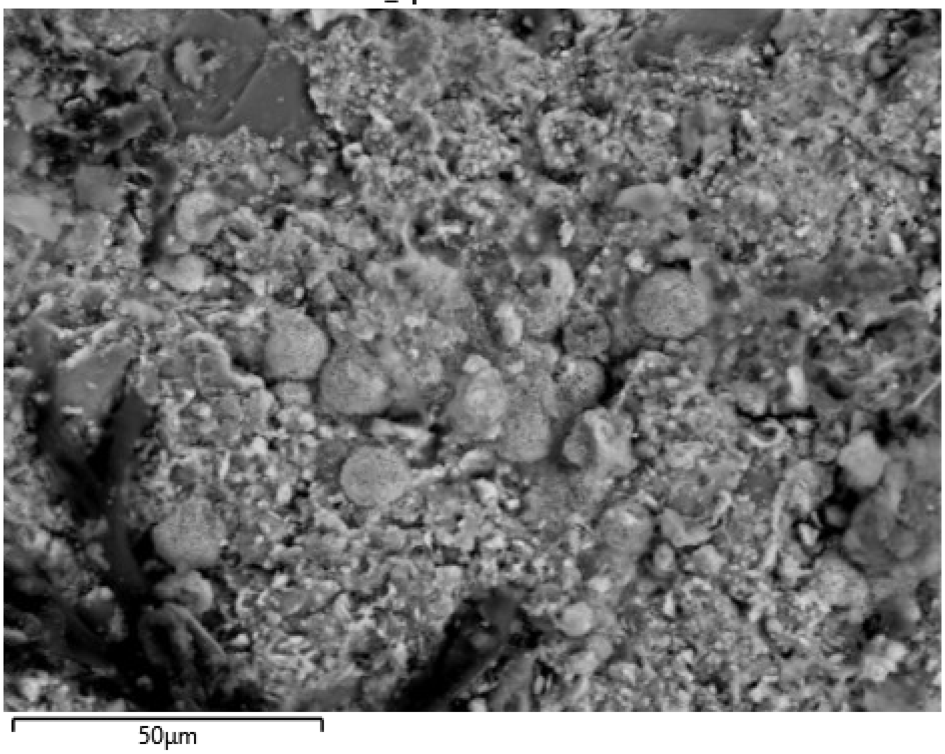
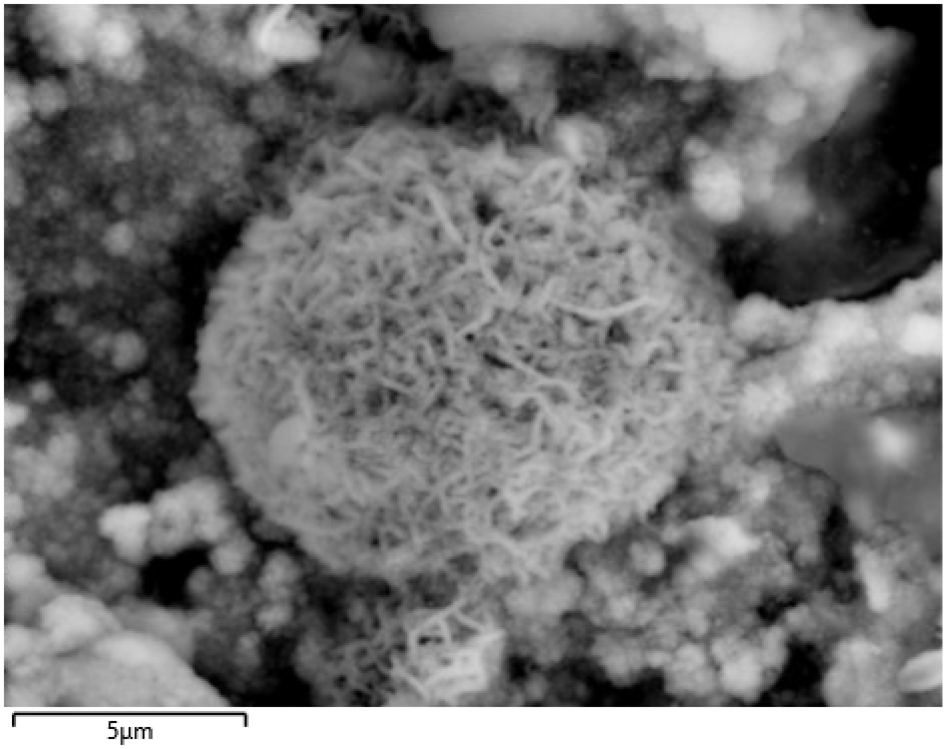

Spectrum 20
Wt% σ
O 35.9 0.1
Fe 34.2 0.1
Si 12.1 0.1
Al 8.2 0.1
Mn 4.6 0.1
K 2.7 0.0
P 0.7 0.0
Mg 0.6 0.0
Ti 0.5 0.0
Na 0.2 0.0
Co 0.2 0.1
Powered by Tru-Q®
cps/eV
400
300
200
100
0
0
5
10
15
keV
O
Si
Al
Fe
C
Ti
Mg
Mn
P
K
Ti
Mn
Fe

Site 3 detail images

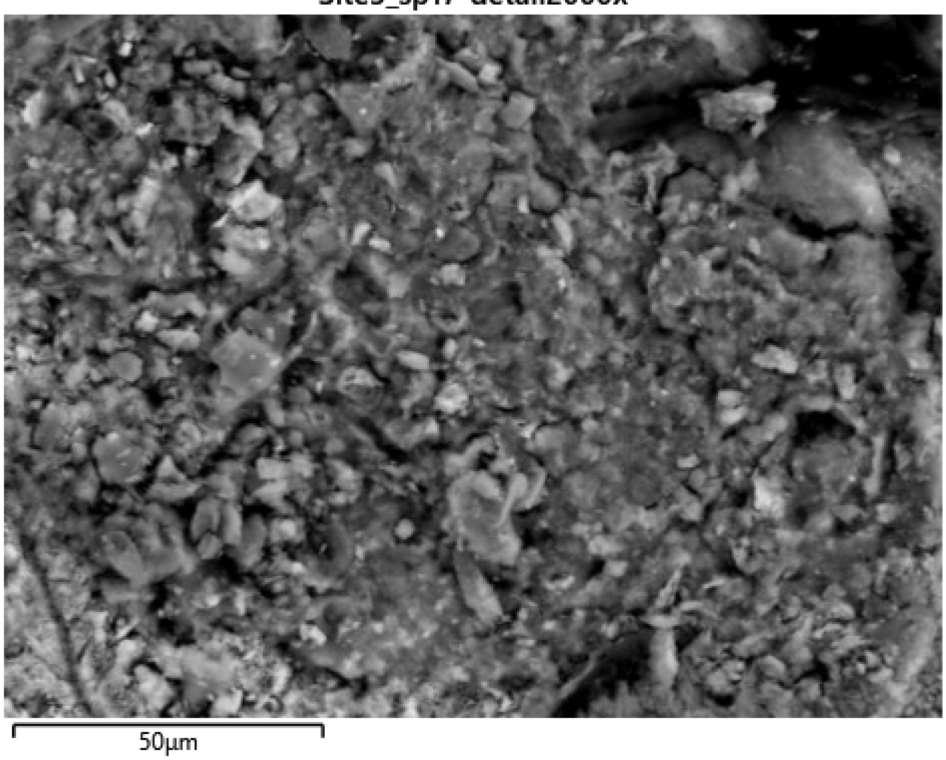
Site3_sp15-detail2000x



Site3_sp15-detail15000x

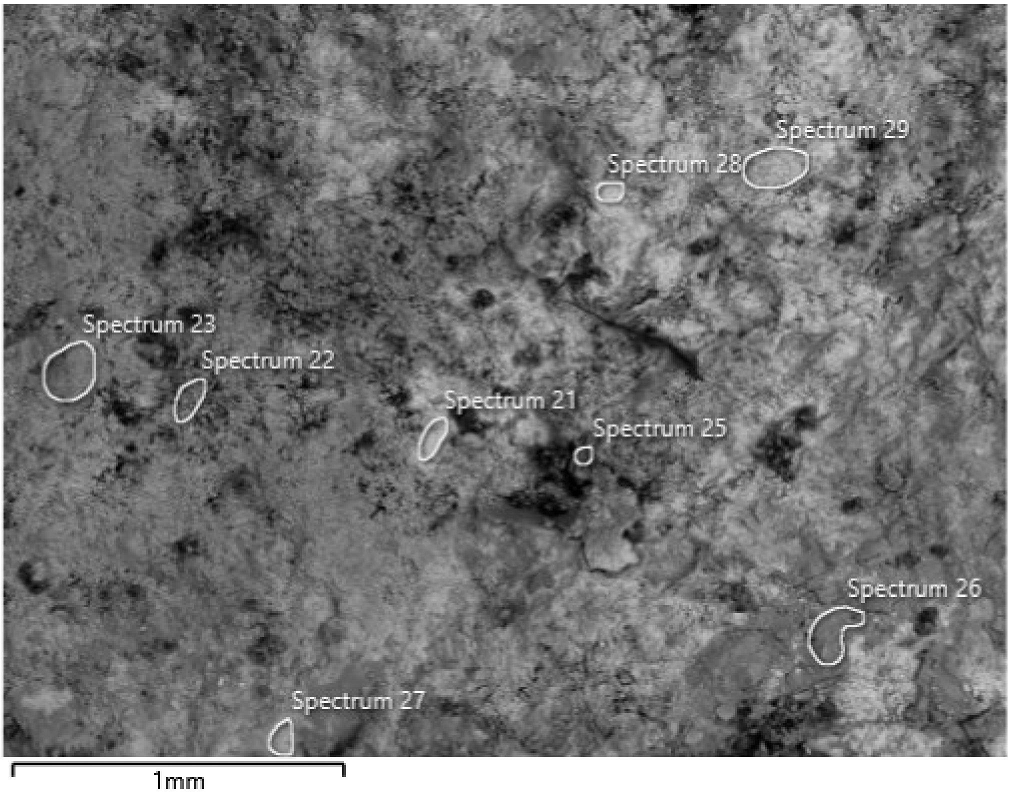


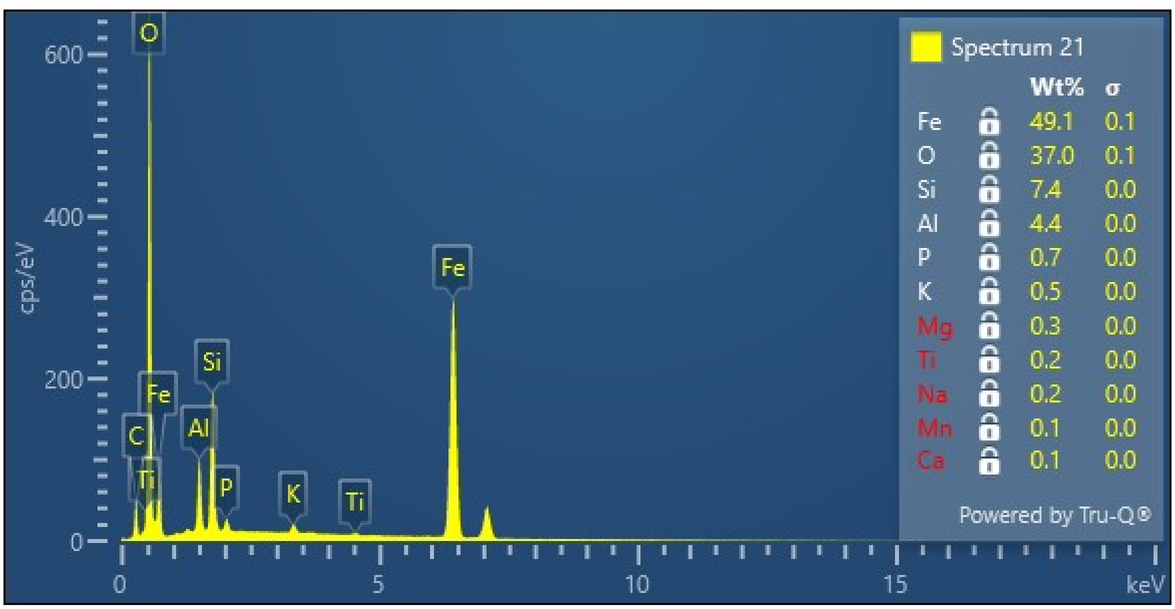
Site3_sp17-detail2000x



Site 1

GC-2 Site 1 overview 100x





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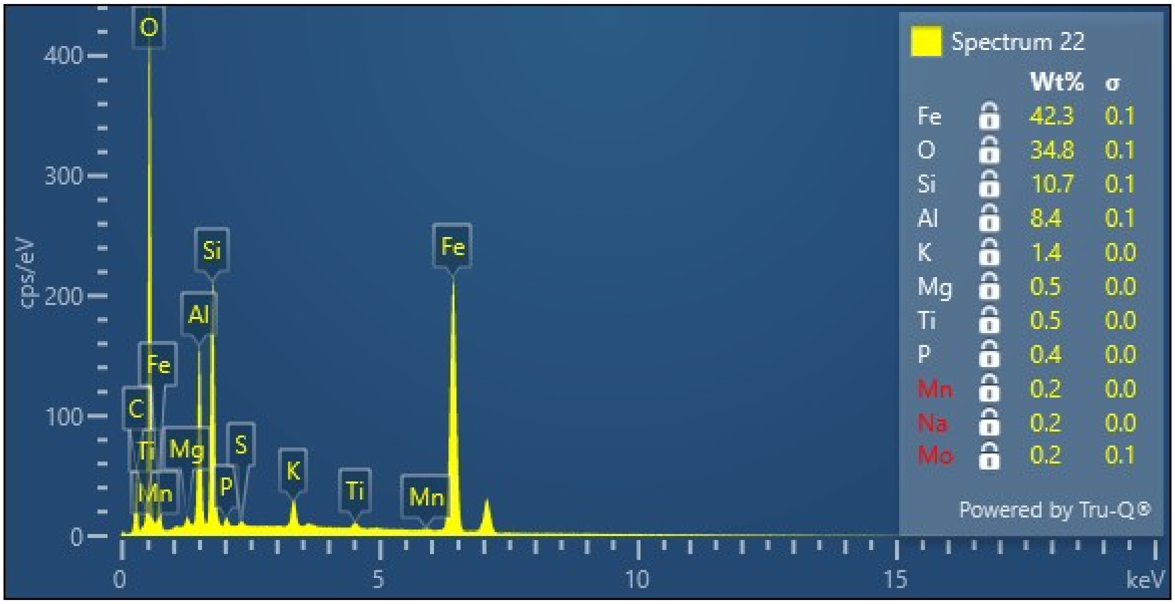
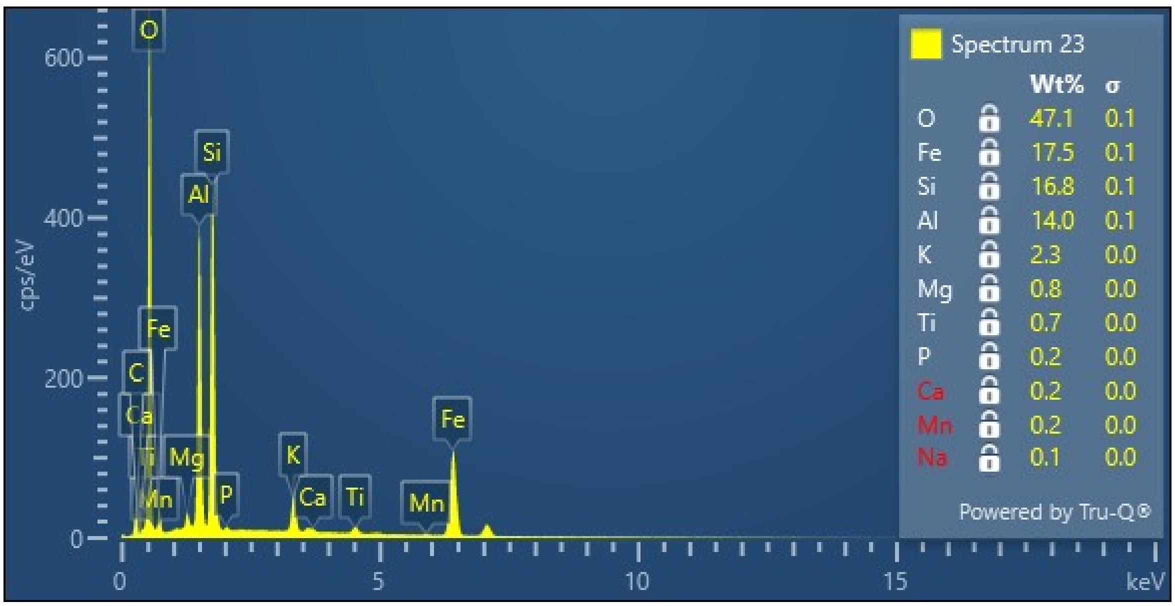
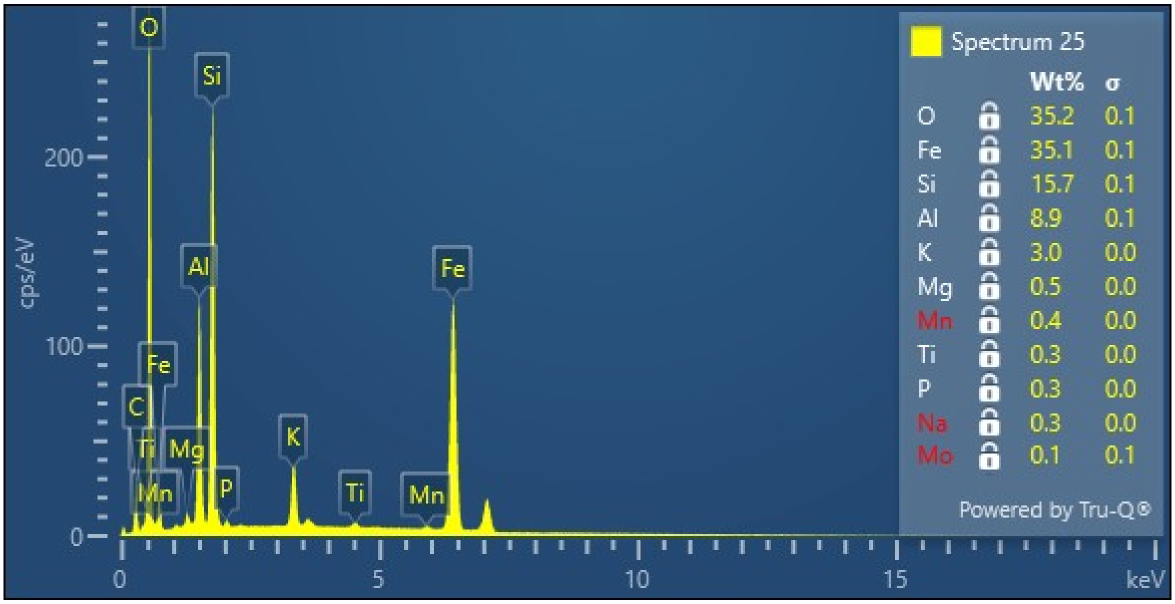
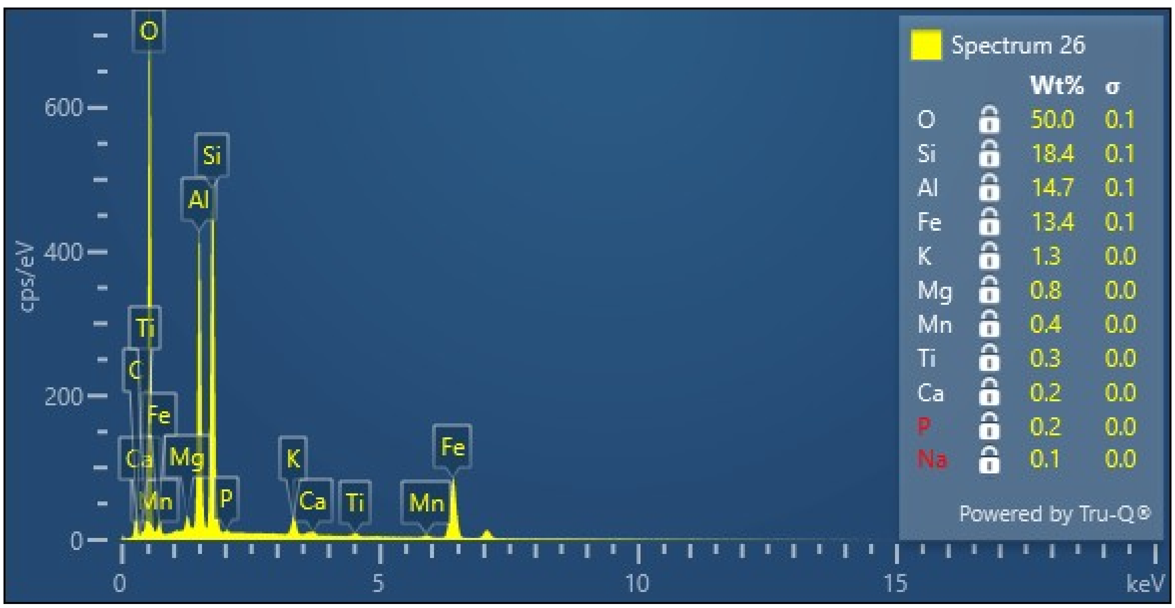
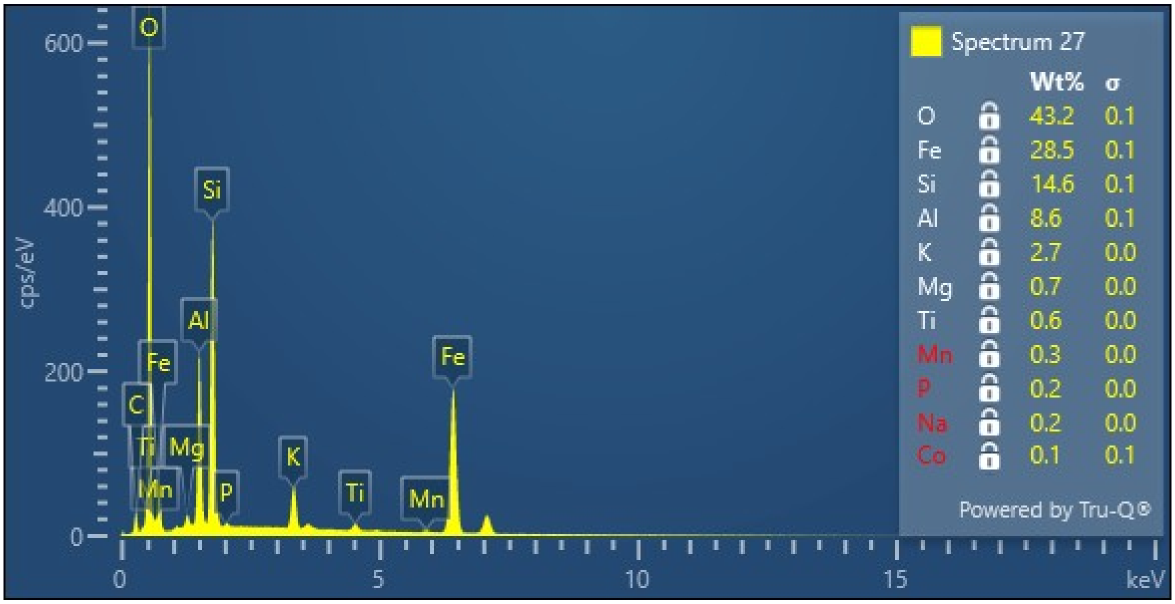
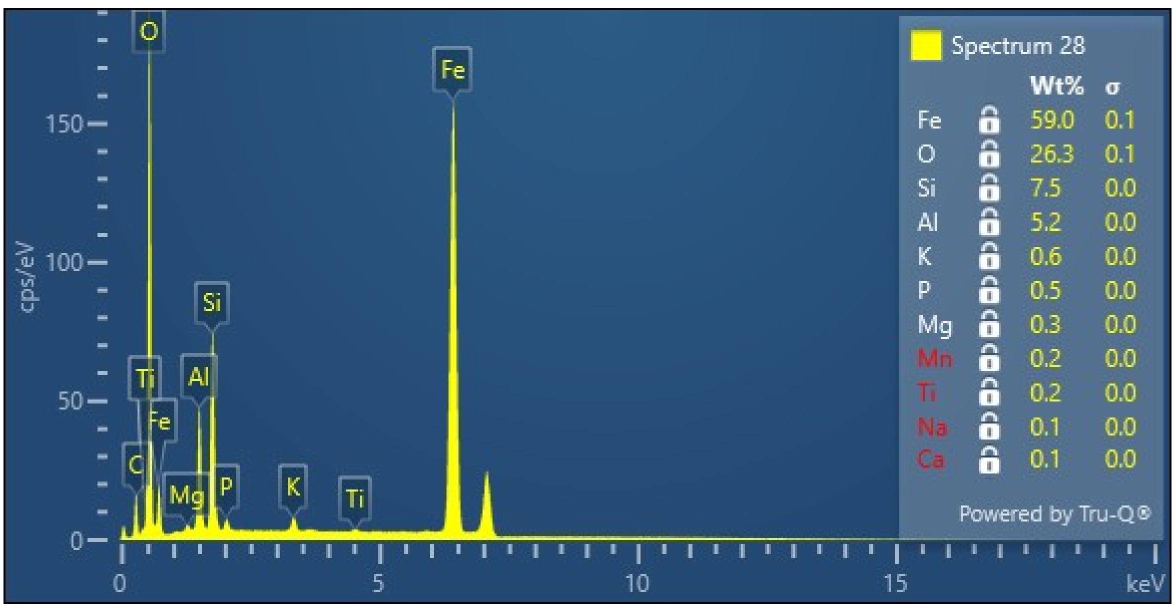


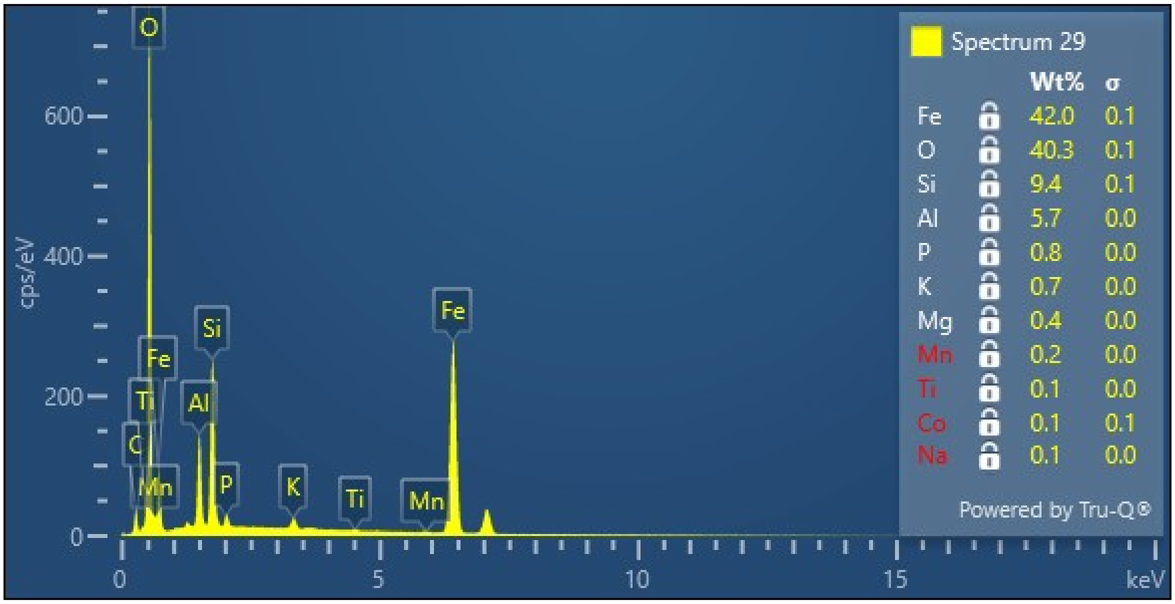



Spectrum 25
Wt% σ
O 35.2 0.1
Fe 35.1 0.1
Si 15.7 0.1
Al 8.9 0.1
K 3.0 0.0
Mg 0.5 0.0
Mn 0.4 0.0
Ti 0.3 0.0
P 0.3 0.0
Na 0.3 0.0
Mo 0.1 0.1
Powered by Tru-Q®
cps/eV
0
100
200
0
5
10
15
keV
O
Si
Al
Fe
Fe
C
Ti
Mg
K
Mn
P
Ti
Mn


Spectrum 26
Wt% σ
O 50.0 0.1
Si 18.4 0.1
Al 14.7 0.1
Fe 13.4 0.1
K 1.3 0.0
Mg 0.8 0.0
Mn 0.4 0.0
Ti 0.3 0.0
Ca 0.2 0.0
P 0.2 0.0
Na 0.1 0.0
Powered by Tru-Q®
cps/eV
0
200
400
600
0
5
10
15
keV
O
Si
Al
Ti
C
Fe
Ca
Mg
K
Fe
Mn
P
Ca
Ti
Mn

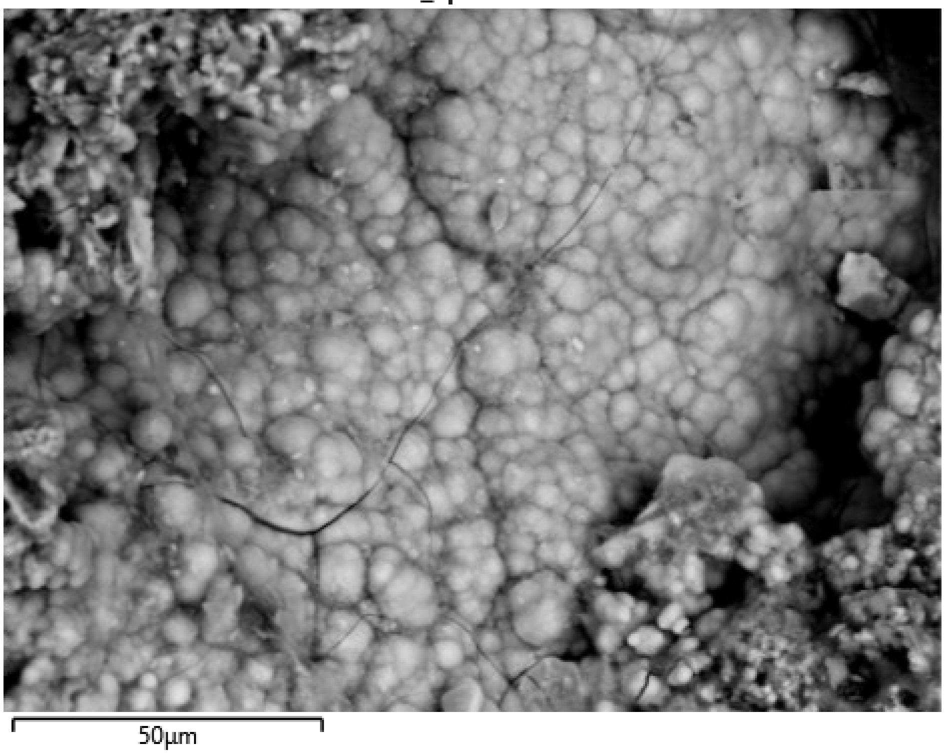

Spectrum 27
Wt% σ
O 43.2 0.1
Fe 28.5 0.1
Si 14.6 0.1
Al 8.6 0.1
K 2.7 0.0
Mg 0.7 0.0
Ti 0.6 0.0
Mn 0.3 0.0
P 0.2 0.0
Na 0.2 0.0
Co 0.1 0.1
Powered by Tru-Q®
cps/eV
600
400
200
0
O
Si
Al
Fe
C
Ti
Mg
Mn
P
K
Ti
Mn
Fe
0
5
10
15
keV


Spectrum 28
Wt% σ
Fe 59.0 0.1
O 26.3 0.1
Si 7.5 0.0
Al 5.2 0.0
K 0.6 0.0
P 0.5 0.0
Mg 0.3 0.0
Mn 0.2 0.0
Ti 0.2 0.0
Na 0.1 0.0
Ca 0.1 0.0
Powered by Tru-Q®
cps/eV
150
100
50
0
O
Fe
Si
Ti
Al
Fe
C
Mg
P
K
Ti
0
5
10
15
keV


Spectrum 29
Wt% σ
Fe 42.0 0.1
O 40.3 0.1
Si 9.4 0.1
Al 5.7 0.0
P 0.8 0.0
K 0.7 0.0
Mg 0.4 0.0
Mn 0.2 0.0
Ti 0.1 0.0
Co 0.1 0.1
Na 0.1 0.0
Powered by Tru-Q®
cps/eV
0
200
400
600
0
5
10
15
keV
O
Fe
Si
Ti
Al
C
Mn
P
K
Ti
Mn
Fe

Site 1 detail images

Site1_sp21-2000x



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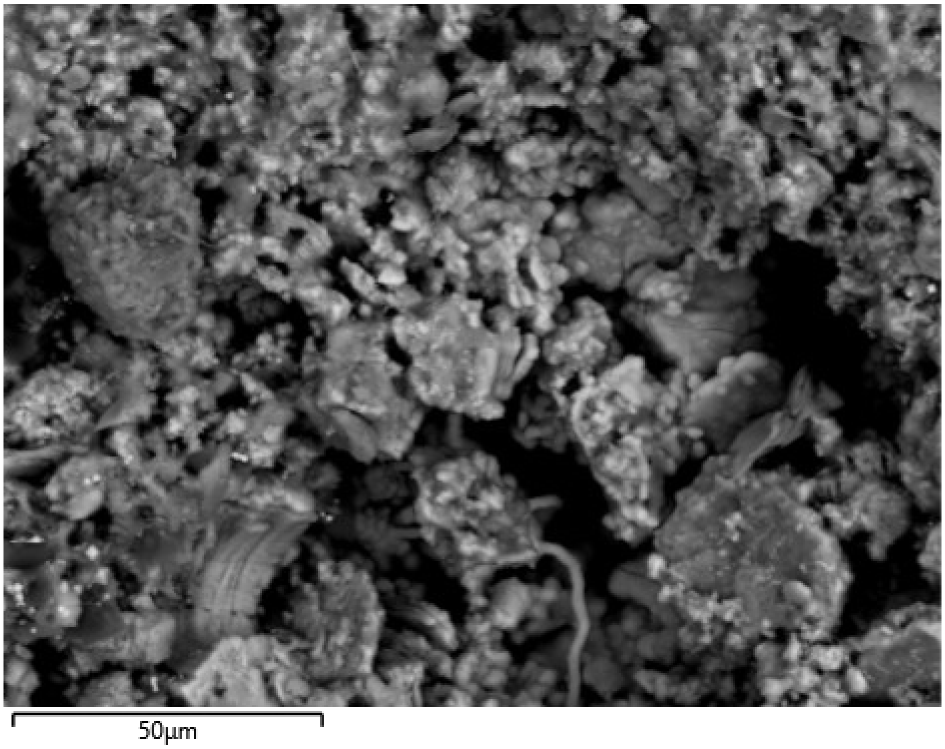
Site1_sp22-2000x



Site1_sp25-1500x

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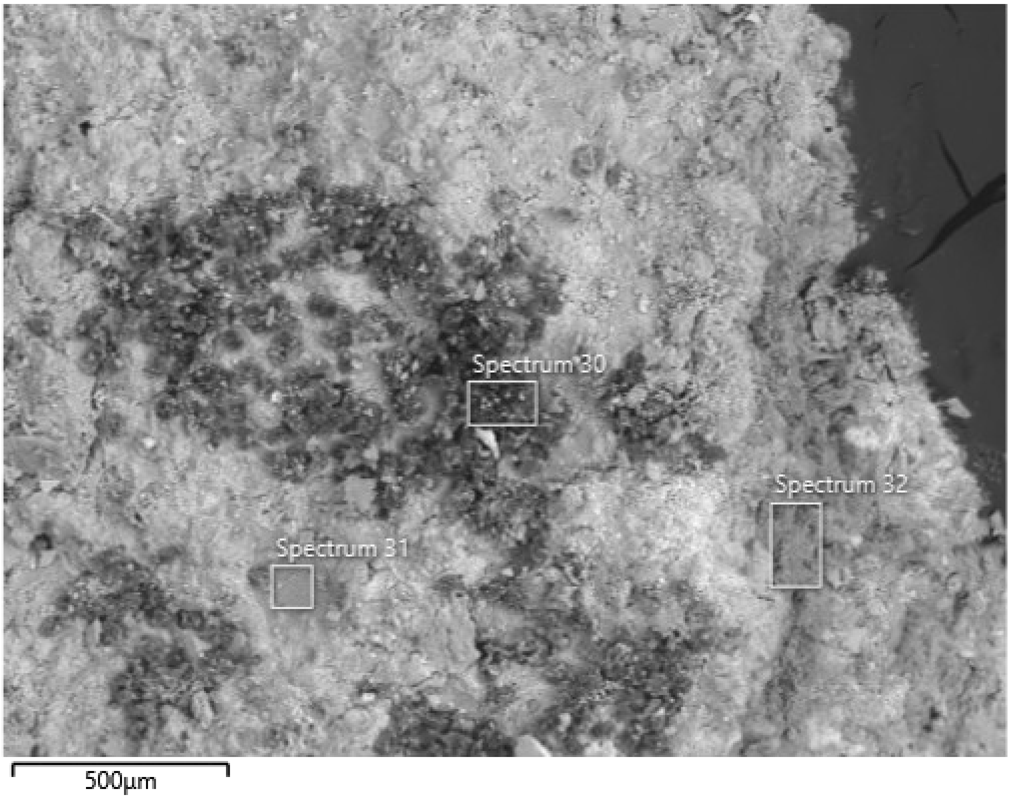
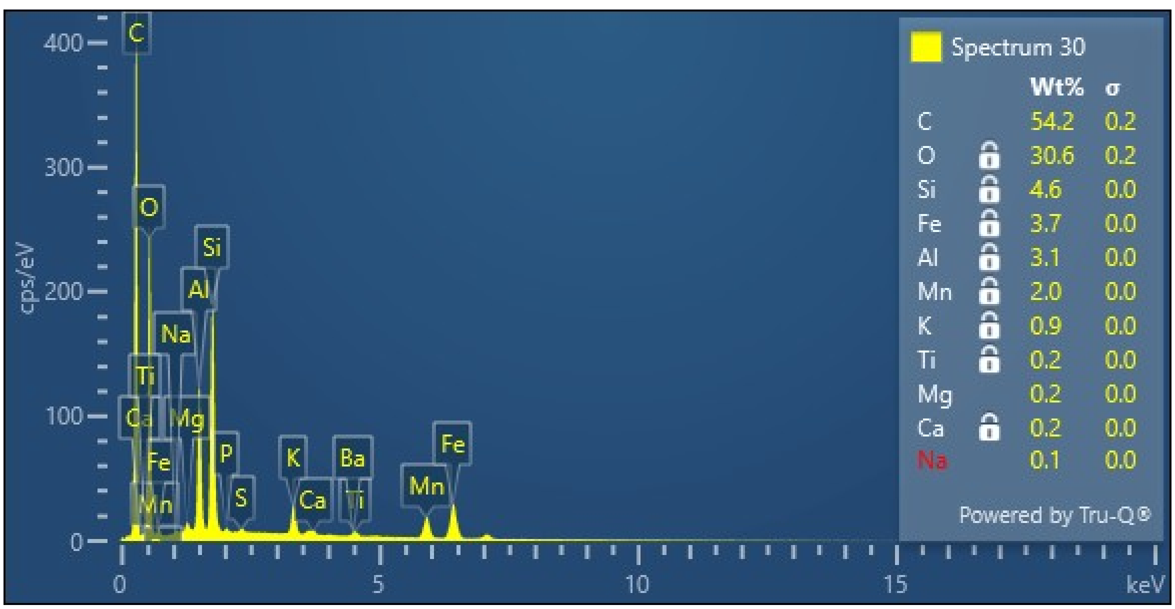
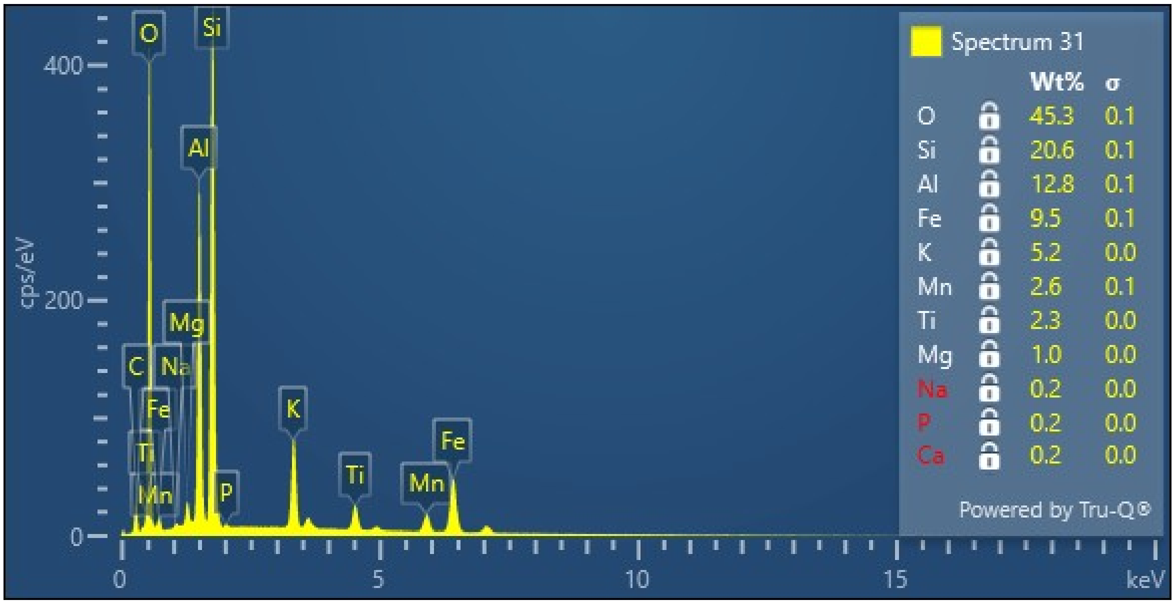
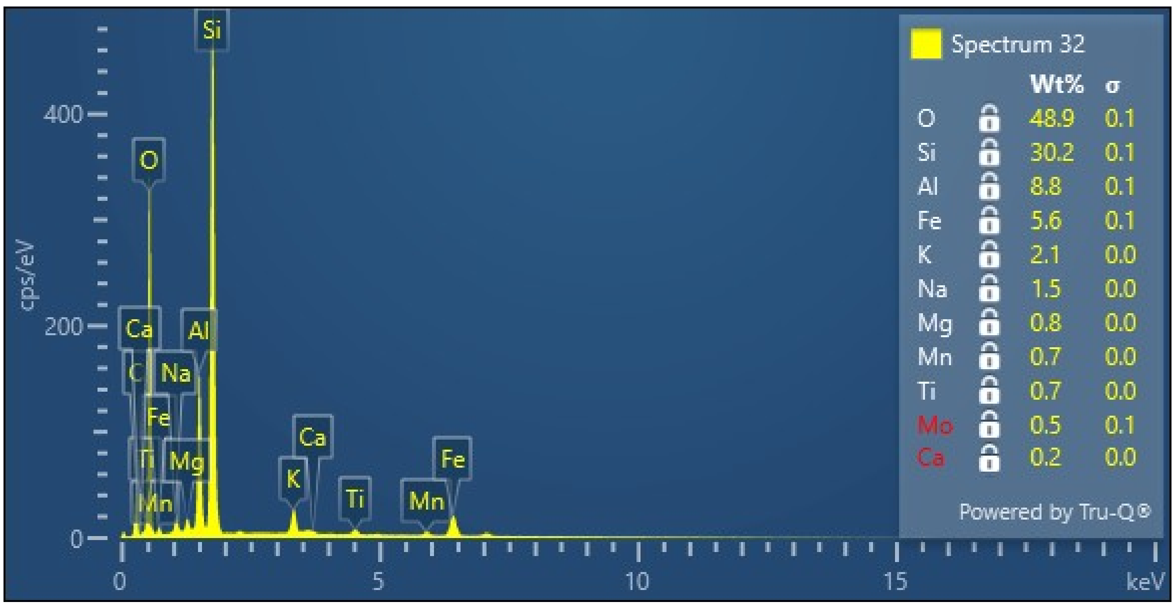
Site 2

GC-2 Site 2 overview 100x



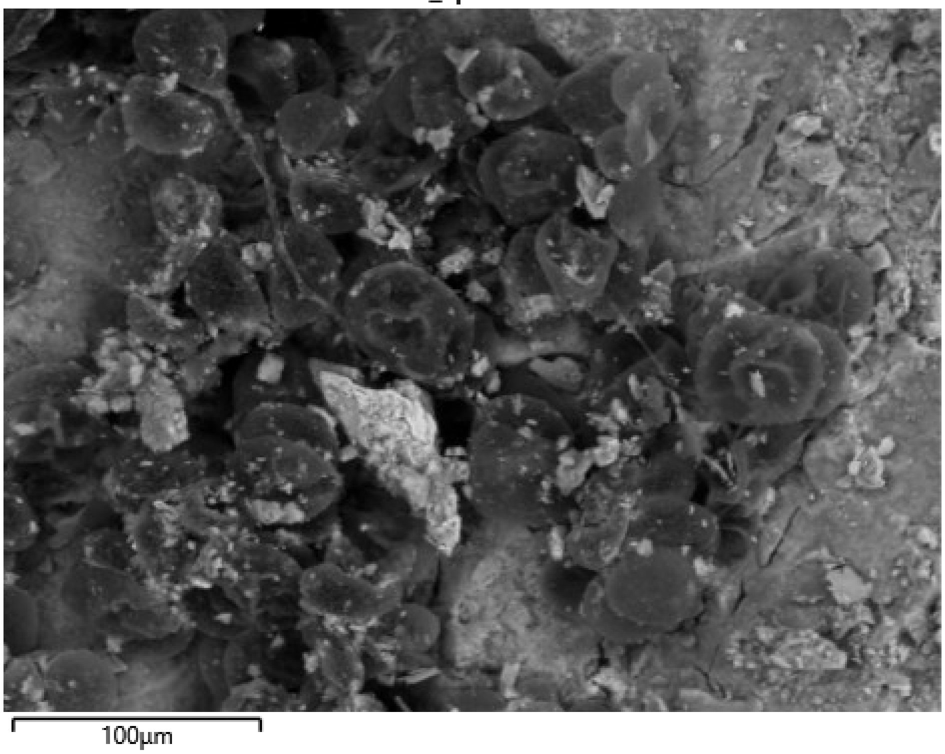



Spectrum 31
Wt% σ
O 45.3 0.1
Si 20.6 0.1
Al 12.8 0.1
Fe 9.5 0.1
K 5.2 0.0
Mn 2.6 0.1
Ti 2.3 0.0
Mg 1.0 0.0
Na 0.2 0.0
P 0.2 0.0
Ca 0.2 0.0
Powered by Tru-Q®
cps/eV
keV

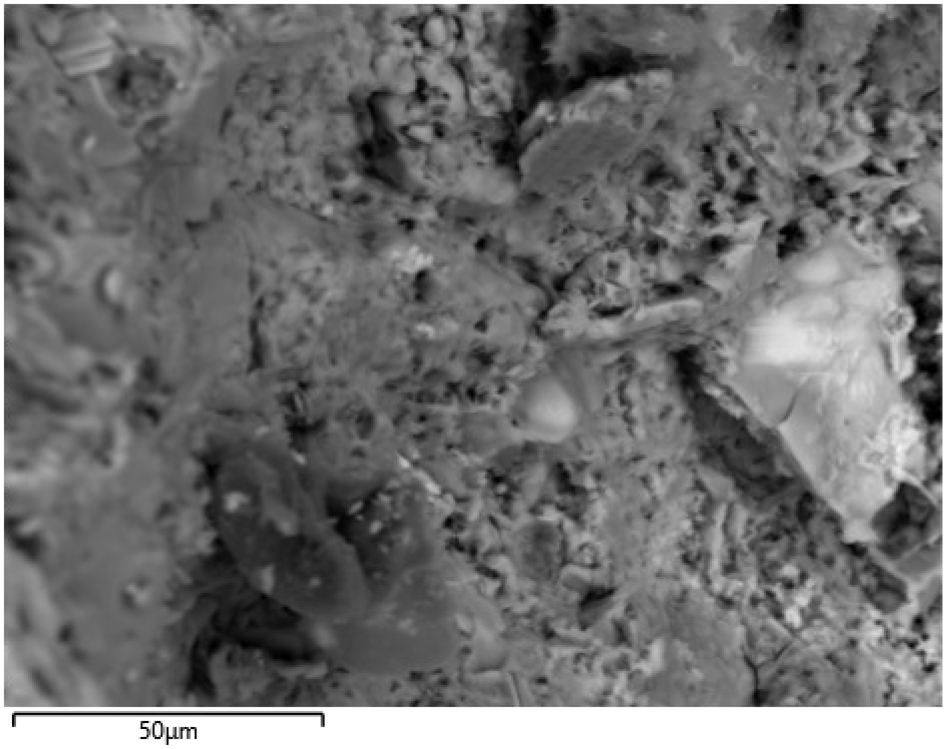

Spectrum 32
Wt% σ
O 48.9 0.1
Si 30.2 0.1
Al 8.8 0.1
Fe 5.6 0.1
K 2.1 0.0
Na 1.5 0.0
Mg 0.8 0.0
Mn 0.7 0.0
Ti 0.7 0.0
Mo 0.5 0.1
Ca 0.2 0.0
Powered by Tru-Q®
cps/eV
keV

Site 2 detail images

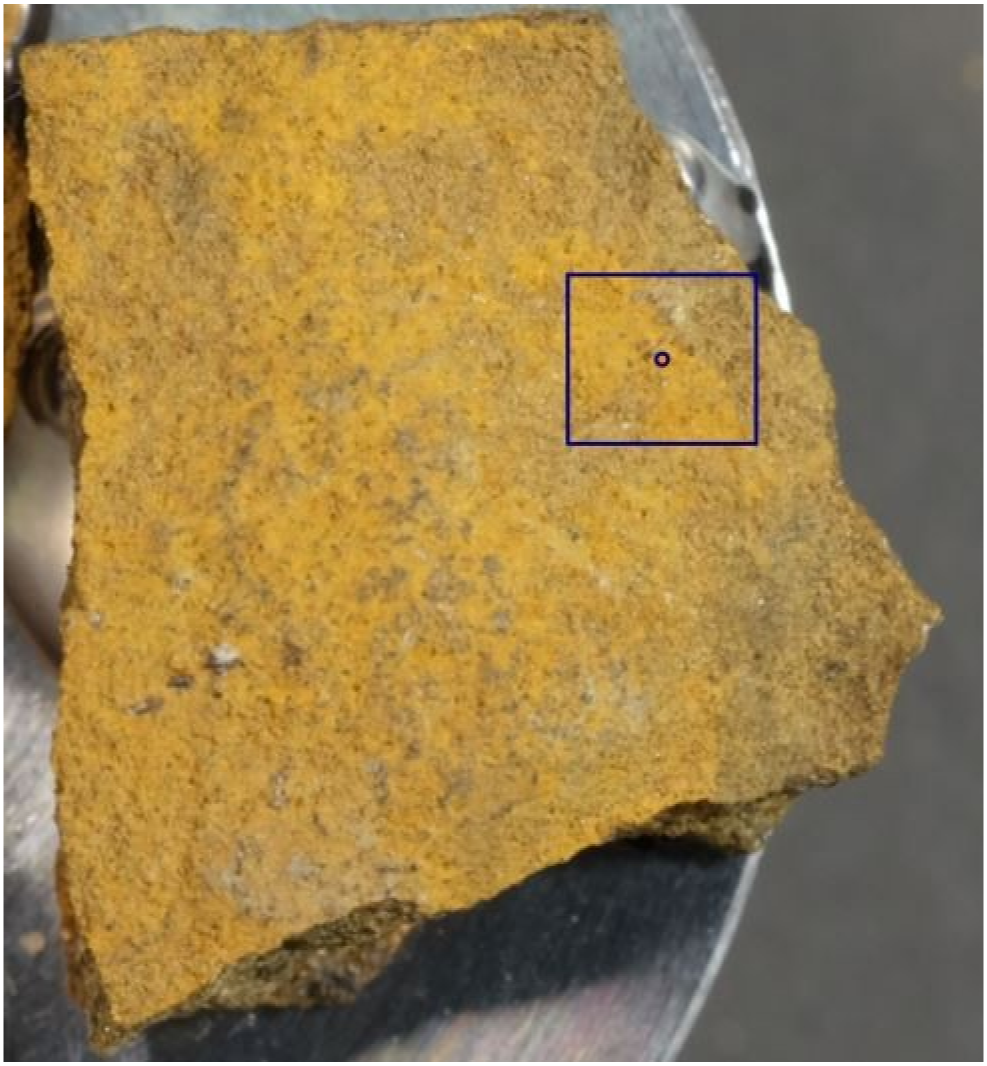
Site2_sp30-800x



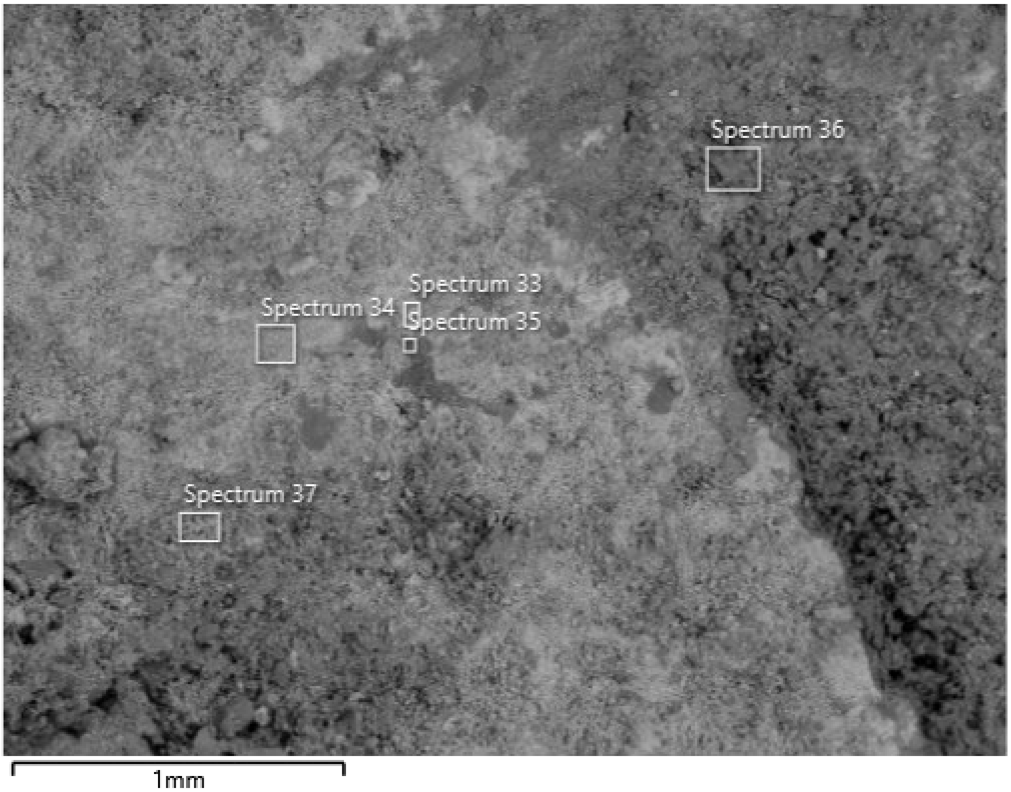
Site2_sp32-2000x

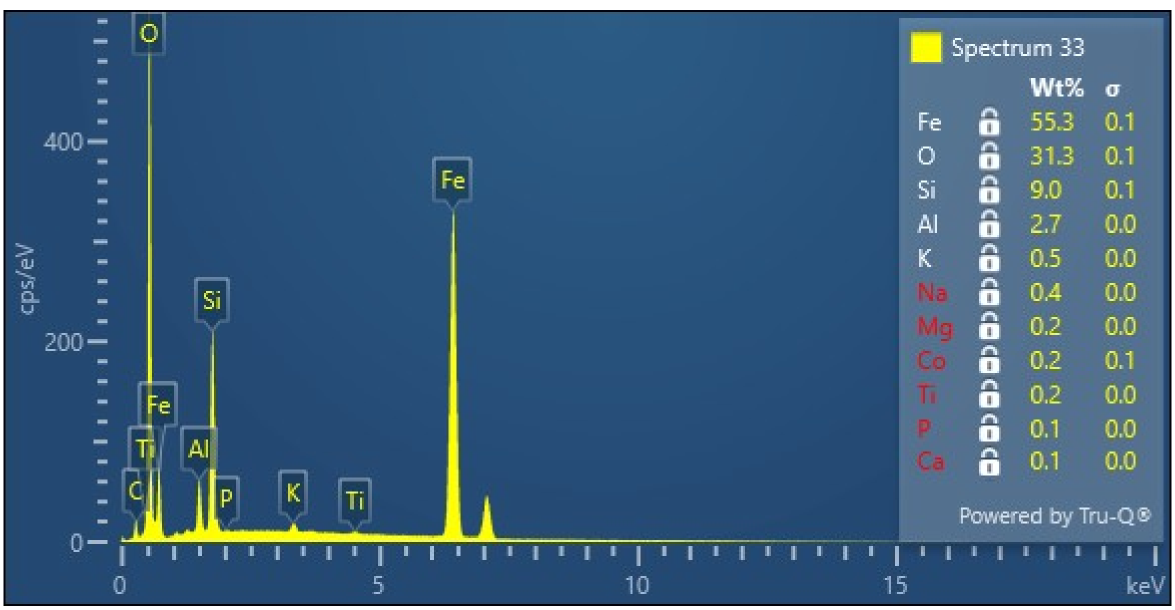


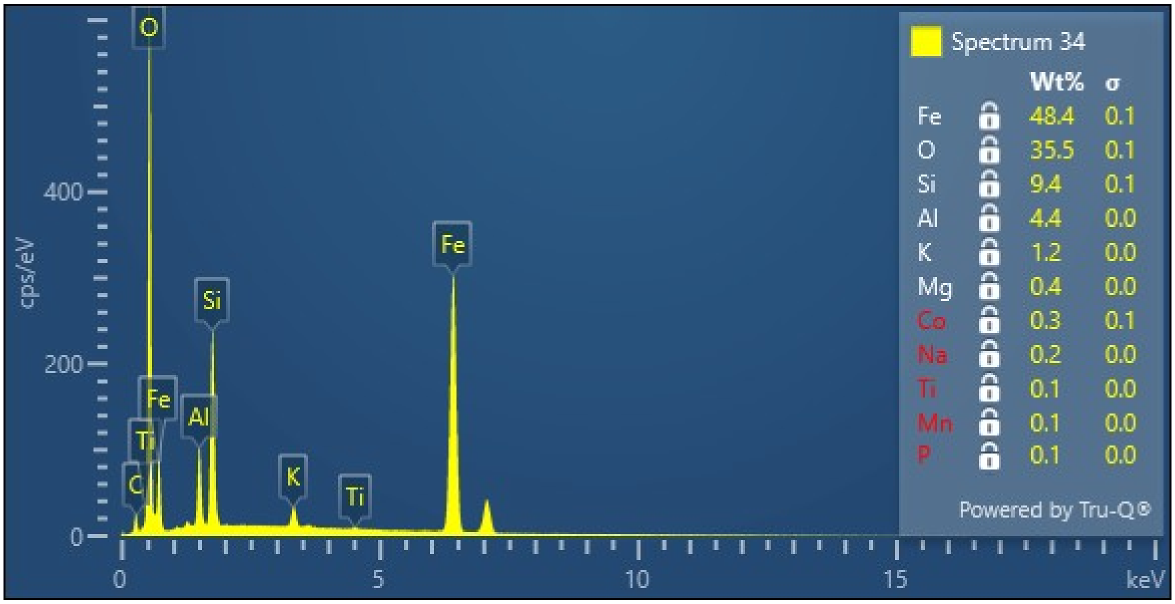
Site 1

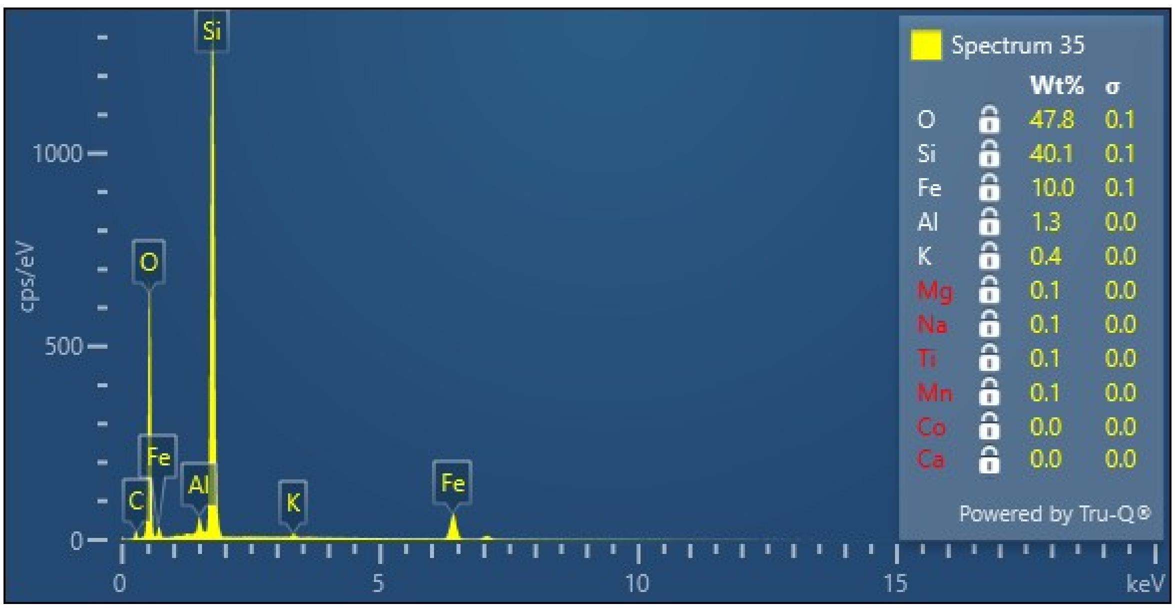


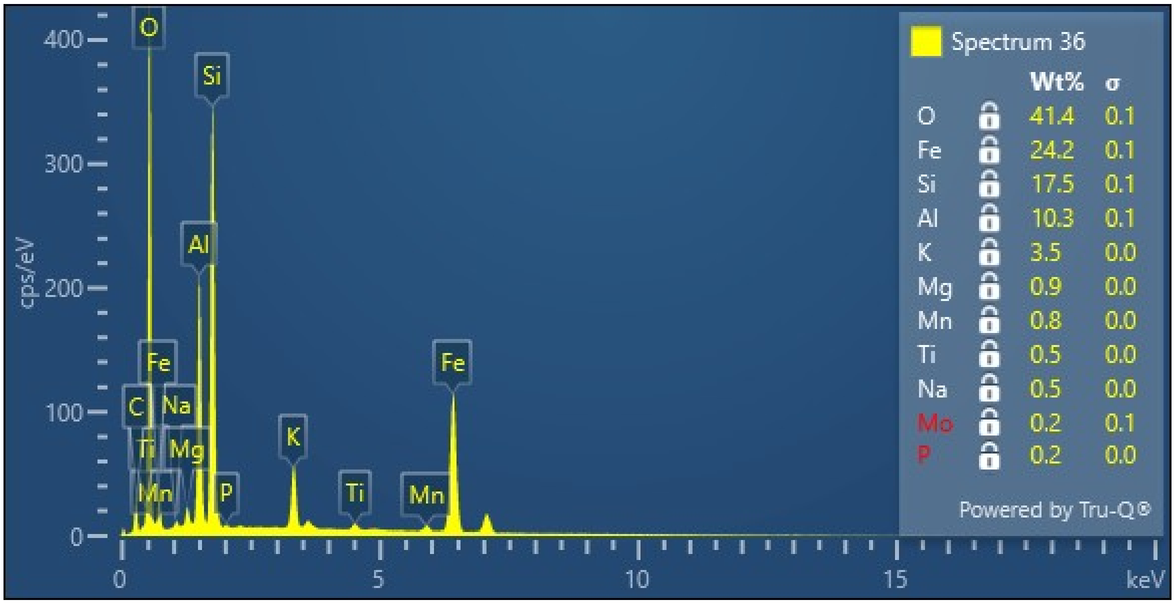
GC-3 Site 1 overview 100x



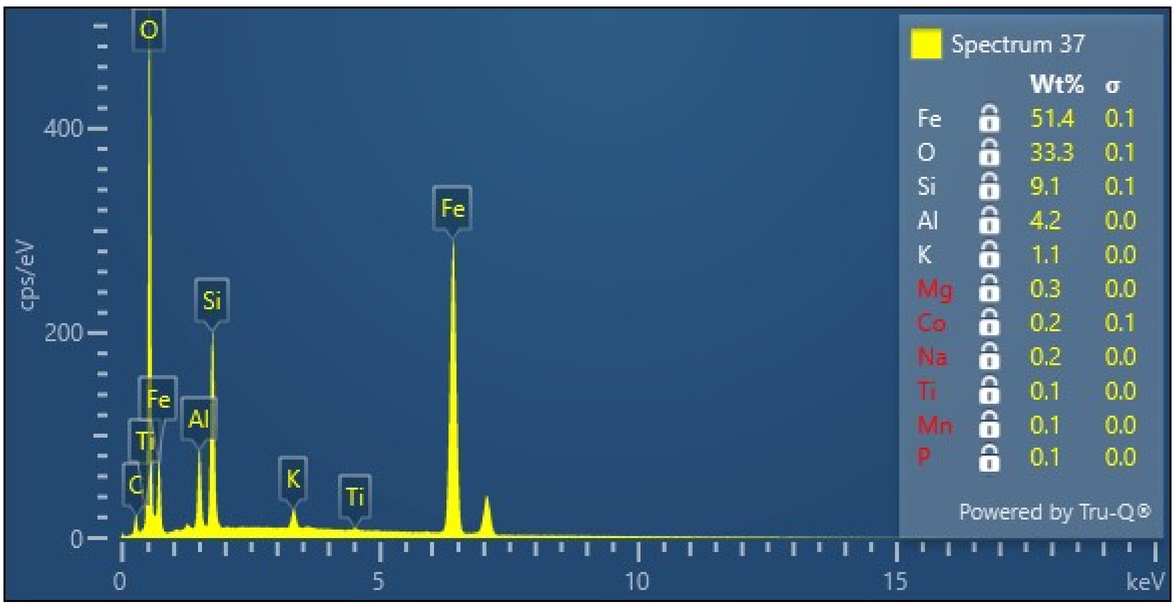



Spectrum 34
Wt% σ
Fe 48.4 0.1
O 35.5 0.1
Si 9.4 0.1
Al 4.4 0.0
K 1.2 0.0
Mg 0.4 0.0
Co 0.3 0.1
Na 0.2 0.0
Ti 0.1 0.0
Mn 0.1 0.0
P 0.1 0.0
Powered by Tru-Q®
cps/eV
0
200
400
5
10
15
keV
O
Fe
Si
Fe
Al
Ti
C
K
Ti


Spectrum 35
Wt% σ
O 47.8 0.1
Si 40.1 0.1
Fe 10.0 0.1
Al 1.3 0.0
K 0.4 0.0
Mg 0.1 0.0
Na 0.1 0.0
Ti 0.1 0.0
Mn 0.1 0.0
Co 0.0 0.0
Ca 0.0 0.0
Powered by Tru-Q®
cps/eV
0
500
1000
5
10
15
keV
Si
O
Fe
Al
C
K
Fe



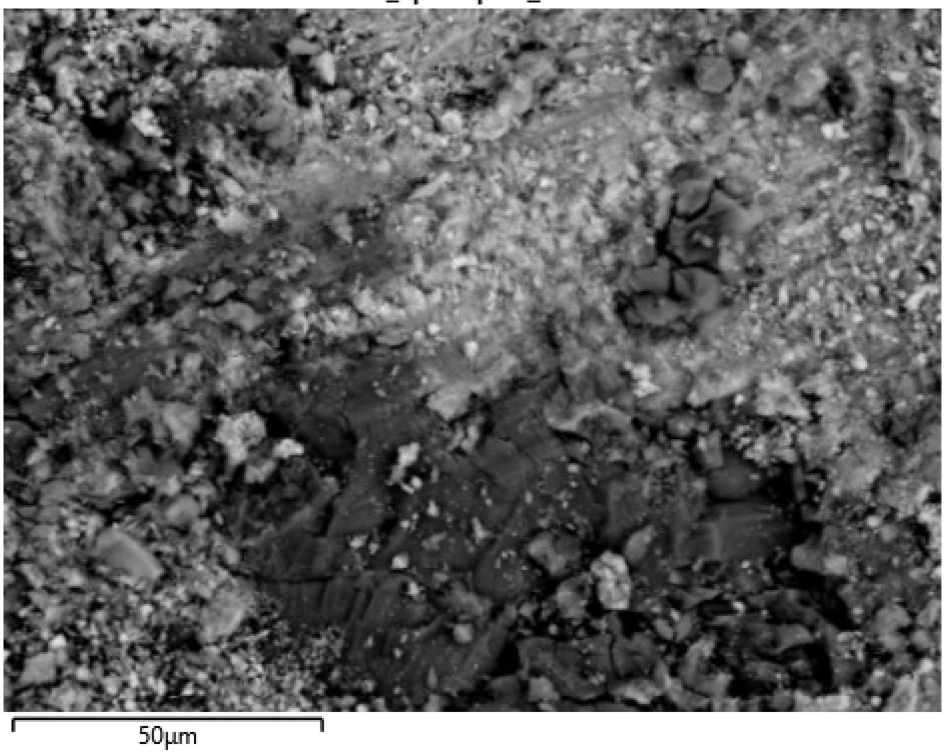
Spectrum 36
Wt% σ
O 41.4 0.1
Fe 24.2 0.1
Si 17.5 0.1
Al 10.3 0.1
K 3.5 0.0
Mg 0.9 0.0
Mn 0.8 0.0
Ti 0.5 0.0
Na 0.5 0.0
Mo 0.2 0.1
P 0.2 0.0
Powered by Tru-Q®
cps/eV
keV



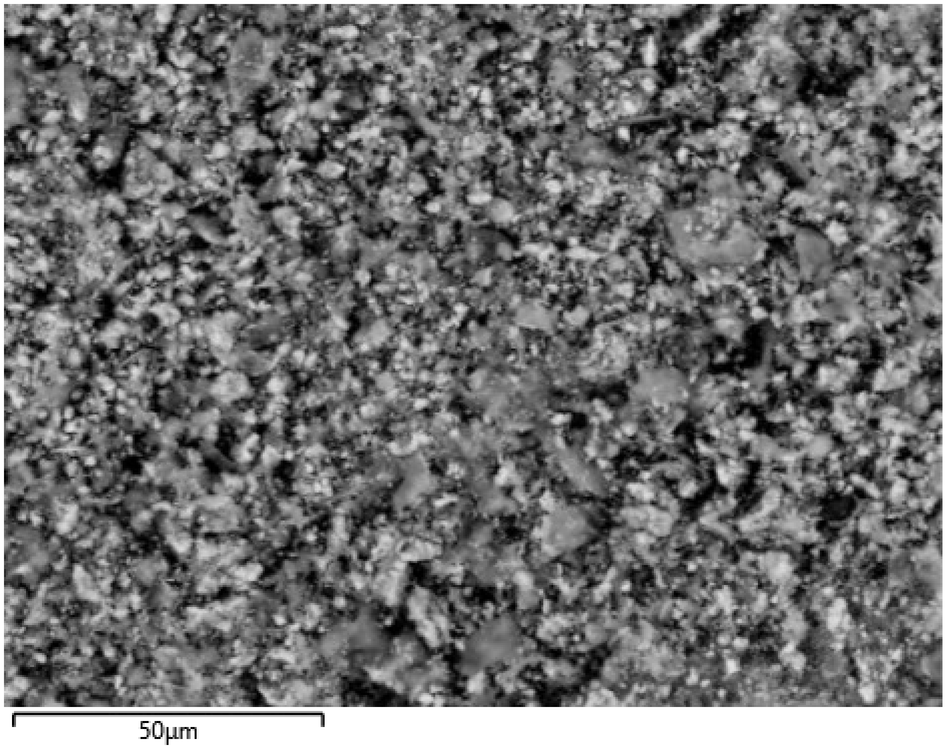
Spectrum 37
Wt% σ
Fe 51.4 0.1
O 33.3 0.1
Si 9.1 0.1
Al 4.2 0.0
K 1.1 0.0
Mg 0.3 0.0
Co 0.2 0.1
Na 0.2 0.0
Ti 0.1 0.0
Mn 0.1 0.0
P 0.1 0.0
Powered by Tru-Q®
cps/eV
keV

Site 1 detail images

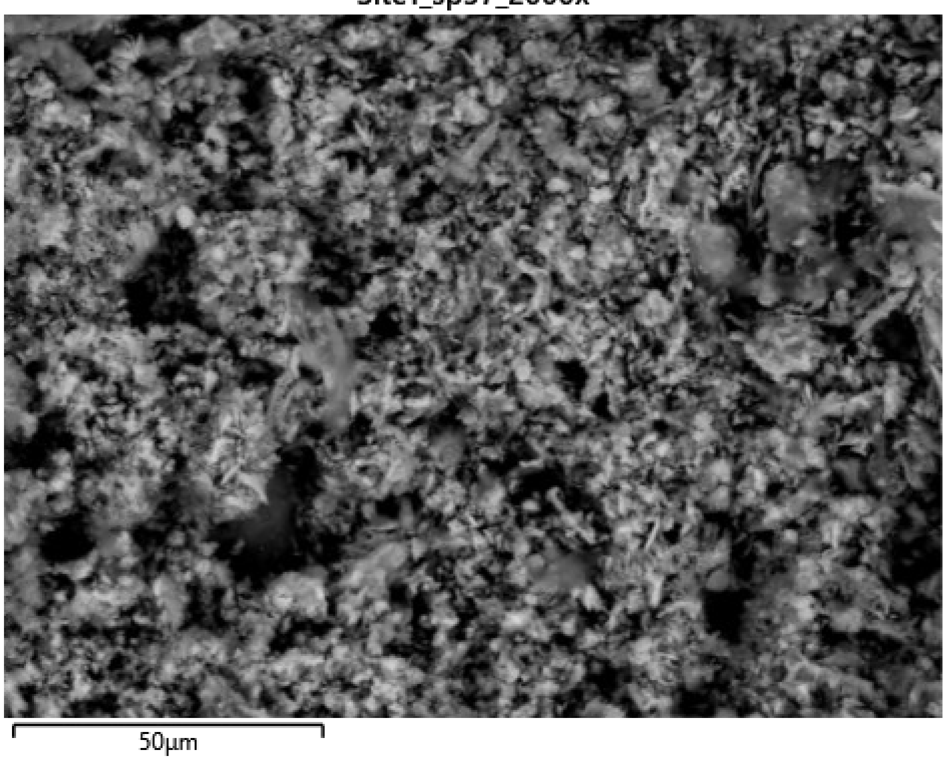
Site1_sp33sp35_2000x



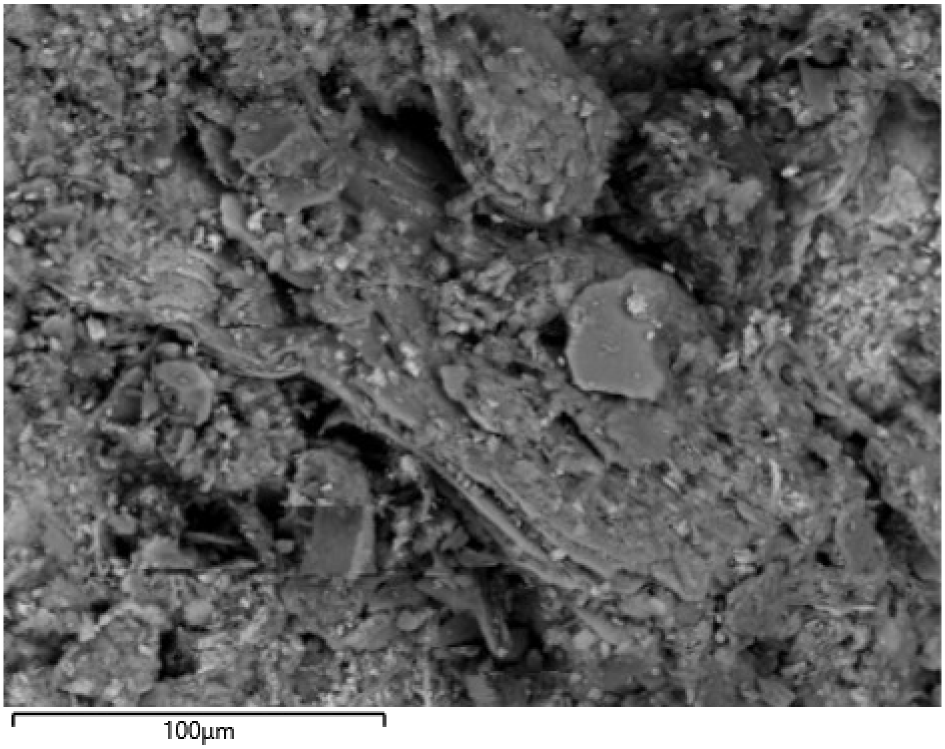
Site1_sp34_2000x



Site1_sp37_2000x

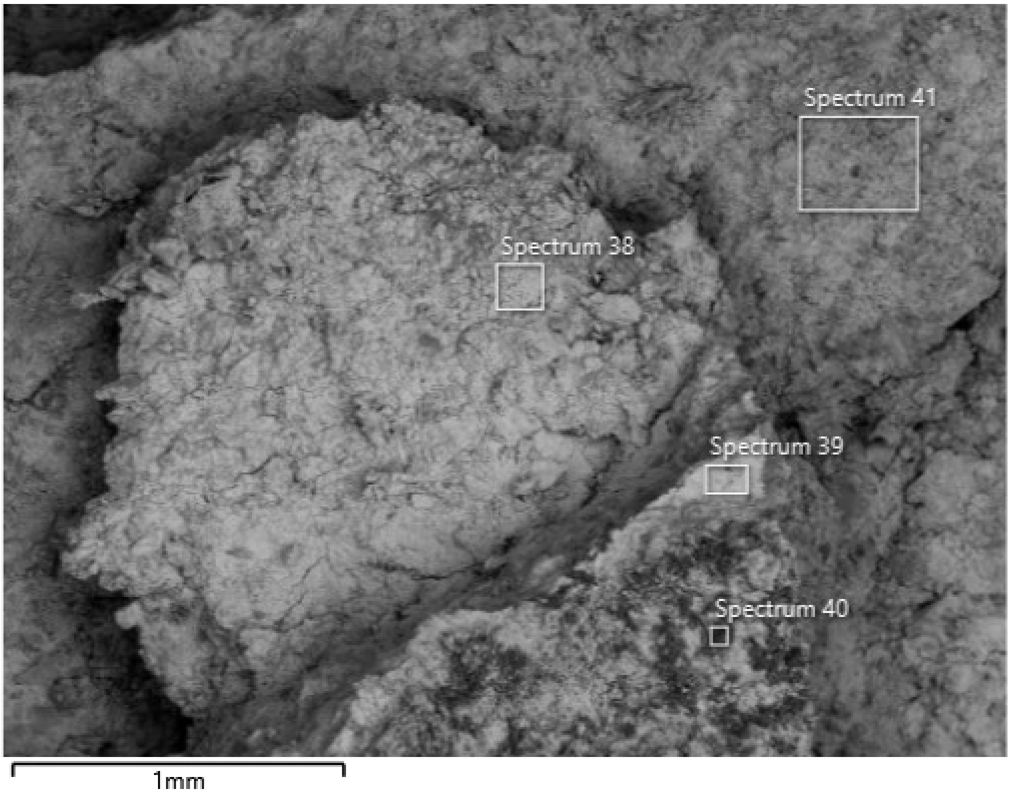


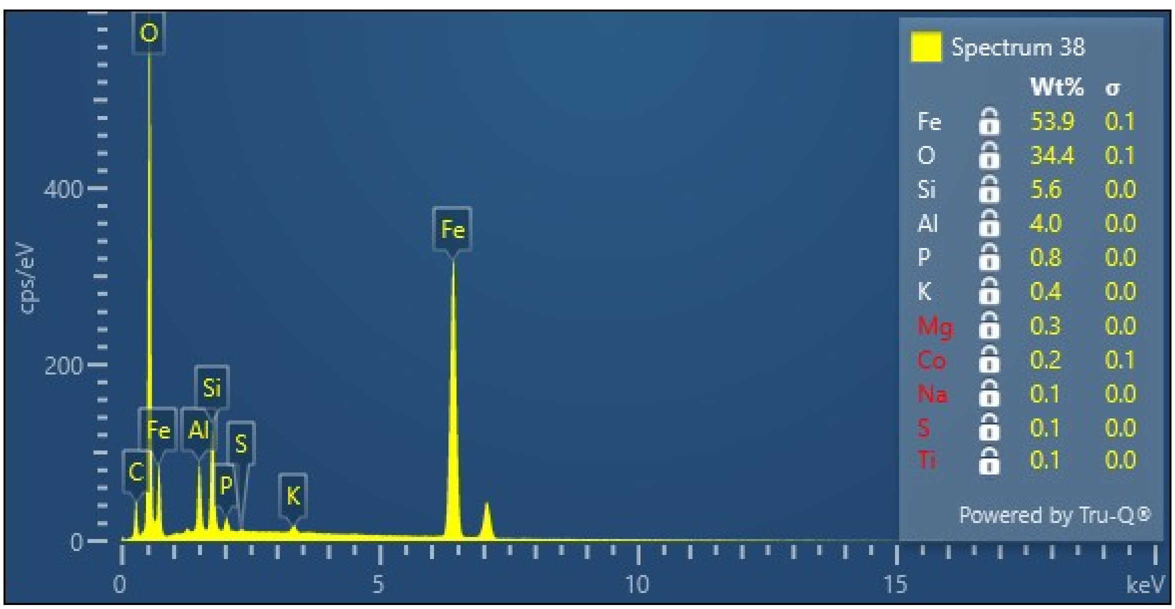
Site1_sp36_2000x



Site 1

GC-4 Site 1 overview 100x





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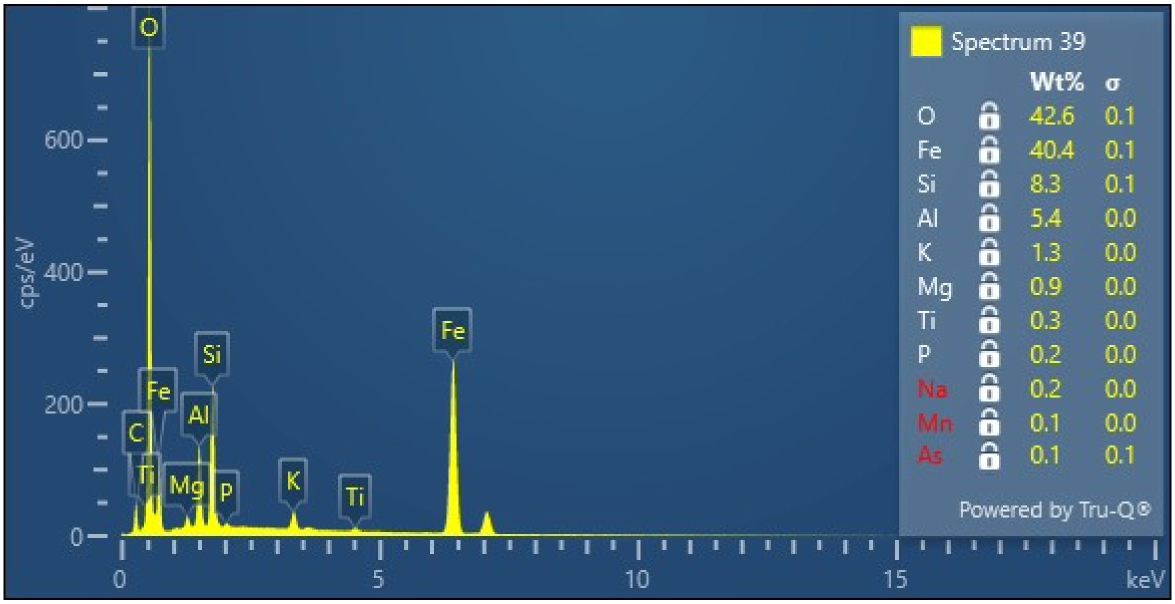
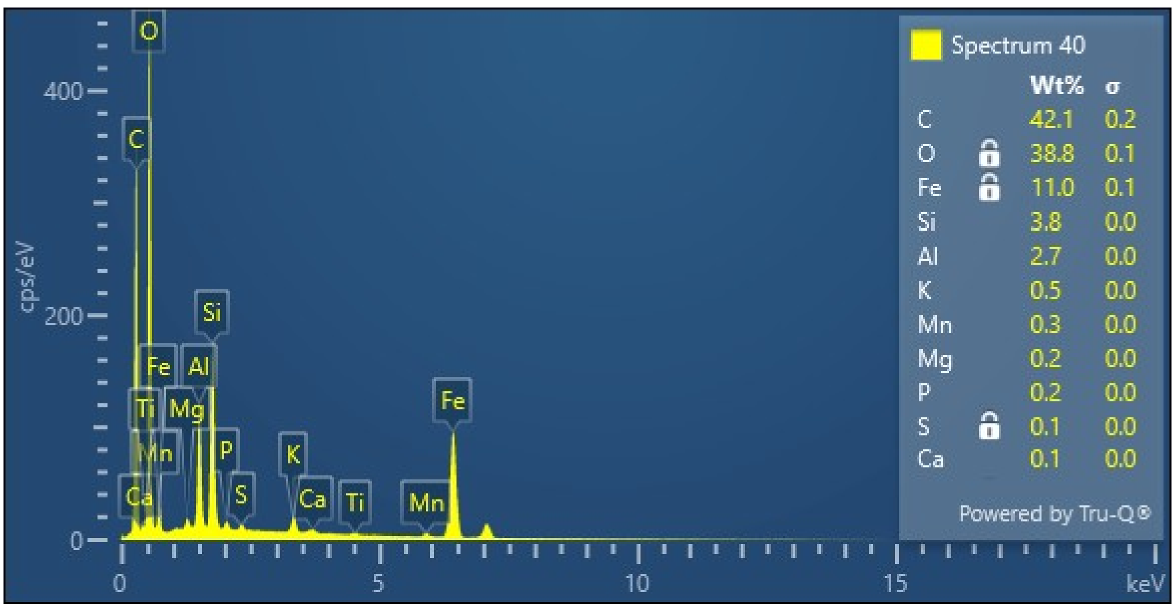
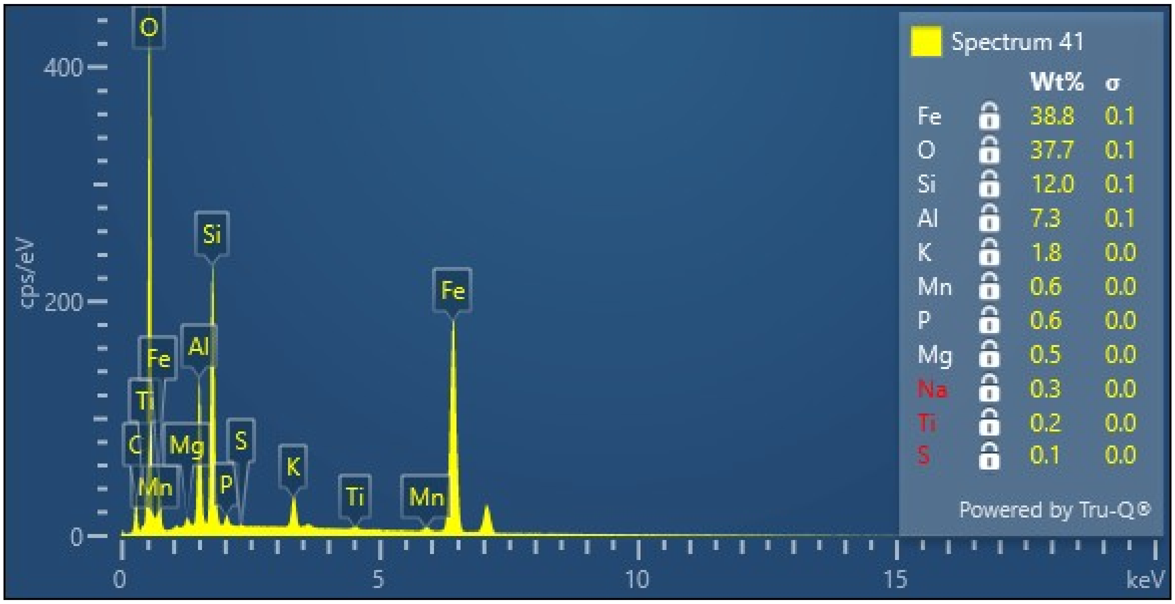

Spectrum 39
Wt% σ
O 42.6 0.1
Fe 40.4 0.1
Si 8.3 0.1
Al 5.4 0.0
K 1.3 0.0
Mg 0.9 0.0
Ti 0.3 0.0
P 0.2 0.0
Na 0.2 0.0
Mn 0.1 0.0
As 0.1 0.1
Powered by Tru-Q®
cps/eV
0
200
400
600
0
5
10
15
keV
O
Fe
Si
Al
C
Ti
Mg
P
K
Ti
Fe


Spectrum 40
Wt% σ
C 42.1 0.2
O 38.8 0.1
Fe 11.0 0.1
Si 3.8 0.0
Al 2.7 0.0
K 0.5 0.0
Mn 0.3 0.0
Mg 0.2 0.0
P 0.2 0.0
S 0.1 0.0
Ca 0.1 0.0
Powered by Tru-Q®
cps/eV
0
200
400
0
5
10
15
keV
O
C
Si
Fe
Al
Ti
Mg
Mn
P
K
Ca
S
Ca
Ti
Mn
Fe


O
Si
Fe
Fe
Al
Ti
C
Mg
S
Mn
P
K
Ti
Mn
cps/eV
400
200
0
0
5
10
15
keV
Spectrum 41
Wt% σ
Fe 38.8 0.1
O 37.7 0.1
Si 12.0 0.1
Al 7.3 0.1
K 1.8 0.0
Mn 0.6 0.0
P 0.6 0.0
Mg 0.5 0.0
Na 0.3 0.0
Ti 0.2 0.0
S 0.1 0.0
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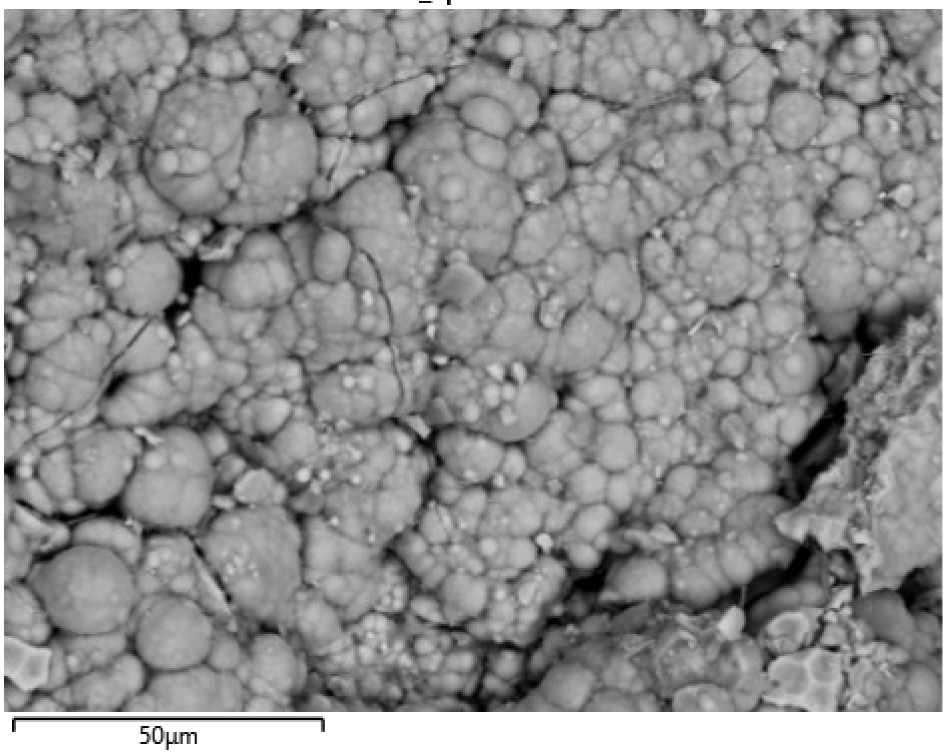
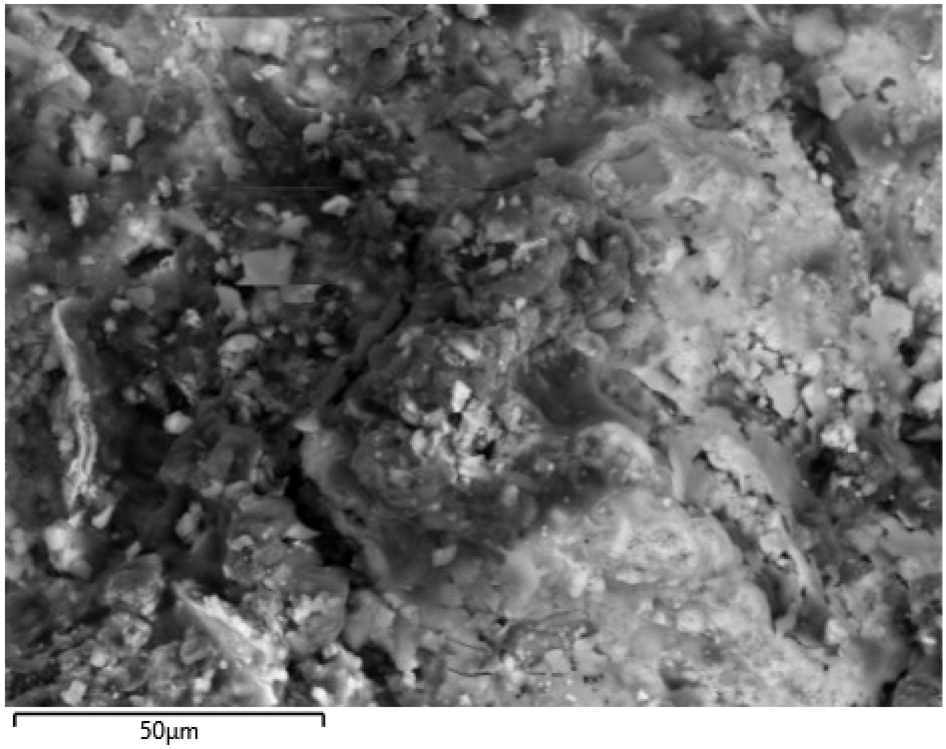
Site 1 detail images

Site1_sp38-2000x

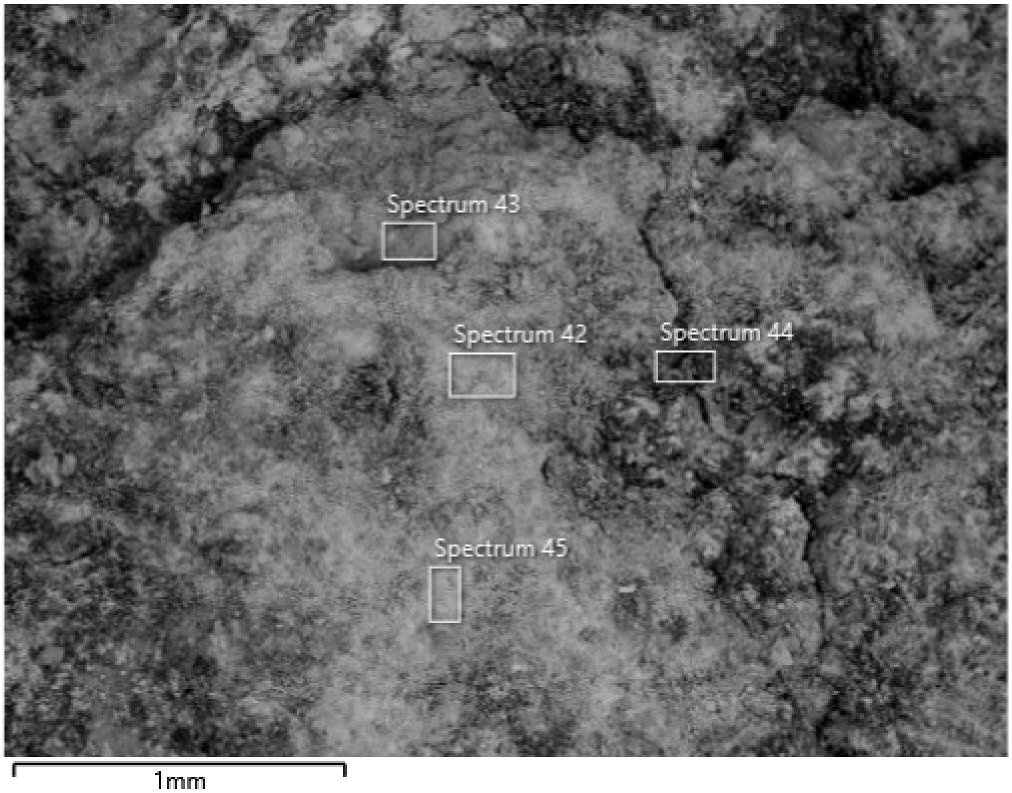


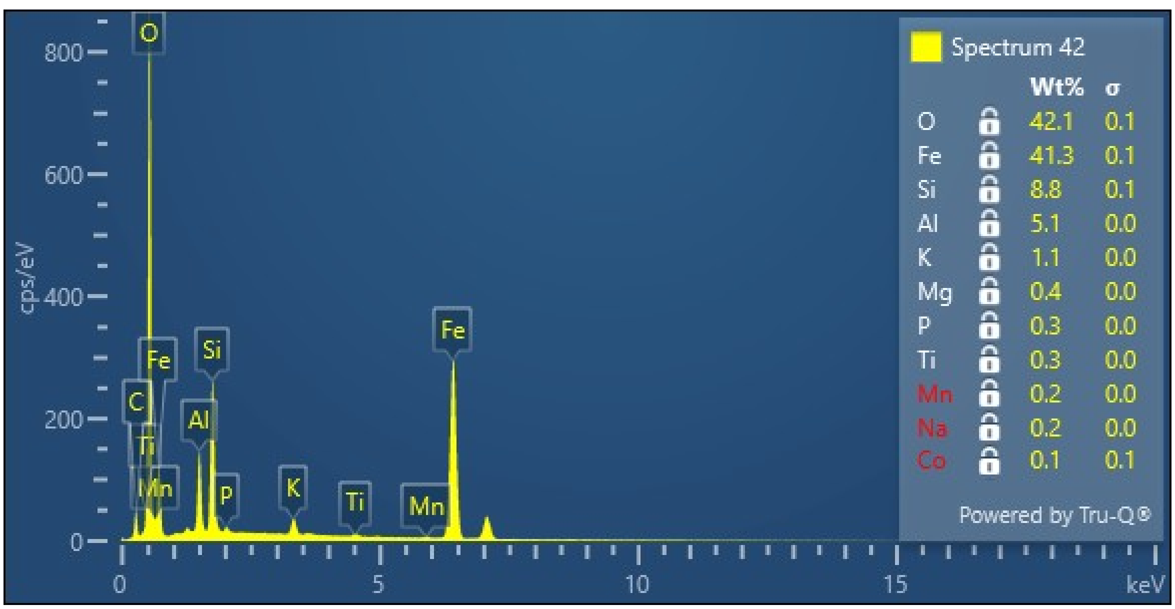
Site1_sp40-2000x

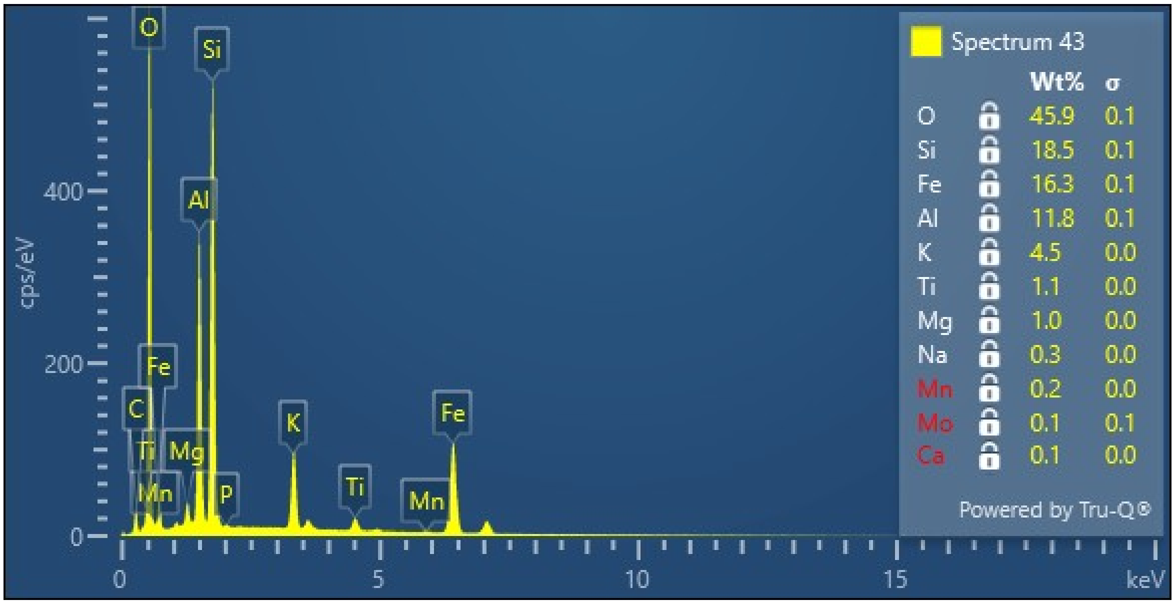


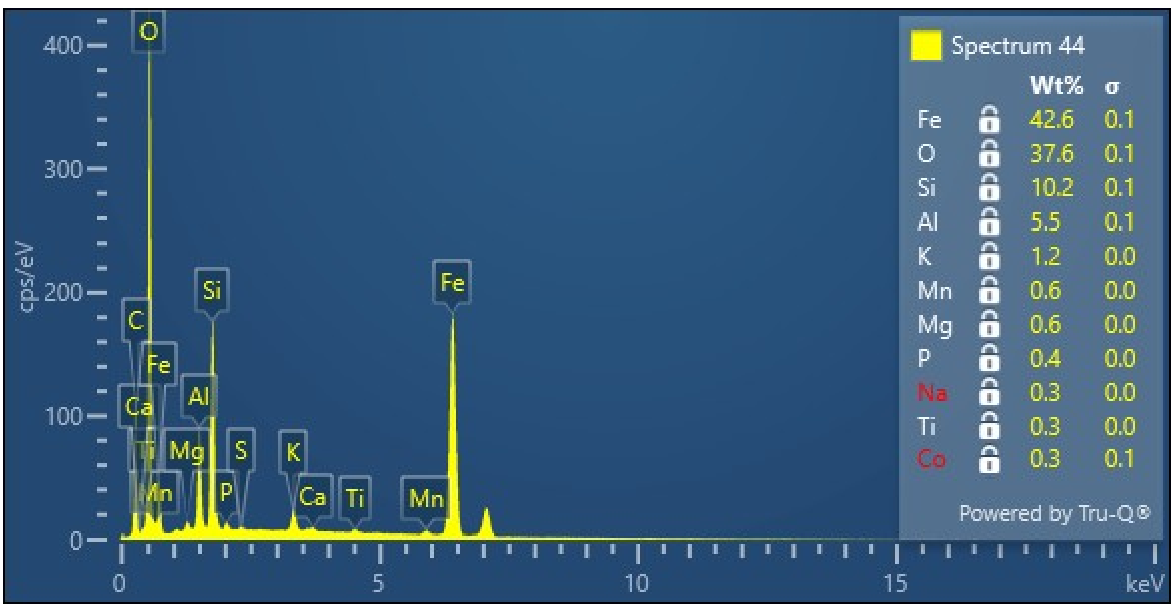
Site 2

GC-4 Site 2 overview









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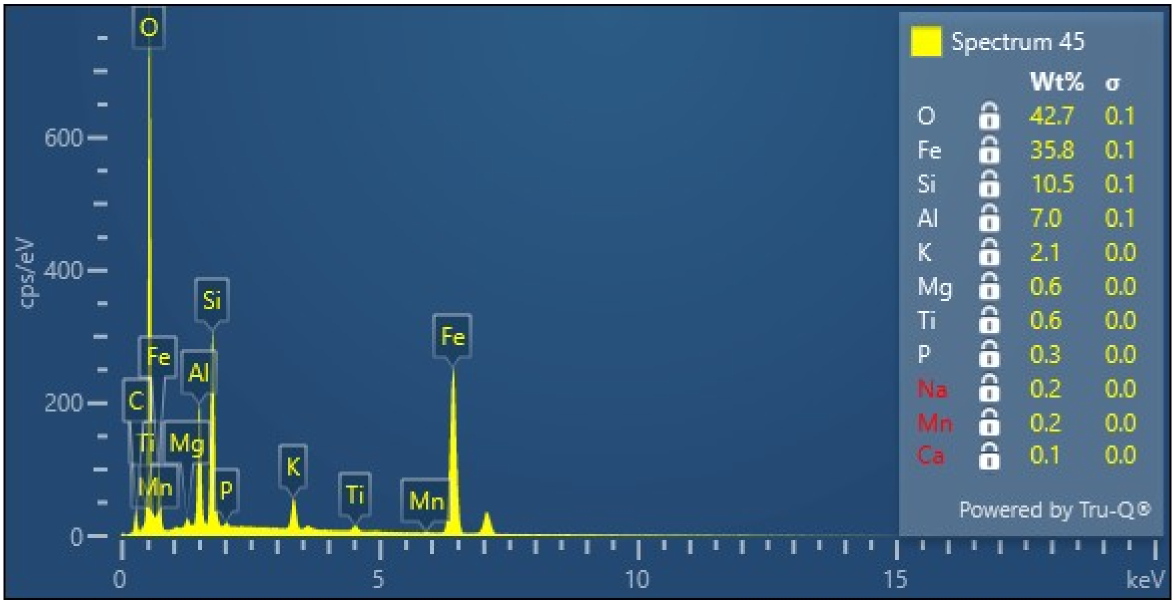
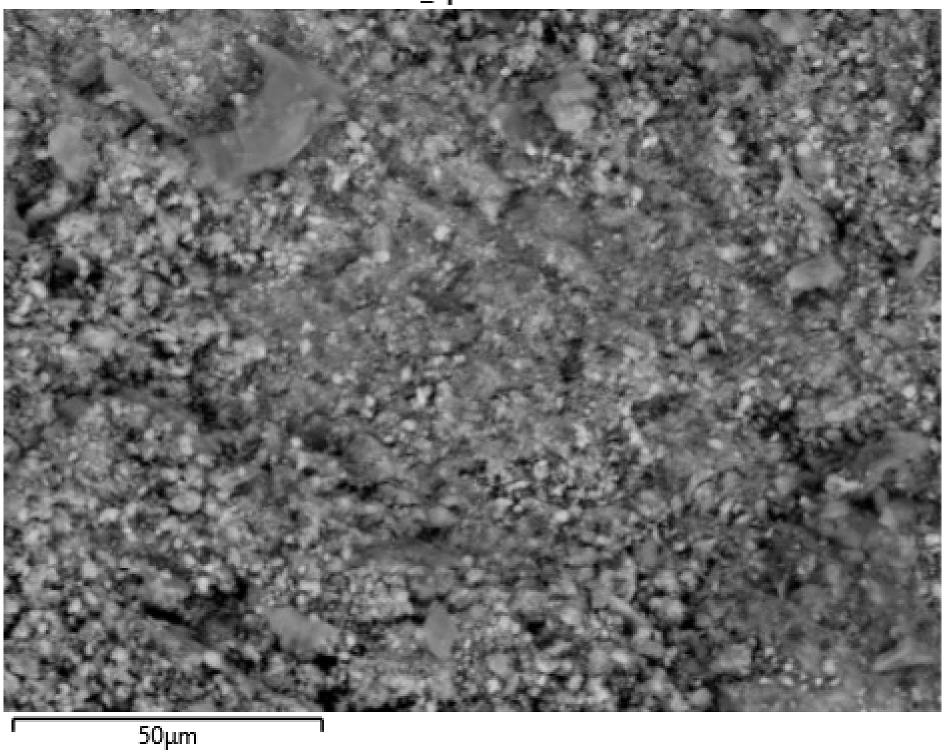
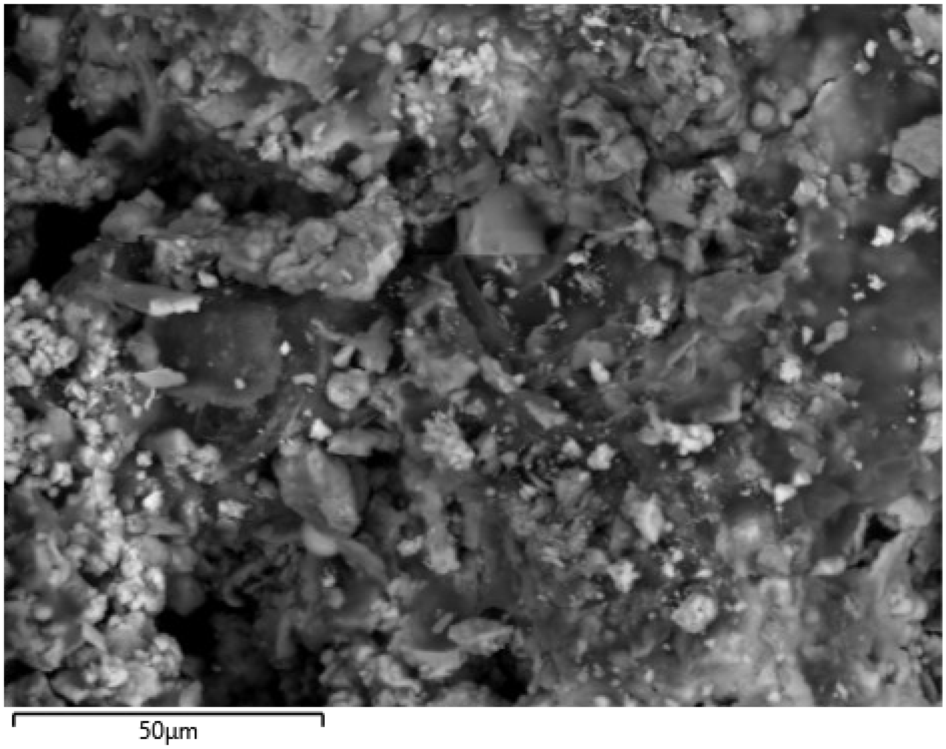

O
Si
Fe
Fe
Al
C
Ti
Mg
Mn
P
K
Ti
Mn
cps/eV
0
200
400
600
0
5
10
15
keV
Spectrum 45
Wt% σ
O 42.7 0.1
Fe 35.8 0.1
Si 10.5 0.1
Al 7.0 0.1
K 2.1 0.0
Mg 0.6 0.0
Ti 0.6 0.0
P 0.3 0.0
Na 0.2 0.0
Mn 0.2 0.0
Ca 0.1 0.0
Powered by Tru-Q®

Site 2 detail images

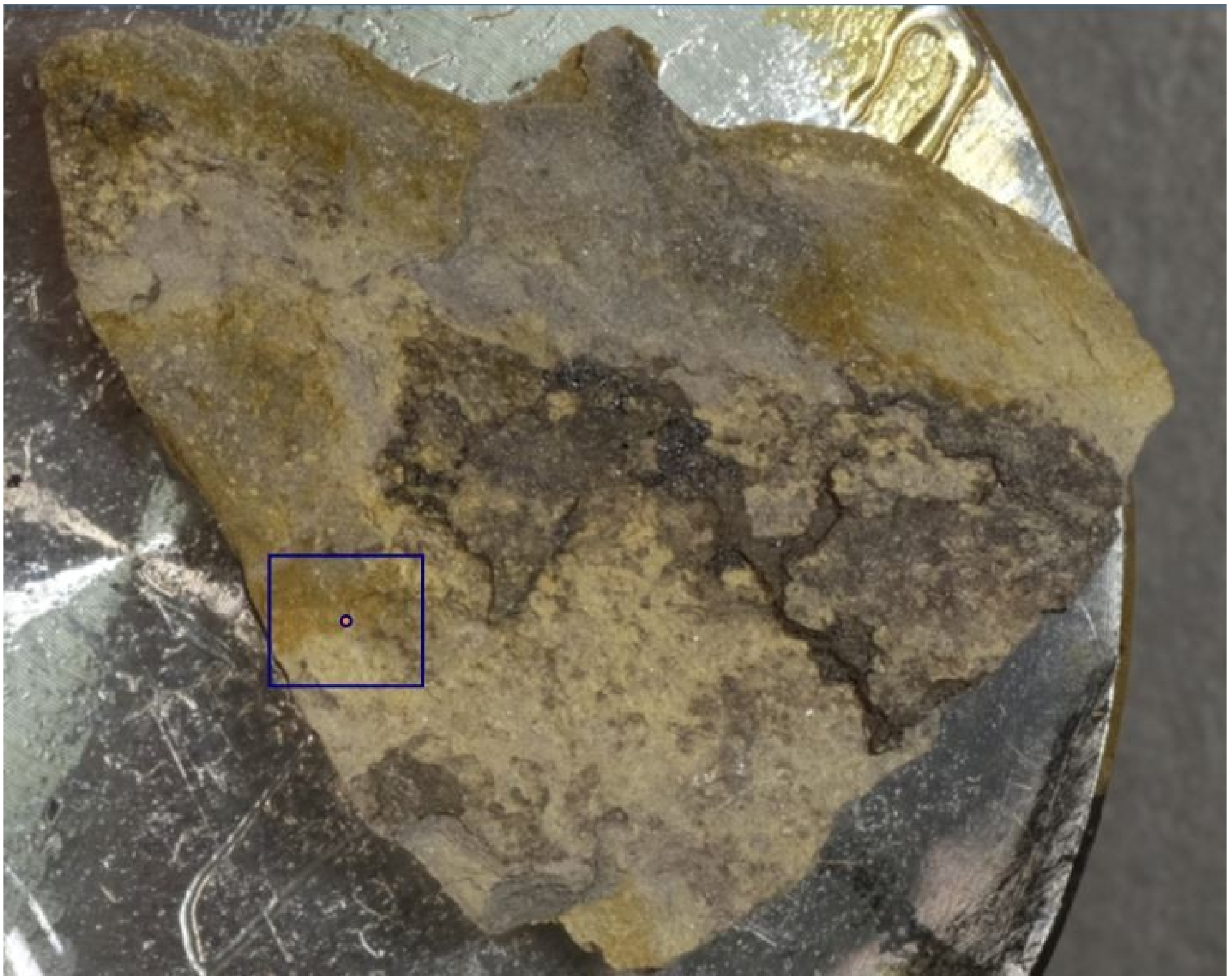
Site2_sp42-2000x



Site2_sp44-2000x

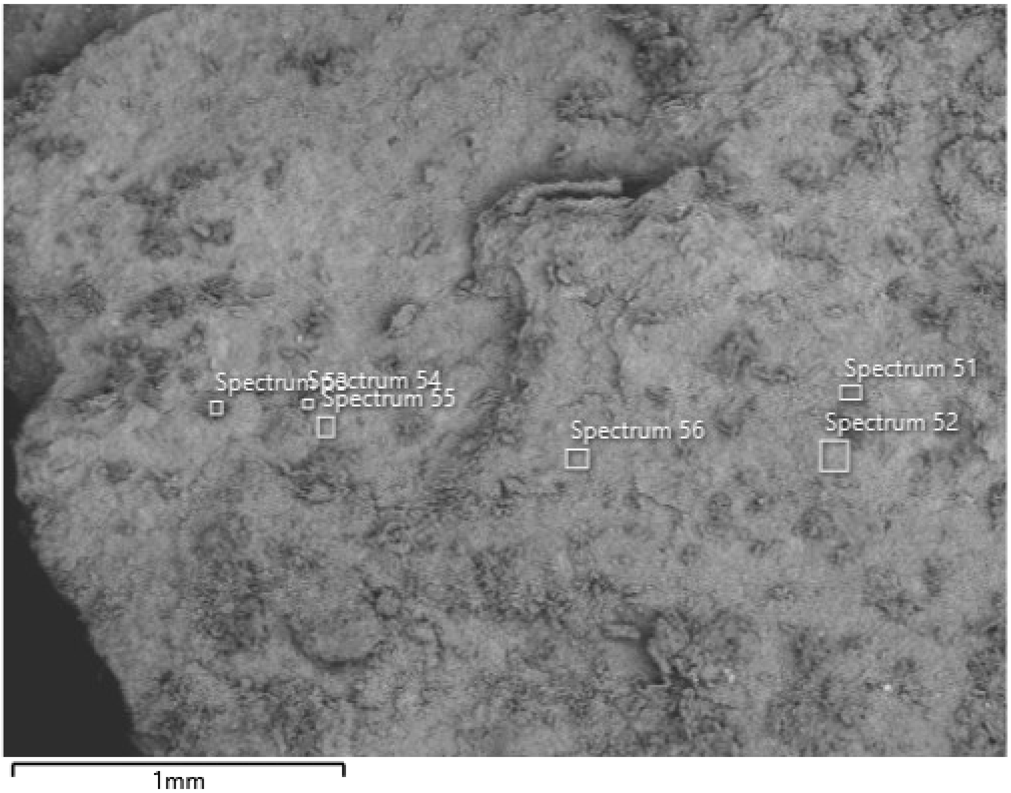


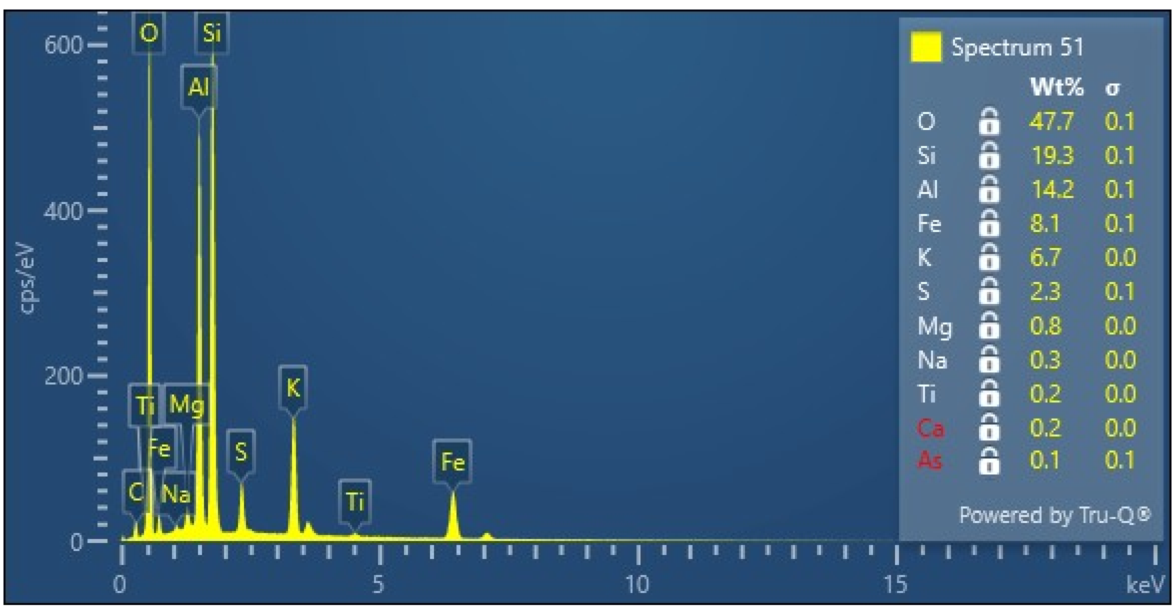
Site 1

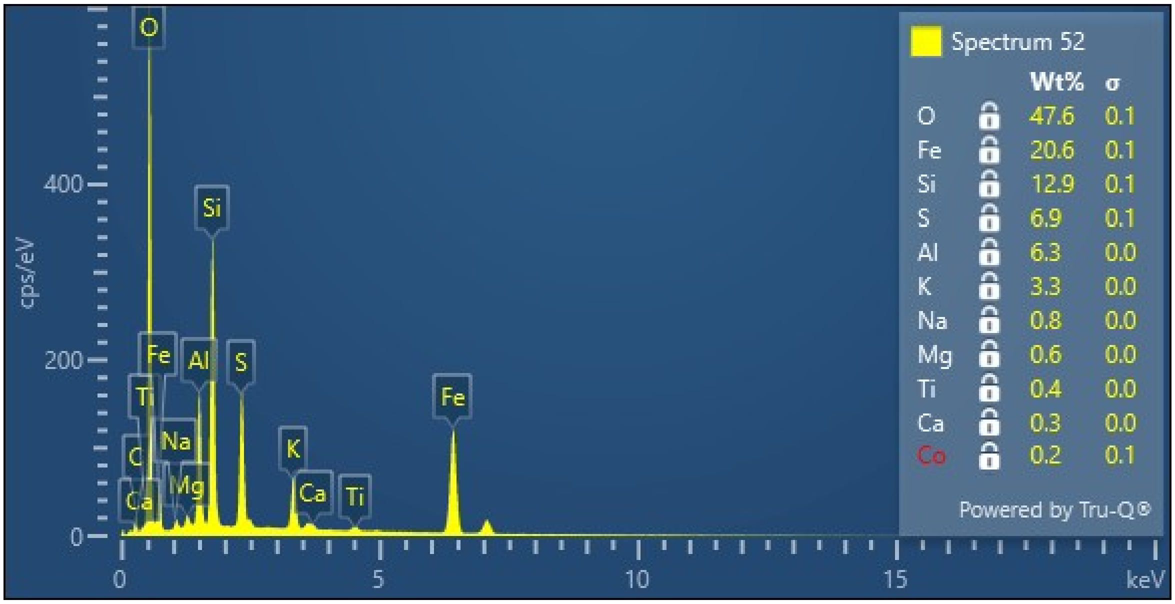


GS-AP-MW-17V 74-75   10/18/2021

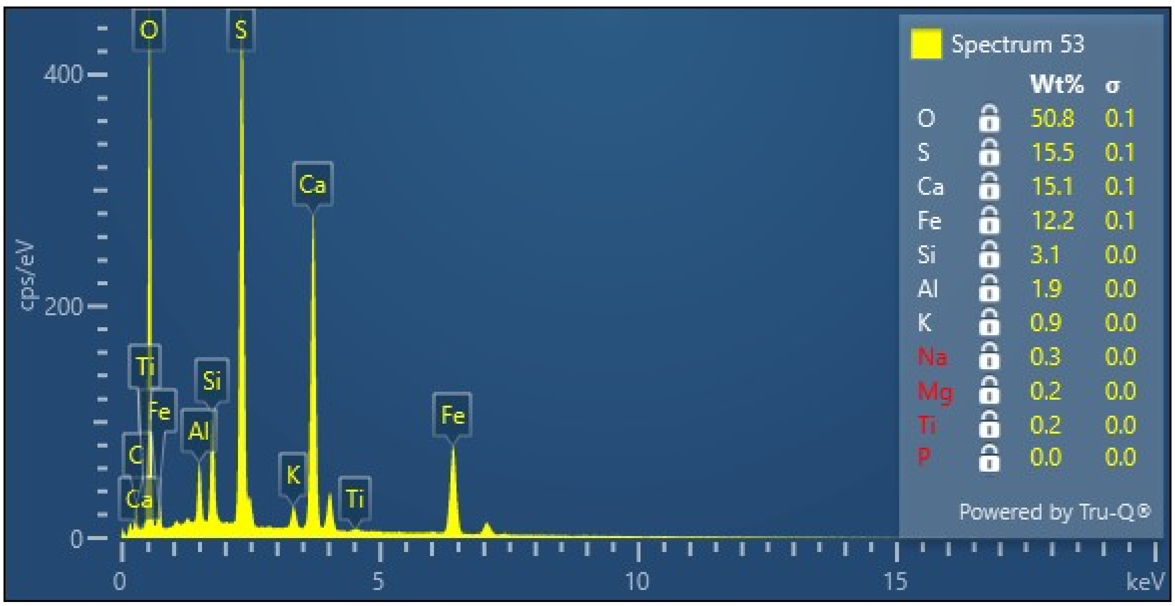
17v_74-75 Site 1 overview 100x



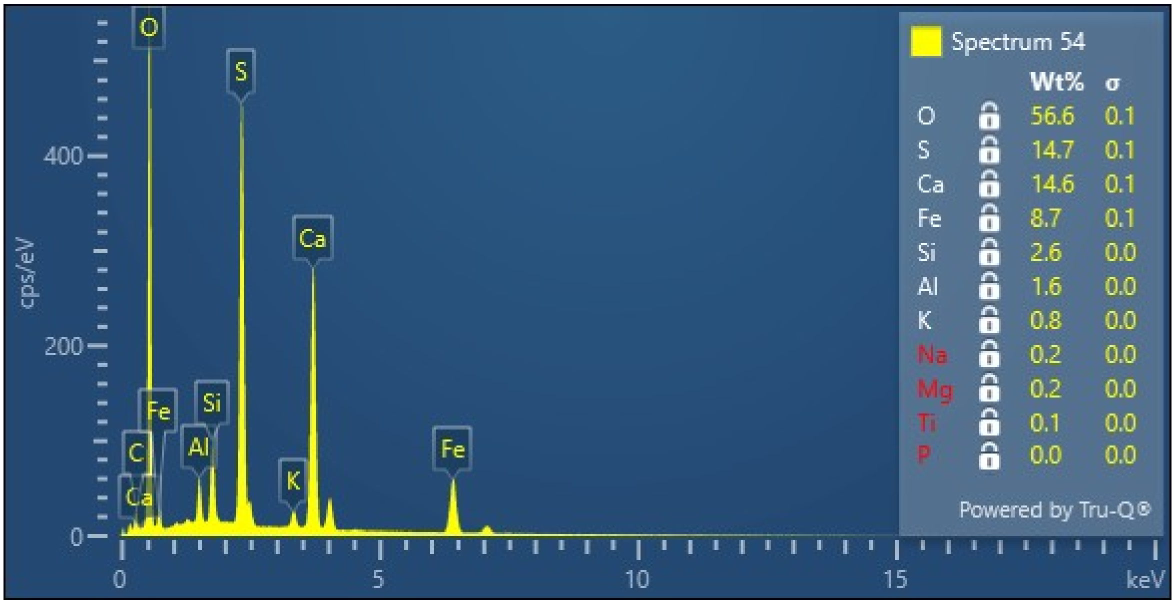


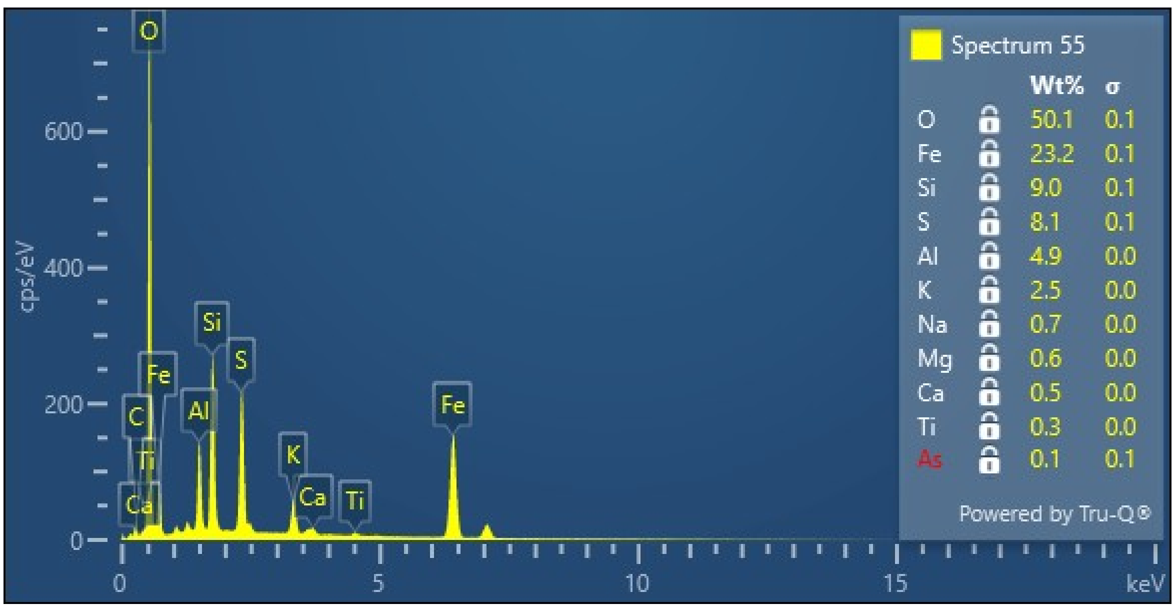


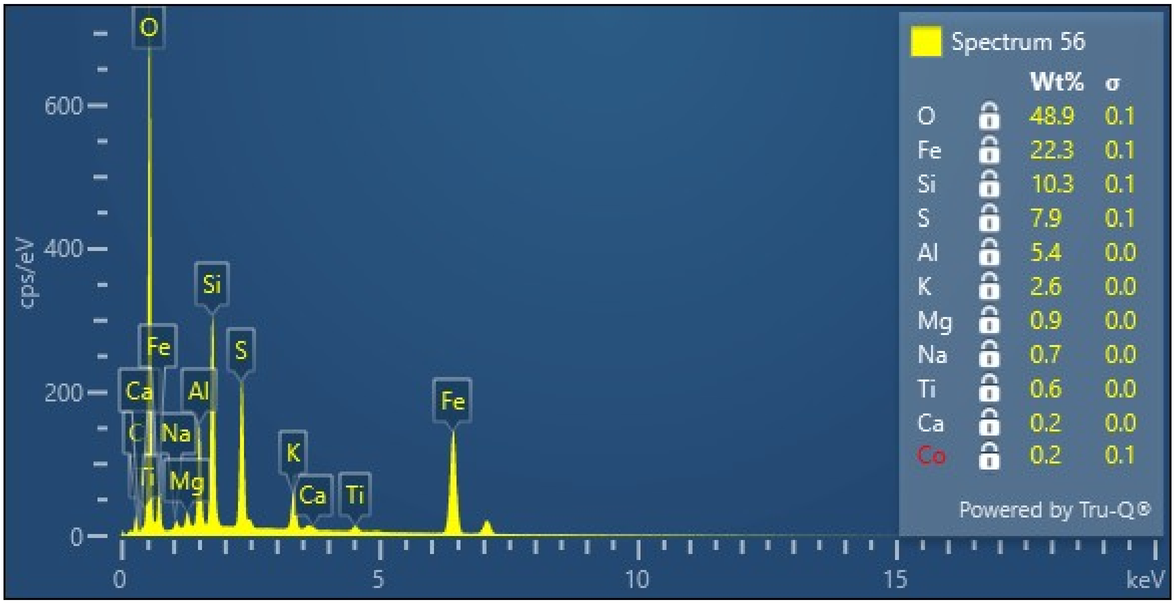
Spectrum 52
Wt% σ
O 47.6 0.1
Fe 20.6 0.1
Si 12.9 0.1
S 6.9 0.1
Al 6.3 0.0
K 3.3 0.0
Na 0.8 0.0
Mg 0.6 0.0
Ti 0.4 0.0
Ca 0.3 0.0
Co 0.2 0.1
Powered by Tru-Q®
cps/eV
keV



Spectrum 53
Wt% σ
O 50.8 0.1
S 15.5 0.1
Ca 15.1 0.1
Fe 12.2 0.1
Si 3.1 0.0
Al 1.9 0.0
K 0.9 0.0
Na 0.3 0.0
Mg 0.2 0.0
Ti 0.2 0.0
P 0.0 0.0
Powered by Tru-Q®
cps/eV
keV


O
S
Ca
Fe
Si
Al
C
Ca
K
Fe
400
200
0
cps/eV
0
5
10
15
keV
Spectrum 54
Wt% σ
O 56.6 0.1
S 14.7 0.1
Ca 14.6 0.1
Fe 8.7 0.1
Si 2.6 0.0
Al 1.6 0.0
K 0.8 0.0
Na 0.2 0.0
Mg 0.2 0.0
Ti 0.1 0.0
P 0.0 0.0
Powered by Tru-Q®


O
Si
S
Fe
C
Al
Ti
Ca
K
Ca
Ti
Fe
600
400
200
0
cps/eV
0
5
10
15
keV
Spectrum 55
Wt% σ
O 50.1 0.1
Fe 23.2 0.1
Si 9.0 0.1
S 8.1 0.1
Al 4.9 0.0
K 2.5 0.0
Na 0.7 0.0
Mg 0.6 0.0
Ca 0.5 0.0
Ti 0.3 0.0
As 0.1 0.1
Powered by Tru-Q®



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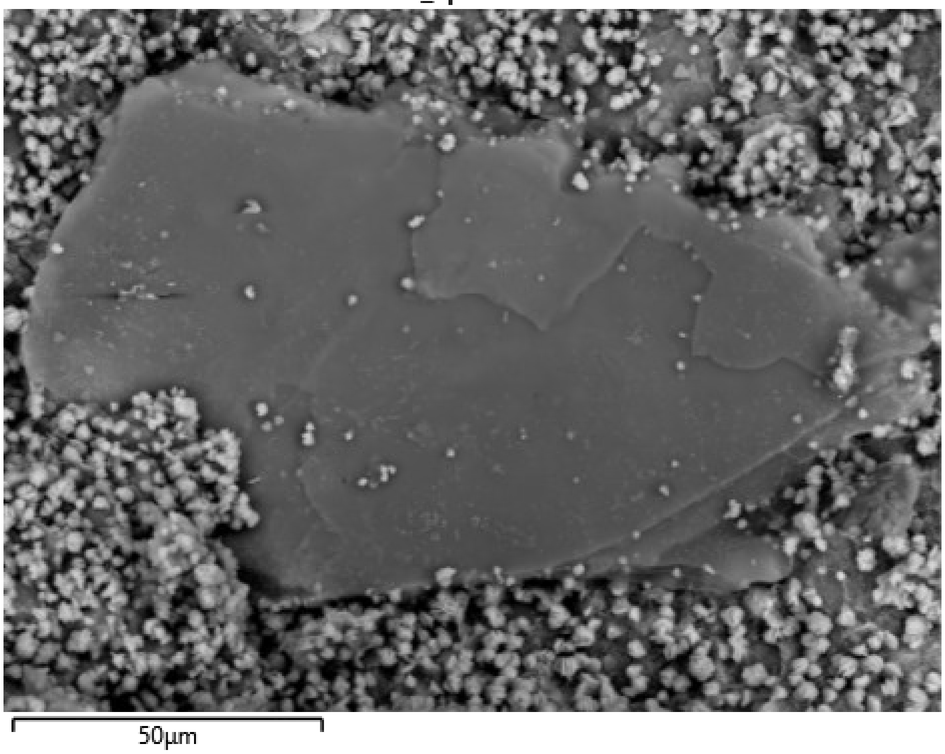
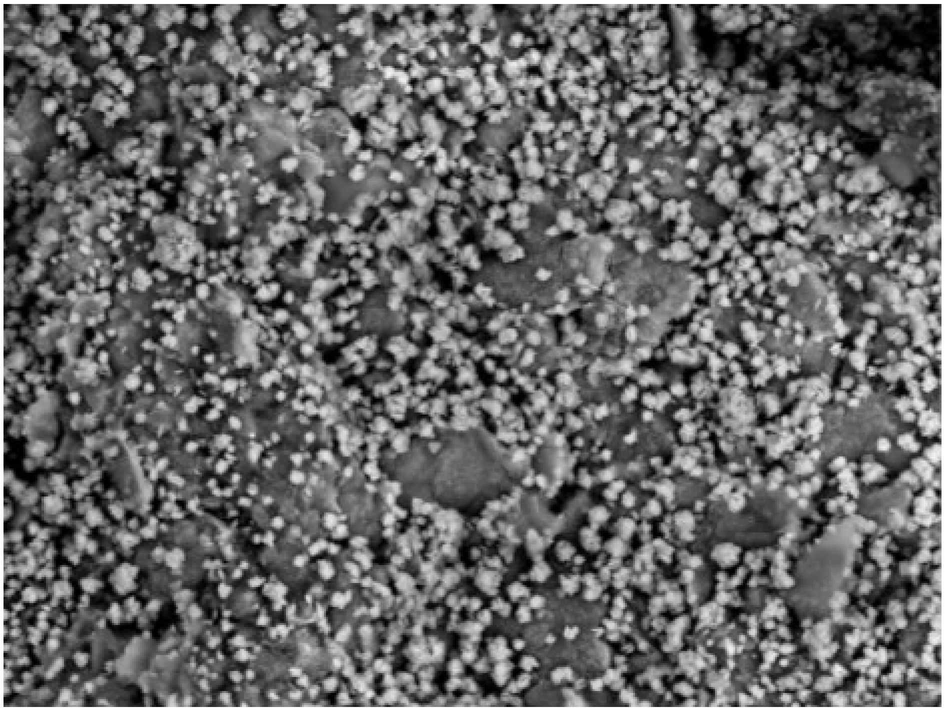
Site 1 detail images

Site1_sp51-2000x

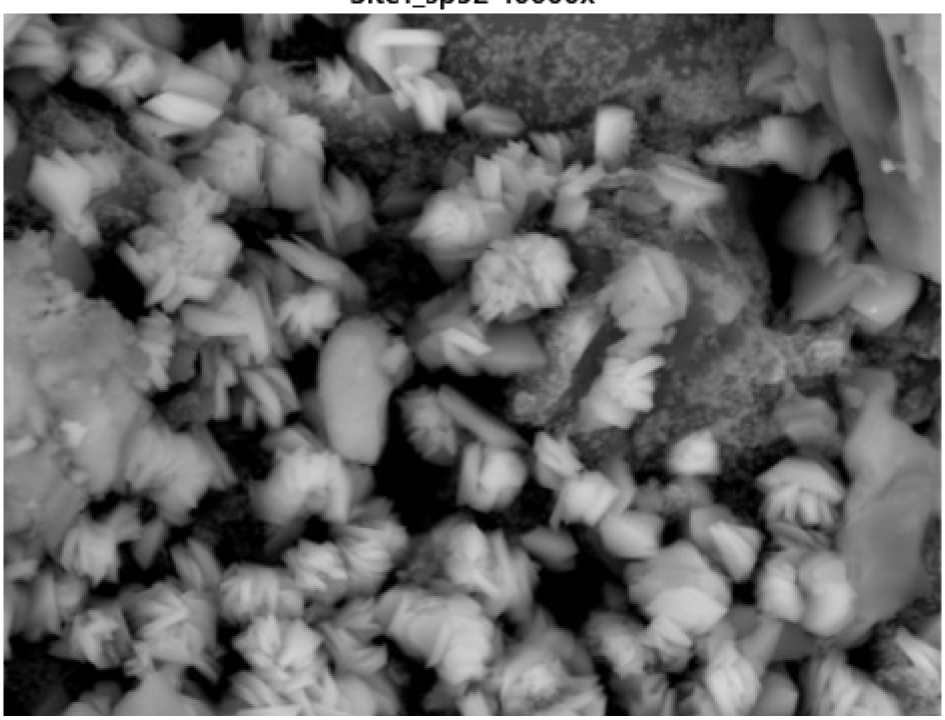


Site1_sp52-2000x



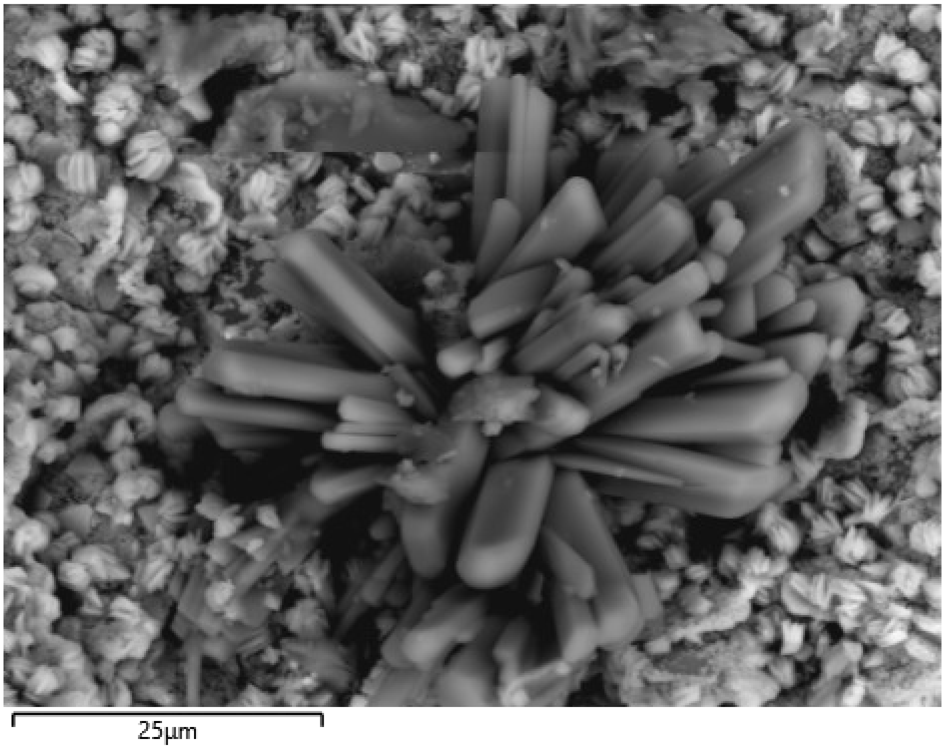
50µm

Site1_sp52-10000x

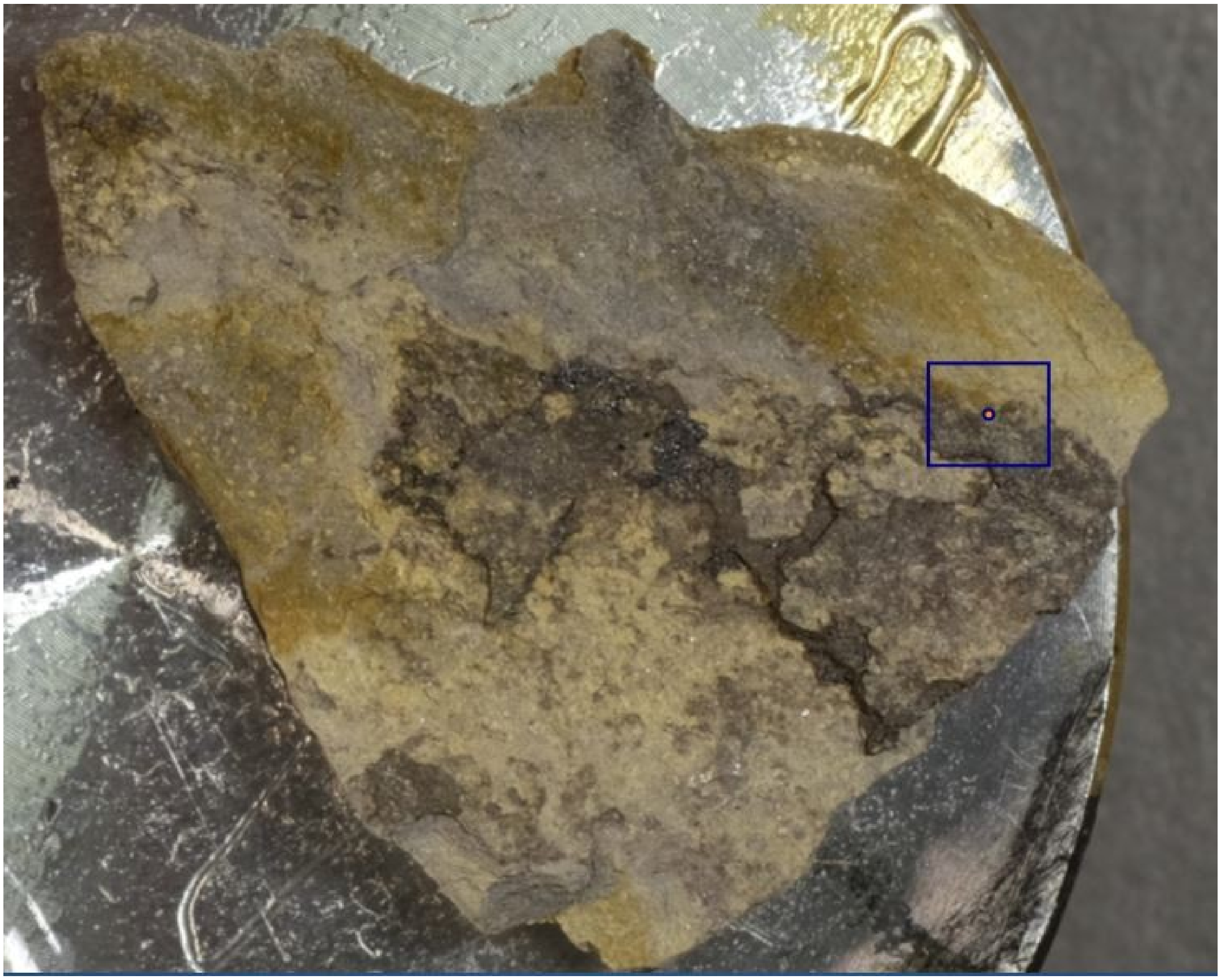


10µm

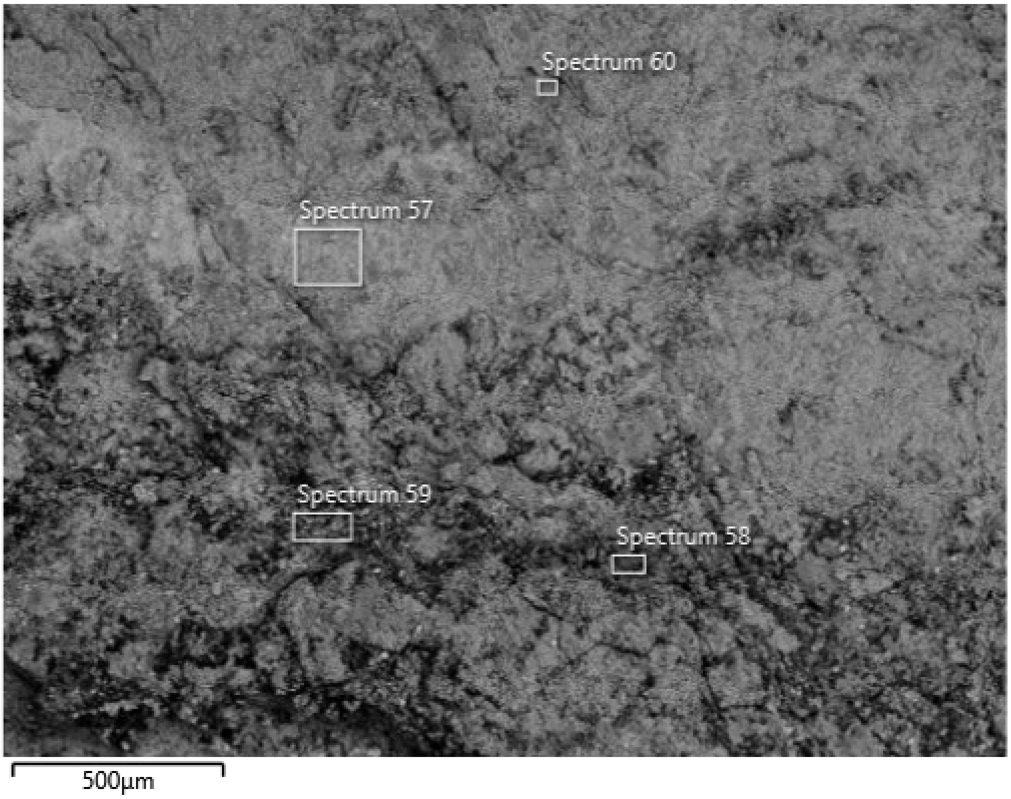
Site1_sp53-4000x

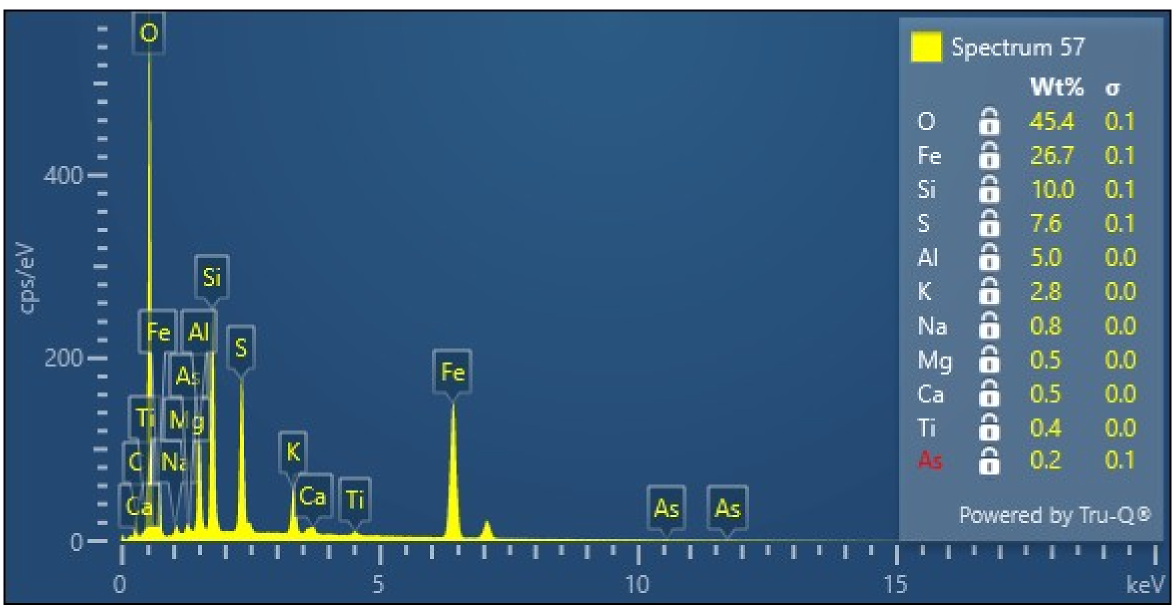


Site 2

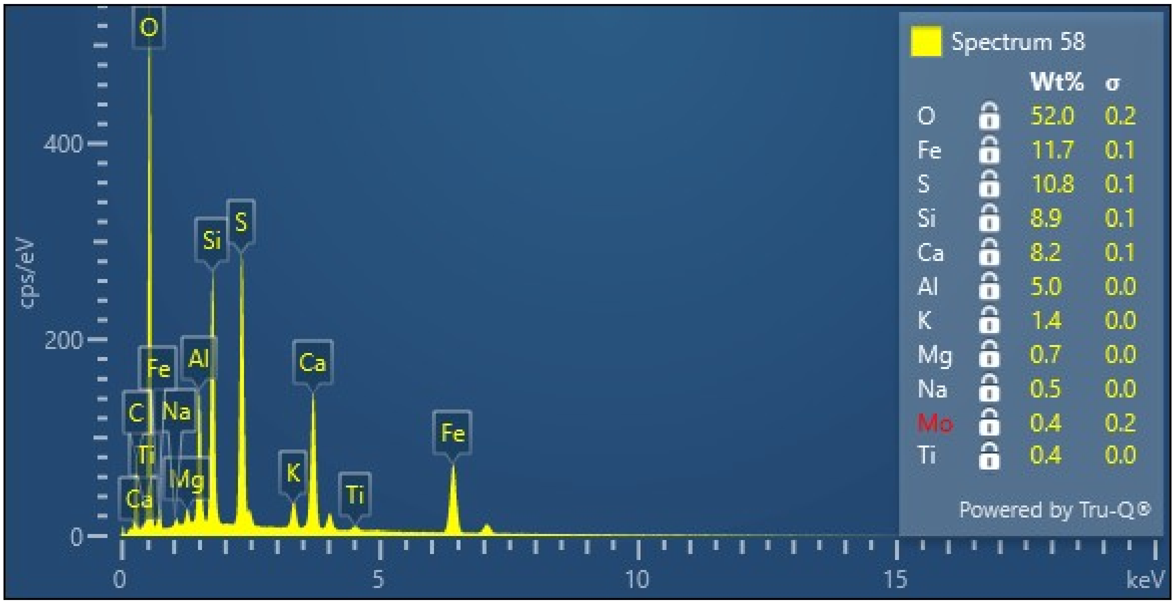


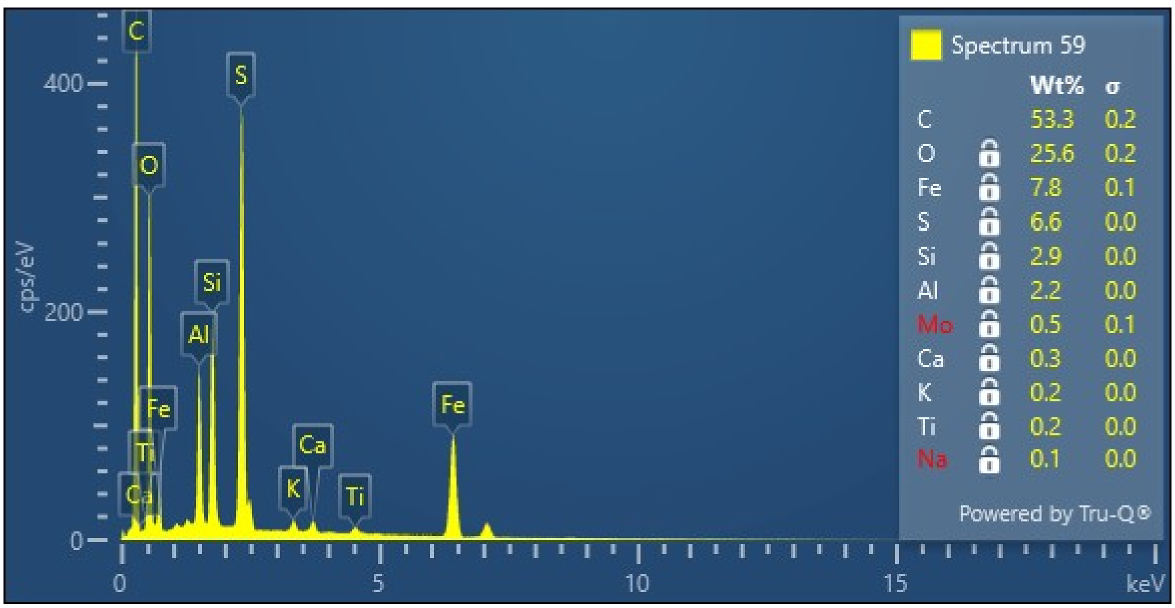
17v_74-75 Site 2 overview 100x

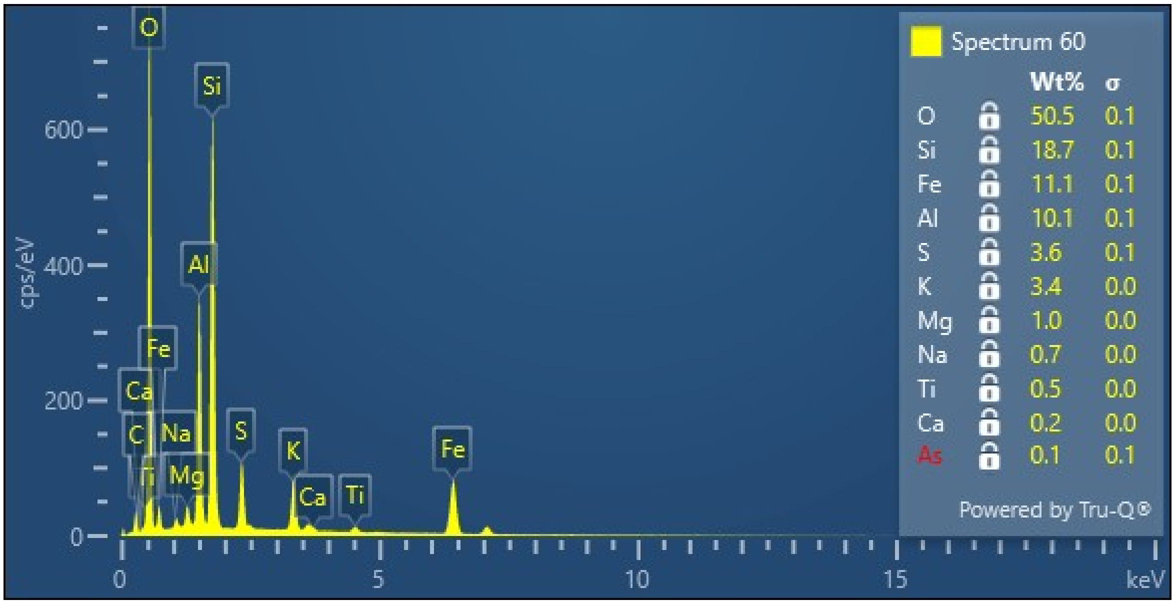




		Wt%	σ
O		45.4	0.1
Fe		26.7	0.1
Si		10.0	0.1
S		7.6	0.1
Al		5.0	0.0
K		2.8	0.0
Na		0.8	0.0
Mg		0.5	0.0
Ca		0.5	0.0
Ti		0.4	0.0
As		0.2	0.1


Spectrum 58
Wt% σ
O 52.0 0.2
Fe 11.7 0.1
S 10.8 0.1
Si 8.9 0.1
Ca 8.2 0.1
Al 5.0 0.0
K 1.4 0.0
Mg 0.7 0.0
Na 0.5 0.0
Mo 0.4 0.2
Ti 0.4 0.0
Powered by Tru-Q®
cps/eV
keV


Spectrum 59
Wt% σ
C 53.3 0.2
O 25.6 0.2
Fe 7.8 0.1
S 6.6 0.0
Si 2.9 0.0
Al 2.2 0.0
Mo 0.5 0.1
Ca 0.3 0.0
K 0.2 0.0
Ti 0.2 0.0
Na 0.1 0.0
Powered by Tru-Q®
cps/eV
keV



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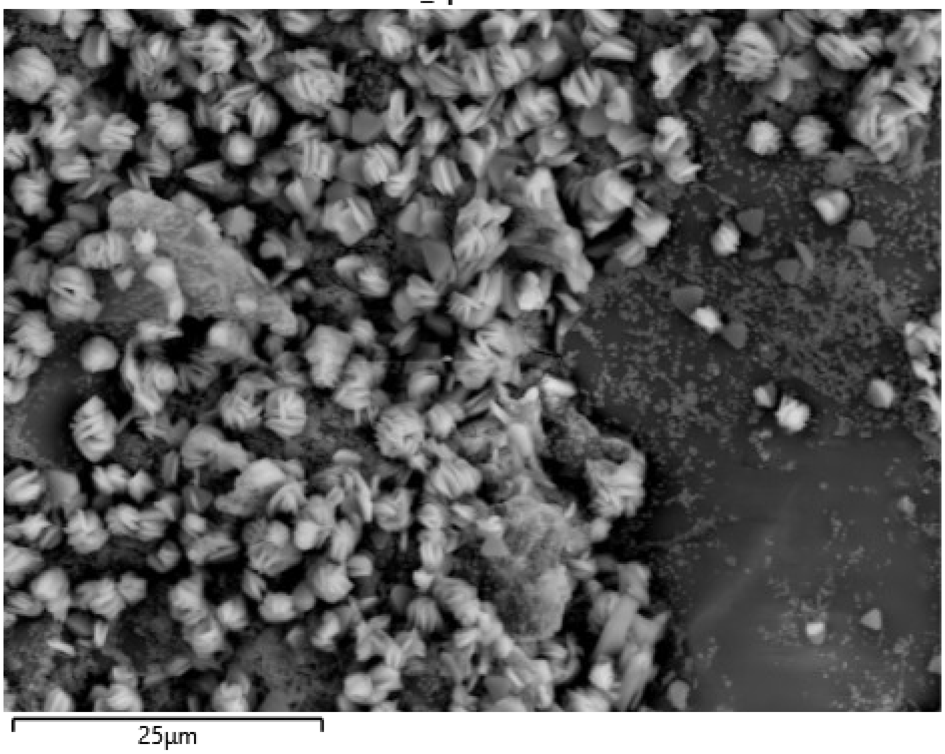
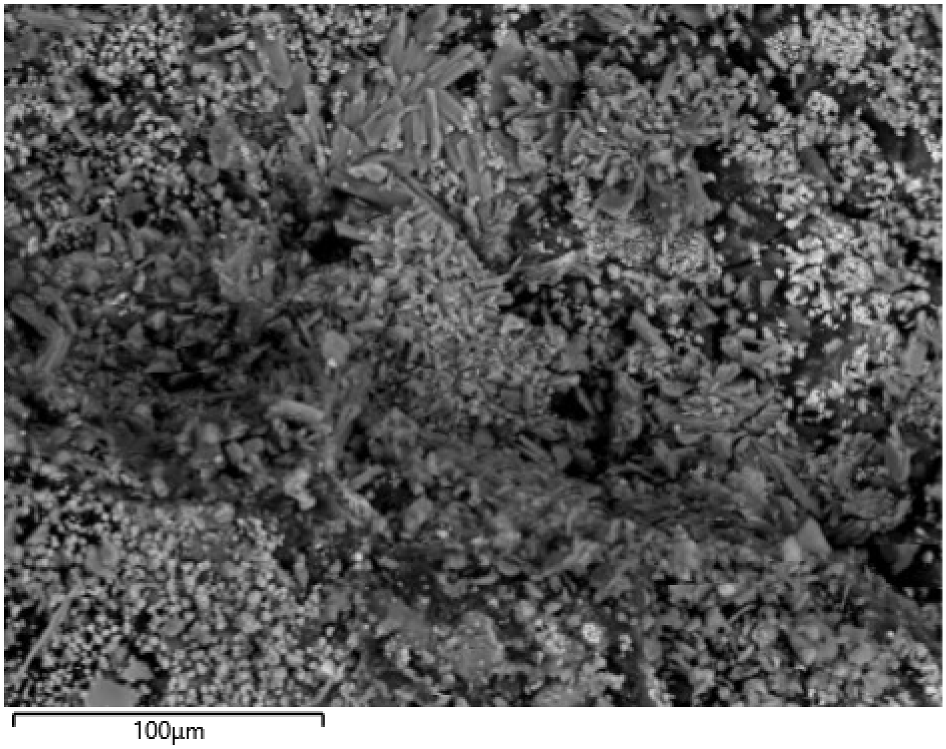
Site 2 detail images

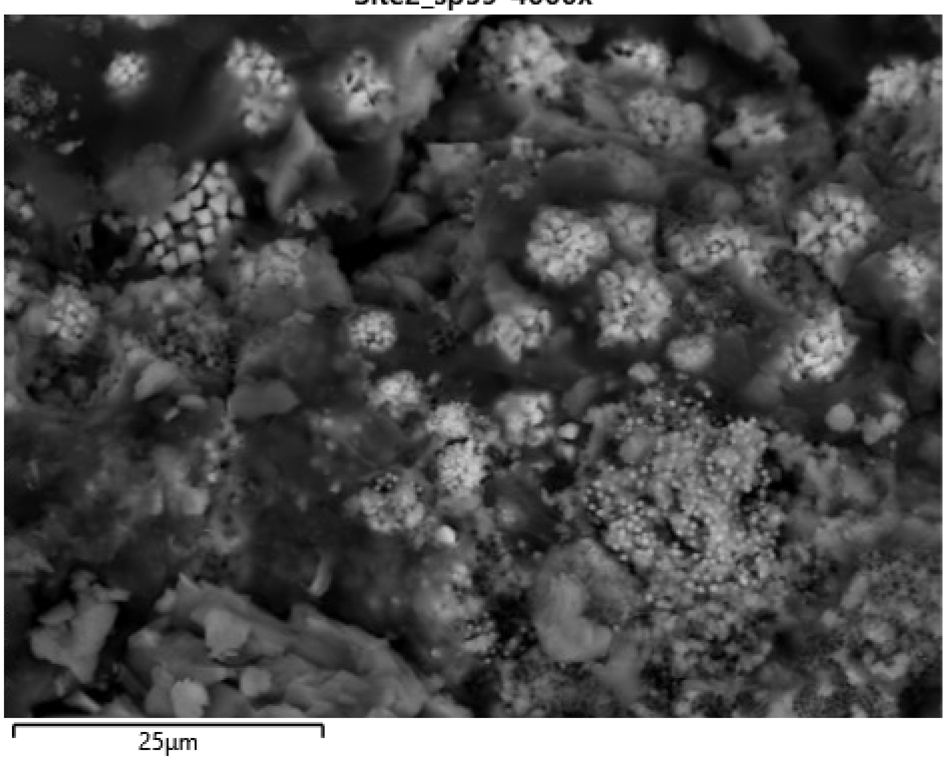
Site2_sp57-4000x



Site2_sp58-1000x

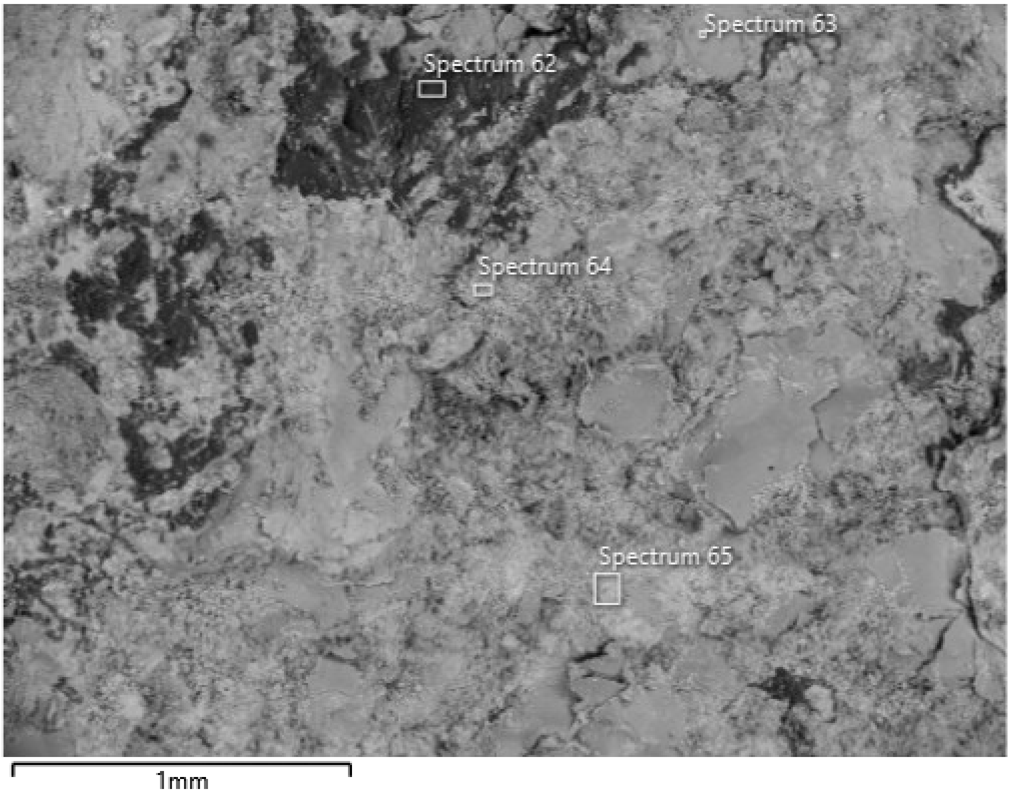


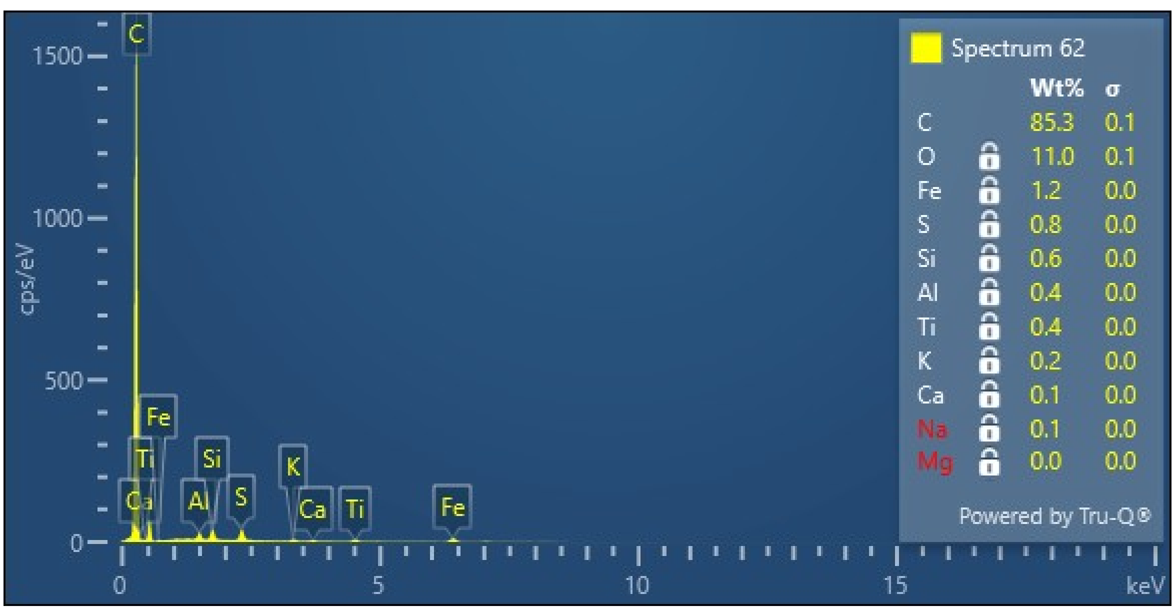
Site2_sp59-4000x

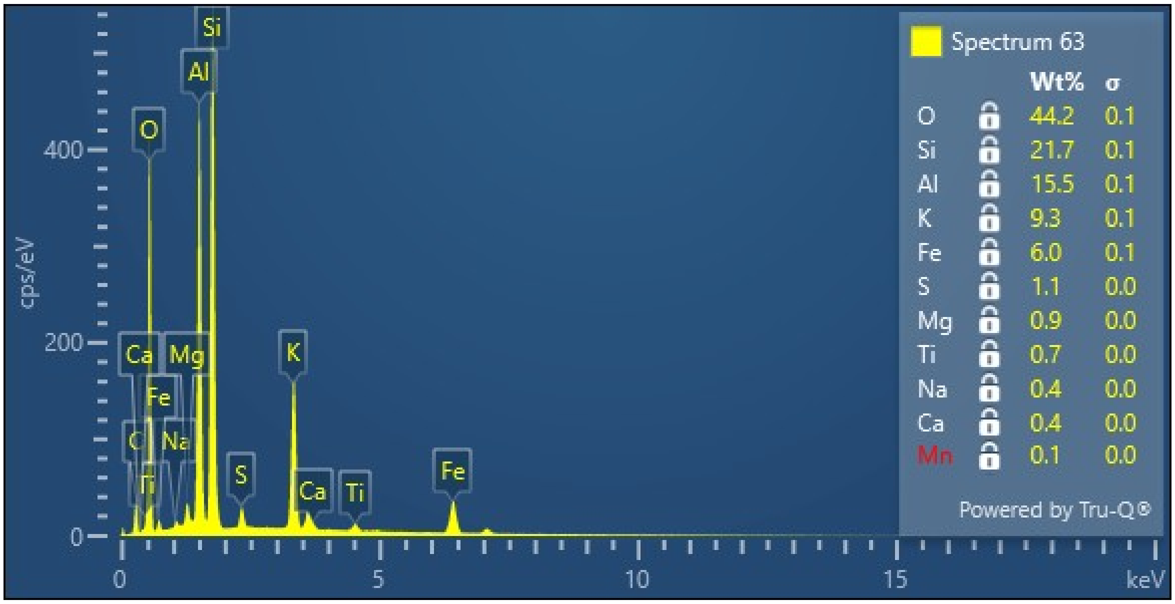


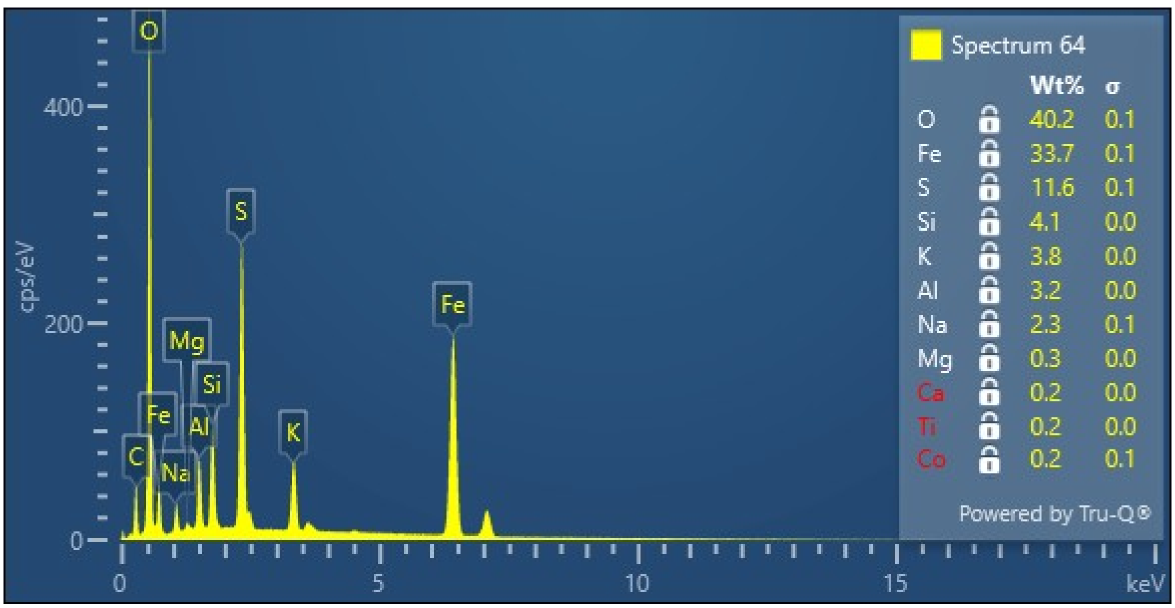
Site 1

17v_177-178 Site 1 overview 100x









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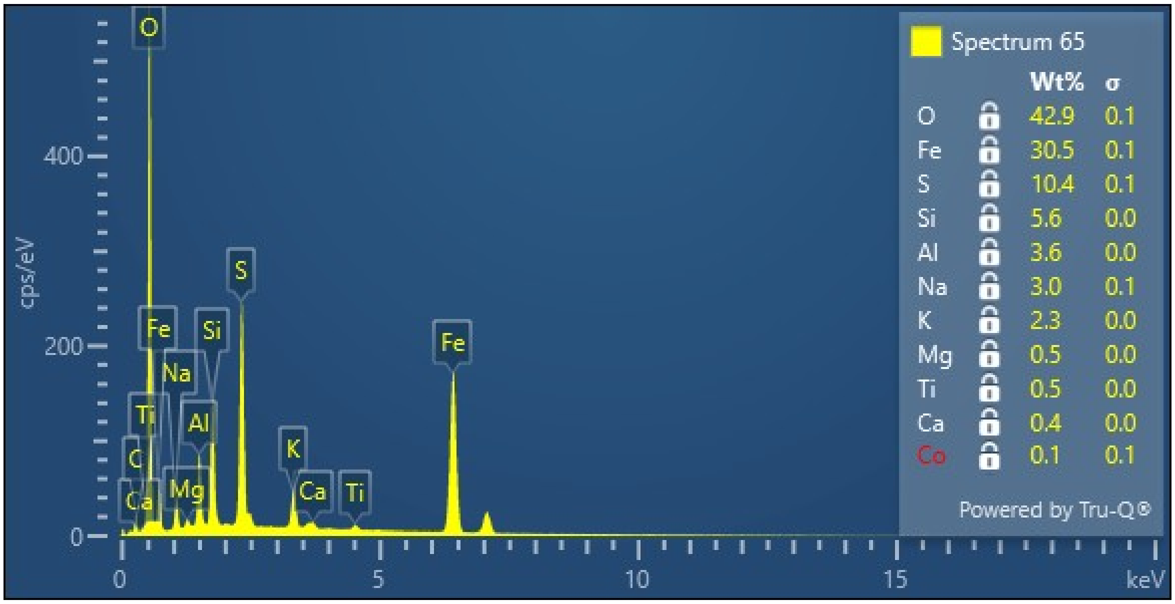

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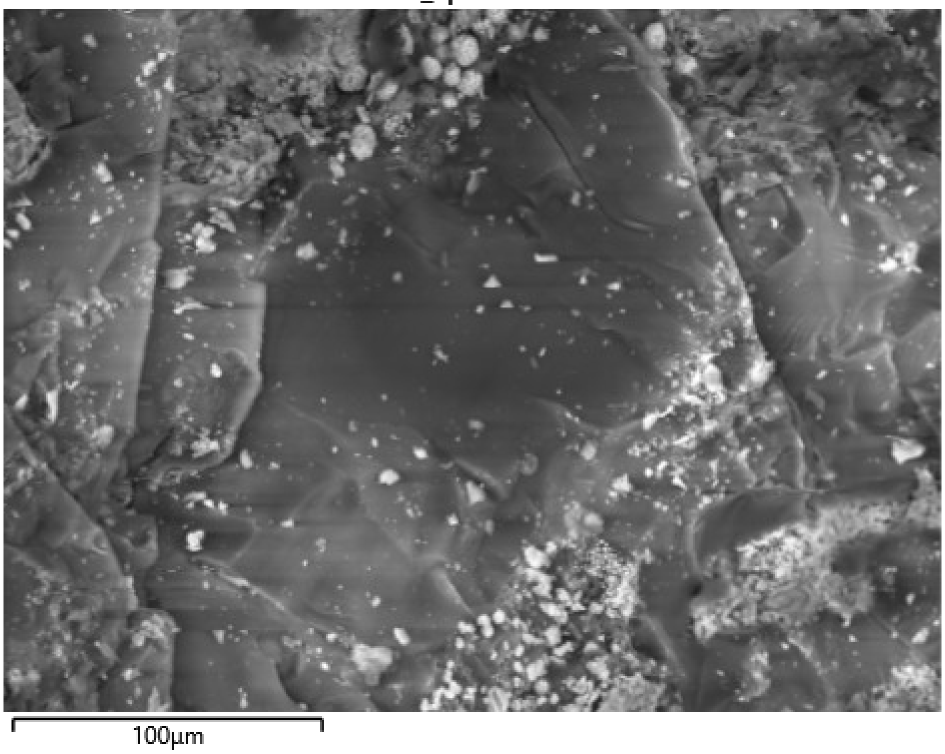
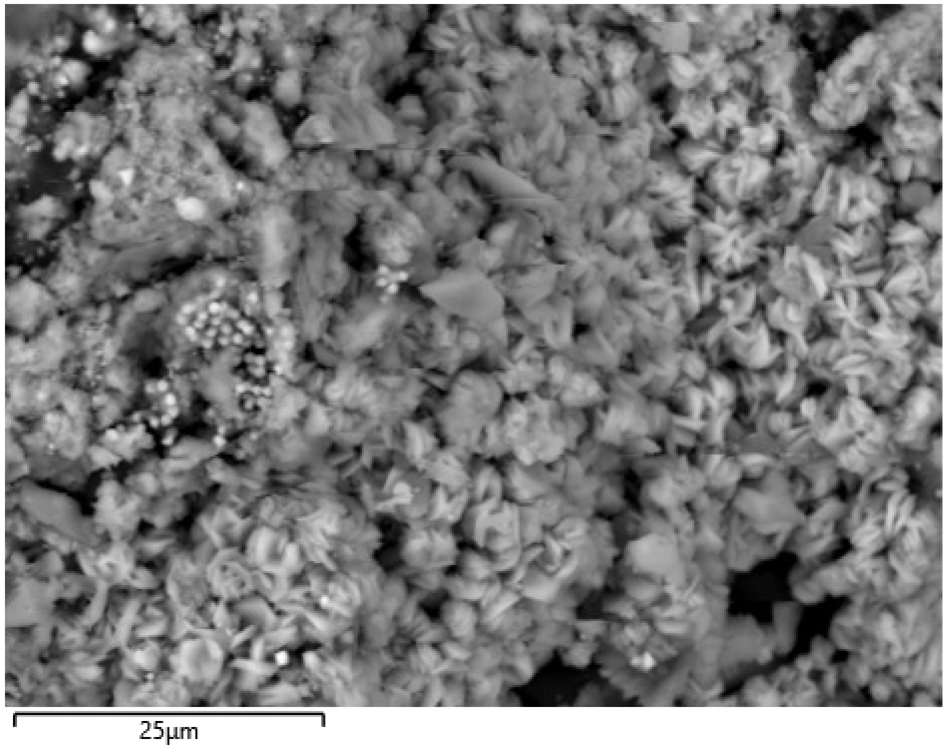
Site 1 detail images

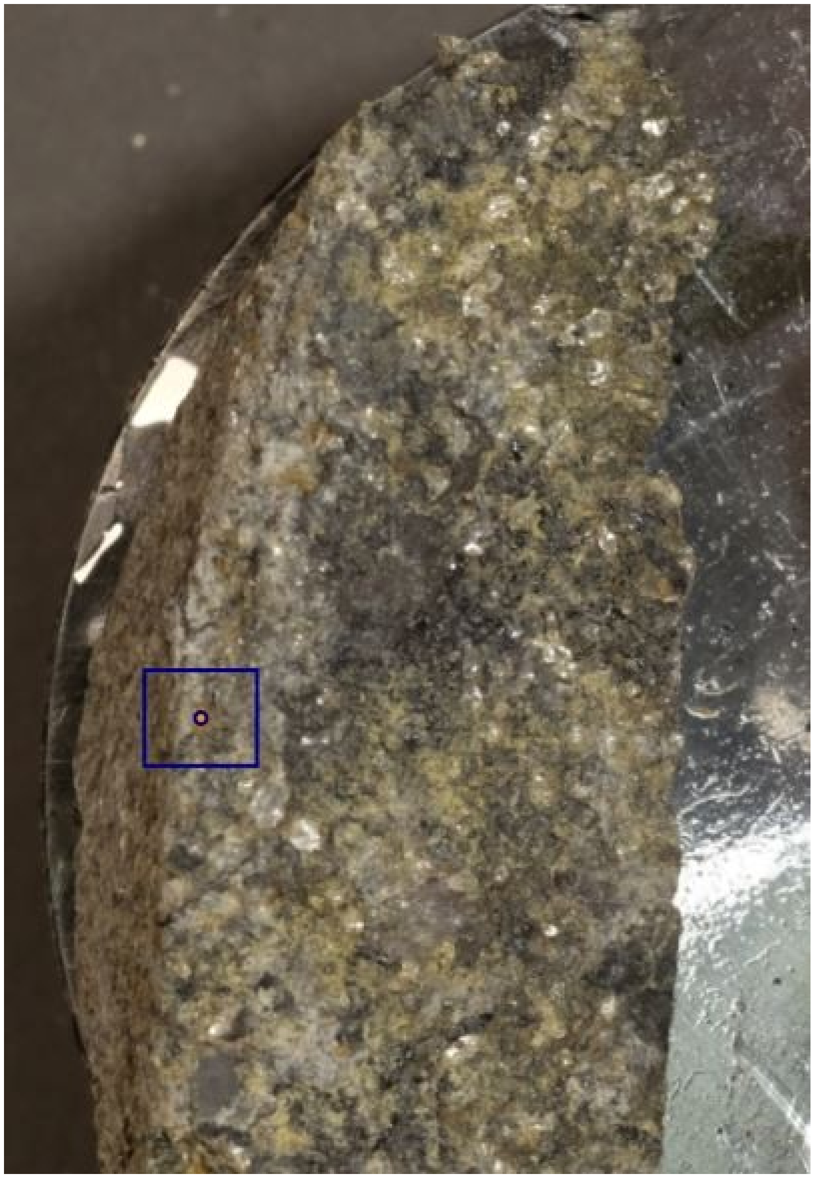
Site1_sp62-1000x



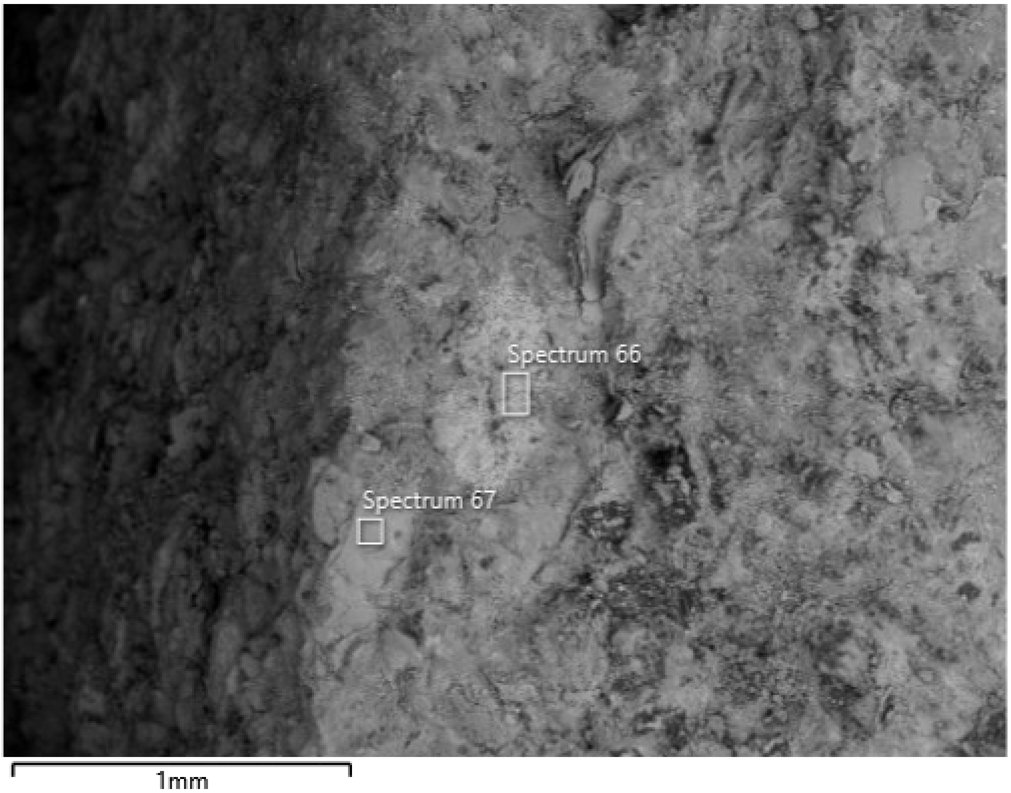
Site1_sp64-4000x

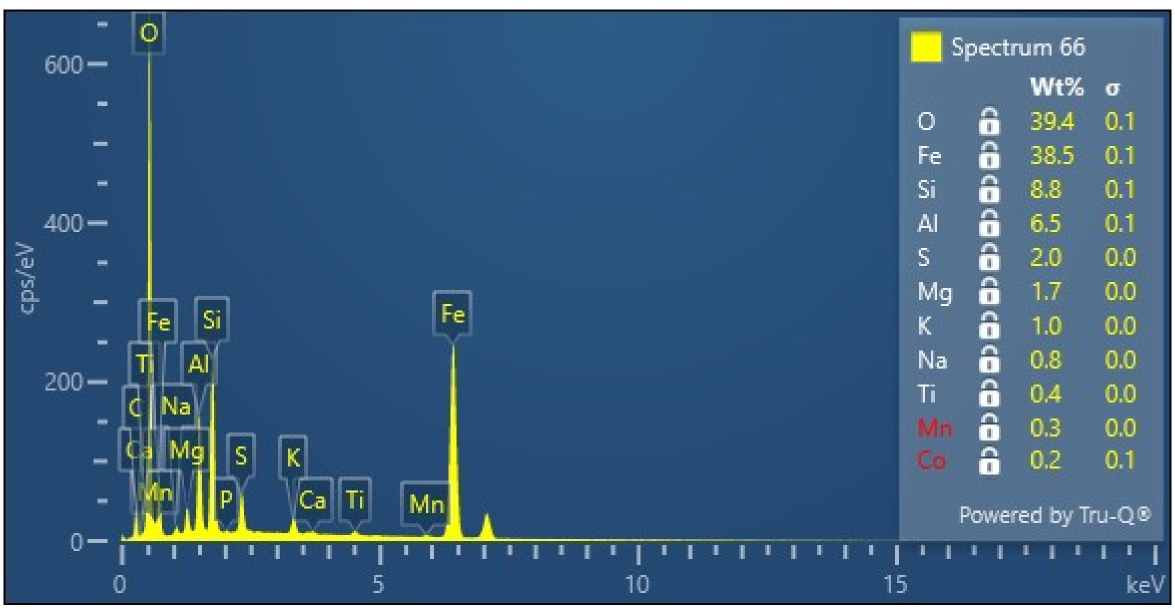


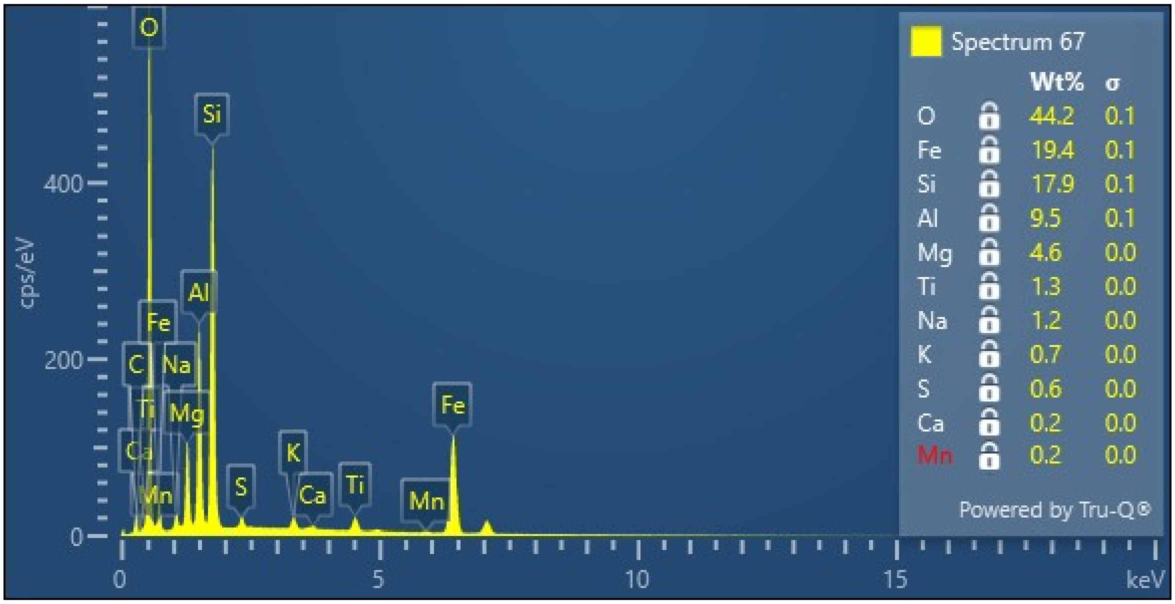
Site 2 (orange spot)



17v_177-178 Site 1 overview 100x

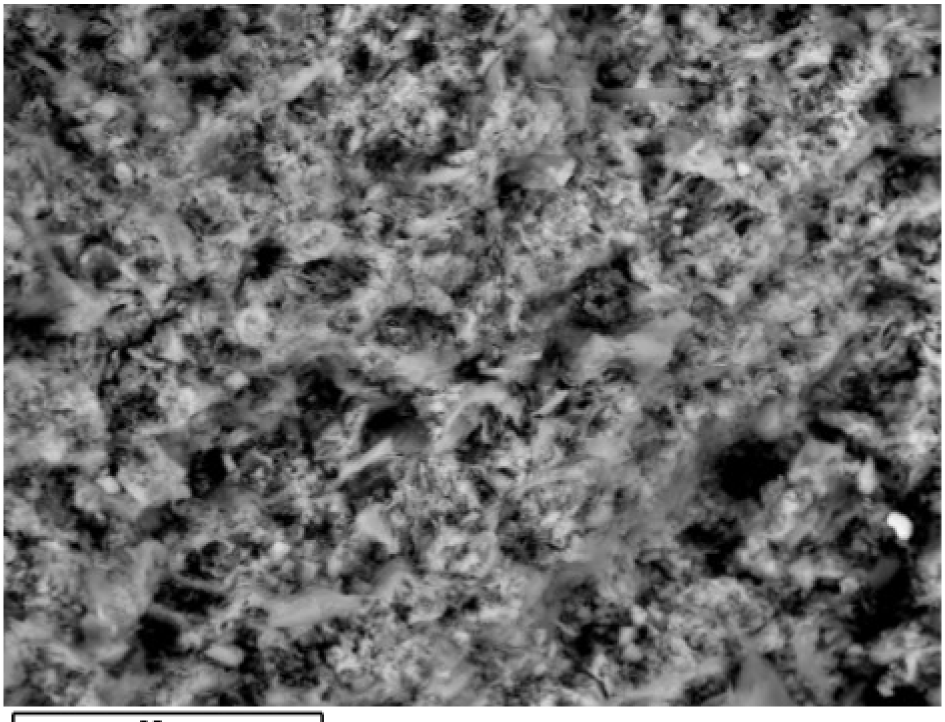





Spectrum 67
Wt% σ
O 44.2 0.1
Fe 19.4 0.1
Si 17.9 0.1
Al 9.5 0.1
Mg 4.6 0.0
Ti 1.3 0.0
Na 1.2 0.0
K 0.7 0.0
S 0.6 0.0
Ca 0.2 0.0
Mn 0.2 0.0
Powered by Tru-Q®
cps/eV
400
200
0
0
5
10
15
keV
O
Si
Al
Fe
C
Na
Ti
Mg
Ca
Mn
S
K
Ca
Ti
Mn
Fe

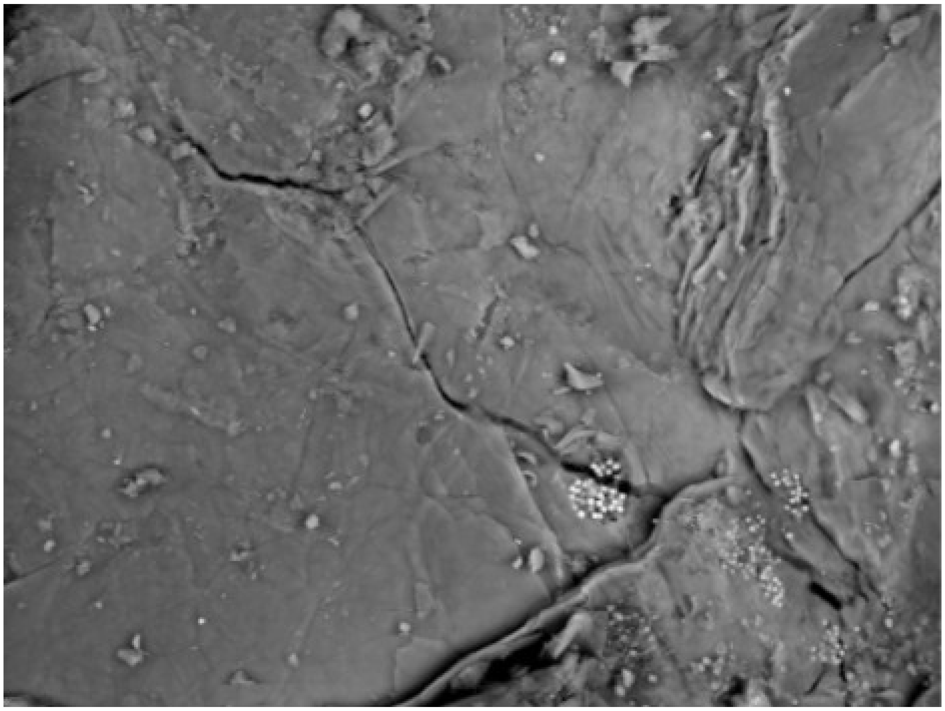
Site 2 detail images

Site2_sp66-4000x



25µm

Site2_sp67-2000x



50µm