REPORT

Annual Groundwater Report – 2022

Great River Energy, Stanton Station

Submitted to:

North Dakota Department of Environmental Quality

4201 Normandy Street
Bismarck, North Dakota 58503

Submitted by:

Great River Energy

12300 Elm Creek Boulevard
Maple Grove, Minnesota 55369

Prepared by:

WSP USA Inc.

7245 W Alaska Drive, Suite 200, Lakewood, Colorado, USA 80226

+1 303 980-0540

21509219-020-RPT-0

January 31, 2023

Executive Summary

This report presents the results from groundwater monitoring events that occurred at Great River Energy's Stanton Station in 2022 to meet the requirements of the United States Environmental Protection Agency's (USEPA) Coal Combustion Residuals (CCR) rule (40 Code of Federal Regulations [CFR] 257.90 through 257.98) and the North Dakota Department of Environmental Quality's (NDDEQ) CCR rule (North Dakota Administrative Code [NDAC] 33.1-20-08), hereafter referred to as the Federal and State CCR rules. The Bottom Ash Landfill entered 2022 under an assessment monitoring program with assessment monitoring samples collected in the first (Q1), second (Q2), and fourth (Q4) quarters of 2022. The Bottom Ash Impoundment remained in detection monitoring in 2022, with detection monitoring samples collected in Q2 and Q4 2022.

Detection Monitoring Summary – Bottom Ash Impoundment and Bottom Ash Landfill

- Comparative statistics for the Q4 2021 and Q2 2022 detection monitoring sampling events were completed in 2022. Comparative statistics for the Q4 2022 detection monitoring sampling event will be completed within 90 days of receipt of the final analytical results, in Q1 2023.
- Verified Statistically Significant Increases (SSIs) for Detection Monitoring Parameters
  - Upgradient/Side-gradient Wells
    - SSI for chloride identified at MW-6B
    - SSI for chloride identified at MW-7B
    - Per the Statistical Methods Certification (Golder 2021), no alternative source demonstration (ASD) has been conducted for MW-6B or MW-7B as they are background locations.
  - Bottom Ash Impoundment Downgradient Wells
    - SSI for total dissolved solids (TDS) identified at MW-104
    - Completed ASDs for MW-104 are included as Appendix F and Appendix G.
  - Bottom Ash Landfill Downgradient Wells
    - SSI for calcium, chloride, fluoride, and TDS identified at MW-9N
    - SSI for boron, chloride, fluoride, field pH, sulfate and TDS identified at MW-103
    - ASDs have not been completed for MW-9N and MW-103 as the Bottom Ash Landfill is already in assessment monitoring.
- Potential Exceedances and False Positives for Detection Monitoring Parameters
  - A potential exceedance identified for calcium at MW-103 (downgradient, Bottom Ash Landfill) in Q4 2021 was determined to be a false positive through confirmatory resampling during the Q1 2022 sampling event. The Q2 2022 analytical result and CUSUM value for calcium at MW-103 are also within the associated statistical limit.

- Potential exceedances were identified for Boron, Sulfate, and TDS at MW-203 (Downgradient, Bottom Ash Impoundment) during the Q2 2022 detection monitoring event. Confirmatory resampling for these well-constituent pairs occurred during the Q4 2022 detection monitoring sampling event. Comparative statistics for the Q4 2022 detection monitoring sampling event will be completed within 90 days of receipt of the final analytical results, in Q1 2023.

At the beginning of 2023, the Bottom Ash Impoundment remains in detection monitoring pending approval of the ASD for MW-104 by the NDDEQ.

Assessment Monitoring Summary – Bottom Ash Landfill

- An assessment monitoring program was initiated for the Bottom Ash Landfill during Q1 2021.
- Comparative statistics following the Q4 2021, Q1 2022 and Q2 2022 assessment monitoring sampling events were completed in 2022. Comparative statistics following the Q4 2022 assessment monitoring sampling event will be completed within 90 days of receipt of the final analytical results, in Q1 2023.
- Statistically Significant Levels (SSLs) Above Groundwater Protection Standards for Assessment Monitoring Parameters
  - MW-103 (Downgradient, Bottom Ash Landfill), Arsenic
    - Assessment of Corrective Measures initiated June 24, 2022, and finalized November 21, 2022, following an extension approved by the NDDEQ.
    - Final remedy selection did not occur in 2022, with remedy selection ongoing into 2023.

As described in the Coal Combustion Residuals Groundwater Monitoring System Certification (GAI 2020) and the Coal Combustion Residuals Groundwater Monitoring Statistical Methods Certification (Golder 2021), the groundwater monitoring and analytical procedures meet the general requirements of both the Federal and State CCR rules.

At the beginning of 2023, the Bottom Ash Landfill remains in assessment monitoring under a corrective measures program.

Table of Contents

TABLES

FIGURES

APPENDICES

1.0 INTRODUCTION

WSP USA Inc. (WSP), which acquired Golder Associates USA Inc. (Golder), has prepared this report for the 2022 groundwater sampling and comparative statistical analysis for Great River Energy's (GRE) Stanton Station to meet the requirements of the United States Environmental Protection Agency's (USEPA) Coal Combustion Residuals (CCR) rule (40 Code of Federal Regulations [CFR] 257.90 through 257.98) and the North Dakota Department of Environmental Quality's (NDDEQ) CCR rule (North Dakota Administrative Code [NDAC] 33.1-20-08-06), hereafter referred to as the Federal and State CCR rules. The CCR units discussed in this report are regulated by the NDDEQ under Permit Number 0043 in accordance with NDAC Article 33.1-20, Solid Waste Management and Land Protection. This report has been prepared in general accordance with the requirements of NDDEQ Permit 0043, the current site Groundwater Monitoring Plan (GMP) (GAI 2019a), the Coal Combustion Residuals Groundwater Monitoring System Certification (GAI 2020) and the Coal Combustion Residuals Groundwater Monitoring Statistical Methods Certification (Golder 2021), and both the Federal and State CCR rules pertaining to the disposal of CCRs in landfills and surface impoundments.

1.1 Purpose

The Federal CCR rule established specific requirements for reporting of actions related to groundwater monitoring and corrective actions in 40 CFR 257.90 to 40 CFR 257.98, and as amended. In accordance with part (e) of 40 CFR 257.90, owners and operators of CCR units must prepare an annual groundwater monitoring and corrective action report.

NDAC Chapter 33.1-20-08 established North Dakota specific requirements for reporting of actions related to groundwater monitoring and corrective actions associated with CCR landfills and surface impoundments, which mirror the requirements of the Federal CCR rule. In accordance with Part (e) of NDAC 33.1-20-08-06.1, owners and operators of CCR units must prepare an annual groundwater monitoring and corrective action report.

1.2 Site Background

Stanton Station was a coal-fired electric generation facility located along the Missouri River in Mercer County, approximately three miles southeast of Stanton, North Dakota. Stanton Station began generating power in 1966 and CCRs were managed in composite-lined surface water impoundment cells and dry waste units regulated and permitted by the NDDEQ. Stanton Station ceased power production in February 2017 and demolition of the industrial site was finished in 2019, with site restoration completed in 2020.

Stanton Station has two CCR units that are within the purview of the Federal and State CCR rules:

- Bottom Ash CCR Landfill (Bottom Ash Landfill)
- Bottom Ash CCR Surface Impoundment (Bottom Ash Impoundment)

Locations of the CCR units and groundwater monitoring wells are shown in Figures 1 and 2.

Additionally, Stanton Station monitors the Closed Special Waste Landfill under Permit Number 0043, which does not fall under the requirements of either the Federal or State CCR rules as the landfill was closed and no longer received CCR prior to October 19, 2015. A separate annual report will be provided to the NDDEQ for the Closed Special Waste Landfill, in accordance with the requirements of NDAC Chapter 33.1-20-13.

1.3 Site Closure and Restoration

CCR unit closure and site restoration activities began in 2019 and were completed in the summer of 2020. This included closure of the Bottom Ash Landfill and Bottom Ash Impoundment as described below, as well as regrading the former industrial site to promote stormwater drainage and vegetative growth.

The north and center cells of the Bottom Ash Impoundment were closed by removal of CCR and liner systems in the fall of 2019. Bottom ash remaining in the north and center cells along with the geomembrane liner and clayey soils underlying the geomembrane liner were excavated and placed in the south cell of the Bottom Ash Impoundment or the Bottom Ash Landfill. The south cell of the Bottom Ash Impoundment was closed with permitted wastes remaining in place and in accordance with the final cover design outlined in the Closure and Post-closure Plan (GAI 2019b).

The Bottom Ash Landfill was closed by consolidating the landfill footprint, then closing with permitted wastes remaining in place and in accordance with the final cover design outlined in the Closure and Post-closure Plan (GAI 2019a). This included removing CCR and soil from the west end of the permitted footprint and placing this on the east end where disposal had historically occurred. A new soil berm was also constructed along the new west edge of CCR placement.

In addition to closure of the two CCR units, the remaining bottom ash and economizer ash from the plant, construction and demolition material from plant demolition activities, as well as coal and coal yard soil, were placed in the Bottom Ash Landfill or the south cell of the Bottom Ash Impoundment, as approved through the NDDEQ state permit program.

2.0 GROUNDWATER MONITORING NETWORK PROGRAM STATUS

Through second quarter (Q2) 2019, the CCR groundwater monitoring system at Stanton Station consisted of a total of twelve monitoring locations (five background and seven downgradient wells). During site restoration, two monitoring wells were abandoned downgradient of the Bottom Ash Landfill, leading to an interim period in 2019 and 2020 where the network consisted of five background and five downgradient wells. Following completion of site restoration in 2020, three additional downgradient monitoring wells were installed. The current monitoring locations are shown in Figures 1 and 2 and listed in Table 1. Additional information on the groundwater monitoring system can be found in the Coal Combustion Residuals Groundwater Monitoring System Certification, Revision 1 (GAI 2020). Each CCR unit is currently part of a monitoring network consisting of at least one upgradient and three downgradient monitoring wells.

The groundwater monitoring system at Stanton Station is currently divided as follows:

- The background monitoring wells are located south and west of the CCR units. Based on groundwater elevations, groundwater flow directions, and the distance from the CCR units (see Figures 1 and 2), these background wells are not expected to have been influenced by CCR deposition. There are four upgradient monitoring wells (MW-7A, MW-7B, MW-8B, and MW-105) and one side-gradient monitoring well (MW-6B) shared between both CCR units.
- The Bottom Ash Landfill has three downgradient monitoring wells (MW-102, MW-9N, and MW-103)
- The Bottom Ash Impoundment monitoring network had two downgradient wells while closure and site restoration activities were ongoing, as new wells could not be installed until site restoration was completed as soil regrading was occurring in the location where new wells were to be placed. Following the completion of

site restoration in 2020, three new downgradient monitoring wells were installed adjacent to the closed south cell of the Bottom Ash Impoundment. Between Q4 2020 and May 2022, nine baseline points were collected for these three new wells to allow them to be fully incorporated into the monitoring well network. Beginning in June 2022, the three new wells (MW-201, MW-202, and MW-203) have been fully incorporated into the monitoring network. As discussed in the current groundwater monitoring system certification (GAI 2020): "Once the new monitoring wells [MW-201, MW-202, and MW-203] are installed and detection monitoring started at these new wells, monitoring wells MW-104 and MW-1R will be removed from the groundwater monitoring system (for detection monitoring) as they are no longer close to the waste boundary and will be replaced by the new wells."

2.1 Completed Key Actions in 2022

The following key actions were completed in 2022:

- The 2021 annual CCR groundwater monitoring and corrective action report was completed and placed in the operating record and on the publicly accessible CCR website (Golder 2022).
- Detection monitoring samples were collected in June (second quarter [Q2]) and November (fourth quarter [Q4]) 2022 and analyzed for the detection monitoring constituent list associated with the Federal and State CCR rules for the background locations, Bottom Ash Landfill downgradient, and the Bottom Ash Impoundment downgradient wells.
- Assessment monitoring samples were collected in March (first quarter [Q1]), June (Q2), and November (Q4) 2022 and analyzed for the assessment monitoring constituent list associated with the Federal and State CCR rules for the background locations and Bottom Ash Landfill downgradient wells.
- Prior to conducting comparative statistical analysis for the assessment monitoring samples, site groundwater protection standards (GWPS) were established for each detected assessment monitoring constituent.
- Comparative statistical analysis was completed for the Q4 2021 assessment monitoring samples, which were collected in November 2021, within 90 days of receipt of the final analytical results. Arsenic at monitoring well MW-103 was identified at a statistically significant level (SSL) to the site GWPS following the Q4 2021 event.
- An alternative source demonstration (ASD) was conducted for arsenic at MW-103 following the SSL identification and is included as part of the 2022 annual report (Appendix H). The ASD was inconclusive, and GRE initiated an assessment of corrective measures for the Bottom Ash Landfill. GRE posted a notification regarding the initiation of an assessment of corrective measures for the Bottom Ash Landfill on the publicly accessible website and provided a copy to the NDDEQ.
- Following identification of the SSL at MW-103, a drilling investigation was conducted downgradient of the Bottom Ash Landfill to meet the requirements of 40 CFR 257.95(g)(1)(i) and NDAC 33.1-20-08-06(5)(g)(1)(a). Section 2.2 includes a discussion of installed wells.
- An extension request was made to and approved by the NDDEQ for additional time to complete the assessment of corrective measures.
- The assessment of corrective measures was completed and provided to the NDDEQ for review and approval.

- Comparative statistical analysis was also completed for the Q1 2022 and Q2 2022 assessment monitoring samples, which were collected in March and June 2022, respectively, within 90 days of receipt of the final analytical results.
- Comparative statistical analysis was completed for the Q4 2021 and Q2 2022 semi-annual detection monitoring samples, which were collected in November 2021 and June 2022, respectively, within 90 days of receipt of the final analytical results.
- An ASD was conducted for TDS at MW-104 following the SSI identification from the Q4 2021 and Q2 2022 detection monitoring sampling events (Appendix F and G). The ASD following the Q2 2022 sampling event was submitted to the NDDEQ for approval.
- Baseline samples were collected for the Bottom Ash Impoundment downgradient wells installed in September 2020 (detailed in the 2020 annual report, GAI 2021) in March and May 2022. Following collection of a minimum of eight independent samples, baseline statistical analysis was conducted for the wells prior to the June (Q2) 2022 detection monitoring sampling event. The June 2022 detection monitoring sampling event was the first detection monitoring comparative statistical event for the wells installed in September 2020.

2.2 Installation and Decommissioning of Wells

A previously installed monitoring well located at the downgradient property boundary adjacent to the Missouri River in the direction of groundwater flow (MW-PB1) was incorporated into the monitoring program to meet the requirements of 40 CFR 257.95(g)(1)(iii) and NDAC 33.1-20-08-06(5)(g)(1)(c). MW-PB1 has been sampled in accordance with the requirements for assessment monitoring. Information regarding installation of MW-PB1 is included in Appendix A.

Five monitoring wells were installed at Stanton Station in May 2022 to characterize the nature and extent of arsenic downgradient of the Bottom Ash Landfill, per the requirements of 40 CFR 257.95(g)(1)(i) and NDAC 33.1-20-08-06(5)(g)(1)(a). Wells MW-210, MW-211, MW-212, and MW-213 were installed downgradient of the Bottom Ash Landfill. Well MW-214 was installed upgradient of the Bottom Ash Landfill, between the existing background wells and the upgradient boundary of the Bottom Ash Landfill. Information regarding the newly installed wells is included in Appendix A.

2.3 Problems and Resolutions

No issues were noted related to the collection of samples or the chemical analysis for sampling events throughout 2022.

2.4 Key Activities for 2023

The following key activities are anticipated to be completed in 2023:

- The 2022 annual CCR groundwater monitoring and corrective action report will be completed and placed in the operating record and on the publicly accessible CCR website and provided to the NDDEQ for review and approval.
- Comparative statistical analysis for the Q4 2022 detection monitoring samples will be completed within 90 days of receipt of the final analytical results.

- Comparative statistical analysis for the Q4 2022 assessment monitoring samples will be completed within 90 days of receipt of the final analytical results.
- Detection monitoring sampling events consisting of the detection monitoring parameters will occur semi-annually in 2023 in Q2 and Q4. Comparative statistical analysis for the collected detection monitoring samples will be completed within 90 days of receipt of the final analytical results.
- Assessment monitoring sampling events, consisting of three events (one annual sampling event during Q1 2023 for the complete assessment monitoring sampling list, and two semi-annual sampling events in Q2 and Q4 2023 consisting of the detected assessment monitoring parameters) will occur for the background (upgradient and sidegradient), downgradient Bottom Ash Landfill, and nature and extent wells. Comparative statistical analysis for collected samples will be completed within 90 days of receipt of the final analytical results.
- Additional wells intended to further delineate the nature and extent of arsenic downgradient of the Bottom Ash Landfill will be drilled.
- The semi-annual report detailing progress towards remedy selection under the assessment of corrective measures will be completed by July 31, 2023.

3.0 GROUNDWATER MONITORING ANALTYICAL PROGRAM STATUS

Analytical activities associated with the groundwater monitoring program are described below.

3.1 Collected Samples

Samples were collected by field staff from Minnesota Valley Testing Laboratory (MVTL) on the general dates listed below. Precise dates vary between locations and can be found in the tables included in Appendix B.

- Initial samples for baseline establishment consisting of both detection monitoring and assessment monitoring parameters were collected from the downgradient Bottom Ash Impoundment wells installed in September 2020 (MW-201, MW-202, MW-203) in March and May 2022.
- Detection monitoring samples were collected from the background locations, the Bottom Ash Impoundment downgradient wells (both existing and those installed in September 2020), and the Bottom Ash Landfill downgradient wells in June (Q2) and November (Q4) 2022.
- Assessment monitoring samples were collected from the background locations and the Bottom Ash Landfill downgradient wells in March (Q1), June (Q2), and November (Q4) 2022.
- Samples were collected from the nature and extent monitoring wells following well installation in May, July, September, and November 2022.
- March (Q1) 2022 samples were collected and analyzed for detection monitoring parameters for both Bottom Ash Landfill locations and Bottom Ash Impoundment locations. These samples were collected and analyzed at GRE’s discretion and were not required as part of either the detection or assessment monitoring programs. Results of these analyses have been included in the tables included in Appendix B and in the discussion of comparative statistics in Section 3.4.

- Similarly, March (Q1) and June (Q2) 2022 samples from the downgradient Bottom Ash Impoundment wells were analyzed for assessment monitoring parameters. These analyses were done at GRE's discretion and were not required as part of either the detection or assessment monitoring programs.

Samples were collected using low-flow methodology. The sampling procedures and analytical testing methods are in accordance with USEPA-accepted procedures and the site groundwater monitoring plan (Golder 2019).

3.1.1 Groundwater Elevation and Flow Rate

Depths to groundwater were measured at sampled wells during each sampling event prior to purging. Groundwater elevations can be found in Appendix B. Groundwater elevations from the June (Q2) 2022 monitoring event are shown in Figure 1. Groundwater elevations from the November (Q4) 2022 monitoring event are shown in Figure 2. Based on the June (Q2) and November (Q4) 2022 groundwater elevations, the shallow groundwater at the Stanton Station CCR facilities generally flows to the north and northeast, towards the Missouri River.

The groundwater flow rate across each facility was estimated with the equation $V_s = k \times \frac{i}{n_e}$, where:

- V_s is the groundwater flow rate in feet per day (ft/day)
- k is the hydraulic conductivity in ft/day, estimated from slug testing results from system wells
- i is the hydraulic gradient in feet per feet (ft/ft), calculated based on groundwater elevations for the presented monitoring events
- n_e is the effective porosity, a unitless parameter, estimated to be 0.25 for a silt/sand (Duffield 2007), reflective of site soils

The range of groundwater flow velocities estimated for the units during the June (Q2) and November (Q4) monitoring sampling events are shown below. Hydraulic conductivity (k) values measured on site ranged from 0.043 ft/day to 8.1 ft/day. As the Bottom Ash Landfill and Bottom Ash Impoundment are adjacent to one another and intersect similar geologic formations within the uppermost water-bearing zone, the groundwater flow rates are assumed to be approximately the same for the facilities during each sampling event and are presented below:

- June (Q2) 2022: 0.0013 to 0.24 ft/day
- November (Q4) 2022: 0.0012 to 0.23 ft/day

3.2 Monitoring Data (Analytical Results)

Analytical results for samples collected in 2022 for monitoring wells within the networks are shown in Appendix B. Collected results for metals are presented as total data.

3.3 Baseline Statistics – Bottom Ash Impoundment New Wells

Downgradient monitoring wells MW-201, MW-202, and MW-203 were installed adjacent to the closed south cell of the Bottom Ash Impoundment following the completion of site restoration activities in 2020. Nine baseline samples were collected on a roughly every other month basis between November 2020 and May 2022 to establish a baseline (or background) period for each constituent at each well. The nine available samples were reviewed for each of the well-constituent pairs following the May 2022 sampling event for the potential to establish initial baselines prior to incorporating the wells into the detection monitoring program for the Bottom Ash Impoundment.

A full description of the steps taken for baseline establishment is provided in the Groundwater Monitoring Statistical Methods Certification (Golder 2021), available on the publicly accessible CCR website. The baseline described in this document, as well as any future baseline updates, included a review of any revisions to federal and state regulations and USEPA statistical guidance documents that may have been recently promulgated.

3.3.1 Results of Baseline Establishment

Either a parametric or non-parametric method was used to generate the baseline statistical limit for each well-constituent pair. The statistical method varies between well-constituent pairs and was selected based on the percentage of non-detect (ND) values in the baseline period and the baseline data distribution for each constituent at each well, in accordance with the Unified Guidance (USEPA 2009).

The baseline periods for most well-constituent pairs were able to be established through inclusion of data collected following well installation between November 30, 2020 and May 25, 2022. Outliers were removed where appropriate and consistent with the Groundwater Monitoring Statistical Methods Certification (Golder 2021). Statistical limits established for MW-201, MW-202, and MW-203 are shown in the corresponding tables for the June (Q2) 2022 detection monitoring event, included in Appendix C. Samples collected in June (Q2) 2022 are the first detection monitoring samples for MW-201, MW-202, and MW-203.

3.3.1.1 Baseline Periods Established by Shifting or Truncating Available Data Range Due to Trending Data

For the following well-constituent pairs, baseline periods were established by shifting or truncating the dates used for the baseline periods, based on the following rationale:

- MW-202, Fluoride: When reviewing the data set, a statistically significant decreasing trend was identified using the nine points collected between November 30, 2020 and May 25, 2022. Ending the baseline at March 28, 2022, results in a baseline period comprised of eight points that do not display a statistically significant trend.
- MW-203, Field-measured pH: When reviewing the data set, a statistically significant increasing trend was identified using the nine points collected between November 30, 2020 and May 25, 2022. Shifting the baseline to begin on February 1, 2021 (the second sample collection date) results in a baseline period comprised of eight points that do not display a statistically significant trend.

3.3.1.2 Outliers Removed when Establishing Baseline Periods

The following outliers were identified and removed from the corresponding baselines:

- MW-202, Calcium, November 30, 2020: Unusually high value collected during the first monitoring event following well installation and development. Removal allows establishment of a more conservative (i.e., lower) statistical limit with a normal data distribution.
- MW-203, Boron, May 25, 2022: Unusually high value. Removal allows establishment of a more conservative (i.e., lower) statistical limit with a normal data distribution.
- MW-203, Sulfate, May 25, 2022: Unusually high value. Removal allows establishment of a more conservative (i.e., lower) statistical limit with a normal data distribution.
- MW-203, Total Dissolved Solids (TDS), May 25, 2022: Unusually high value. Removal allows establishment of a more conservative (i.e., lower) statistical limit with a normal data distribution.

3.4 Comparative Statistical Analysis for Detection Monitoring Parameters

The comparative statistical analysis for the Q4 2021 and Q2 2022 detection monitoring results is presented below, with the results presented in the tables included as Appendix C. Additionally, comparative statistics are presented for the results of detection monitoring parameters collected in Q1 2022. Comparative statistical analysis for the Q4 2022 detection monitoring event will occur within 90 days of receipt of the final analytical data. Based on the timing of the detection monitoring sampling event in Q4 2022, comparative statistical analysis for the Q4 2022 event will be completed during Q1 2023. A full description of the steps taken for comparative statistical analysis is provided in the Coal Combustion Residuals Groundwater Statistical Methods Certification (Golder 2021), available on the publicly accessible CCR website.

Comparative statistical analysis is conducted following each event consisting of the detection monitoring parameters. For both Shewhart-CUSUM (cumulative summation) limits and non-parametric prediction limits (NP-PL), the comparative statistical analysis consists of a comparison of detection monitoring results collected during the period of interest to the statistical limit calculated from the baseline data collection period. At present, no parameters are currently analyzed using alternative comparative methods due to trending datasets. However, if well-constituent pairs with increasing trends were identified during the baseline period, those well-constituent pairs would be evaluated with an alternative trend test, such as that described by the Electric Power Research Institute (EPRI 2015) or a Sen’s Slope trend test, to determine compliance. For well-constituent pairs with decreasing trends during the baseline period, a Sen’s Slope test would be used to assess the compliance results.

For reporting purposes, non-detect results for compliance samples are shown at the primary quantitation limit (PQL) in the tables included as Appendix C.

3.4.1 Definitions

The following definitions will be used in discussion of the comparative statistical analysis for detection monitoring parameters:

- Elevated CUSUM – occurs when the calculated CUSUM value is greater than the Shewhart-CUSUM limit established by the baseline statistical analysis, but the analytical result does not exceed the Shewhart-CUSUM limit. An elevated CUSUM is an indication that concentrations are gradually increasing and that analytical results may exceed the Shewhart-CUSUM limit in the future. For elevated CUSUM values in the case of two-tailed analysis for field-measured pH, the calculated CUSUM value may also be below the lower Shewhart-CUSUM limit established by the baseline statistical analysis.
- Potential Exceedance – an initial elevated calculated CUSUM value or an initial analytical result that exceeds the parametric prediction limit (PL), the Shewhart-CUSUM limit, or the NP-PL established by the baseline statistical analysis. Confirmatory resampling will determine if the potential exceedance is a false positive or a verified statistically significant increase (SSI). Non-detect results that exceed the statistical limit are not considered potential exceedances.
- False positive – an analytical result that exceeds the statistical limit that can clearly be attributed to laboratory error, changes in analytical precision, or is invalidated through confirmatory resampling. False positives are not used in calculation of any subsequent CUSUM values.
- Confirmatory resampling – designated in 2022 as the next sampling event.

- Verified SSI – interpreted as two consecutive exceedances (the original sample and the confirmatory resample for analytical results, two consecutive elevated CUSUM values, or a combination of an analytical result above the statistical limit and an elevated CUSUM value in either event order) for the same constituent at the same well.

3.4.2 Potential Exceedances

A potential exceedance was identified for calcium at MW-103 (downgradient, Bottom Ash Landfill) during the Q4 2021 detection monitoring sampling event. Confirmatory resampling for calcium at MW-103 occurred during the next sampling event in Q1 2022, with results discussed in Section 3.4.3.

No potential exceedances were identified for detection monitoring parameters collected during the March (Q1) 2022 sampling event. As noted in Section 3.1, detection monitoring parameters collected during the Q1 2022 sampling event were analyzed at GRE's discretion.

The following potential exceedances were identified for the June (Q2) 2022 sampling event:

- MW-203 (Downgradient, Bottom Ash Impoundment), Boron
- MW-203 (Downgradient, Bottom Ash Impoundment), Sulfate
- MW-203 (Downgradient, Bottom Ash Impoundment), TDS

Confirmatory resampling for these well-constituent pairs occurred during the Q4 2022 detection monitoring sampling event. Comparative statistics for the Q4 2022 detection monitoring sampling event will be completed within 90 days of receipt of the final analytical results, in Q1 2023.

3.4.3 False Positives

No false positives were identified for the Q2 2022 detection monitoring event based on results of the Q4 2021 detection monitoring and comparative statistical analysis.

A false positive was identified for the Q4 2021 sampling event following the Q1 2022 confirmatory resampling event for calcium at MW-103. The Q2 2022 analytical result and CUSUM value for calcium at MW-103 are also within the associated statistical limit.

3.4.4 Verified SSIs

The following verified SSIs were identified during the comparative statistical analysis for the detection monitoring parameters for the Q4 2021, Q1 2022, and Q2 2022 detection monitoring sampling events:

- MW-6B (Side-gradient), Chloride (ongoing, initially verified in Q3 2021)
- MW-7B (Upgradient), Chloride (ongoing, initially verified in Q4 2020)
- MW-9N (Downgradient, Bottom Ash Landfill), Calcium (ongoing, initially verified in Q4 2020)
- MW-9N (Downgradient, Bottom Ash Landfill), Chloride (ongoing, initially verified in Q2 2019)
- MW-9N (Downgradient, Bottom Ash Landfill), Fluoride (ongoing, initially verified in Q2 2021)
- MW-9N (Downgradient, Bottom Ash Landfill), Total Dissolved Solids (ongoing, initially verified in Q2 2021)

  - Note: both the analytical value and calculated CUSUM value for the Q2 2022 sampling event are below the statistical limit. At present, the result remains an ongoing verified SSI.
- MW-103 (Downgradient, Bottom Ash Landfill), Boron (ongoing, initially verified in Q2 2020)
- MW-103 (Downgradient, Bottom Ash Landfill), Chloride (ongoing, initially verified in Q2 2019)
- MW-103 (Downgradient, Bottom Ash Landfill), Fluoride (ongoing, initially verified in Q2 2019)
- MW-103 (Downgradient, Bottom Ash Landfill), Field-measured pH (initially verified in Q4 2021, SSI below the lower statistical limit)
  - Note: both the analytical value and calculated CUSUM values for the Q2 2022 sampling event are within the associated statistical limits. At present, the result remains on ongoing verified SSI.
- MW-103 (Downgradient, Bottom Ash Landfill), Sulfate (ongoing, initially verified in Q1 2021)
- MW-103 (Downgradient, Bottom Ash Landfill), TDS (ongoing, initially verified in Q2 2020)
- MW-104 (Downgradient, Bottom Ash Impoundment), TDS

Associated steps following identification of the verified SSIs confirmed in Q4 2021 are described in Section 4.1.1.

3.5 Establishment of Groundwater Protection Standards

Groundwater protection standards (GWPS) were established for each detected assessment monitoring constituent. Per the Federal and State CCR rules, the GWPS must fall within one of the following categories:

- For constituents for which a maximum contaminant level (MCL) has been established by the USEPA (40 CFR 141.62 and 141.66), the MCL for that constituent will be the GWPS, per 40 CFR 257.95(h)(1) and NDAC 33.1-20-08-06.5.h(1).
- For the following constituents, the following alternative specified limits (ASLs) apply, per 40 CFR 257.95(h)(2) and NDAC 33.1-20-08-06.5.h(2):
  - Cobalt – 0.006 milligrams per liter (mg/L)
  - Lead – 0.015 mg/L
  - Lithium – 0.04 mg/L
  - Molybdenum – 0.1 mg/L
- For constituents where the upgradient baseline concentration is higher than the levels identified above, a statistical limit determined from the baseline data (see the Statistical Method Certification, Golder 2021) will be the GWPS per 40 CFR 257.95(h)(3) and NDAC 33.1-20-08-06.h(3).

For those constituents where the upgradient baseline concentration is higher than the MCL or levels designated in 40 CFR 257.95(h)(2) and NDAC 33.1-20-08-06.5.h(2), the GWPS will be determined through statistical methods. The USEPA's Unified Guidance (USEPA 2009) provides two acceptable approaches for conducting statistical evaluations using non-MCL or specified limit based GWPS: a tolerance interval approach or a predication interval approach. The Unified Guidance prefers using a tolerance interval approach over a prediction interval approach if the background (or historical) dataset is normally distributed, transform-normally distributed, or has a sufficient number of background (or historical) observations for a non-parametric tolerance interval approach (USEPA 2009). For this program, a tolerance interval approach is the primary method used to determine site-specific GWPS levels.

Per the Unified Guidance, a tolerance interval is “a concentration range designed to contain a pre-specified proportion of the underlying population from which the statistical sample is drawn.” A tolerance limit is a one-sided tolerance interval. The Unified Guidance recommends “an upper tolerance limit (UTL) based on both the background sample size and sample variability” for site-specific GWPS. Where applicable, tolerance limits were produced using data collected from multiple upgradient wells that can be “reasonably combined”, giving a pooled background data set (USEPA 2009). Tolerance limits are defined with two coefficients, representing the portion of the population that the limit is intended to cover (the coverage, γ) and the degree of confidence that the interval reaches the coverage (the confidence, 1-α). A coverage of 95% (γ = 0.95) and a confidence of 95% (α = 0.05) will be used. For background data sets with a normal distribution, the formula for the UTL serving as the GWPS is as follows:

$$UTL = \bar{x} + \tau_{(n,0.95,0.95)} \cdot s$$

Within the equation, $\bar{x}$ is the background sample mean, s is the background sample deviation, and τ is a tolerance factor based on the number of background measurements, n, with a coverage of 95% (γ = 0.95) and a confidence of 95% (α = 0.05). Tabulated τ values are available in Table 17-3 in Appendix D of the Unified Guidance (USEPA 2009).

For background datasets with non-normal distributions, particularly for cases with a significant portion of non-detect observations, a non-parametric tolerance interval approach has been used. The UTL for the non-parametric tolerance interval was set at the highest detected value or the highest PQL (excluding outliers and elevated reporting limits), whichever was greater.

3.5.1 Upgradient and Side-Gradient Assessment Monitoring Data Analysis

Prior to determining GWPS values, the upgradient and side-gradient datasets were reviewed (data collected between 2016 and 2021). The pooled background datasets consist of data from MW-6B as a side-gradient location, and MW-7A, MW-7B, MW-8B, and MW-105 as upgradient locations. In addition to a review of the datasets, summary statistics were compiled for the pooled background wells (table included in Appendix D).

Of the 15 assessment monitoring parameters, five parameters have never been detected in the pooled background dataset, based on data collected between 2016 and 2021: antimony, beryllium, cadmium, cobalt, and mercury. The remaining parameters were detected in 3% to 100% of the collected samples in the pooled background dataset.

Based on the pooled background dataset, the MCL or ASL were set as the GWPS for the following constituents:

- antimony
- arsenic
- barium
- beryllium
- cadmium
- chromium
- cobalt
- fluoride
- lead
- mercury
- molybdenum
- thallium

Summary statistics and the specific GWPS values for the 12 parameters listed above are shown in the table included in Appendix D. For the remaining three constituents (lithium, combined radium-226 and radium-228, and selenium), additional considerations were required as described below.

3.5.1.1 Lithium

Within the pooled background dataset, 100% of the detected lithium concentrations exceed the ASL of 0.04 mg/L. Non-detect values within the pooled background dataset were collected at a PQL of 0.10 mg/L, exceeding the ASL, but were collected prior to promulgation of the ASL. The PQL is the lowest concentration that can be reliably measured within the specified limits of precision and accuracy during routine laboratory operating conditions for a given method. Further, several non-detect results for MW-7A were provided with qualifiers indicating that the samples required dilution due to the sample matrix, likely a consequence of the high total dissolved solids concentrations, resulting in an elevated reporting limit of 0.50 mg/L. The current PQL for lithium from MVTL is 0.02 mg/L as analyzed by SW6010D, 50% of the 0.04 mg/L ASL. Samples have been analyzed with a PQL below the ASL since 2019 (i.e., all samples collected since the ASL was promulgated).

For determination of the GWPS, only those samples analyzed with a PQL below the ASL have been used in the pooled dataset, comprising data collected between 2019 and 2021. The pooled upgradient dataset for lithium displayed a non-normal distribution, resulting in a GWPS of 0.325 mg/L as the highest value in the background, as shown in Appendix D.

3.5.1.2 Combined Radium-226 and Radium-228

During the course of CCR sampling, MVTL (the primary analytical laboratory) has subcontracted radiochemical analysis to three separate laboratories using different methods, as listed below. Each of the methods that have been used are deemed acceptable for radiochemical analysis of radium-226 and radium-228 by the USEPA, as detailed in 40 CFR 141.25.

- For samples collected between 2016 and June 2019, radiochemical analysis was conducted by the former Inter-mountain Laboratories (IML) of Sheridan, Wyoming, which was acquired by Pace Analytical in 2019.
  - Radium-226 was analyzed by Standard Method 7500 Ra-B.
  - Radium-228 was analyzed by the Georgia Tech method for radium-226 and radium-228.
- For samples collected between November 2019 and May 2021, radiochemical analysis was conducted by Energy Laboratories, Inc. (ELI) of Casper, Wyoming.
  - Radium-226 was analyzed by USEPA Method 903.0.
  - Radium-228 was analyzed by USEPA Method Ra-05.
- For samples collected between July 2021 and November 2021, radiochemical analysis was conducted by GEL Laboratories, LLC (GEL) of Charleston, South Carolina.
  - Radium-226 was analyzed by USEPA Method 903.1.
  - Radium-228 was analyzed by USEPA Method 904.0.

Reporting of combined radium-226 and radium-228 by all three laboratories has been by calculation (i.e., summation of the radium-226 and radium-228 results obtained from the separate methods). Detected results for the three laboratories were reported with precision (±; as reported by IML and ELI) or uncertainty (±; GEL).

While the three sets of methods used are acceptable for reporting of radium-226 and radium-228 results, differences were noted in the handling of the data between the three laboratories. For the samples analyzed by IML, only detections above the stated reporting limit (varies by sample and method) were reported, with results below the reporting limit given a "ND" qualifier, indicating that the analyte was "Not Detected at the Reporting Limit."

For the samples analyzed by both ELI and GEL, results have been reported with both a reporting limit and a minimum detectable concentration (MDC; varies by sample and method). The "ND" qualifier has not been used by either ELI or GEL, although provided in the definitions on the associated laboratory reports for ELI with a similar definition to that provided by IML. Instead, the provided results have been reported in relationship to the MDC, with some results marked with a "U" qualifier, indicating that the sample was "Not detected at minimum detectable concentration" (ELI definition) or "Analyte was analyzed for, but not detected above the…MDC" (GEL definition).

Based on the differences between the two reporting styles, only samples collected after November 2019 have been considered in determination of the GWPS, resulting in the GWPS being set at the MCL (5.0 pCi/L).

3.5.1.3 Selenium

In considering potential site-specific GWPS, the pooled background dataset was reviewed for overarching trends that might impact the GWPS. The majority of samples collected from MW-105 during the baseline period in 2016 and 2017 exceeded the MCL for selenium. However, in considering the entire data set collected between 2016 to 2021, selenium at MW-105 displays an ongoing decreasing trend. No changes have been noted to the chemical analysis of selenium, suggesting that a natural change may be occurring further upgradient of the system. In establishing the GWPS, only data collected since 2018 were considered, allowing the GWPS to be conservatively established at the MCL (0.05 mg/L). As additional samples are collected, the data from 2016 and 2017 may be reconsidered in determination of the GWPS.

3.6 Comparative Statistical Analysis for Assessment Monitoring Parameters

To determine if detected assessment monitoring constituents have statistically exceeded the associated GWPS, a confidence interval approach was used for determining compliance. Per recommendations provided by the Unified Guidance and detailed by EPRI (2015), a confidence interval statistically defines the upper and lower bound (the upper and lower confidence limit) of the true mean associated with a groundwater population. The Unified Guidance recommends confidence intervals for assessment monitoring. A confidence interval statistically defines the confidence range and the upper and lower bound of a true mean, median, or other statistical measure of a compliance monitoring dataset. Confidence intervals identify statistically significance levels (SSLs) through comparison against a fixed standard, namely the GWPS for each parameter identified in Section 3.5.

The specific type of confidence interval for each well-constituent pair is based on three factors:

1) the detection frequency of the compliance data

2) the distribution of the compliance data

3) the determination of the presence of statistically significant trends within the compliance data

Prior to constructing the confidence intervals, initial data review was conducted on the compliance data for determining the detection frequency and data distribution, as described in the Statistical Method Certification (Golder 2021). Additionally, compliance data was tested for trends using Sen's Slope methodology prior to constructing confidence intervals.

A parametric confidence interval around the mean was used if the compliance dataset had less than 50% non-detects (ND) and was either normally distributed or transform-normally distributed. A confidence (α) of 95% was used for calculating the parametric Upper Confidence Limit (UCL) and Lower Confidence Limit (LCL) of the compliance data. Parametric confidence intervals (CI) were calculated using the following equation:

$$CI = \bar{x} \pm t_{(1-\alpha,n-1)} \frac{s}{\sqrt{n}}$$

Where $\bar{x}$ is the mean of the comparative sample population, s is the standard deviation of the comparative sample population, n is the number of samples in the comparative sample population, and t is a value from a Student's t-test derived from the desired level of confidence $(1-\alpha)$ and the degrees of freedom $(n-1)$. Summarized values for t are compiled in the Unified Guidance in Table 16-1, Appendix D.

A non-parametric confidence interval around the median was used for datasets that did not show normal or transform-normal distributions, and for compliance populations with greater than 50% ND. For non-parametric confidence intervals, the LCL is the minimum value of the comparative sample population, while the UCL is the maximum value of the comparative sample population.

For determination of SSLs, the LCL is of primary interest. A confidence interval is only considered statistically above the associated GWPS if both the UCL and LCL exceed the GWPS. If only the UCL exceeds the GWPS while the LCL remains below the GWPS, the results of the test are considered inconclusive. The Unified Guidance recommends results of this category to be interpreted as "in compliance" and not consider the results to represent an SSL. If both the UCL and LCL are below the GWPS, the data are considered not statistically significant.

Confidence intervals are only constructed on data that do not display statistically significant trends. If compliance data was found to display a statistically significant trend, a confidence band would be constructed around the estimated trend line. Per the Unified Guidance, a confidence band is "essentially a continuous series of confidence intervals estimated along every point of the trend." With the comparative points collected to date following the start of assessment monitoring, no data set results in a statistically significant trend using the Sen's Slope Test. Consequently, the data presented in this report have only been constructed using confidence intervals.

Results of the comparative statistical analysis for the downgradient wells at the Bottom Ash Landfill are shown on the tables of Appendix E.

Based on the comparative statistical analysis following the Q4 2021, Q1 2022, and Q2 2022 assessment monitoring sampling events, no results with statistically significant levels were identified for MW-9N or MW-102. An SSL was initially identified for arsenic at MW-103 following the Q4 2021 assessment monitoring sampling event. The remainder of parameters at MW-103 were determined not to be statistically significant. Arsenic remains an SSL at MW-103 following the Q1 2022 and Q2 2022 assessment monitoring sampling events.

4.0 PROGRAM TRANSITIONS

Prior to the start of detection monitoring in Q4 2017, baseline samples were collected that meet the requirements of 40 CFR 257.94(b) and NDAC 33.1-20-08-06(4)(b).

4.1 Detection Monitoring

The Bottom Ash Impoundment is currently in detection monitoring. Samples for the detection monitoring program are collected on a semi-annual basis, beginning with the samples collected in Q4 2017. GRE plans to collect semi-annual samples for the detection monitoring program at the Bottom Ash Impoundment in Q2 2023 and Q4 2023.

40 CFR 257.94(e) states the conditions under which a CCR unit must transition to assessment monitoring or complete an ASD:

> “If the owner or operator of a CCR unit determines, pursuant to 40 CFR 257.93(h) that there is an SSI over background levels for one or more of the constituents listed in Appendix III to this part at any monitoring well at the waste boundary specified under 40 CFR 257.91(a)(2), the owner or operator must: (1) Except as provided for in paragraph (e)(2) of this section, within 90 days of detecting a SSI over background levels for any constituent, establish an assessment monitoring program meeting the requirements of 40 CFR 257.95. (2) The owner or operator may demonstrate that a source other than the CCR unit caused the statistically significant levels for a constituent or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.”

NDAC 33.1-20-08-06(4)(e) describes similar conditions for transitioning to assessment monitoring or completing an ASD, with the additional requirement of NDDEQ review and approval for ASDs and the determination for remaining in detection monitoring.

4.1.1 Alternative Source Demonstrations

ASDs have not been pursued for either newly verified or ongoing detection monitoring parameter verified SSIs at the Bottom Ash Landfill downgradient wells since Q4 2020, following the beginning of assessment monitoring.

GRE pursued an ASD for TDS at MW-104, part of the Bottom Ash Impoundment monitoring network, following identification of the SSI described in Section 3.4.4 during the Q4 2021 detection monitoring event. The ASD was completed within 90 days of identification of the verified SSI and is included in this report as Appendix F. As a result of the successful ASD outcome, the Bottom Ash Impoundment remained in detection monitoring.

An ASD was pursued following the identification of the SSI described in Section 3.4.4 during the Q2 2022 detection monitoring event for TDS at MW-104. The ASD was completed within 90 days of identification of the verified SSI and was submitted to the NDDEQ for approval. A copy of the ASD is included in this report as Appendix G. Pending approval of the NDDEQ, the Bottom Ash Landfill will remain in detection monitoring for the first semi-annual detection monitoring event of 2023.

4.1.2 Upgradient Locations

Per the Groundwater Monitoring Statistical Methods Certification (Golder 2021), an ASD will only be completed for verified SSIs identified in downgradient wells. ASDs are not planned for the verified SSIs for chloride at MW-6B and MW-7B, as the CCR units have been determined to not be the cause of the verified SSIs, based on groundwater flow and direction.

4.2 Assessment Monitoring

Assessment monitoring was initiated for the Bottom Ash Landfill in Q1 2021 consistent with 40 CFR 257.95 and NDAC 33.1-20-08-06(5). Assessment monitoring samples have been collected since Q1 2021 to meet the assessment monitoring sampling frequency requirements detailed in 40 CFR 257.95(b) and (d) and NDAC 33.1-20-08-06(5)(b) and (d). A transition to assessment monitoring does not preclude the continued collection of detection monitoring parameters on at least a semi-annual basis. Detection monitoring parameters continue to be collected at the Bottom Ash Landfill.

The Federal and State CCR rules require that concentrations of assessment monitoring constituents detected in downgradient wells during assessment monitoring be statistically compared to site specific established GWPS. If a GWPS is exceeded in one or more downgradient wells at SSLs, both the Federal and State CCR Rules require additional groundwater characterization and an Assessment of Corrective Measures unless the SSLs can be attributed to a source other than the CCR unit, an error in sampling, an error in statistical analysis, or natural variation in groundwater quality.

Based on the statistical methods selected for assessment monitoring and detailed in the Groundwater Monitoring Statistical Methods Certification (Golder 2021), an SSL was initially identified for arsenic following the Q4 2021 sampling event within 90 days of receipt of the analytical results, in Q1 2022.

4.2.1 Alternative Source Demonstrations

GRE pursued an ASD after identifying the SSL for arsenic at MW-103 following the Q4 2021 sampling event. The ASD evaluation determined that insufficient evidence was available to make conclusive statements about an alternative source for the arsenic SSL at MW-103. The attempted ASD is included as Appendix H.

4.3 Assessment of Corrective Measures

Following identification of the SSL for arsenic at MW-103, GRE initiated an assessment of corrective measures (ACM) in June 2022 following the requirements of 40 CFR 257.96 and NDAC 33.1-20-08-06(6) for the Bottom Ash Landfill. An extension, as detailed in 40 CFR 257.96(a) and NDAC 33.1-20-08-06(6)(a), was requested in September 2022 prior to completion of the ACM and approved by the NDDEQ (Appendix I). The ACM was completed and submitted to the NDDEQ for approval on November 21, 2022. A copy of the submitted ACM is included as Appendix I.

Remedy selection is ongoing. The next semi-annual report detailing progress towards a final remedy selection will be completed by July 31, 2023.

4.3.1 Corrective Measures Actions Taken Following Assessment of Corrective Measures

Following submittal of the ACM in November 2022, the following actions have been taken in support of remedy selection for the Bottom Ash Landfill:

- An assessment for the first tier of monitored natural attenuation has been initiated.
- An additional round of drilling and well installation to better delineate the nature and extent of arsenic downgradient of the Bottom Ash Landfill has been planned and is scheduled to occur in early 2023.

5.0 CLOSING

This report presents the analytical results for the 2022 monitoring events for the CCR groundwater monitoring programs at Stanton Station. Comparative statistics for samples collected between Q4 2021 and Q2 2022 at both the Bottom Ash Impoundment and Bottom Ash Landfill are included. Comparative statistics for the Q4 2022 monitoring events conducted in November 2021 will occur within 90 days of finalizing data review, during Q1 2022.

At the start of 2022, the Bottom Ash Impoundment entered the year under a detection monitoring program. At the close of 2022, the Bottom Ash Impoundment remains in detection monitoring pending approval of the ASD for MW-104 submitted to the NDDEQ. As discussed in the current groundwater monitoring system certification (GAI 2020): "Once the new monitoring wells [MW-201, MW-202, and MW-203] are installed and detection monitoring started at these new wells, monitoring wells MW-104 and MW-1R will be removed from the groundwater monitoring system (for detection monitoring) as they are no longer close to the waste boundary and will be replaced by the new wells." MW-104 and MW-1R are recommended for removal from routine monitoring of the Bottom Ash Impoundment.

The Bottom Ash Landfill was operating under an assessment monitoring program at the beginning of 2022. At the end of the year, an assessment of corrective measures has been completed, and remedy selection for the chosen corrective measures is ongoing. The next semi-annual report detailing the remedy selection process will be completed by July 31, 2023.

Signature Page

WSP USA Inc.

Erin L. Hunter, PhD
Lead Consultant

Todd J. Stong, PE
Vice President and Director

ELH/TJS/af

https://golderassociates.sharepoint.com/:w:/r/sites/157762/Project%20Files/6%20Deliverables/Reports/20-R-Annual_GW_2022/20-R-0/21509219-20-RPT-0-2022_Annual_GW_Report_31JAN23.docx

6.0 REFERENCES

Duffield Glenn M. 2007. AQTESOLV for Windows Version 4.5 User's Guide.

EPRI (Electric Power Research Institute). 2015. Groundwater Monitoring Guidance for the Coal Combustion Residuals Rule – 2015 Technical Report. November.

GAI (Golder Associates Inc.). 2019a. Closure and Post-Closure Plan, Revision 1, Bottom Ash CCR Landfill – Stanton Station. September 2019.

GAI. 2019b. Closure and Post-Closure Plan, Revision 1, Bottom Ash CCR Surface Impoundment – Stanton Station. September 2019.

GAI. 2020. Coal Combustion Residuals Groundwater Monitoring System Certification, Revision 1, Great River Energy – Stanton Station. January 29, 2020.

GAI. 2021. Annual Groundwater Report – 2020, Great River Energy – Stanton Station. January 2021.

Golder (Golder Associate USA Inc.). 2021. Coal Combustion Residuals Groundwater Statistical Method Certification, Revision 2, Great River Energy – Stanton Station. November 18, 2021.

Golder. 2022. Annual Groundwater Report – 2021, Great River Energy – Stanton Station. January 2022.

NDDEQ (North Dakota Department of Environmental Quality). 2020. North Dakota Administrative Code Chapter 33.1-20-08, Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments. Effective July 1, 2020.

USEPA (United States Environmental Protection Agency). 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance. EPA 530/R-09-007. March 2009.

USEPA. 2015. Code of Federal Regulations Title 40 Part 257: Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities. April 17, 2015.

Tables

Table 1: Stanton Station Monitoring Well Summary

Location	Well ID	Date Constructed	TOC Elevation	Ground Surface Elevation	Screen Interval	Top of Screen Elevation	Bottom of Screen Elevation	Sand Pack Interval	Geologic Unit(s) Completed In
			ft AMSL	ft AMSL	ft bgs	ft AMSL	ft AMSL	ft bgs	
Upgradient/Side-gradient	MW-6B	9/8/1992	1711.5	1709.4	28.4-38.4	1681	1671	19.0-38.5	Outwash
	MW-7A	8/27/1992	1713.7	1711.3	7.0-17.0	1704	1694	5.0-18.0	Silty Sand/Clay
	MW-7B	9/9/1992	1712.9	1711.2	28.1-38.1	1683	1673	23.0-38.5	Silty Sand/Outwash
	MW-8B	9/3/1992	1749.8	1747.6	54.0-64.0	1694	1684	49.0-64.5	Outwash
	MW-105	11/18/2015	1717.0	1714.0	9.0-19.0	1705	1695	7.0-19.0	Clay/Outwash
Bottom Ash Landfill Downgradient	MW-9N	7/19/2010	*1703.5*	*1701.0*	*11.5-21.5*	1690	1680	*9.5-21.5*	Sand, Clayey Sand, Gravel
	MW-102	11/17/2015	1712.1	1708.8	14.0-24.0	1695	1685	12.0-24.0	Silty Sand/Clay
	MW-103	11/17/2015	1709.5	1706.2	14.0-24.0	1692	1682	12.0-24.0	Outwash
Bottom Ash Impoundment Downgradient	MW-1R	11/8/1995	*1706.7*	*1703.5*	*23.7-32.7*	1680	1671	*21.7-34.7*	Gravel, Fat Clay
	MW-104	11/17/2015	1712.0	1709.0	14.0-24.0	1695	1685	12.0-24.0	Outwash
	MW-201	8/10/2020	1704.9	1701.9	9.5-19.5	1692	1682	7.0-19.5	Fat Clay, Sand w/Silt
	MW-202	8/10/2020	1703.7	1701.6	8.0 - 18.0	1694	1684	6.0-18.0	Fat Clay, Lean Clay w/Sand
	MW-203	8/10/2020	1705.8	1702.7	6.0 -16.0	1697	1687	5.0-16.0	Sand w/Silt, Fat Clay
Bottom Ash Landfill Nature and Extent	MW-210	5/9/2020	1703.1	1699.9	12.0 - 22.0	1688	1678	12.0 - 22.0	Sand w/Silt
	MW-211	5/10/2022	1708.7	1705.4	12.0 - 22.0	1693	1683	10.0 - 22.0	Lean Clay, Sand w/Silt
	MW-212	5/10/2022	1709.6	1706.4	13.5 - 23.5	1693	1683	10.0 - 23.5	Fat Clay, Lean Clay Silty Sand
	MW-213	5/12/2022	1706.0	1702.7	19.5 - 29.5	1683	1673	19.5 - 29.5	Fat Clay, Lean Clay Silty Sand
	MW-214	5/12/2022	1709.2	1705.8	5.0 - 15.0	1701	1691	4.0 - 15.0	Fat Clay, Silty Sand
Property Boundary	MW-PB1	8/11/2020	1698.8	1695.9	15.0 - 25.0	1681	1671	13.0 -25.0	Silt w/Sand, Silty Sand

Notes:

ft AMSL: feet above mean sea level

ft bgs: feet below ground surface

GW: groundwater

Top of casing (TOC) and ground surface elevations surveyed by Interstate Engineering, Inc. in September 2020 and October 2022.

Well construction measurements are from the original bore log, well data sheet or well construction form.

Well construction information for MW-9N and MW-1R shown in italics are estimates based on the original well logs, accounting for the casing reductions completed in June 2020.

Figures

LEGEND

- UPGRADIENT OR SIDEGRADIENT MONITORING WELL
- LANDFILL DOWNGRADIENT MONITORING WELL
- IMPOUNDMENT DOWNGRADIENT MONITORING WELL
- NATURE AND EXTENT WELLS (NOTE 7)
- CLOSED BOTTOM ASH LANDFILL/IMPOUNDMENT FOOTPRINT
- GENERAL DIRECTION OF GROUNDWATER FLOW
- GROUNDWATER CONTOURS AND ELEVATIONS

NOTE(S)

1. AERIAL IMAGERY OBTAINED FROM UNITED STATES DEPARTMENT OF AGRICULTURE, NATIONAL AGRICULTURE IMAGERY PROGRAM, 2020.
2. GROUNDWATER CONTOURS ARE BASED ON MAY AND JUNE 2022 ELEVATION INFORMATION FROM THE SHOWN MONITORING WELLS, AS WELL AS MONITORING WELLS AND PIEZOMETERS NOT SHOWN.
3. THE NORTH AND CENTER CELLS OF THE BOTTOM ASH IMPOUNDMENT WERE CLOSED BY REMOVAL OF WASTE AND LINER.
4. THE SOUTH CELL OF THE BOTTOM ASH IMPOUNDMENT WAS CLOSED WITH A FINAL COVER OVER PLACED WASTE.
5. THE BOTTOM ASH LANDFILL WAS CLOSED BY CONSOLIDATION OF PLACED WASTE INTO A SMALLER FOOTPRINT AND CONSTRUCTION OF A FINAL COVER.

N

0 200 400
1" = 200' FEET

Path: \\golder.gds\complexdata\office\Denver\acad\GREAT RIVER ENERGY\STANTON\99_PROJECTS\21509219\Annual Monitoring Reports\ | File Name: 21509219_2022 WQ-StantonNDDEQ_Q2.dwg

wsp

MONITORING WELL LOCATIONS AND Q2 2022 GROUNDWATER ELEVATIONS GREAT RIVER ENERGY - STANTON STATION

FIGURE 1

LEGEND

- UPGRADIENT OR SIDEGRADIENT MONITORING WELL
- LANDFILL DOWNGRADIENT MONITORING WELL
- IMPOUNDMENT DOWNGRADIENT MONITORING WELL
- NATURE AND EXTENT WELLS (NOTE 7)
- CLOSED BOTTOM ASH LANDFILL/IMPOUNDMENT FOOTPRINT
- GENERAL DIRECTION OF GROUNDWATER FLOW
- GROUNDWATER CONTOURS AND ELEVATIONS

NOTE(S)

1. AERIAL IMAGERY OBTAINED FROM UNITED STATES DEPARTMENT OF AGRICULTURE, NATIONAL AGRICULTURE IMAGERY PROGRAM, 2020.
2. GROUNDWATER CONTOURS ARE BASED ON NOVEMBER 2022 ELEVATION INFORMATION FROM THE SHOWN MONITORING WELLS, AS WELL AS MONITORING WELLS AND PIEZOMETERS NOT SHOWN.
3. THE NORTH AND CENTER CELLS OF THE BOTTOM ASH IMPOUNDMENT WERE CLOSED BY REMOVAL OF WASTE AND LINER.
4. THE SOUTH CELL OF THE BOTTOM ASH IMPOUNDMENT WAS CLOSED WITH A FINAL COVER OVER PLACED WASTE.
5. THE BOTTOM ASH LANDFILL WAS CLOSED BY CONSOLIDATION OF PLACED WASTE INTO A SMALLER FOOTPRINT AND CONSTRUCTION OF A FINAL COVER.

N

0 200 400

1" = 200' FEET

MONITORING WELL LOCATIONS AND
Q4 2022 GROUNDWATER ELEVATIONS
GREAT RIVER ENERGY - STANTON STATION

FIGURE 2

APPENDIX A

New Well Boring Log and Construction Information

WELL LOG NO. MW210

PROJECT: Monitoring Well Installation

CLIENT: Golder Associates Inc
Lakewood, CO

SITE: Hwy 200
Stanton, ND

LOCATION See Exploration Plan

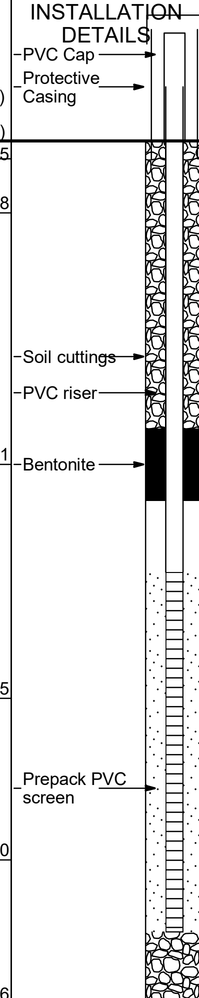
Latitude: 47.2851° Longitude: -101.3310°

Surface Elev.: 1700 (Ft.)

DEPTH	Description	ELEVATION (Ft.)
0.5	**TOPSOIL**, dark brown	1699.5
2.0	**FILL - LEAN CLAY WITH SAND**, dark brown	1698
9.0	**FILL - SILTY SAND**, trace gravel, fine to medium grained, brown, seams of clay	1691
15.5	**POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)**, fine to coarse grained, brown, medium dense, waterbearing	1684.5
20.0	**POORLY GRADED SAND WITH SILT (SP-SM)**, trace gravel, fine to medium grained, brown, loose to medium dense	1680
24.0	**POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)**, fine to medium grained, brown, medium dense	1676

Boring Terminated at 24 Feet

INSTALLATION DETAILS



DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS
5			13	8-17-25 N=42
10	▽		16	4-9-10 N=19
15			18	1-2-8-9 N=10
			18	1-2-4-8 N=6
			15	2-6-7-14 N=13
20			18	2-4-11-15 N=15
			18	9-10-8-11 N=18

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4¼" HSA, 0-22'

Abandonment Method:

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While sampling*

Terracon
1805 Hancock Dr PO Box 2084
Bismarck, ND

Well Started: 05-09-2022	Well Completed: 05-09-2022
Drill Rig: Mobile B-57	Driller: Mike R.
Project No.: M2225030	

WELL LOG NO. MW211

PROJECT: Monitoring Well Installation

CLIENT: Golder Associates Inc
Lakewood, CO

SITE: Hwy 200
Stanton, ND

LOCATION See Exploration Plan

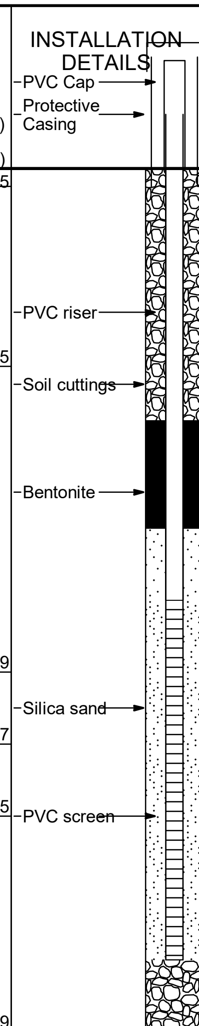
Latitude: 47.2845° Longitude: -101.3323°

Surface Elev.: 1703 (Ft.)

DEPTH	Description	ELEVATION (Ft.)	SAMPLE DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS
0.5	**TOPSOIL**, dark brown	1702.5					
5.5	**LEAN CLAY WITH SAND**, dark brown	1697.5	5		X	15	5-13-11 N=24
14.0	**SILTY SAND (SM)**, fine to medium grained, grayish brown, medium dense to loose waterbearing at 9.5'	1689	10	▽	X	16	3-2-3 N=5
16.0	**LEAN CLAY WITH SAND (CL)**, grayish brown, stiff	1687	15		X	18	2-3-6-7 N=9
18.0	**SILTY SAND (SM)**, fine to medium grained, gray, medium dense, waterbearing	1685			X	19	3-5-9-11 N=14
24.0	**POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)**, fine to coarse grained, grayish brown to gray, medium dense, waterbearing	1679	20		X	24	8-11-8-14 N=19
					X	14	4-7-17-14 N=24
					X	16	3-7-12-12 N=19

Boring Terminated at 24 Feet

INSTALLATION DETAILS



Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4¼" HSA, 0-22'

Abandonment Method:

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While sampling*

Terracon
1805 Hancock Dr PO Box 2084
Bismarck, ND

Well Started: 05-10-2022	Well Completed: 05-10-2022
Drill Rig: Mobile B-57	Driller: Mike R.
Project No.: M2225030	

WELL LOG NO. MW212

PROJECT: Monitoring Well Installation

CLIENT: Golder Associates Inc
Lakewood, CO

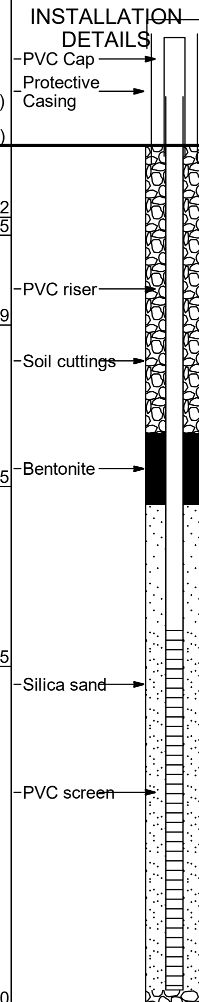
SITE: Hwy 200
Stanton, ND

LOCATION See Exploration Plan

Latitude: 47.2845° Longitude: -101.3313°

Surface Elev.: 1704 (Ft.)

INSTALLATION DETAILS



DEPTH	Description	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS
2.0	**TOPSOIL AND ROOTZONE**, dark brown	1702					
2.5	**COAL/LIGNITE**, black	1701.5					
5.0	**SANDY LEAN CLAY (CL)**, dark brown, stiff	1699	5			18	3-7-7 N=14
9.5	**SILTY SAND (SM)**, brown, medium dense	1694.5	10			9	2-4-5 N=9
14.5	**FAT CLAY (CH)**, brown to dark brown, stiff, seam of coal at 14.5'	1689.5	15			17	7-9-9-11 N=18
	POORLY GRADED SAND WITH SILT (SP-SM), fine to coarse grained, brown, medium dense to loose, seams of gravel			▽		16	4-5-4-5 N=9
	waterbearing at 16'					11	2-3-4-5 N=7
			20			12	1-2-4-5 N=6
24.0		1680				11	2-1-3-5 N=4

Boring Terminated at 24 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4¼" HSA, 0-22'

Abandonment Method:

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While sampling*

Terracon
1805 Hancock Dr PO Box 2084
Bismarck, ND

Well Started: 05-10-2022	Well Completed: 05-10-2022
Drill Rig: Mobile B-57	Driller: Mike R.
Project No.: M2225030	

WELL LOG NO. MW213

PROJECT: Monitoring Well Installation

CLIENT: Golder Associates Inc
Lakewood, CO

SITE: Hwy 200
Stanton, ND

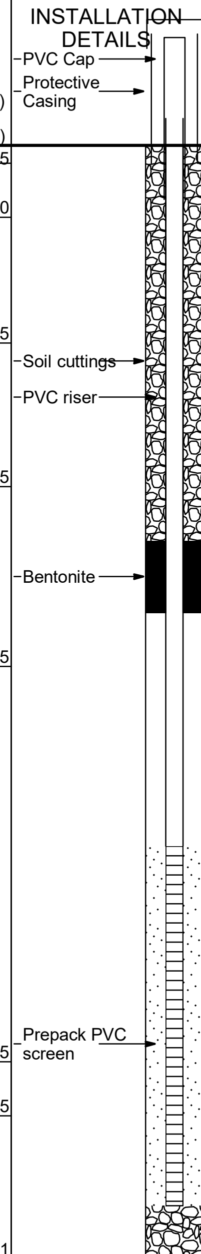
LOCATION See Exploration Plan

Latitude: 47.2856° Longitude: -101.3303°

Surface Elev.: 1702 (Ft.)

DEPTH (Ft.)	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.5	**TOPSOIL**, dark brown	1701.5
2.0	**LEAN CLAY WITH SAND**, dark brown	1700
5.5	**LEAN CLAY WITH SAND (CL)**, dark brown	1696.5
9.5	**SILTY SAND (SM)**, trace gravel, fine to medium grained, brown, dense	1692.5
14.5	**POORLY GRADED SAND WITH SILT (SP-SM)**, trace gravel, brown, medium dense	1687.5
25.5	**SILTY SAND (SM)**, trace gravel, fine to medium grained, grayish brown to brown, medium dense, waterbearing	1676.5
27.0	**FAT CLAY (CH)**, gray, hard	1675
31.0	**SANDY FAT CLAY (CH)**, gray, very stiff to hard	1671
	Boring Terminated at 31 Feet	

INSTALLATION DETAILS



DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS
5			16	14-21-22 N=43
10			12	6-9-9 N=18
15	▽		17	4-8-10 N=18
20			19	8-11-18-21 N=29
25			18	6-11-35-41 N=46
			23	8-10-15-21 N=25
30			24	9-12-21-26 N=33

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3¼" HSA, 0-29'

Abandonment Method:

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While sampling*

Terracon
1805 Hancock Dr PO Box 2084
Bismarck, ND

Well Started: 05-12-2022	Well Completed: 05-12-2022
Drill Rig: Mobile B-57	Driller: Mike R.
Project No.: M2225030	

WELL LOG NO. MW214

PROJECT: Monitoring Well Installation

CLIENT: Golder Associates Inc Lakewood, CO

SITE: Hwy 200 Stanton, ND

LOCATION See Exploration Plan

Latitude: 47.2822° Longitude: -101.3357°

Surface Elev.: 1703 (Ft.)

INSTALLATION DETAILS: PVC Cap, Protective Casing

DEPTH	Description	ELEVATION (Ft.)	Installation Details
0.5	**TOPSOIL AND ROOTZONE**, dark brown	1702.5	Soil cuttings
2.5	**CLAYEY SAND (SC)**, brown	1700.5	PVC riser; Bentonite
10.0	**SILTY SAND (SM)**, fine to medium grained, brown, loose, waterbearing at 4.5'	1693	
16.5	**FAT CLAY (CH)**, brown, stiff	1686.5	Silica sand; PVC screen
	Boring Terminated at 16.5 Feet		

DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS
4.5	▽			
5		X	18	1-2-2-4 N=4
10		X	18	2-3-5-8 N=8
15		X	18	3-4-4-8 N=8

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4¼" HSA, 0-14½'

Abandonment Method:

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While sampling*

Terracon
1805 Hancock Dr PO Box 2084
Bismarck, ND

Well Started: 05-12-2022 | Well Completed: 05-12-2022

Drill Rig: Mobile B-57 | Driller: Mike R.

Project No.: M2225030

BORING LOG NO. MW-PB1

PROJECT: GRE Stanton Monitoring Well Installation

CLIENT: Golder Associates Inc
Lakewood, CO

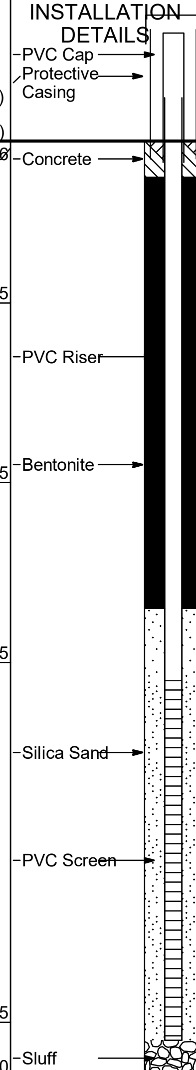
SITE: 4001 Highway 200A
Stanton, ND

LOCATION See Exploration Plan

Latitude: 47.2866° Longitude: -101.3289°

Surface Elev.: 1696 (Ft.)

INSTALLATION DETAILS



DEPTH	Material Description	ELEVATION (Ft.)	Sample Depth (Ft.)	Water Level Observations	Field Test Results
0.2	**TOPSOIL**, brown	1696	0		3-4-5 N=9
4.5	**LEAN CLAY (CL)**, brown, medium stiff	1691.5			
9.5	**SANDY LEAN CLAY (CL)**, light brown, soft	1686.5	5		2-2-2 N=4
14.5	**CLAYEY SAND**, light brown, loose	1681.5	10		2-2-2 N=4
24.5	**SILT WITH SAND**, gray, very loose, fine-grained, waterbearing at 15½'	1671.5	15	▽	1-2-1 N=3
			20		0-1-2 N=3
26.0	**SILTY SAND**, gray, very loose, fine to medium-grained, waterbearing, fat clay seams	1670	25		0-1-1 N=2

Boring Terminated at 26 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3¼" Inside Diameter, Hollow Stem Auger 0-24½

Abandonment Method:
Boring converted to monitoring well installation

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While sampling*

Terracon
1805 Hancock Dr PO Box 2084
Bismarck, ND

Boring Started: 08-11-2020	Boring Completed: 08-11-2020
Drill Rig: B-57	Driller: Mike R.
Project No.: M2205068	

APPENDIX B

Monitoring Data

Table 1: Sample Results Summary Table - MW-6B (Sidegradient)

		MW-6B		
		Detection Monitoring / Assessment Monitoring		
	Units	14-Mar-22	27-Jun-22	30-Nov-22
Water Elevation	ft AMSL	1694.5	1694.5	1693.9
Field Parameters				
Temperature, Field	deg C	6.98	11.8	8.18
Turbidity, Field	ntu	2.75	1.29	2.2
Specific Conductance, Field	µmhos/cm	1581	1489	1567
Detection Monitoring Parameters				
Boron	mg/L	0.34	0.27	0.31
Calcium	mg/L	18.8	19.5	21.5
Chloride	mg/L	16.9	18.2	17.3
Fluoride	mg/L	0.61	0.61	0.57
pH, Field	s.u.	7.56	7.68	7.81
pH, Lab	s.u.	8.0	8.0	7.7
Sulfate	mg/L	325	326	317
Total Dissolved Solids	mg/L	1090	1040	1060
Assessment Monitoring Parameters				
Antimony	mg/L	< 0.001	< 0.001	< 0.001
Arsenic	mg/L	0.0055	0.0039	0.0044
Barium	mg/L	0.0274	0.0237	0.0346
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005
Chromium	mg/L	< 0.002	< 0.002	< 0.002
Cobalt	mg/L	< 0.002	< 0.002	< 0.002
Fluoride	mg/L	0.61	0.61	0.57
Lead	mg/L	< 0.0005	< 0.0005	< 0.0005
Lithium	mg/L	0.0507	0.0479	0.0527
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	0.0160	0.0134	0.0121
Radium 226	pCi/L	0.264 ± 0.194	0.0447 U ± 0.164	0.564 ± 0.354
Radium 228	pCi/L	0.624 U ± 0.826	-0.191 U ± 0.777	2.04 ± 1.19
Radium 226 and 228 combined	pCi/L	0.888 U ± 0.849	0.0447 U ± 0.794	2.60 ± 1.24
Selenium	mg/L	< 0.005	< 0.005	< 0.005
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005

Notes:
--: not analyzed
ft AMSL: feet above mean sea level
deg C: degrees Celsius
ntu: Nephelometric Turbidity Units
µmhos/cm: micromhos per centimeter
mg/L: milligrams per liter
s.u.: standard units for pH
pCi/L: picocuries per liter
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).

Laboratory Provided Qualifiers:
U (Radiochem): Not detected above the minimum detectable concentration (varies by sample).

Table 2: Sample Results Summary Table - MW-7A (Upgradient)

		MW-7A Detection Monitoring / Assessment Monitoring		
	Units	**14-Mar-22**	**27-Jun-22**	**30-Nov-22**
Water Elevation	**ft AMSL**	**1701.8**	**1703.1**	**1701.8**
Field Parameters				
Temperature, Field	deg C	6.35	11.28	8.87
Turbidity, Field	ntu	0.95	< 0.1	< 0.1
Specific Conductance, Field	µmhos/cm	15768	15876	15074
Detection Monitoring Parameters				
Boron	mg/L	0.56	< 0.50	< 0.50
Calcium	mg/L	406	418	416
Chloride	mg/L	33.9	32.7	33.3
Fluoride	mg/L	0.53	0.54	0.53
pH, Field	s.u.	7.26	7.29	7.33
pH, Lab	s.u.	7.4	7.7	7.7
Sulfate	mg/L	10500	10700	9020
Total Dissolved Solids	mg/L	16600	17200	15900
Assessment Monitoring Parameters				
Antimony	mg/L	< 0.001	< 0.001	< 0.001
Arsenic	mg/L	< 0.002	< 0.004	0.0022
Barium	mg/L	0.0096	0.0084	0.0087
Beryllium	mg/L	< 0.0005	< 0.001	< 0.0005
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005
Chromium	mg/L	0.0022	< 0.004	< 0.002
Cobalt	mg/L	< 0.002	< 0.004	< 0.002
Fluoride	mg/L	0.53	0.54	0.53
Lead	mg/L	< 0.0005	< 0.0005	< 0.0005
Lithium	mg/L	0.279	0.309	0.294
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	0.0117	0.0105	0.0111
Radium 226	pCi/L	0.198 U ± 0.215	1.21 ± 0.369	0.444 ± 0.301
Radium 228	pCi/L	0.475 U ± 1.06	1.07 U ± 0.753	1.97 ± 1.17
Radium 226 and 228 combined	pCi/L	0.674 U ± 1.08	2.29 ± 0.838	2.42 ± 1.20
Selenium	mg/L	< 0.005	< 0.01	< 0.005
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005

Notes:
--: not analyzed
ft AMSL: feet above mean sea level
deg C: degrees Celsius
ntu: Nephelometric Turbidity Units
µmhos/cm: micromhos per centimeter
mg/L: milligrams per liter
pCi/L: picocuries per liter
s.u.: standard units for pH
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample).

Table 3: Sample Results Summary Table - MW-7B (Upgradient)

		MW-7B		
		Detection Monitoring / Assessment Monitoring		
	Units	**14-Mar-22**	**27-Jun-22**	**30-Nov-22**
Water Elevation	**ft AMSL**	**1702.7**	**1702.8**	**1701.5**
Field Parameters				
Temperature, Field	deg C	7.5	10.39	5.77
Turbidity, Field	ntu	0.99	< 0.1	< 0.1
Specific Conductance, Field	µmhos/cm	1498	1445	1590
Detection Monitoring Parameters				
Boron	mg/L	0.42	0.38	0.43
Calcium	mg/L	15.6	14.5	17.1
Chloride	mg/L	12.7	13.3	12.5
Fluoride	mg/L	0.60	0.64	0.60
pH, Field	s.u.	7.68	7.76	7.74
pH, Lab	s.u.	7.9	7.7	8.1
Sulfate	mg/L	250	271	236
Total Dissolved Solids	mg/L	951	970	1020
Assessment Monitoring Parameters				
Antimony	mg/L	< 0.001	< 0.001	< 0.001
Arsenic	mg/L	< 0.002	< 0.002	< 0.002
Barium	mg/L	0.0194	0.0157	0.0170
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005
Chromium	mg/L	< 0.002	< 0.002	< 0.002
Cobalt	mg/L	< 0.002	< 0.002	< 0.002
Fluoride	mg/L	0.60	0.64	0.60
Lead	mg/L	< 0.0005	< 0.0005	< 0.0005
Lithium	mg/L	0.0566	0.0541	0.0566
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	0.0071	0.0053	0.0052
Radium 226	pCi/L	0.239 U ± 0.234	0.271 U ± 0.231	0.352 U ± 0.345
Radium 228	pCi/L	1.15 U ± 1.20	-0.0229 U ± 0.961	1.31 ± 0.859
Radium 226 and 228 combined	pCi/L	1.39 U ± 1.23	0.271 U ± 0.989	1.66 ± 0.926
Selenium	mg/L	< 0.005	< 0.005	< 0.005
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005

Notes:
--: not analyzed
ft AMSL: feet above mean sea level
deg C: degrees Celsius
ntu: Nephelometric Turbidity Units
µmhos/cm: micromhos per centimeter
mg/L: milligrams per liter
pCi/L: picocuries per liter
s.u.: standard units for pH
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample).

Table 4: Sample Results Summary Table - MW-8B (Upgradient)

		MW-8B		
		Detection Monitoring / Assessment Monitoring		
	Units	14-Mar-22	27-Jun-22	30-Nov-22
Water Elevation	ft AMSL	1709.9	1707.9	1705.9
Field Parameters				
Temperature, Field	deg C	8.38	13.1	7.77
Turbidity, Field	ntu	7.85	0.96	1.6
Specific Conductance, Field	µmhos/cm	1102	1035	1064
Detection Monitoring Parameters				
Boron	mg/L	0.23	0.20	0.26
Calcium	mg/L	91.8	86.3	88.5
Chloride	mg/L	11.6	11.6	10.7
Fluoride	mg/L	0.17	0.20	0.19
pH, Field	s.u.	7.31	7.42	7.26
pH, Lab	s.u.	7.6	7.6	7.5
Sulfate	mg/L	221	205	194
Total Dissolved Solids	mg/L	693	721	719
Assessment Monitoring Parameters				
Antimony	mg/L	< 0.001	< 0.001	< 0.001
Arsenic	mg/L	< 0.002	< 0.002	< 0.002
Barium	mg/L	0.0336	0.0297	0.0297
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005
Chromium	mg/L	< 0.002	< 0.002	< 0.002
Cobalt	mg/L	< 0.002	< 0.002	< 0.002
Fluoride	mg/L	0.17	0.20	0.19
Lead	mg/L	< 0.0005	< 0.0005	< 0.0005
Lithium	mg/L	0.0650	0.0661	0.0721
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	< 0.002	< 0.002	< 0.002
Radium 226	pCi/L	0.282 U ± 0.247	0.330 U ± 0.239	0.285 U ± 0.348
Radium 228	pCi/L	-0.200 U ± 0.744	-0.0872 U ± 0.568	1.15 U ± 0.908
Radium 226 and 228 combined	pCi/L	0.282 U ± 0.784	0.330 U ± 0.616	1.44 ± 0.972
Selenium	mg/L	< 0.005	< 0.005	< 0.005
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005

Notes:
--: not analyzed
ft AMSL: feet above mean sea level
deg C: degrees Celsius
ntu: Nephelometric Turbidity Units
µmhos/cm: micromhos per centimeter
mg/L: milligrams per liter
pCi/L: picocuries per liter
s.u.: standard units for pH
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample).

Table 5: Sample Results Summary Table - MW-105 (Upgradient

		MW-105		
		Detection Monitoring / Assessment Monitoring		
	Units	14-Mar-22	27-Jun-22	30-Nov-22
Water Elevation	ft AMSL	1703.6	1703.5	1702.2
Field Parameters				
Temperature, Field	deg C	7.95	9.29	8.98
Turbidity, Field	ntu	2.01	0.52	295.5
Specific Conductance, Field	µmhos/cm	1834	1939	1871
Detection Monitoring Parameters				
Boron	mg/L	0.35	0.29	0.37
Calcium	mg/L	38.3	46.0	45.5
Chloride	mg/L	13.5	11.7	11.1
Fluoride	mg/L	0.97	0.90	0.92
pH, Field	s.u.	7.78	7.63	7.67
pH, Lab	s.u.	8.0	7.9	7.8
Sulfate	mg/L	396	424	242
Total Dissolved Solids	mg/L	1180	1390	1360
Assessment Monitoring Parameters				
Antimony	mg/L	< 0.001	< 0.001	< 0.001
Arsenic	mg/L	0.0020	< 0.002	0.0061
Barium	mg/L	0.0410	0.0463	0.1698
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005
Chromium	mg/L	< 0.002	0.0032	0.0148
Cobalt	mg/L	< 0.002	< 0.002	0.0052
Fluoride	mg/L	0.97	0.90	0.92
Lead	mg/L	< 0.0005	< 0.0005	0.0051
Lithium	mg/L	0.0474	0.0500	0.0646
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	0.0403	0.0247	0.0285
Radium 226	pCi/L	0.264 U ± 0.250	0.472 ± 0.253	0.402 U ± 0.315
Radium 228	pCi/L	-0.219 U ± 1.16	1.60 U ± 1.08	2.13 ± 1.04
Radium 226 and 228 combined	pCi/L	0.264 U ± 1.19	2.07 ± 1.11	2.53 ± 1.08
Selenium	mg/L	0.0210	0.0281	0.0318
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005

Notes:
--: not analyzed
ft AMSL: feet above mean sea level
deg C: degrees Celsius
ntu: Nephelometric Turbidity Units
µmhos/cm: micromhos per centimeter
mg/L: milligrams per liter
pCi/: picocuries per liter
s.u.: standard units for pH
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample).

Table 6: Sample Results Summary Table - MW-9N (Downgradient, Bottom Ash Landfill

		MW-9N		
		Assessment Monitoring		
	Units	15-Mar-22	28-Jun-22	30-Nov-22
Water Elevation	**ft AMSL**	**1689.7**	**1690.6**	**1689.5**
Field Parameters				
Temperature, Field	deg C	6.98	9.44	10.47
Turbidity, Field	ntu	1.37	12.08	9.77
Specific Conductance, Field	µmhos/cm	3801	3486	4406
Detection Monitoring Parameters				
Boron	mg/L	2.55	2.25	2.50
Calcium	mg/L	83.8	85.7	100
Chloride	mg/L	22.6	23.2	27.2
Fluoride	mg/L	0.68	0.72	0.70
pH, Field	s.u.	7	7.16	7.15
pH, Lab	s.u.	7.3	7.6	7.8
Sulfate	mg/L	1200	1260	1430
Total Dissolved Solids	mg/L	2800	2710	3320
Assessment Monitoring Parameters				
Antimony	mg/L	< 0.001	< 0.001	< 0.001
Arsenic	mg/L	< 0.002	< 0.002	< 0.002
Barium	mg/L	0.0584	0.0529	0.0906
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005
Chromium	mg/L	< 0.002	< 0.002	< 0.002
Cobalt	mg/L	0.0021	0.0038	0.0070
Fluoride	mg/L	0.68	0.72	0.70
Lead	mg/L	< 0.0005	< 0.0005	< 0.0005
Lithium	mg/L	0.0508	0.0500	0.0598
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	0.0539	0.0543	0.0602
Radium 226	pCi/L	0.287 U ± 0.225	0.987 ± 0.483	1.02 ± 0.435
Radium 228	pCi/L	-0.0226 U ± 0.853	1.60 U ± 1.25	0.456 U ± 0.938
Radium 226 and 228 combined	pCi/L	0.287 U ± 0.882	2.58 ± 1.34	1.48 U ± 1.03
Selenium	mg/L	0.0125	0.0106	0.0247
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005

Notes:
--: not analyzed
ft AMSL: feet above mean sea level
deg C: degrees Celsius
ntu: Nephelometric Turbidity Units
µmhos/cm: micromhos per centimeter
mg/L: milligrams per liter
pCi/L: picocuries per liter
s.u.: standard units for pH
Non-detects have been listed at the reported primary quantitation limit
Metal concentrations represent the total fraction (i.e. samples have not been filtered

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample)

Table 7: Sample Results Summary Table - MW-102 (Downgradient, Bottom Ash Landfill

		MW-102		
		Assessment Monitoring		
	Units	15-Mar-22	28-Jun-22	30-Nov-22
Water Elevation	ft AMSL	1694.5	1695.1	1694.0
Field Parameters				
Temperature, Field	deg C	9.28	9.56	9.77
Turbidity, Field	ntu	3.45	1.09	6.94
Specific Conductance, Field	µmhos/cm	2033	1953	2010
Detection Monitoring Parameters				
Boron	mg/L	0.46	0.43	0.43
Calcium	mg/L	65.2	60.7	63.2
Chloride	mg/L	15.9	17.0	16.0
Fluoride	mg/L	0.49	0.50	0.49
pH, Field	s.u.	7.44	7.57	7.61
pH, Lab	s.u.	7.8	7.7	7.6
Sulfate	mg/L	566	575	491
Total Dissolved Solids	mg/L	1360	1440	1380
Assessment Monitoring Parameters				
Antimony	mg/L	< 0.001	< 0.001	< 0.001
Arsenic	mg/L	< 0.002	< 0.002	< 0.002
Barium	mg/L	0.0260	0.0257	0.0362
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005
Chromium	mg/L	< 0.002	< 0.002	< 0.002
Cobalt	mg/L	< 0.002	< 0.002	0.0023
Fluoride	mg/L	0.49	0.50	0.49
Lead	mg/L	< 0.0005	< 0.0005	< 0.0005
Lithium	mg/L	0.0601	0.0558	0.0614
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	0.0184	0.0252	0.0218
Radium 226	pCi/L	0.116 U ± 0.254	0.189 U ± 0.339	0.605 ± 0.379
Radium 228	pCi/L	-0.473 U ± 0.775	1.27 U ± 1.07	1.70 ± 0.906
Radium 226 and 228 combined	pCi/L	0.116 U ± 0.815	1.46 U ± 1.12	2.31 ± 0.982
Selenium	mg/L	< 0.005	< 0.005	< 0.005
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005

Notes:
--: not analyzed
ft AMSL: feet above mean sea level
deg C: degrees Celsius
ntu: Nephelometric Turbidity Units
µmhos/cm: micromhos per centimeter
mg/L: milligrams per liter
pCi/L: picocuries per liter
s.u.: standard units for pH
Non-detects have been listed at the reported primary quantitation limit
Metal concentrations represent the total fraction (i.e. samples have not been filtered

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample)

Table 8: Sample Results Summary Table - MW-103 (Downgradient, Bottom Ash Landfill

		MW-103		
		Assessment Monitoring		
	Units	15-Mar-22	28-Jun-22	30-Nov-22
Water Elevation	**ft AMSL**	**1690.0**	**1690.8**	**1689.8**
Field Parameters				
Temperature, Field	deg C	7.87	10.05	8.76
Turbidity, Field	ntu	32.3	1.27	2.11
Specific Conductance, Field	µmhos/cm	2826	2505	3002
Detection Monitoring Parameters				
Boron	mg/L	1.27	0.86	1.47
Calcium	mg/L	23.6	20.7	31.2
Chloride	mg/L	18.2	19.5	17.9
Fluoride	mg/L	0.34	0.22	0.43
pH, Field	s.u.	8.95	9.21	9.1
pH, Lab	s.u.	9.1	9.0	8.8
Sulfate	mg/L	779	725	734
Total Dissolved Solids	mg/L	1950	1810	2090
Assessment Monitoring Parameters				
Antimony	mg/L	< 0.001	< 0.001	< 0.001
Arsenic	mg/L	0.0131	0.0097	0.0170
Barium	mg/L	0.0611	0.0713	0.0620
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005
Chromium	mg/L	< 0.002	< 0.002	< 0.002
Cobalt	mg/L	< 0.002	< 0.002	< 0.002
Fluoride	mg/L	0.34	0.22	0.43
Lead	mg/L	0.0031	0.0038	0.0030
Lithium	mg/L	0.0302	0.0374	0.0234
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	0.0504	0.0316	0.0656
Radium 226	pCi/L	0.280 U ± 0.257	1.21 ± 0.521	0.573 U ± 0.465
Radium 228	pCi/L	2.21 ± 1.40	0.386 U ± 0.937	2.35 ± 1.42
Radium 226 and 228 combined	pCi/L	2.49 ± 1.42	1.60 U ± 1.07	2.93 ± 1.49
Selenium	mg/L	0.0061	< 0.005	0.0130
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005

Notes:
--: not analyzed
ft AMSL: feet above mean sea level
deg C: degrees Celsius
ntu: Nephelometric Turbidity Units
µmhos/cm: micromhos per centimeter
mg/L: milligrams per liter
pCi/L: picocuries per liter
s.u.: standard units for pH
Non-detects have been listed at the reported primary quantitation limit
Metal concentrations represent the total fraction (i.e. samples have not been filtered

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample)

Table 9: Sample Results Summary Table - MW-1R (Downgradient, Bottom Ash Impoundment)

		MW-1R				
		Additional Collected Data			Detection Monitoring	
	Units	28-Mar-22	28-Jun-22	1-Dec-22	28-Jun-22	1-Dec-22
Water Elevation	ft AMSL	1689.6	1690.3	1689.4	1690.3	1689.4
Field Parameters						
Temperature, Field	deg C	8.08	12.52	8.95	12.52	8.95
Turbidity, Field	ntu	60.3	184.67	185.72	184.67	185.72
Specific Conductance, Field	µmhos/cm	1523	1466	1545	1466	1545
Detection Monitoring Parameters						
Boron	mg/L	1.23	---	---	1.15	1.15
Calcium	mg/L	106	---	---	109	103
Chloride	mg/L	14.2	---	---	14.6	13.3
Fluoride	mg/L	0.70	---	---	0.72	0.74
pH, Field	s.u.	7.63	---	---	7.68	7.63
pH, Lab	s.u.	7.8	---	---	8.1	8.0
Sulfate	mg/L	404	---	---	405	374
Total Dissolved Solids	mg/L	1080	---	---	1070	1100
Assessment Monitoring Parameters						
Antimony	mg/L	< 0.001	< 0.001	---	---	---
Arsenic	mg/L	< 0.002	0.0026	---	---	---
Barium	mg/L	0.0481	0.0732	---	---	---
Beryllium	mg/L	< 0.0005	< 0.0005	---	---	---
Cadmium	mg/L	< 0.0005	< 0.0005	---	---	---
Chromium	mg/L	< 0.002	< 0.002	---	---	---
Cobalt	mg/L	< 0.002	< 0.002	---	---	---
Fluoride	mg/L	0.70	0.72	---	---	---
Lead	mg/L	< 0.0005	< 0.0005	---	---	---
Lithium	mg/L	0.0491	0.0461	0.0513	---	---
Mercury	mg/L	< 0.0002	< 0.0002	---	---	---
Molybdenum	mg/L	0.0142	0.0134	---	---	---
Radium 226	pCi/L	0.446 ± 0.240	1.26 ± 0.430	---	---	---
Radium 228	pCi/L	1.54 ± 0.580	2.37 ± 1.31	---	---	---
Radium 226 and 228 combined	pCi/L	1.98 ± 0.628	3.63 ± 1.38	---	---	---
Selenium	mg/L	< 0.005	< 0.005	---	---	---
Thallium	mg/L	< 0.0005	< 0.0005	---	---	---

Notes:
--: not analyzed
ft AMSL: feet above mean sea level
deg C: degrees Celsius
ntu: Nephelometric Turbidity Units
µmhos/cm: micromhos per centimeter
mg/L: milligrams per liter
pCi/L: picocuries per liter
s.u.: standard units for pH
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample).

Table 10: Sample Results Summary Table - MW-104 (Downgradient, Bottom Ash Impoundment)

		MW-104				
		Additional Collected Data			Detection Monitoring	
	Units	28-Mar-22	28-Jun-22	1-Dec-22	28-Jun-22	1-Dec-22
Water Elevation	ft AMSL	1690.0	1690.7	1689.7	1690.7	1689.7
Field Parameters						
Temperature, Field	deg C	8.63	11.41	9.22	11.41	9.22
Turbidity, Field	ntu	71.9	0.97	1.83	0.97	1.83
Specific Conductance, Field	µmhos/cm	1747	1736	1746	1736	1746
Detection Monitoring Parameters						
Boron	mg/L	0.74	---	---	0.69	0.68
Calcium	mg/L	83.9	---	---	80.3	75.0
Chloride	mg/L	15.3	---	---	15.4	14.4
Fluoride	mg/L	0.69	---	---	0.69	0.76
pH, Field	s.u.	7.26	---	---	7.26	7.32
pH, Lab	s.u.	7.5	---	---	7.9	7.5
Sulfate	mg/L	471	---	---	469	390
Total Dissolved Solids	mg/L	1210	---	---	1280	1190
Assessment Monitoring Parameters						
Antimony	mg/L	< 0.001	< 0.001	---	---	---
Arsenic	mg/L	0.0024	< 0.002	---	---	---
Barium	mg/L	0.0981	0.0578	---	---	---
Beryllium	mg/L	< 0.0005	< 0.0005	---	---	---
Cadmium	mg/L	< 0.0005	< 0.0005	---	---	---
Chromium	mg/L	0.0025	< 0.002	---	---	---
Cobalt	mg/L	0.0058	0.0022	---	---	---
Fluoride	mg/L	0.69	0.69	---	---	---
Lead	mg/L	0.0015	< 0.0005	---	---	---
Lithium	mg/L	0.0313	0.0302	0.0290	---	---
Mercury	mg/L	< 0.0002	< 0.0002	---	---	---
Molybdenum	mg/L	0.0438	0.0467	---	---	---
Radium 226	pCi/L	0.475 ± 0.239	0.647 ± 0.447	---	---	---
Radium 228	pCi/L	0.287 U ± 0.336	2.11 U ± 1.40	---	---	---
Radium 226 and 228 combined	pCi/L	0.762 ± 0.412	2.75 ± 1.47	---	---	---
Selenium	mg/L	< 0.005	< 0.005	---	---	---
Thallium	mg/L	< 0.0005	< 0.0005	---	---	---

Notes:
--: not analyzed
ft AMSL: feet above mean sea level
deg C: degrees Celsius
ntu: Nephelometric Turbidity Units
µmhos/cm: micromhos per centimeter
mg/L: milligrams per liter
pCi/L: picocuries per liter
s.u.: standard units for pH
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample).

Table 11: Sample Results Summary Table - MW-201 (Downgradient, Bottom Ash Impoundment)

		MW-201					
		Baseline Period		Additional Collected Data		Detection Monitoring	
	Units	28-Mar-22	25-May-22	28-Jun-22	1-Dec-22	28-Jun-22	1-Dec-22
Water Elevation	ft AMSL	1694.5	1695.2	1695.1	1694.3	1695.1	1694.3
Field Parameters							
Temperature, Field	deg C	6.28	7.93	11.52	9.99	11.52	9.99
Turbidity, Field	ntu	15.5	3.53	5.25	17.12	5.25	17.12
Specific Conductance, Field	µmhos/cm	2789	2653	2706	2906	2706	2906
Detection Monitoring Parameters							
Boron	mg/L	1.52	1.53	---	---	1.48	1.62
Calcium	mg/L	97.4	102	---	---	99.2	96.3
Chloride	mg/L	18.5	18.6	---	---	19.3	18.2
Fluoride	mg/L	0.74	0.72	---	---	0.79	0.84
pH, Field	s.u.	7.38	7.55	---	---	7.43	7.48
pH, Lab	s.u.	7.5	7.8	---	---	7.8	7.4
Sulfate	mg/L	1220	955	---	---	1160	1180
Total Dissolved Solids	mg/L	2140	2150	---	---	2130	2130
Assessment Monitoring Parameters							
Antimony	mg/L	< 0.001	< 0.001	< 0.001	---	---	---
Arsenic	mg/L	< 0.002	< 0.002	< 0.002	---	---	---
Barium	mg/L	0.0170	0.0164	0.0178	---	---	---
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005	---	---	---
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005	---	---	---
Chromium	mg/L	< 0.002	< 0.002	< 0.002	---	---	---
Cobalt	mg/L	< 0.002	< 0.002	< 0.002	---	---	---
Fluoride	mg/L	0.74	0.72	0.79	---	---	---
Lead	mg/L	< 0.0005	< 0.0005	< 0.0005	---	---	---
Lithium	mg/L	< 0.02	< 0.02	< 0.02	< 0.02	---	---
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002	---	---	---
Molybdenum	mg/L	0.2064	0.2154	0.2060	---	---	---
Radium 226	pCi/L	0.722 ± 0.288	1.09 ± 0.354	1.80 ± 0.603	---	---	---
Radium 228	pCi/L	0.391 U ± 0.459	1.64 ± 1.04	1.46 U ± 1.24	---	---	---
Radium 226 and 228 combined	pCi/L	1.11 ± 0.542	2.73 ± 1.10	3.25 ± 1.38	---	---	---
Selenium	mg/L	< 0.005	< 0.005	< 0.005	---	---	---
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005	---	---	---

Notes:
--: not analyzed
ft AMSL: feet above mean sea level
deg C: degrees Celsius
ntu: Nephelometric Turbidity Units
µmhos/cm: micromhos per centimeter
mg/L: milligrams per liter
pCi/L: picocuries per liter
s.u.: standard units for pH
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample).

Table 12: Sample Results Summary Table - MW-202 (Downgradient, Bottom Ash Impoundment)

		MW-202					
		Baseline Period		Additional Collected Data		Detection Monitoring	
	Units	28-Mar-22	25-May-22	28-Jun-22	#######	########	1-Dec-22
Water Elevation	ft AMSL	1692.4	1693.6	1693.6	1692.6	1693.6	1692.6
Field Parameters							
Temperature, Field	deg C	6.4	7.86	11.52	10.08	11.52	10.08
Turbidity, Field	ntu	430	69.3	64.54	110.24	64.54	110.24
Specific Conductance, Field	µmhos/cm	1900	1791	1787	1979	1787	1979
Detection Monitoring Parameters							
Boron	mg/L	1.71	1.54	---	---	1.46	1.86
Calcium	mg/L	198	180	---	---	175	174
Chloride	mg/L	12.9	12.4	---	---	12.8	12.0
Fluoride	mg/L	0.12	0.11	---	---	0.13	0.16
pH, Field	s.u.	7.16	7.26	---	---	7.22	7.29
pH, Lab	s.u.	7.5	7.9	---	---	7.9	7.7
Sulfate	mg/L	631	545	---	---	597	614
Total Dissolved Solids	mg/L	1550	1450	---	---	1500	1500
Assessment Monitoring Parameters							
Antimony	mg/L	< 0.001	< 0.001	< 0.001	---	---	---
Arsenic	mg/L	0.0037	< 0.002	< 0.002	---	---	---
Barium	mg/L	0.1350	0.0590	0.0698	---	---	---
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005	---	---	---
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005	---	---	---
Chromium	mg/L	0.0102	0.0038	0.0052	---	---	---
Cobalt	mg/L	0.0060	0.0036	0.0037	---	---	---
Fluoride	mg/L	0.12	0.11	0.13	---	---	---
Lead	mg/L	0.0050	0.0012	0.0013	---	---	---
Lithium	mg/L	0.0271	0.0238	0.0227	0.0262	---	---
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002	---	---	---
Molybdenum	mg/L	0.0045	0.0028	0.0034	---	---	---
Radium 226	pCi/L	0.626 ± 0.344	0.522 U ± 0.380	1.30 ± 0.507	---	---	---
Radium 228	pCi/L	0.719 ± 0.372	1.39 ± 0.911	0.423 U ± 1.12	---	---	---
Radium 226 and 228 combined	pCi/L	1.34 ± 0.506	1.91 ± 0.987	1.72 U ± 1.23	---	---	---
Selenium	mg/L	0.0081	0.0062	0.0080	---	---	---
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005	---	---	---

Notes:
--: not analyzed
ft AMSL: feet above mean sea level
deg C: degrees Celsius
ntu: Nephelometric Turbidity Units
µmhos/cm: micromhos per centimeter
mg/L: milligrams per liter
pCi/L: picocuries per liter
s.u.: standard units for pH
Non-detects have been listed at the reported primary quantitation limit
Metal concentrations represent the total fraction (i.e. samples have not been filtered

Laboratory Provided Qualifiers
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample)

Table 13: Sample Results Summary Table - MW-203 (Downgradient, Bottom Ash Impoundment)

		MW-203					
		Baseline Period		Additional Collected Data		Detection Monitoring	
	Units	28-Mar-22	25-May-22	28-Jun-22	1-Dec-22	28-Jun-22	1-Dec-22
Water Elevation	**ft AMSL**	**1697.1**	**1698.7**	**1698.2**	**1697.0**	**1698.2**	**1697.0**
Field Parameters							
Temperature, Field	deg C	4.91	7.38	14.59	9.29	14.59	9.29
Turbidity, Field	ntu	29.3	5.7	3.2	9.97	3.2	9.97
Specific Conductance, Field	µmhos/cm	1852	4307	5133	2184	5133	2184
Detection Monitoring Parameters							
Boron	mg/L	1.28	2.67	---	---	3.65	1.63
Calcium	mg/L	29.2	59.7	---	---	84.3	16.1
Chloride	mg/L	17.1	29.5	---	---	39.1	16.2
Fluoride	mg/L	0.76	0.67	---	---	0.69	0.93
pH, Field	s.u.	9.32	8.86	---	---	8.37	9.63
pH, Lab	s.u.	9.3	8.8	---	---	8.2	9.4
Sulfate	mg/L	326	1330	---	---	2150	507
Total Dissolved Solids	mg/L	1360	3410	---	---	4140	1530
Assessment Monitoring Parameters							
Antimony	mg/L	< 0.001	0.0011	0.0010	---	---	---
Arsenic	mg/L	0.0220	0.0150	0.0118	---	---	---
Barium	mg/L	0.0544	0.1042	0.1208	---	---	---
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005	---	---	---
Cadmium	mg/L	0.0008	< 0.0005	< 0.0005	---	---	---
Chromium	mg/L	0.0031	< 0.002	< 0.002	---	---	---
Cobalt	mg/L	0.0040	0.0027	0.0029	---	---	---
Fluoride	mg/L	0.76	0.67	0.69	---	---	---
Lead	mg/L	0.0090	0.0023	0.0007	---	---	---
Lithium	mg/L	< 0.02	0.0270	0.0319	< 0.02	---	---
Mercury	mg/L	< 0.0002	0.0005	< 0.0002	---	---	---
Molybdenum	mg/L	0.0713	0.1156	0.1108	---	---	---
Radium 226	pCi/L	0.984 ± 0.378	0.810 ± 0.323	1.13 ± 0.459	---	---	---
Radium 228	pCi/L	0.441 U ± 0.598	0.889 U ± 1.14	1.95 U ± 1.33	---	---	---
Radium 226 and 228 combined	pCi/L	1.42 ± 0.708	1.70 U ± 1.18	3.08 ± 1.40	---	---	---
Selenium	mg/L	0.0054	< 0.005	< 0.005	---	---	---
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005	---	---	---

Notes:
--: not analyzed
deg C: degrees Celsius
ntu: Nephelometric Turbidity Units
µmhos/cm: micromhos per centimeter
ft AMSL: feet above mean sea level
mg/L: milligrams per liter
pCi/L: picocuries per liter
s.u.: standard units for pH
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample).

Table 14: Sample Results Summary Table - MW-210

		MW-210			
	Units	**26-May-22**	**19-Jul-22**	**6-Sep-22**	**30-Nov-22**
Water Elevation	**ft AMSL**	**1690.7**	**1690.4**	**1689.8**	**1689.3**
Field Parameters					
Temperature, Field	deg C	11.29	11.03	20.21	9.26
Turbidity, Field	ntu	44.1	38.59	39.46	42.24
Specific Conductance, Field	µmhos/cm	1487	1696	1706	1610
Detection Monitoring Parameters					
Boron	mg/L	0.66	0.67	0.69	0.7
Calcium	mg/L	78.6	75.2	77.1	76.5
Chloride	mg/L	14.7	14.2	14.8	14.0
Fluoride	mg/L	0.54	0.55	0.55	0.57
pH, Field	s.u.	7.75	7.60	7.61	7.64
pH, Lab	s.u.	7.9	7.8	8.0	7.6
Sulfate	mg/L	422	400	534	397
Total Dissolved Solids	mg/L	1240	1200	1160	1160
Assessment Monitoring Parameters					
Antimony	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Arsenic	mg/L	0.0024	0.0020	0.0021	0.0023
Barium	mg/L	0.0589	0.0566	0.0658	0.0586
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Chromium	mg/L	< 0.002	0.0028	0.0024	0.0021
Cobalt	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Fluoride	mg/L	0.54	0.55	0.55	0.57
Lead	mg/L	0.001	0.0011	0.0014	0.0012
Lithium	mg/L	0.0392	0.0405	0.044	0.0422
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	0.0105	0.0107	0.0106	0.0109
Radium 226	pCi/L	0.958 ± 0.326	0.299 U ± 0.344	0.233 U ± 0.302	0.931 ± 0.447
Radium 228	pCi/L	1.10 U ± 0.816	1.12 U ± 1.09	1.54 U ± 1.59	3.19 ± 1.33
Radium 226 and 228 combined	pCi/L	2.06 ± 0.879	1.41 U ± 1.14	1.77 U ± 1.62	4.12 ± 1.40
Selenium	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005

Notes:
--: not analyzed
ft AMSL: feet above mean sea level
deg C: degrees Celsius
ntu: Nephelometric Turbidity Units
µmhos/cm: micromhos per centimeter
mg/L: milligrams per liter
pCi/L: picocuries per liter
s.u.: standard units for pH
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample).

Table 15: Sample Results Summary Table - MW-211

		MW-211			
	Units	26-May-22	19-Jul-22	6-Sep-22	30-Nov-22
Water Elevation	**ft AMSL**	**1691.0**	**1690.7**	**1690.1**	**1689.5**
Field Parameters					
Temperature, Field	deg C	11.67	10.05	15.03	8.05
Turbidity, Field	ntu	90.8	268.75	1516	1071.7
Specific Conductance, Field	µmhos/cm	2189	2664	3324	2519
Detection Monitoring Parameters					
Boron	mg/L	1.26	1.60	2.18	1.67
Calcium	mg/L	53.4	56.9	97.9	64.7
Chloride	mg/L	19.3	17.9	18.0	17.4
Fluoride	mg/L	0.55	0.56	0.55	0.55
pH, Field	s.u.	8.04	7.73	7.23	7.77
pH, Lab	s.u.	8.3	7.9	7.8	7.6
Sulfate	mg/L	787	791	1020	791
Total Dissolved Solids	mg/L	1830	1950	2380	1880
Assessment Monitoring Parameters					
Antimony	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Arsenic	mg/L	0.011	0.0152	0.0251	0.0496
Barium	mg/L	0.1802	0.2714	0.3744	0.6071
Beryllium	mg/L	< 0.0005	< 0.0005	0.0007	0.001
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Chromium	mg/L	0.0038	0.0110	0.0191	0.0336
Cobalt	mg/L	0.002	0.0058	0.0101	0.0185
Fluoride	mg/L	0.55	0.56	0.55	0.55
Lead	mg/L	0.0016	0.0055	0.0089	0.0164
Lithium	mg/L	0.0233	0.0300	0.0455	0.0463
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	0.0214	0.0242	0.0244	0.0256
Radium 226	pCi/L	1.28 ± 0.398	0.698 ± 0.362	0.851 ± 0.381	1.02 ± 0.474
Radium 228	pCi/L	0.993 U ± 1.08	0.113 U ± 0.841	1.86 U ± 1.28	1.45 U ± 0.966
Radium 226 and 228 combined	pCi/L	2.28 ± 1.15	0.810 U ± 0.916	2.71 ± 1.33	2.47 ± 1.08
Selenium	mg/L	< 0.005	< 0.005	0.0244	0.0062
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005

Notes:
--: not analyzed
ft AMSL: feet above mean sea level
deg C: degrees Celsius
ntu: Nephelometric Turbidity Units
µmhos/cm: micromhos per centimeter
mg/L: milligrams per liter
pCi/L: picocuries per liter
s.u.: standard units for pH
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample).

Table 16: Sample Results Summary Table - MW-212

		MW-212			
	Units	**26-May-22**	**19-Jul-22**	**6-Sep-22**	**30-Nov-22**
Water Elevation	**ft AMSL**	**1691.0**	**1690.7**	**1690.1**	**1689.5**
Field Parameters					
Temperature, Field	deg C	12.61	10.32	15.92	7.04
Turbidity, Field	ntu	26.7	18.15	< 0.1	30.15
Specific Conductance, Field	µmhos/cm	1660	1931	1954	1885
Detection Monitoring Parameters					
Boron	mg/L	0.66	0.65	0.74	0.72
Calcium	mg/L	50.9	52.6	43.0	40.6
Chloride	mg/L	16.6	15.7	17.3	16.7
Fluoride	mg/L	0.44	0.48	0.49	0.49
pH, Field	s.u.	8.06	7.90	8.09	8.21
pH, Lab	s.u.	8.3	8.2	8.2	8.3
Sulfate	mg/L	522	486	477	400
Total Dissolved Solids	mg/L	1430	1370	1360	1030
Assessment Monitoring Parameters					
Antimony	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Arsenic	mg/L	0.0041	0.0034	0.0041	0.0047
Barium	mg/L	0.1065	0.0888	0.0860	0.0859
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Chromium	mg/L	0.0024	< 0.002	0.002	0.0022
Cobalt	mg/L	0.0023	0.0022	0.0036	0.0037
Fluoride	mg/L	0.44	0.48	0.49	0.49
Lead	mg/L	0.0014	0.0017	0.0028	0.003
Lithium	mg/L	0.0255	0.0304	0.0252	0.0251
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	0.0322	0.0365	0.0501	0.0524
Radium 226	pCi/L	0.701 ± 0.310	0.281 U ± 0.237	0.317 ± 0.245	0.876 ± 0.392
Radium 228	pCi/L	0.575 U ± 0.821	1.18 U ± 0.929	0.635 U ± 1.36	2.46 ± 1.28
Radium 226 and 228 combined	pCi/L	1.28 U ± 0.878	1.46 U ± 0.959	0.952 U ± 1.38	3.33 ± 1.34
Selenium	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005

Notes:
--: not analyzed
ft AMSL: feet above mean sea level
deg C: degrees Celsius
ntu: Nephelometric Turbidity Units
µmhos/cm: micromhos per centimeter
mg/L: milligrams per liter
pCi/L: picocuries per liter
s.u.: standard units for pH
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample).

Table 17: Sample Results Summary Table - MW-213

		MW-213			
	Units	**26-May-22**	**19-Jul-22**	**6-Sep-22**	**30-Nov-22**
Water Elevation	**ft AMSL**	**1690.5**	**1689.8**	**1689.5**	**1688.9**
Field Parameters					
Temperature, Field	deg C	9.44	11.49	13.23	8.02
Turbidity, Field	ntu	20	156.26	1468.1	483.27
Specific Conductance, Field	µmhos/cm	1337	1525	1538	1270
Detection Monitoring Parameters					
Boron	mg/L	1.09	1.1	1.22	1.13
Calcium	mg/L	91.4	90.6	100	99.7
Chloride	mg/L	14.7	13.8	14.4	14.0
Fluoride	mg/L	0.74	0.78	0.75	0.79
pH, Field	s.u.	7.73	7.59	7.53	7.64
pH, Lab	s.u.	8.0	7.5	7.9	8.0
Sulfate	mg/L	368	354	389	382
Total Dissolved Solids	mg/L	1110	1110	1090	1060
Assessment Monitoring Parameters					
Antimony	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Arsenic	mg/L	< 0.002	0.0028	0.0057	0.0048
Barium	mg/L	0.0463	0.0769	0.1282	0.1212
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Chromium	mg/L	< 0.002	0.0056	0.0124	0.0122
Cobalt	mg/L	< 0.002	0.0021	0.0049	0.0044
Fluoride	mg/L	0.74	0.78	0.75	0.79
Lead	mg/L	< 0.0005	0.0026	0.0048	0.0044
Lithium	mg/L	0.0342	0.0384	0.0463	0.0455
Mercury	mg/L	0.0002	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	0.0126	0.0138	0.0152	0.0161
Radium 226	pCi/L	0.552 ± 0.318	0.210 U ± 0.194	0.643 ± 0.441	1.07 ± 0.457
Radium 228	pCi/L	-0.724 U ± 1.08	0.431 U ± 1.07	2.91 ± 1.51	3.44 ± 1.36
Radium 226 and 228 combined	pCi/L	0.552 U ± 1.12	0.641 U ± 1.09	3.55 ± 1.57	4.51 ± 1.43
Selenium	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005

Notes:
--: not analyzed
ft AMSL: feet above mean sea level
deg C: degrees Celsius
ntu: Nephelometric Turbidity Units
µmhos/cm: micromhos per centimeter
mg/L: milligrams per liter
pCi/L: picocuries per liter
s.u.: standard units for pH
Non-detects have been listed at the reported primary quantitation limit
Metal concentrations represent the total fraction (i.e. samples have not been filtered

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample)

Table 18: Sample Results Summary Table - MW-214

		MW-214			
	Units	26-May-22	19-Jul-22	6-Sep-22	30-Nov-22
Water Elevation	ft AMSL	1702.7	1702.2	1701.2	1701.3
Field Parameters					
Temperature, Field	deg C	11.13	12.9	16.43	7.3
Turbidity, Field	ntu	112	56.21	168.82	99.1
Specific Conductance, Field	µmhos/cm	1600	1797	1707	1692
Detection Monitoring Parameters					
Boron	mg/L	0.29	0.35	0.4	0.38
Calcium	mg/L	45.5	45.4	43.2	47.0
Chloride	mg/L	23.1	70.2	16.6	16.4
Fluoride	mg/L	0.60	0.61	0.54	0.53
pH, Field	s.u.	7.70	7.49	7.70	7.57
pH, Lab	s.u.	8.1	8.0	8.0	7.8
Sulfate	mg/L	452	338	536	422
Total Dissolved Solids	mg/L	1320	1260	1220	1250
Assessment Monitoring Parameters					
Antimony	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Arsenic	mg/L	0.0023	< 0.002	0.0023	0.0024
Barium	mg/L	0.0609	0.0559	0.0528	0.0574
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Chromium	mg/L	0.0054	0.0044	0.0048	0.0043
Cobalt	mg/L	0.0021	< 0.002	< 0.002	< 0.002
Fluoride	mg/L	0.60	0.61	0.54	0.53
Lead	mg/L	0.0015	0.0047	0.0016	0.0012
Lithium	mg/L	0.0453	0.0496	0.0504	0.0585
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	0.0136	0.0165	0.0161	0.0154
Radium 226	pCi/L	0.644 ± 0.346	0.686 ± 0.304	0.827 ± 0.386	0.628 ± 0.338
Radium 228	pCi/L	1.09 U ± 0.858	0.0913 U ± 0.974	2.40 U ± 1.59	2.13 ± 1.22
Radium 226 and 228 combined	pCi/L	1.73 ± 0.925	0.777 U ± 1.02	3.22 ± 1.64	2.76 ± 1.27
Selenium	mg/L	0.0074	< 0.005	< 0.005	0.0051
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005

Notes:
--: not analyzed
ft AMSL: feet above mean sea level
deg C: degrees Celsius
ntu: Nephelometric Turbidity Units
µmhos/cm: micromhos per centimeter
mg/L: milligrams per liter
pCi/L: picocuries per liter
s.u.: standard units for pH
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample).

Table 19: Sample Results Summary Table - MW-PB1 (Property Boundary Well)

		MW-PB1			
	Units	28-Mar-22	25-May-22	27-Jun-22	30-Nov-22
Water Elevation	**ft AMSL**	**1674.3**	**1675.2**	**1675.0**	**1674.5**
Field Parameters					
Temperature, Field	deg C	7.7	13.19	16.72	6.22
Turbidity, Field	ntu	173	228	62.56	90.29
Specific Conductance, Field	µmhos/cm	1831	2144	1967	1920
Detection Monitoring Parameters					
Boron	mg/L	1.28	1.25	1.17	1.14
Calcium	mg/L	120	154	158	136
Chloride	mg/L	25.6	24.5	23.6	22.8
Fluoride	mg/L	0.51	0.53	0.58	0.52
pH, Field	s.u.	7.00	7.18	7.17	7.00
pH, Lab	s.u.	7.4	7.7	7.7	7.5
Sulfate	mg/L	438	610	567	470
Total Dissolved Solids	mg/L	1400	1610	1500	1360
Assessment Monitoring Parameters					
Antimony	mg/L	< 0.001	< 0.001	< 0.001	--
Arsenic	mg/L	0.0044	0.0033	0.0024	--
Barium	mg/L	0.1115	0.1073	0.0564	--
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	--
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005	--
Chromium	mg/L	0.0077	0.0076	<0.002	--
Cobalt	mg/L	0.0053	0.0049	<0.002	--
Fluoride	mg/L	0.51	0.53	0.58	--
Lead	mg/L	0.0048	0.0038	<0.0005	--
Lithium	mg/L	0.0430	0.0438	0.0387	--
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002	--
Molybdenum	mg/L	0.0101	0.0109	0.0091	--
Radium 226	pCi/L	0.850 ± 0.305	1.13 ± 0.411	0.566 ± 0.236	--
Radium 228	pCi/L	-0.0439 U ± 0.435	2.85 ± 1.47	-0.346 U ± 0.752	--
Radium 226 and 228 combined	pCi/L	0.850 ± 0.531	3.98 ± 1.52	0.566 U ± 0.789	--
Selenium	mg/L	< 0.005	< 0.005	< 0.005	--
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005	--

Notes:
--: not analyzed
ft AMSL: feet above mean sea level
deg C: degrees Celsius
ntu: Nephelometric Turbidity Units
µmhos/cm: micromhos per centimeter
mg/L: milligrams per liter
pCi/L: picocuries per liter
s.u.: standard units for pH
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample).

APPENDIX C

Detection Monitoring Comparative Statistics

Table C-1: MW-6B (Sidegradient Background) Detection Monitoring Parameters Comparative Statistical Analysis

		Statistical Method	Statistical Limit	Q4 2021 Result	CUSUM Value	Within Compliance?	Q1 2022 Result	CUSUM Value	Within Compliance?	Q2 2022 Result	CUSUM Value	Within Compliance?
Detection Monitoring Parameters	**Units**			**22-Nov-21**			**14-Mar-22**			**7-Jun-22**		
Boron, Tota	mg/L	CUSUM	0.41	0.31	0.33	Yes	0.34	0.33	Yes	0.27	0.33	Yes
Calcium, Total	mg/L	CUSUM	41.7	18.4	29.3	Yes	18.8	29.3	Yes	19.5	29.3	Yes
Chloride	mg/L	CUSUM	19.8	18.2	29.0	No - Verified Exceedance	16.9	31.0	No - Verified Exceedance	18.2	34.4	No - Verified Exceedance
Fluoride	mg/L	CUSUM	0.64	0.57	0.56	Yes	0.61	0.57	Yes	0.61	0.62	Yes
pH, Field-Measurec	s.u.	CUSUM	7.19, 8.03	7.56	7.61, 7.61	Yes	7.56	7.61, 7.61	Yes	7.68	7.61, 7.61	Yes
Sulfate	mg/L	CUSUM	442	330	344	Yes	325	344	Yes	326	344	Yes
Total Dissolved Solids	mg/L	CUSUM	1147	1060	1051	Yes	1090	1066	Yes	1040	1051	Yes

Notes:
mg/L, milligrams per lite
s.u., standard units for pH
CUSUM: Parametric Shewhart-CUSUM Control Char
Statistical limit for fluoride was deseasonalized and may vary slightly between even

Table C-2: MW-7A (Upgradient Background) Detection Monitoring Parameters Comparative Statistical Analysis

		Statistical Method	Statistical Limit	Q4 2021 Result	CUSUM Value	Within Compliance?	Q1 2022 Result	CUSUM Value	Within Compliance?	Q2 2022 Result	CUSUM Value	Within Compliance?
Detection Monitoring Parameters	**Units**			**22-Nov-21**			**14-Mar-22**			**27-Jun-22**		
Boron, Tota	mg/L	CUSUM	1.36	0.68	0.70	Yes	0.56	0.70	Yes	< 0.50	0.70	Yes
Calcium, Total	mg/L	CUSUM	521	372	428	Yes	406	428	Yes	418	428	Yes
Chloride	mg/L	CUSUM	63.0	34.9	41.6	Yes	33.9	41.6	Yes	32.7	41.6	Yes
Fluoride	mg/L	CUSUM	0.62	0.52	0.54	Yes	0.53	0.54	Yes	0.54	0.54	Yes
pH, Field-Measurec	s.u.	CUSUM	6.83, 7.57	7.22	7.20, 7.20	Yes	7.26	7.20, 7.20	Yes	7.29	7.20, 7.20	Yes
Sulfate	mg/L	CUSUM	13706	9360	10454	Yes	10500	10454	Yes	10700	10454	Yes
Total Dissolved Solids	mg/L	CUSUM	18675	14800	16740	Yes	16600	16831	Yes	17200	17522	Yes

Notes:
mg/L, milligrams per lite
s.u., standard units for pH
CUSUM: Parametric Shewhart-CUSUM Control Chai
Statistical limit for fluoride was deseasonalized and may vary slightly between even

Table C-3: MW-7B (Upgradient Background) Detection Monitoring Parameters Comparative Statistical Analysis

		Statistical Method	Statistical Limit	Q4 2021 Result	CUSUM Value	Within Compliance?	Q1 2022 Result	CUSUM Value	Within Compliance?	Q2 2022 Result	CUSUM Value	Within Compliance?
Detection Monitoring Parameters	**Units**			**21-Nov-21**			**14-Mar-22**			**27-Jun-22**		
Boron, Tota	mg/L	CUSUM	0.54	0.40	0.43	Yes	0.42	0.43	Yes	0.38	0.43	Yes
Calcium, Total	mg/L	CUSUM	21.2	16.1	18.9	Yes	15.6	18.9	Yes	14.5	18.9	Yes
Chloride	mg/L	CUSUM	14.1	13.3	23.8	No - Verified Exceedance	12.7	26.2	No - Verified Exceedance	13.3	29.2	No - Verified Exceedance
Fluoride	mg/L	CUSUM	0.70	0.56	0.58	Yes	0.60	0.58	Yes	0.64	0.61	Yes
pH, Field-Measurec	s.u.	CUSUM	7.18, 8.06	7.73	7.62, 7.62	Yes	7.68	7.62, 7.62	Yes	7.76	7.62, 7.65	Yes
Sulfate	mg/L	CUSUM	446	248	309	Yes	250	309	Yes	271	309	Yes
Total Dissolved Solids	mg/L	CUSUM	1324	914	1040	Yes	951	1040	Yes	970	1040	Yes

Notes:
mg/L, milligrams per lite
s.u., standard units for pH
CUSUM: Parametric Shewhart-CUSUM Control Chai

Table C-4: MW-8B (Upgradient Background) Detection Monitoring Parameters Comparative Statistical Analysis

		Statistical Method	Statistical Limit	Q4 2021 Result	CUSUM Value	Within Compliance?	Q1 2022 Result	CUSUM Value	Within Compliance?	Q2 2022 Result	CUSUM Value	Within Compliance?
Detection Monitoring Parameters	**Units**			**22-Nov-21**			**14-Mar-22**			**27-Jun-22**		
Boron, Tota	mg/L	CUSUM	0.54	0.23	0.31	Yes	0.23	0.31	Yes	0.20	0.31	Yes
Calcium, Total	mg/L	CUSUM	112.7	76.8	84.5	Yes	91.8	84.8	Yes	86.3	84.5	Yes
Chloride	mg/L	CUSUM	20.0	12.4	12.2	Yes	11.6	11.3	Yes	11.6	11.3	Yes
Fluoride	mg/L	CUSUM	0.46	0.22	0.25	Yes	0.17	0.25	Yes	0.20	0.25	Yes
pH, Field-Measurec	s.u.	CUSUM	7.10, 7.65	7.37	7.33, 7.37	Yes	7.31	7.34, 7.37	Yes	7.42	7.37, 7.37	Yes
Sulfate	mg/L	CUSUM	848	221	367	Yes	221	367	Yes	205	367	Yes
Total Dissolved Solids	mg/L	CUSUM	1846	719	1000	Yes	693	1000	Yes	721	1000	Yes

Notes:
mg/L, milligrams per lite
s.u., standard units for pH
CUSUM: Parametric Shewhart-CUSUM Control Chai

Table C-5: MW-105 (Upgradient Background) Detection Monitoring Parameters Comparative Statistical Analysis

		Statistical Method	Statistical Limit	Q4 2021 Result	CUSUM Value	Within Compliance?	Q1 2022 Result	CUSUM Value	Within Compliance?	Q2 2022 Result	CUSUM Value	Within Compliance?
Detection Monitoring Parameters	**Units**			**22-Nov-21**			**14-Mar-22**			**27-Jun-22**		
Boron, Tota	mg/L	CUSUM	0.47	0.37	0.36	Yes	0.35	0.36	Yes	0.29	0.36	Yes
Calcium, Total	mg/L	CUSUM	84.0	38.4	50.9	Yes	38.3	50.9	Yes	46.0	50.9	Yes
Chloride	mg/L	CUSUM	66.8	15.5	19.7	Yes	13.5	19.7	Yes	11.7	19.7	Yes
Fluoride	mg/L	CUSUM	1.20	0.93	0.95	Yes	0.97	0.95	Yes	0.90	0.95	Yes
pH, Field-Measurec	s.u.	CUSUM	7.47, 7.98	7.78	7.73, 7.76	Yes	7.78	7.73, 7.75	Yes	7.63	7.69, 7.73	Yes
Sulfate	mg/L	CUSUM	2028	415	916	Yes	396	916	Yes	424	916	Yes
Total Dissolved Solids	mg/L	CUSUM	3095	1270	1843	Yes	1180	1845	Yes	1390	1845	Yes

Notes:

mg/L, milligrams per lite

s.u., standard units for pH

CUSUM: Parametric Shewhart-CUSUM Control Chai

Statistical limit for fluoride was deseasonalized when setting the baseline and may vary slightly between eve

Statistical limit for field-measured pH was deseasonalized when setting the baseline and may vary slightly between eve

Statistical limit for total dissolved solids was deseasonalized when setting the baseline and may vary slightly between eve

Table C-6: MW-9N (Downgradient, Bottom Ash Landfill) Detection Monitoring Parameters Comparative Statistical Analysis

		Statistical Method	Statistical Limit	Q4 2021 Result	CUSUM Value	Within Compliance?	Q1 2022 Result	CUSUM Value	Within Compliance?	Q2 2022 Result	CUSUM Value	Within Compliance?
Detection Monitoring Parameters	**Units**			**23-Nov-21**			**15-Mar-22**			**28-Jun-22**		
Boron, Tota	mg/L	CUSUM	3.67	2.89	2.68	Yes	2.55	2.68	Yes	2.25	2.68	Yes
Calcium, Total	mg/L	CUSUM	94.4	74.7	139.6	No - Ongoing Verified Exceedance	83.8	141.7	No - Ongoing Verified Exceedance	85.7	145.6	No - Ongoing Verified Exceedance
Chloride	mg/L	CUSUM	22.0	24.4	99.3	No - Ongoing Verified Exceedance	22.6	104.9	No - Ongoing Verified Exceedance	23.2	111.1	No - Ongoing Verified Exceedance
Fluoride	mg/L	CUSUM	0.69	0.73	1.03	No - Ongoing Verified Exceedance	0.68	1.12	No - Ongoing Verified Exceedance	0.72	1.25	No - Ongoing Verified Exceedance
pH, Field-Measurec	s.u.	CUSUM	6.65, 7.32	7.14	6.99, 7.20	Yes	7.00	6.99, 7.13	Yes	7.16	6.99, 7.22	Yes
Sulfate	mg/L	CUSUM	1685	1270	1282	Yes	1200	1282	Yes	1260	1282	Yes
Total Dissolved Solids	mg/L	CUSUM	3394	2860	3602	No - Ongoing Verified Exceedance	2800	3456	No - Ongoing Verified Exceedance	2710	3219	Yes

Notes:
mg/L, milligrams per lite
s.u., standard units for pH
CUSUM: Parametric Shewhart-CUSUM Control Chai

Table C-7: MW-102 (Downgradient, Bottom Ash Landfill) Detection Monitoring Parameters Comparative Statistical Analysis

		Statistical Method	Statistical Limit	Q4 2021 Result	CUSUM Value	Within Compliance?	Q1 2022 Result	CUSUM Value	Within Compliance?	Q2 2022 Result	CUSUM Value	Within Compliance?
Detection Monitoring Parameters	**Units**			**23-Nov-21**			**15-Mar-22**			**28-Jun-22**		
Boron, Tota	mg/L	CUSUM	2.89	0.48	1.90	Yes	0.46	1.90	Yes	0.43	1.90	Yes
Calcium, Total	mg/L	CUSUM	106.3	60.5	63.0	Yes	65.2	63.0	Yes	60.7	63.0	Yes
Chloride	mg/L	CUSUM	23.1	17.1	16.4	Yes	15.9	16.4	Yes	17.0	16.4	Yes
Fluoride	mg/L	CUSUM	1.20	0.50	0.69	Yes	0.49	0.69	Yes	0.50	0.69	Yes
pH, Field-Measurec	s.u.	CUSUM	6.95, 7.85	7.58	7.40, 7.68	Yes	7.44	7.40, 7.61	Yes	7.57	7.40, 7.66	Yes
Sulfate	mg/L	CUSUM	1592	601	1008	Yes	566	1008	Yes	575	1008	Yes
Total Dissolved Solids	mg/L	NP-PL	2410	1390	--	Yes	1360	--	Yes	1440	--	Yes

Notes:
mg/L, milligrams per lite
s.u., standard units for pH
NP-PL: Non-Parametric Prediction Limi
CUSUM: Parametric Shewhart-CUSUM Control Chai

Table C-8: MW-103 (Downgradient, Bottom Ash Landfill) Detection Monitoring Parameters Comparative Statistical Analysis

		Statistical Method	Statistical Limit	Q4 2021 Result	CUSUM Value	Within Compliance?	Q1 2022 Result	CUSUM Value	Within Compliance?	Q2 2022 Result	CUSUM Value	Within Compliance?
Detection Monitoring Parameters	**Units**			**23-Nov-21**			**15-Mar-22**			**28-Jun-22**		
Boron, Total	mg/L	CUSUM	1.33	1.38	2.87	No - Ongoing Verified Exceedance	1.27	2.96	No - Ongoing Verified Exceedance	0.86	2.63	No - Ongoing Verified Exceedance
Calcium, Total	mg/L	CUSUM	34.5	29.4	39.4	No - Potential Exceedance	23.6	33.6	Yes - Prior Result was a False-Positive	20.7	30.3	Yes
Chloride	mg/L	CUSUM	18.7	19.1	44.6	No - Ongoing Verified Exceedance	18.2	48.0	No - Ongoing Verified Exceedance	19.5	52.7	No - Ongoing Verified Exceedance
Fluoride	mg/L	CUSUM	0.33	0.43	1.51	No - Ongoing Verified Exceedance	0.34	1.59	No - Ongoing Verified Exceedance	0.22	1.54	No - Ongoing Verified Exceedance
pH, Field-Measured	s.u.	CUSUM	8.89, 9.47	8.93	8.84, 9.18	No - Verified Exceedance	8.95	8.86, 9.18	No - Ongoing Verified Exceedance	9.21	9.12, 9.18	Yes
Sulfate	mg/L	CUSUM	961	891	1750	No - Ongoing Verified Exceedance	779	1811	No - Ongoing Verified Exceedance	725	1818	No - Ongoing Verified Exceedance
Total Dissolved Solids	mg/L	CUSUM	1948	2140	3609	No - Ongoing Verified Exceedance	1950	3659	No - Ongoing Verified Exceedance	1810	3684	No - Ongoing Verified Exceedance

Notes:
mg/L, milligrams per lite
s.u., standard units for pH
CUSUM: Parametric Shewhart-CUSUM Control Chai

Table C-9: MW-1R (Downgradient, Bottom Ash Impoundment) Detection Monitoring Parameters Comparative Statistical Analysis

		Statistical Method	Statistical Limit	Q4 2021 Result	CUSUM Value	Within Compliance?	Q1 2022 Result	CUSUM Value	Within Compliance?	Q2 2022 Result	CUSUM Value	Within Compliance?
Detection Monitoring Parameters	**Units**			**24-Nov-21**			**28-Mar-22**			**28-Jun-22**		
Boron, Tota	mg/L	CUSUM	1.46	1.18	1.27	Yes	1.23	1.27	Yes	1.15	1.27	Yes
Calcium, Total	mg/L	CUSUM	143	110	118	Yes	106	118	Yes	109	118	Yes
Chloride	mg/L	CUSUM	25.4	14.8	18.1	Yes	14.2	18.1	Yes	14.6	18.1	Yes
Fluoride	mg/L	CUSUM	0.87	0.71	0.69	Yes	0.70	0.69	Yes	0.72	0.69	Yes
pH, Field-Measurec	s.u.	CUSUM	7.28, 7.95	7.66	7.61, 7.73	Yes	7.63	7.61, 7.66	Yes	7.68	7.61, 7.65	Yes
Sulfate	mg/L	CUSUM	470	361	377	Yes	404	381	Yes	405	386	Yes
Total Dissolved Solids	mg/L	CUSUM	1194	1070	1054	Yes	1080	1054	Yes	1070	1054	Yes

Notes:
mg/L, milligrams per lite
s.u., standard units for pH
CUSUM: Parametric Shewhart-CUSUM Control Char
Statistical limit for calcium was deseasonalized and may vary slightly between even

Table C-10: MW-104 (Downgradient, Bottom Ash Impoundment) Detection Monitoring Parameters Comparative Statistical Analysis

		Statistical Method	Statistical Limit	Q4 2021 Result	CUSUM Value	Within Compliance?	Q1 2022 Result	CUSUM Value	Within Compliance?	Q2 2022 Result	CUSUM Value	Within Compliance?
Detection Monitoring Parameters	**Units**			**24-Nov-21**			**28-Mar-22**			**28-Jun-22**		
Boron, Tota	mg/L	CUSUM	0.82	0.72	0.72	Yes	0.74	0.74	Yes	0.69	0.72	Yes
Calcium, Total	mg/L	CUSUM	114.6	77.4	92.3	Yes	83.9	92.3	Yes	80.3	92.3	Yes
Chloride	mg/L	CUSUM	19.2	15.8	14.5	Yes	15.3	14.7	Yes	15.4	15.1	Yes
Fluoride	mg/L	CUSUM	0.96	0.24	0.74	Yes	0.69	0.74	Yes	0.69	0.74	Yes
pH, Field-Measurec	s.u.	CUSUM	6.78, 7.53	7.27	7.16, 7.25	Yes	7.26	7.16, 7.26	Yes	7.26	7.16, 7.26	Yes
Sulfate	mg/L	CUSUM	529	420	390	Yes	471	436	Yes	469	480	Yes
Total Dissolved Solids	mg/L	CUSUM	1254	1170	1342	No - Verified Exceedance	1210	1419	No - Verified Exceedance	1280	1566	No - Verified Exceedance

Notes:
mg/L, milligrams per lite
s.u., standard units for pH
CUSUM: Parametric Shewhart-CUSUM Control Char

Table C-11: MW-201 (Downgradient, Bottom Ash Impoundment) Detection Monitoring Parameters Comparative Statistical Analysis

		Statistical Method	Statistical Limit	Q2 2022 Result	CUSUM Value	Within Compliance?
Detection Monitoring Parameters	**Units**			**28-Jun-22**		
Boron, Total	mg/L	CUSUM	2.44	1.48	1.67	Yes
Calcium, Total	mg/L	CUSUM	122.7	99.2	100.8	Yes
Chloride	mg/L	CUSUM	21.9	19.3	19.3	Yes
Fluoride	mg/L	CUSUM	1.11	0.79	0.81	Yes
pH, Field-Measured	s.u.	CUSUM	7.09, 7.75	7.43	7.42, 7.42	Yes
Sulfate	mg/L	CUSUM	1484	1160	1090	Yes
Total Dissolved Solids	mg/L	CUSUM	2377	2130	2174	Yes

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
CUSUM: Parametric Shewhart-CUSUM Control Chart
The June (Q2) 2022 sample is the first comparative sample following baseline establishment for MW-201.

Table C-12: MW-202 (Downgradient, Bottom Ash Impoundment) Detection Monitoring Parameters Comparative Statistical Analysis

		Statistical Method	Statistical Limit	Q2 2022 Result	CUSUM Value	Within Compliance?
Detection Monitoring Parameters	**Units**			**28-Jun-22**		
Boron, Total	mg/L	CUSUM	2.13	1.46	1.68	Yes
Calcium, Total	mg/L	CUSUM	228	175	174	Yes
Chloride	mg/L	CUSUM	17.5	12.8	11.4	Yes
Fluoride	mg/L	CUSUM	0.24	0.13	0.16	Yes
pH, Field-Measured	s.u.	CUSUM	6.85, 7.62	7.22	7.23, 7.23	Yes
Sulfate	mg/L	CUSUM	725	597	557	Yes
Total Dissolved Solids	mg/L	CUSUM	1697	1500	1452	Yes

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
CUSUM: Parametric Shewhart-CUSUM Control Chart
The June (Q2) 2022 sample is the first comparative sample following baseline establishment for MW-202.

Table C-13: MW-203 (Downgradient, Bottom Ash Impoundment) Detection Monitoring Parameters Comparative Statistical Analysis

		Statistical Method	Statistical Limit	Q2 2022 Result	CUSUM Value	Within Compliance?
Detection Monitoring Parameters	**Units**			**28-Jun-22**		
Boron, Total	mg/L	CUSUM	2.06	3.65	3.49	No - Potential Exceedance
Calcium, Total	mg/L	CUSUM	124.8	84.3	67.7	Yes
Chloride	mg/L	CUSUM	50.9	39.1	33.6	Yes
Fluoride	mg/L	CUSUM	1.27	0.69	0.84	Yes
pH, Field-Measured	s.u.	CUSUM	6.86, 10.66	8.37	8.76, 8.76	Yes
Sulfate	mg/L	CUSUM	706	2150	2080	No - Potential Exceedance
Total Dissolved Solids	mg/L	CUSUM	1793	4140	4065	No - Potential Exceedance

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
CUSUM: Parametric Shewhart-CUSUM Control Chart
The June (Q2) 2022 sample is the first comparative sample following baseline establishment for MW-203.

APPENDIX D

Groundwater Protection Standards

Table 1: Available Pooled Background Data (Upgradient and Side-Gradient) - Assessment Monitoring Parameter Data 2016-2021

Parameter	Units	Primary MCL or ASL	Earliest CCR Sample	Most Recent CCR Sample	Number of Samples	Number of non-detects	Percent of Non-detects	Min	Max	Mean	Median	Standard Deviation
Assessment Monitoring Parameters												
Antimony, Tota	mg/L	0.006	6/13/2016	11/22/2021	79	79	100%	0.001	0.002	0.001	0.001	0.000
Arsenic, Total	mg/L	0.01	6/13/2016	11/22/2021	79	58	73%	0.0020	0.0054	0.0026	0.0020	0.0010
Barium, Tota	mg/L	2	6/13/2016	11/22/2021	79	0	0%	0.0073	0.0966	0.0273	0.0245	0.0180
Beryllium, Tota	mg/L	0.004	6/13/2016	11/22/2021	79	79	100%	0.0005	0.0010	0.0005	0.0005	0.0001
Cadmium, Tota	mg/L	0.005	6/13/2016	11/22/2021	79	79	100%	0.0005	0.0010	0.0005	0.0005	0.0001
Chromium, Tota	mg/L	0.1	6/13/2016	11/22/2021	79	67	85%	0.0020	0.0075	0.0024	0.0020	0.0012
Cobalt, Tota	mg/L	0.006	6/13/2016	11/22/2021	79	79	100%	0.002	0.004	0.002	0.002	0.0003
Fluoride	mg/L	4	6/13/2016	11/22/2021	108	0	0%	0.17	1.07	0.57	0.56	0.22
Lead, Tota	mg/L	0.015	6/13/2016	11/22/2021	79	74	94%	0.0005	0.0020	0.0008	0.0005	0.0006
Lithium, Tota	mg/L	0.04	6/13/2016	11/22/2021	79	47	59%	0.047	0.500	0.151	0.100	0.141
Mercury, Total	mg/L	0.002	6/13/2016	11/22/2021	79	79	100%	0.0002	0.0002	0.0002	0.0002	0.0000
Molybdenum, Tota	mg/L	0.1	6/13/2016	11/22/2021	79	17	22%	0.0020	0.0331	0.0126	0.0112	0.0090
Radium-226 and -228, combined	pCi/L	5	6/13/2016	11/22/2021	79	51	65%	-0.050	6.000	1.328	1.000	0.884
Selenium, Tota	mg/L	0.05	6/13/2016	11/22/2021	80	61	76%	0.0020	0.0651	0.0129	0.0050	0.0165
Thallium, Tota	mg/L	0.002	6/13/2016	11/22/2021	79	76	96%	0.0005	0.0011	0.0005	0.0005	0.0001

Notes:
Background data was pooled from the following locations: MW-6B, MW-7A, MW-7B, MW-8B, and MW-105.
MW-6B is a sidegradient location, while the other four wells are upgradient locations
MCL: USEPA Maximum Contaminant Level
ASL: CCR Alternate Specified Limit

Table 2: Selected Pooled Background (Upgradient and Side-Gradient) Data for Establishment of Groundwater Protection Standards

Parameter	Units	Primary MCL or ASL	Earliest Sample Used in GWPS Determination	Final Sample Used in GWPS Determination	Number of Samples	Number of non-detects	Percent of Non-detects	Min	Max	Mean	Median	Standard Deviation	Which is Greater: MCL or ASL, or MAX?	Baseline Data Distribution	GWPS to be set Using	Type of Tolerance Interval	GWPS Value
Assessment Monitoring Parameters																	
Antimony, Total	mg/L	0.006	6/13/2016	11/22/2021	79	79	100%	0.001	0.002	0.001	0.001	0.0001	MCL or ASL	NA	MCL or ASL	NA	0.006
Arsenic, Total	mg/L	0.01	6/13/2016	11/22/2021	79	58	73%	0.0020	0.0054	0.0026	0.0020	0.0010	MCL or ASL	NA	MCL or ASL	NA	0.01
Barium, Total	mg/L	2	6/13/2016	11/22/2021	79	0	0%	0.0073	0.0966	0.0273	0.0245	0.0180	MCL or ASL	Non-Normal	MCL or ASL	NA	2
Beryllium, Tota	mg/L	0.004	6/13/2016	11/22/2021	79	79	100%	0.0005	0.0010	0.0005	0.0005	0.0001	MCL or ASL	NA	MCL or ASL	NA	0.004
Cadmium, Total	mg/L	0.005	6/13/2016	11/22/2021	79	79	100%	0.0005	0.0010	0.0005	0.0005	0.0001	MCL or ASL	NA	MCL or ASL	NA	0.005
Chromium, Total	mg/L	0.1	6/13/2016	11/22/2021	79	67	85%	0.0020	0.0075	0.0024	0.0020	0.0012	MCL or ASL	NA	MCL or ASL	NA	0.1
Cobalt, Total	mg/L	0.006	6/13/2016	11/22/2021	79	79	100%	0.002	0.004	0.002	0.002	0.0003	MCL or ASL	NA	MCL or ASL	NA	0.006
Fluoride	mg/L	4	6/13/2016	11/22/2021	108	0	0%	0.17	1.07	0.57	0.56	0.22	MCL or ASL	Non-Normal	MCL or ASL	NA	4
Lead, Total	mg/L	0.015	6/13/2016	11/22/2021	79	74	94%	0.0005	0.0020	0.0008	0.0005	0.0006	MCL or ASL	NA	MCL or ASL	NA	0.015
Lithium, Total	mg/L	0.04	6/10/2019	11/22/2021	30	0	0%	0.047	0.325	0.107	0.006	0.096	MAX	Non-Normal	Tolerance Interva	Non-Parametric	0.325
Mercury, Total	mg/L	0.002	6/13/2016	11/22/2021	79	79	100%	0.0002	0.0002	0.0002	0.0002	0.0000	MCL or ASL	NA	MCL or ASL	NA	0.002
Molybdenum, Tota	mg/L	0.1	6/13/2016	11/22/2021	79	17	22%	0.0020	0.0331	0.0126	0.0112	0.0090	MCL or ASL	Non-Normal	MCL or ASL	NA	0.1
Radium-226 and -228, combinec	pCi/L	5	11/25/2019	11/22/2021	25	0	0%	-0.050	2.960	0.777	0.700	0.654	MCL or ASL	Non-Normal	MCL or ASL	NA	5
Selenium, Total	mg/L	0.05	11/26/2018	11/22/2021	31	23	74%	0.0050	0.0443	0.0108	0.0050	0.0114	MCL or ASL	NA	MCL or ASL	NA	0.05
Thallium, Tota	mg/L	0.002	6/13/2016	11/22/2021	79	76	96%	0.0005	0.0011	0.0005	0.0005	0.0001	MCL or ASL	NA	MCL or ASL	NA	0.002

Notes:
Background data was pooled from the following locations: MW-6B, MW-7A, MW-7B, MW-8B, and MW-105.
MW-6B is a sidegradient location, while the other four wells are upgradient locations
MCL: USEPA Maximum Contaminant Leve
ASL: CCR Alternate Specified Limit
NA: Not applicable
Normality was not tested for parameters with greater than 50% non-detects

APPENDIX E

Assessment Monitoring Comparative Statistics

Table 1: Q4 2021 Assessment Monitoring Comparative Statistics, MW-9N (Downgradient, Bottom Ash Landfill)

Parameter	Units	GWPS	Number of Samples	Number of Non-Detects	Percent of Non-Detects	Trends	Data Distribution	Type of Confidence Interval	Lower Confidence Limit	Upper Confidence Limit	Confidence Interval Within Compliance?
Assessment Monitoring Parameters											
Antimony, Total	mg/L	0.006	4	3	75%	N/A	N/A	Non-Parametric	0.0010	0.0011	Yes
Arsenic, Total	mg/L	0.01	4	4	100%	N/A	N/A	Non-Parametric	0.0020	0.0020	Yes
Barium, Total	mg/L	2	4	0	0%	None	Normal	Parametric	0.0537	0.0802	Yes
Beryllium, Total	mg/L	0.004	4	4	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Cadmium, Total	mg/L	0.005	4	4	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Chromium, Total	mg/L	0.1	4	3	75%	N/A	N/A	Non-Parametric	0.0020	0.0024	Yes
Cobalt, Total	mg/L	0.006	4	0	0%	None	Non-Normal	Non-Parametric	0.0027	0.0132	Yes
Fluoride	mg/L	4	4	0	0%	None	Normal	Parametric	0.64	0.73	Yes
Lead, Total	mg/L	0.015	4	4	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Lithium, Total	mg/L	0.325	4	0	0%	None	Normal	Parametric	0.051	0.057	Yes
Mercury, Total	mg/L	0.002	4	4	100%	N/A	N/A	Non-Parametric	0.0002	0.0002	Yes
Molybdenum, Total	mg/L	0.1	4	0	0%	None	Normal	Parametric	0.0354	0.0864	Yes
Radium-226 + Radium-228	pCi/L	5	4	0	0%	None	Normal	Parametric	0.558	2.612	Yes
Selenium, Total	mg/L	0.05	4	0	0%	None	Normal	Parametric	0.0125	0.0211	Yes
Thallium, Total	mg/L	0.002	4	4	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes

Notes:
mg/L: milligrams per liter
pCi/L: picocuries per liter
GWPS: Groundwater Protection Standard
Trends were tested at α = 99%. Statistically significant trends are reported at α = 99%.
N/A: Not applicable - trends and normality were not tested for parameters with greater than 50% non-detects.
None: No statistically significant trends were identified.
For data sets with 4 points or less, no data set will result in a significant Mann-Kendall statistic for determination of the statistical significance of trends.
A discussion of the calculation of lower and upper confidence intervals is provided in-text.
Only datasets where both the upper and lower confidence intervals exceed the GWPS are considered outside of compliance.

Table 2: Q4 2021 Assessment Monitoring Comparative Statistics, MW-102 (Downgradient, Bottom Ash Landfill)

Parameter	Units	GWPS	Number of Samples	Number of Non-Detects	Percent of Non-Detects	Trends	Data Distribution	Type of Confidence Interval	Lower Confidence Limit	Upper Confidence Limit	Confidence Interval Within Compliance?
Assessment Monitoring Parameters											
Antimony, Total	mg/L	0.006	4	4	100%	N/A	N/A	Non-Parametric	0.0010	0.0010	Yes
Arsenic, Total	mg/L	0.01	4	4	100%	N/A	N/A	Non-Parametric	0.0020	0.0020	Yes
Barium, Total	mg/L	2	4	0	0%	None	Non-Normal	Non-Parametric	0.0250	0.0390	Yes
Beryllium, Total	mg/L	0.004	4	4	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Cadmium, Total	mg/L	0.005	4	4	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Chromium, Total	mg/L	0.1	4	4	100%	N/A	N/A	Non-Parametric	0.0020	0.0020	Yes
Cobalt, Total	mg/L	0.006	4	3	75%	N/A	N/A	Non-Parametric	0.0020	0.0036	Yes
Fluoride	mg/L	4	4	0	0%	None	Normal	Parametric	0.47	0.52	Yes
Lead, Total	mg/L	0.015	4	4	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Lithium, Total	mg/L	0.325	4	0	0%	None	Normal	Parametric	0.056	0.064	Yes
Mercury, Total	mg/L	0.002	4	4	100%	N/A	N/A	Non-Parametric	0.0002	0.0002	Yes
Molybdenum, Total	mg/L	0.1	4	0	0%	None	Non-Normal	Non-Parametric	0.0206	0.0274	Yes
Radium-226 + Radium-228	pCi/L	5	4	0	0%	None	Normal	Parametric	0.345	1.527	Yes
Selenium, Total	mg/L	0.05	4	4	100%	N/A	N/A	Non-Parametric	0.0050	0.0050	Yes
Thallium, Total	mg/L	0.002	4	4	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes

Notes:
mg/L: milligrams per liter
pCi/L: picocuries per liter
GWPS: Groundwater Protection Standard
Trends were tested at α = 99%. Statistically significant trends are reported at α = 99%.
N/A: Not applicable - trends and normality were not tested for parameters with greater than 50% non-detects.
None: No statistically significant trends were identified.
For data sets with 4 points or less, no data set will result in a significant Mann-Kendall statistic for determination of the statistical significance of trends.
A discussion of the calculation of lower and upper confidence intervals is provided in-text.
Only datasets where both the upper and lower confidence intervals exceed the GWPS are considered outside of compliance.

Table 3: Q4 2021 Assessment Monitoring Comparative Statistics, MW-103 (Downgradient, Bottom Ash Landfill)

Parameter	Units	GWPS	Number of Samples	Number of Non-Detects	Percent of Non-Detects	Trends	Data Distribution	Type of Confidence Interval	Lower Confidence Limit	Upper Confidence Limit	Confidence Interval Within Compliance?
Assessment Monitoring Parameters											
Antimony, Total	mg/L	0.006	4	4	100%	N/A	N/A	Non-Parametric	0.0010	0.0010	Yes
Arsenic, Total	mg/L	0.01	4	0	0%	None	Normal	Parametric	0.0130	0.0178	No
Barium, Total	mg/L	2	4	0	0%	None	Normal	Parametric	0.0456	0.0682	Yes
Beryllium, Total	mg/L	0.004	4	4	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Cadmium, Total	mg/L	0.005	4	4	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Chromium, Total	mg/L	0.1	4	3	75%	N/A	N/A	Non-Parametric	0.0020	0.0024	Yes
Cobalt, Total	mg/L	0.006	4	3	75%	N/A	N/A	Non-Parametric	0.0020	0.0022	Yes
Fluoride	mg/L	4	4	0	0%	None	Normal	Parametric	0.34	0.43	Yes
Lead, Total	mg/L	0.015	4	0	0%	None	Normal	Parametric	0.0012	0.0024	Yes
Lithium, Total	mg/L	0.325	4	0	0%	None	Normal	Parametric	0.022	0.030	Yes
Mercury, Total	mg/L	0.002	4	4	100%	N/A	N/A	Non-Parametric	0.0002	0.0002	Yes
Molybdenum, Total	mg/L	0.1	4	0	0%	None	Normal	Parametric	0.0433	0.0608	Yes
Radium-226 + Radium-228	pCi/L	5	4	0	0%	None	Normal	Parametric	0.535	1.153	Yes
Selenium, Total	mg/L	0.05	4	0	0%	None	Normal	Parametric	0.0083	0.0127	Yes
Thallium, Total	mg/L	0.002	4	4	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes

Notes:
mg/L: milligrams per liter
pCi/L: picocuries per liter
GWPS: Groundwater Protection Standard
AM: Assessment Monitoring
Trends were tested at α = 99%. Statistically significant trends are reported at α = 99%.
N/A: Not applicable - trends and normality were not tested for parameters with greater than 50% non-detects.
None: No statistically significant trends were identified.
For data sets with 4 points or less, no data set will result in a significant Mann-Kendall statistic for determination of the statistical significance of trends.
A discussion of the calculation of lower and upper confidence intervals is provided in-text.
Only datasets where both the upper and lower confidence intervals exceed the GWPS are considered outside of compliance.

Table 1: Q1 2022 Assessment Monitoring Comparative Statistics, MW-9N (Downgradient, Bottom Ash Landfill)

Parameter	Units	GWPS	Number of Samples	Number of Non-Detects	Percent of Non-Detects	Trends	Data Distribution	Type of Confidence Interval	Lower Confidence Limit	Upper Confidence Limit	Confidence Interval Within Compliance?
Assessment Monitoring Parameters											
Antimony, Total	mg/L	0.006	5	4	80%	N/A	N/A	Non-Parametric	0.0010	0.0011	Yes
Arsenic, Total	mg/L	0.01	5	5	100%	N/A	N/A	Non-Parametric	0.0020	0.0020	Yes
Barium, Total	mg/L	2	5	0	0%	None	Normal	Parametric	0.0552	0.0752	Yes
Beryllium, Total	mg/L	0.004	5	5	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Cadmium, Total	mg/L	0.005	5	5	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Chromium, Total	mg/L	0.1	5	4	80%	N/A	N/A	Non-Parametric	0.0020	0.0024	Yes
Cobalt, Total	mg/L	0.006	5	0	0%	None	Non-Normal	Non-Parametric	0.0021	0.0132	Yes
Fluoride	mg/L	4	5	0	0%	None	Normal	Parametric	0.65	0.72	Yes
Lead, Total	mg/L	0.015	5	5	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Lithium, Total	mg/L	0.325	5	0	0%	None	Normal	Parametric	0.0509	0.0558	Yes
Mercury, Total	mg/L	0.002	5	5	100%	N/A	N/A	Non-Parametric	0.0002	0.0002	Yes
Molybdenum, Total	mg/L	0.1	5	0	0%	None	Normal	Parametric	0.0414	0.0776	Yes
Radium-226 + Radium-228	pCi/L	5	5	0	0%	None	Normal	Parametric	0.416	2.234	Yes
Selenium, Total	mg/L	0.05	5	0	0%	None	Normal	Parametric	0.0124	0.0195	Yes
Thallium, Total	mg/L	0.002	5	5	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes

Notes:
mg/L: milligrams per liter
pCi/L: picocuries per liter
GWPS: Groundwater Protection Standard
Trends were tested at α = 99%. Statistically significant trends are reported at α = 99%.
N/A: Not applicable - trends and normality were not tested for parameters with greater than 50% non-detects.
None: No statistically significant trends were identified.
A discussion of the calculation of lower and upper confidence intervals is provided in-text.
Only datasets where both the upper and lower confidence intervals exceed the GWPS are considered outside of compliance.

Table 2: Q1 2022 Assessment Monitoring Comparative Statistics, MW-102 (Downgradient, Bottom Ash Landfill)

Parameter	Units	GWPS	Number of Samples	Number of Non-Detects	Percent of Non-Detects	Trends	Data Distribution	Type of Confidence Interval	Lower Confidence Limit	Upper Confidence Limit	Confidence Interval Within Compliance?
Assessment Monitoring Parameters											
Antimony, Total	mg/L	0.006	5	5	100%	N/A	N/A	Non-Parametric	0.0010	0.0010	Yes
Arsenic, Total	mg/L	0.01	5	5	100%	N/A	N/A	Non-Parametric	0.0020	0.0020	Yes
Barium, Total	mg/L	2	5	0	0%	None	Non-Normal	Non-Parametric	0.0250	0.0390	Yes
Beryllium, Total	mg/L	0.004	5	5	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Cadmium, Total	mg/L	0.005	5	5	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Chromium, Total	mg/L	0.1	5	5	100%	N/A	N/A	Non-Parametric	0.0020	0.0020	Yes
Cobalt, Total	mg/L	0.006	5	4	80%	N/A	N/A	Non-Parametric	0.0020	0.0036	Yes
Fluoride	mg/L	4	5	0	0%	None	Normal	Parametric	0.47	0.51	Yes
Lead, Total	mg/L	0.015	5	5	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Lithium, Total	mg/L	0.325	5	0	0%	None	Normal	Parametric	0.0575	0.0629	Yes
Mercury, Total	mg/L	0.002	5	5	100%	N/A	N/A	Non-Parametric	0.0002	0.0002	Yes
Molybdenum, Total	mg/L	0.1	5	0	0%	None	Normal	Parametric	0.0185	0.0249	Yes
Radium-226 + Radium-228	pCi/L	5	5	0	0%	None	Normal	Parametric	0.229	1.314	Yes
Selenium, Total	mg/L	0.05	5	5	100%	N/A	N/A	Non-Parametric	0.0050	0.0050	Yes
Thallium, Total	mg/L	0.002	5	5	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes

Notes:
mg/L: milligrams per liter
pCi/L: picocuries per liter
GWPS: Groundwater Protection Standard
Trends were tested at α = 99%. Statistically significant trends are reported at α = 99%.
N/A: Not applicable - trends and normality were not tested for parameters with greater than 50% non-detects.
None: No statistically significant trends were identified.
A discussion of the calculation of lower and upper confidence intervals is provided in-text.
Only datasets where both the upper and lower confidence intervals exceed the GWPS are considered outside of compliance.

Table 3: Q1 2022 Assessment Monitoring Comparative Statistics, MW-103 (Downgradient, Bottom Ash Landfill)

Parameter	Units	GWPS	Number of Samples	Number of Non-Detects	Percent of Non-Detects	Trends	Data Distribution	Type of Confidence Interval	Lower Confidence Limit	Upper Confidence Limit	Confidence Interval Within Compliance?
Assessment Monitoring Parameters											
Antimony, Total	mg/L	0.006	5	5	100%	N/A	N/A	Non-Parametric	0.0010	0.0010	Yes
Arsenic, Total	mg/L	0.01	5	0	0%	None	Normal	Parametric	0.0130	0.0169	No
Barium, Total	mg/L	2	5	0	0%	None	Normal	Parametric	0.0496	0.0658	Yes
Beryllium, Total	mg/L	0.004	5	5	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Cadmium, Total	mg/L	0.005	5	5	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Chromium, Total	mg/L	0.1	5	4	80%	N/A	N/A	Non-Parametric	0.0020	0.0024	Yes
Cobalt, Total	mg/L	0.006	5	4	80%	N/A	N/A	Non-Parametric	0.0020	0.0022	Yes
Fluoride	mg/L	4	5	0	0%	None	Normal	Parametric	0.34	0.42	Yes
Lead, Total	mg/L	0.015	5	0	0%	None	Normal	Parametric	0.0014	0.0027	Yes
Lithium, Total	mg/L	0.325	5	0	0%	None	Normal	Parametric	0.0238	0.0302	Yes
Mercury, Total	mg/L	0.002	5	5	100%	N/A	N/A	Non-Parametric	0.0002	0.0002	Yes
Molybdenum, Total	mg/L	0.1	5	0	0%	None	Normal	Parametric	0.0455	0.0579	Yes
Radium-226 + Radium-228	pCi/L	5	5	0	0%	None	Normal	Parametric	0.438	1.908	Yes
Selenium, Total	mg/L	0.05	5	0	0%	None	Normal	Parametric	0.0072	0.0120	Yes
Thallium, Total	mg/L	0.002	5	5	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes

Notes:
mg/L: milligrams per liter
pCi/L: picocuries per liter
GWPS: Groundwater Protection Standard
Trends were tested at α = 99%. Statistically significant trends are reported at α = 99%.
N/A: Not applicable - trends and normality were not tested for parameters with greater than 50% non-detects.
None: No statistically significant trends were identified.
A discussion of the calculation of lower and upper confidence intervals is provided in-text.
Only datasets where both the upper and lower confidence intervals exceed the GWPS are considered outside of compliance.

Table 1: Q2 2022 Assessment Monitoring Comparative Statistics, MW-9N (Downgradient, Bottom Ash Landfill)

Parameter	Units	GWPS	Number of Samples	Number of Non-Detects	Percent of Non-Detects	Trends	Data Distribution	Type of Confidence Interval	Lower Confidence Limit	Upper Confidence Limit	Confidence Interval Within Compliance?
Assessment Monitoring Parameters											
Antimony, Total	mg/L	0.006	6	5	83%	N/A	N/A	Non-Parametric	0.0010	0.0011	Yes
Arsenic, Total	mg/L	0.01	6	6	100%	N/A	N/A	Non-Parametric	0.0020	0.0020	Yes
Barium, Total	mg/L	2	6	0	0%	None	Normal	Parametric	0.0544	0.0719	Yes
Beryllium, Total	mg/L	0.004	6	6	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Cadmium, Total	mg/L	0.005	6	6	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Chromium, Total	mg/L	0.1	6	5	83%	N/A	N/A	Non-Parametric	0.0020	0.0024	Yes
Cobalt, Total	mg/L	0.006	6	0	0%	None	Non-Normal	Non-Parametric	0.0021	0.0132	Yes
Fluoride	mg/L	4	6	0	0%	None	Normal	Parametric	0.66	0.72	Yes
Lead, Total	mg/L	0.015	6	6	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Lithium, Total	mg/L	0.325	6	0	0%	None	Normal	Parametric	0.0506	0.0550	Yes
Mercury, Total	mg/L	0.002	6	6	100%	N/A	N/A	Non-Parametric	0.0002	0.0002	Yes
Molybdenum, Total	mg/L	0.1	6	0	0%	None	Normal	Parametric	0.0445	0.0727	Yes
Radium-226 + Radium-228	pCi/L	5	6	0	0%	None	Normal	Parametric	0.717	2.353	Yes
Selenium, Total	mg/L	0.05	6	0	0%	None	Normal	Parametric	0.0118	0.0183	Yes
Thallium, Total	mg/L	0.002	6	6	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes

Notes:
mg/L: milligrams per liter
pCi/L: picocuries per liter
GWPS: Groundwater Protection Standard
Trends were tested at α = 99%. Statistically significant trends are reported at α = 99%.
N/A: Not applicable - trends and normality were not tested for parameters with greater than 50% non-detects.
None: No statistically significant trends were identified.
A discussion of the calculation of lower and upper confidence intervals is provided in-text.
Only datasets where both the upper and lower confidence intervals exceed the GWPS are considered outside of compliance.

Table 2: Q2 2022 Assessment Monitoring Comparative Statistics, MW-102 (Downgradient, Bottom Ash Landfill)

Parameter	Units	GWPS	Number of Samples	Number of Non-Detects	Percent of Non-Detects	Trends	Data Distribution	Type of Confidence Interval	Lower Confidence Limit	Upper Confidence Limit	Confidence Interval Within Compliance?
Assessment Monitoring Parameters											
Antimony, Total	mg/L	0.006	6	6	100%	N/A	N/A	Non-Parametric	0.0010	0.0010	Yes
Arsenic, Total	mg/L	0.01	6	6	100%	N/A	N/A	Non-Parametric	0.0020	0.0020	Yes
Barium, Total	mg/L	2	6	0	0%	None	Non-Normal	Non-Parametric	0.0250	0.0390	Yes
Beryllium, Total	mg/L	0.004	6	6	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Cadmium, Total	mg/L	0.005	6	6	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Chromium, Total	mg/L	0.1	6	6	100%	N/A	N/A	Non-Parametric	0.0020	0.0020	Yes
Cobalt, Total	mg/L	0.006	6	5	83%	N/A	N/A	Non-Parametric	0.0020	0.0036	Yes
Fluoride	mg/L	4	6	0	0%	None	Normal	Parametric	0.48	0.51	Yes
Lead, Total	mg/L	0.015	6	6	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Lithium, Total	mg/L	0.325	6	0	0%	None	Normal	Parametric	0.0569	0.0621	Yes
Mercury, Total	mg/L	0.002	6	6	100%	N/A	N/A	Non-Parametric	0.0002	0.0002	Yes
Molybdenum, Total	mg/L	0.1	6	0	0%	None	Normal	Parametric	0.0195	0.0250	Yes
Radium-226 + Radium-228	pCi/L	5	6	0	0%	None	Normal	Parametric	0.408	1.365	Yes
Selenium, Total	mg/L	0.05	6	6	100%	N/A	N/A	Non-Parametric	0.0050	0.0050	Yes
Thallium, Total	mg/L	0.002	6	6	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes

Notes:
mg/L: milligrams per liter
pCi/L: picocuries per liter
GWPS: Groundwater Protection Standard
Trends were tested at α = 99%. Statistically significant trends are reported at α = 99%.
N/A: Not applicable - trends and normality were not tested for parameters with greater than 50% non-detects.
None: No statistically significant trends were identified.
A discussion of the calculation of lower and upper confidence intervals is provided in-text.
Only datasets where both the upper and lower confidence intervals exceed the GWPS are considered outside of compliance.

Table 3: Q2 2022 Assessment Monitoring Comparative Statistics, MW-103 (Downgradient, Bottom Ash Landfill)

Parameter	Units	GWPS	Number of Samples	Number of Non-Detects	Percent of Non-Detects	Trends	Data Distribution	Type of Confidence Interval	Lower Confidence Limit	Upper Confidence Limit	Confidence Interval Within Compliance?
Assessment Monitoring Parameters											
Antimony, Total	mg/L	0.006	6	6	100%	N/A	N/A	Non-Parametric	0.0010	0.0010	Yes
Arsenic, Total	mg/L	0.01	6	0	0%	None	Normal	Parametric	0.0117	0.0164	No
Barium, Total	mg/L	2	6	0	0%	None	Normal	Parametric	0.0522	0.0677	Yes
Beryllium, Total	mg/L	0.004	6	6	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Cadmium, Total	mg/L	0.005	6	6	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes
Chromium, Total	mg/L	0.1	6	5	83%	N/A	N/A	Non-Parametric	0.0020	0.0024	Yes
Cobalt, Total	mg/L	0.006	6	5	83%	N/A	N/A	Non-Parametric	0.0020	0.0022	Yes
Fluoride	mg/L	4	6	0	0%	None	Normal	Parametric	0.29	0.41	Yes
Lead, Total	mg/L	0.015	6	0	0%	None	Normal	Parametric	0.0016	0.0031	Yes
Lithium, Total	mg/L	0.325	6	0	0%	None	Normal	Parametric	0.0245	0.0330	Yes
Mercury, Total	mg/L	0.002	6	6	100%	N/A	N/A	Non-Parametric	0.0002	0.0002	Yes
Molybdenum, Total	mg/L	0.1	6	0	0%	None	Normal	Parametric	0.0401	0.0566	Yes
Radium-226 + Radium-228	pCi/L	5	6	0	0%	None	Normal	Parametric	0.659	1.829	Yes
Selenium, Total	mg/L	0.05	6	1	17%	None	Normal	Parametric	0.0066	0.0110	Yes
Thallium, Total	mg/L	0.002	6	6	100%	N/A	N/A	Non-Parametric	0.0005	0.0005	Yes

Notes:
mg/L: milligrams per liter
pCi/L: picocuries per liter
GWPS: Groundwater Protection Standard
Trends were tested at α = 99%. Statistically significant trends are reported at α = 99%.
N/A: Not applicable - trends and normality were not tested for parameters with greater than 50% non-detects.
None: No statistically significant trends were identified.
A discussion of the calculation of lower and upper confidence intervals is provided in-text.
Only datasets where both the upper and lower confidence intervals exceed the GWPS are considered outside of compliance.

APPENDIX F

Detection Monitoring Alternative Source Demonstration – Q4 2021

REPORT

Alternative Source Demonstration for Total Dissolved Solids at Monitoring Well MW-104

Bottom Ash Impoundment - Stanton Station

Submitted to:

Great River Energy

12300 Elm Creek Boulevard
Maple Grove, Minnesota 55369

Submitted by:

Golder Associates USA Inc.

7245 W Alaska Drive, Suite 200, Lakewood, Colorado, USA 80226

+1 303 980-0540

21509219-8-R-0

June 6, 2022

Table of Contents

TABLES

FIGURES

1.0 INTRODUCTION

On behalf of Great River Energy (GRE), Golder Associates USA Inc. (Golder), a member of WSP, performed a statistical evaluation of groundwater geochemistry results from the fourth quarter (Q4) 2021 groundwater detection monitoring event at Stanton Station's Bottom Ash coal combustion residual (CCR) Surface Impoundment. The statistical evaluation was performed in accordance with applicable provisions of 40 Code of Federal Regulations (CFR) Part 257, "Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule" (CCR rule), as amended, and as described in the Coal Combustion Residuals Groundwater Statistical Method Certification for Stanton Station, Revision 2 (Golder 2021b).

Statistical analyses of the second quarter (Q2) 2021 Appendix III detection monitoring sampling results for groundwater at the downgradient monitoring well MW-104 indicated a potential exceedance of the statistical limit for total dissolved solids (TDS) based on the parametric Shewhart-CUSUM (Cumulative Summation) control chart analysis. This potential exceedance was subsequently verified as a statistically significant increase (SSI) following the Q4 2021 detection monitoring sampling event.

Although determination of a verified SSI generally indicates that the groundwater monitoring program should transition from detection monitoring to assessment monitoring, 40 CFR Part 257.94(e)(2) allows the owner or operator (i.e., GRE) 90 days from the date of determining a verified SSI to demonstrate a source other than the regulated CCR facility caused the SSI or that the SSI is an indication of an error in sampling, analysis, or statistical evaluation or natural variability in groundwater quality that was not fully captured during the baseline data collection period.

Golder's review of the hydrological and geologic conditions at the site indicates the TDS SSI in MW-104 is not an indication of impacts from the Bottom Ash Impoundment. A desktop study of previously collected groundwater quality data and CCR-contact waters from the facility was conducted to assess potential TDS sources. Based upon this review and in accordance with provisions of the CCR Rule, Golder prepared this Alternative Source Demonstration (ASD) for TDS at MW-104.

This ASD conforms to the requirements of 40 CFR Part 257.94(e)(2) and provides the basis for concluding that the verified SSI for TDS at MW-104 is not an indication of a release from the Bottom Ash Impoundment. The following sections provide a summary of the CCR facilities at Stanton Station, geochemical assessment results, and lines of evidence demonstrating an alternative source is responsible for a TDS SSI at MW-104.

2.0 BACKGROUND

2.1 Site Background

Stanton Station was a coal-fired electric generation facility located along the Missouri River in Mercer County, approximately three miles southeast of Stanton, North Dakota. Stanton Station began generating power in 1966 and ceased power production in February 2017.

Stanton Station has two CCR facilities that are within the purview of the EPA CCR rule (see Figure 1):

- Bottom Ash CCR Landfill (Bottom Ash Landfill) located south of the former plant site and west of the Bottom Ash Impoundment.
- Bottom Ash CCR Surface Impoundment (Bottom Ash Impoundment) located south of the former plant site and east of the Bottom Ash Landfill.

2.2 Recent Closure Activities at Site CCR Facilities

Stanton Station ceased operation in February of 2017 and site deconstruction and restoration activities began shortly thereafter. These activities affected surface water recharge associated with precipitation and runoff and may have affected groundwater conditions (flow regime and chemistry) near Stanton Station and the associated CCR facilities.

As a part of site deconstruction, the following general activities were completed between the summer of 2017 and 2020:

- Stanton Station power generating station, associated buildings, and pavement were deconstructed and/or demolished. A majority of the above-grade structures were recycled or taken offsite for disposal; however, a small amount of construction and demolition (C&D) material was disposed of onsite in the Bottom Ash Landfill and Bottom Ash Impoundment, as approved and permitted via the North Dakota Department of Environmental Quality.
- The coal unloading sump (located near monitoring wells MW-104 and MW-1R), which extended below the elevation of anticipated typical groundwater, was taken out of service (i.e., the sump was turned off) and subsequently filled with compacted earthen material.
- Near-surface utilities (piping, duct banks, etc.) were excavated and disposed of as C&D material.
- Other below-grade structures and utilities were either abandoned in place or filled and abandoned depending on the size of the buried structure/utility.

Site restoration work began at the end of the site deconstruction effort and generally involved the following activities:

- Between 2017 and 2019, the remaining bottom ash and economizer ash from the plant and Bottom Ash Impoundment (north and center cells), the north and center cell liner systems, and any impacted soils were placed in the south cell of the Bottom Ash Impoundment. The north and center cells of the Bottom Ash Impoundment were closed by removal of CCR and composite liner in the fall of 2019.
- Regrading of the site to promote drainage and vegetative growth started in 2019 and was completed in 2020. As part of the site regrading, a retention pond was re-located, the stormwater pond near the historic plant site was filled in, and drainages were modified to accommodate general site drainage toward the Missouri River.
- Closure of the south cell of the Bottom Ash Impoundment included installation of a sump, adjusting CCR grades, and installing the final composite cover system, consisting of a geomembrane and geosynthetic clay liner overlain with soil to promote vegetative growth. Closure of the south cell of the Bottom Ash Impoundment was partially completed in 2019.
- Final closure of the Bottom Ash Impoundment and Bottom Ash Landfill, including placement of growth medium, infiltration, and topsoil layers was completed in 2020.
- Since 2020 the site has been in post-closure care with no significant site changes and continued establishment of vegetation over the CCR facilities and surrounding areas.

2.3 Site Geology

Regional geology of the area surrounding Stanton Station is documented in the Hydrogeologic Assessment Report, Stanton Station Ash Ponds (Braun 1993). Stanton Station is located in the Missouri Slope District of the Glaciated Missouri Plateau Section of the Great Plains Province. Subsurface and surficial stratigraphy of Mercer County and the adjacent Oliver County were reviewed in depth by C.G. Carlson for the North Dakota Geological Society (Carlson 1973). Primary near-surface stratigraphic units in the area of Stanton Station include the Tongue River Formation and Cannonball Formation, with named lignite beds prominent near the site.

Near-surface geology at Stanton Station consists of two primary geologic units: the upper alluvial terrace deposits of the Missouri River, and underlying sediments and bedrock belonging to the Bullion Creek Formation, each having variable extents and thicknesses across the site (Braun 1993). Discontinuous seams of coal are located throughout the site, in addition to gravel, sand, silt, and clay.

2.4 Site Hydrogeology

The principal hydrostratigraphic unit and uppermost water-bearing unit near the CCR facilities consists of alluvial deposits, which includes two subunits: an upper silty sand and clay, and an underlying outwash sand and gravel. Individually, these subunits are laterally heterogeneous and geologic conditions within these subunits can be characterized by interbedded layers of gravel, sand, silt, clay, and coal.

Due to variations in sub-unit thickness throughout the site, groundwater in the uppermost water bearing unit is monitored in both the outwash subunit and the silty sand and clay subunit, with flow generally moving from southwest to northeast towards the Missouri River. Depths from the ground surface to the uppermost water-bearing unit range from 5 to 20 feet in the area around Stanton Station. A map showing recent available groundwater elevations is shown in Figure 1.

Figure 2 displays a time series of the water elevations from the monitoring well network. Groundwater levels have remained relatively stable in the monitoring wells over the monitoring period

The groundwater gradient across the site is influenced by the subsurface units, and ranges from 0.002 to 0.01 (Braun 1993). As presented in Golder (2022), measured hydraulic conductivities in the region of the bottom ash impoundment range from 1.05 ft/day to 40 ft/day. The range of groundwater flow velocities measured in November (Q4) 2021 is 0.04 to 1.33 ft/day.

2.5 Groundwater Monitoring Network

The groundwater monitoring network for the Bottom Ash Impoundment was developed for the size, disposal and operational history, anticipated flow direction, and location of adjacent facilities. Based on these factors, a monitoring well network consisting of upgradient and downgradient monitoring wells is used for monitoring the unit under the CCR Rule.

Four upgradient wells (MW-7A, MW-7B, MW-8B, and MW-105) and one side-gradient well (MW-6B) are used to characterize groundwater upgradient of the Bottom Ash Impoundment and Bottom Ash Landfill. These wells are to the north and west of the facility and based on groundwater flow directions are not expected to be influenced by the CCR facilities (Figure 1).

As a result of site deconstruction and restoration activities (removal of wells associated with site regrading, and adjustment of CCR unit boundaries), between Q4 2019 and fourth quarter (Q4) 2021, the Bottom Ash Impoundment monitoring network only had two downgradient wells (MW-104, MW-1R). Following the completion of site restoration in 2020, three new downgradient monitoring wells were installed adjacent to the closed south cell of the Bottom Ash Impoundment (MW-201, MW-202, and MW-203). Baseline sampling for the new Bottom Ash Impoundment downgradient wells (detailed in the 2020 annual report, Golder 2021a) is currently underway. Following collection of a minimum of eight independent samples in 2022, a baseline statistical analysis will be conducted for the new wells and they will be added to the downgradient detection monitoring program.

Table 1 : Monitoring Wells Upgradient and Downgradient of the Bottom Ash Impoundment

Location	Monitoring Wells
Upgradient/Side-gradient Wells	MW-7A
	MW-7B
	MW-8B
	MW-105
	MW-6B
Bottom Ash Impoundment Downgradient Wells	MW-1R
	MW-104
New Downgradient Wells (currently in baseline monitoring)	MW-201
	MW-202
	MW-203

2.6 Summary of Groundwater Conditions

Between June 2016 and July 2017, field personnel collected a minimum of eight independent baseline groundwater samples from MW-7A, MW-7B, MW-8B, MW-105, MW-6B, MW-1R, and MW-104, as required by 40 CFR Part 257.94, for use within the CCR Rule monitoring program. The results of the CCR baseline monitoring were used to develop statistical limits for each constituent at each monitoring well, based on site conditions and parameter specific characteristics such as the data distribution and detection frequency (Golder 2021b).

Following completion of the baseline monitoring events for MW-7A, MW-7B, MW-8B, MW-105, MW-6B, MW-1R, and MW-104, GRE began collecting groundwater samples on a semi-annual basis to support the detection monitoring program. Groundwater samples for detection monitoring are collected at each upgradient and downgradient monitoring well and analyzed for 40 CFR Part 257 Appendix III constituents. During the detection monitoring program, groundwater analysis results are compared to the calculated statistical limits to determine whether groundwater quality remains consistent or if changes in groundwater quality are observed.

TDS concentrations in groundwater samples collected between June 2016 and November 2021 from the CCR monitoring wells are shown in Figure 3.

TDS concentrations in groundwater at MW-104 during the baseline monitoring period (June 2016 to April 2017) ranged between 1,050 and 1,160 milligrams per liter (mg/L) in the nine baseline samples collected as part of the CCR Rule monitoring program. The Shewhart-CUSUM statistical limit for the well-constituent pair was set at 1,254 mg/L.

The Q2 2021 detection monitoring event reported a TDS concentration of 1,210 mg/L, with a calculated CUSUM value of 1306 mg/L that exceeded the statistical limit. Verification resampling was conducted during the Q4 2021 detection monitoring event with a measured value of 1,170 mg/L and a calculated CUSUM value of 1,342 mg/L, confirming the SSI for TDS based on the CUSUM value.

3.0 DATA SOURCES

To assess groundwater downgradient of the Bottom Ash Impoundment, Golder reviewed previously collected data and performed supplemental assessment activities. The following sections summarize the data sources used in supplemental assessment activities.

3.1 Site Groundwater

As discussed in Section 2.6, field personnel routinely collect groundwater samples from monitoring wells around the CCR facilities at Stanton Station and submit them to a certified laboratory for chemical analysis. Groundwater monitoring samples collected between June 2016 and November 2021 were used for this evaluation. Samples were analyzed for field parameters, major cations, major anions, and Appendix III and Appendix IV constituents.

3.2 CCR Contact Waters

3.2.1 South Cell Sump

As part of the planned closure process for the Bottom Ash Impoundment a sump was installed to accommodate south cell dewatering. Two water samples taken from the south cell sump were analyzed for field parameters, major cations, major anions, and Appendix III and Appendix IV constituents. One sample was collected shortly after consolidation of the north and center pond materials into the south cell (in October 2019) and one sample was collected a few years after materials were consolidated (March 2022). The sump water samples represent CCR contact water from the south cell, and therefore are representative of the water that would potentially impact groundwater downgradient of the Bottom Ash Impoundment if there was a release from the facility.

3.2.2 Bottom Ash Landfill Test Pit Water

In addition to monitoring well data, a water sample was collected from below the Bottom Ash Landfill in October 2019 during closure construction. A test pit was excavated through placed bottom ash within the landfill and approximately four feet into the underlying saturated native soil, which was visually identified as clay. Water accumulated in this test pit over a period of approximately 24 hours, was sampled, and analyzed for field parameters, major cations, major anions, and Appendix III and Appendix IV constituents.

Due to the nature of how this sample was collected, it likely represents a mixture of seepage from the Bottom Ash Landfill and shallow groundwater.

4.0 EVALUATION OF POTENTIAL TDS SOURCES

Several potential sources, other than the Bottom Ash Impoundment, could contribute TDS to groundwater at monitoring well MW-104, including upgradient groundwater and surface disturbances from recently removed ash impoundments. This section evaluates the geochemical characteristics of the TDS increases at MW-104 and evaluates these potential sources of TDS to groundwater.

4.1 Geochemistry of TDS at MW-104

Total dissolved solids, the main constituent of interest in this assessment, is the combined amount of all dissolved (filterable) ions, as determined by use of the method specified in 40 CFR part 136. Therefore, the most abundant ions in the groundwater samples are the dominant components of the TDS concentration of a sample. In natural waters, the most abundant cations in groundwater are generally calcium, magnesium, sodium, and potassium, and the most abundant anions are generally sulfate, bicarbonate, carbonate, and chloride.

An assessment of the major ion concentration provides an indication of which major ions control the increases in TDS at monitoring well MW-104. Figures 4 displays a stacked bar chart, with a time series of the TDS concentration and cumulative concentrations of the major cations and anions in groundwater from monitoring well MW-104 between March 2017 and November 2021. Only samples where the full list of major cations and anions were analyzed are shown on Figure 4. The major cations and anions in groundwater at monitoring well MW-104 are primarily sodium, calcium, bicarbonate, and sulfate.

Figure 5 show the correlation statistics (R^2) between each of the major cations and anions and the TDS concentrations to determine which major ions are increasing and contribute to higher TDS concentrations. Sodium, potassium, and alkalinity (bicarbonate) have the best correlations with increasing TDS values (R^2 values of 0.669, 0.492, and 0.237, respectively). Calcium, magnesium, chloride, and sulfate concentrations do not correlate with the increases in TDS concentrations (R^2 values of 0.029, 0.002, 0.021 and 0.085, respectively).

4.2 Upgradient Groundwater

As described in Section 2.4 the groundwater gradient in the area around the Bottom Ash Impoundment shows groundwater flows from southwest to northeast, towards the Missouri River. TDS concentrations at monitoring well MW-104 will reflect the concentrations of upgradient groundwater and any additions from potential seepage from the Bottom Ash Impoundment (if occurring).

A wide range of TDS concentrations are observed in the upgradient and side-gradient monitoring wells. The highest upgradient TDS concentrations are observed in groundwater from monitoring well MW-7A, ranging from 14,200 to 17,600 mg/L. The lowest upgradient TDS concentrations are observed in groundwater from monitoring well MW-8B, ranging from 706 to 1,440 mg/L. TDS concentrations at MW-7B, MW-105, and MW-6B range between 914 and 2,470 mg/L.

Figure 6 displays a box and whisker plot showing the ranges of TDS concentrations in upgradient, side-gradient, and downgradient wells in area around the Bottom Ash Impoundment. Representative CCR contact waters (Bottom Ash Landfill Test Pit Water and South Cell Sump samples) are also presented on the plot for comparison. Given the variability of TDS concentrations in upgradient groundwater, changes in the site hydrology due to closure activities (Section 2.2) could change the relative proportions of upgradient groundwater sources flowing towards monitoring well MW-104 and increase TDS concentrations at MW-104.

Figure 7 shows a Piper diagram of upgradient and side-gradient groundwater (red), downgradient groundwater (blue), and CCR contact waters (black). Groundwater from monitoring well MW-104 is shown in Figure 7 in varying shades of green to show the change with time, with lighter green representing older samples and darker green representing more recent samples. Piper diagrams help to visualize the relative proportions of major cations and anions in water samples. They can be helpful in identifying unique water signatures and potential water mixing relationships.

Groundwater from monitoring well MW-104 is changing from a chemical signature near upgradient monitoring wells MW-105 and MW-8B towards a chemical signature like upgradient monitoring well MW-7B and side-gradient well MW-6B. In addition, groundwater signatures from monitoring well MW-104 are also moving towards other downgradient monitoring wells (MW-203 and MW-1R).

Based on the results shown and recognized trends in upgradient wells in Figures 2 through 7, the increases in TDS at MW-104 most likely reflect the change in the relative proportions of upgradient groundwater sources (which have variable TDS concentrations) flowing towards MW-104. There is not an indication that the verified SSI of TDS from well MW-104 is the result of a release from the CCR facilities.

4.3 Current and Historical Ash Impoundments

The TDS concentrations measured in the two samples from the South Cell Sump of the Bottom Ash Impoundment (6,340 to 10,800 mg/L) are higher than samples collected from monitoring well MW-104 and therefore indicate that seepage (if occurring) from the Bottom Ash Impoundment could increase TDS concentrations in groundwater at MW-104 (Figure 6). However, the presence of the liner system described below for the Bottom Ash Impoundment reduces the likelihood of seepage to groundwater.

The south cell of the Bottom Ash Impoundment has a liner system consisting of (from bottom to top):

- 2 feet or more of compacted clay rich material with a hydraulic conductivity of $1x10^{-7}$ centimeters per second or less
- 60-mil high density polyethylene geomembrane liner
- 2 feet of protective cover on the floor

The Piper diagram (Figure 7) indicates that CCR contact waters in the Bottom Ash Impoundment are sodium and sulfate dominant. Groundwater samples collected from MW-104 have a higher proportion of calcium and bicarbonate than the contact water. Additionally, the Piper diagram indicates that higher TDS groundwater samples from MW-104 have major ion signatures that shift towards higher proportions of sodium, potassium, and bicarbonate, consistent with the trends observed in Figure 5. This shift indicates the water samples with elevated TDS collected from MW-104 were progressing away from the CCR contact water signature on the Piper diagram. If seepage from the Bottom Ash Impoundment was impacting groundwater at MW-104, the groundwater geochemistry would be expected to shift towards the major ion signature of CCR contact waters on the Piper diagram. Therefore, it is unlikely that water from the Bottom Ash Impoundment is the source of the change in TDS concentrations leading to the identification of the SSIs.

5.0 EVIDENCE OF AN ALTERNATIVE SOURCE

Based on the review of potential alternative site sources of TDS presented in this report, primary lines of evidence and conclusions drawn from the evidence used to support this ASD are provided in Table 2.

Table 2: Primary and Supporting Lines of Evidence from ASD Evaluation

Key Line of Evidence	Supporting Evidence	Description and Conclusions
Offsite source of elevated TDS concentrations	Elevated TDS concentrations in groundwater upgradient of the Bottom Ash Impoundment	Figure 6 indicates that high TDS concentrations are present in groundwater in monitoring wells upgradient of the Bottom Ash Impoundment. This upgradient groundwater has high enough TDS concentrations to explain the minor increases observed at MW-104.
	Upgradient groundwater major ion signatures in groundwater at MW-104	The Piper diagram (Figure 7) suggests that the major ion signature of groundwater from MW-104 has shifted towards the signature of groundwater at upgradient well MW-7B and side-gradient well MW-6B and not toward the signature of CCR contact waters.

Key Line of Evidence	Supporting Evidence	Description and Conclusions
Hydrogeology	Recent construction upgradient of MW-104 has the potential to alter the groundwater flow regime near MW-104	The removal of the north and center cells of the Bottom Ash Impoundment disturbed the surface immediately upgradient of monitoring well MW-104. These construction activities may have altered the hydrological flow regime around monitoring well MW-104 and altered the proportions of upgradient groundwater sources flowing towards MW-104
Engineering controls	Bottom Ash Impoundment is lined	The Bottom Ash Impoundment has a composite liner system, which decreases the likelihood of seepage from this facility.
Water Quality	Relative ion abundances in groundwater differ from Bottom Ash Impoundment water	The water quality signature of groundwater samples collected from downgradient well MW104 are not consistent with the signature of potential seepage from the Bottom Ash Impoundment. As presented in Figure 7, the Piper diagram shows that groundwater from MW-104 is distinctly different from CCR contact waters. This suggests that the Bottom Ash Impoundment is not the cause of the change in TDS concentrations.
	Geochemistry results from MW-104 are shifting away from Bottom Ash Impoundment water samples	Major ion chemistry in MW-104 samples with higher TDS has shifted to a higher proportions of sodium, potassium, and bicarbonate relative to other major ions. These high TDS samples collected from MW-104 are progressing away from the CCR contact water signature on the Piper diagram.

6.0 CONCLUSIONS

In accordance with 40 CFR Part 257.95(g)(3), this ASD has been prepared in response to the identification of a verified SSI for TDS at monitoring well MW-104, following the Q4 2021 sampling event for the Bottom Ash Impoundment at Stanton Station.

Based on review of historical analytical results, recent changes to TDS concentrations in groundwater at MW-104 are likely not a result of seepage from the Bottom Ash Impoundment. The increase in TDS concentrations in groundwater at MW-104 likely reflect variability of upgradient groundwater sources and recent changes to site hydrogeology due to site closure activities. Therefore, no further action (i.e., a transition to assessment monitoring) is warranted, and the Bottom Ash Impoundment facility will remain in detection monitoring.

REFERENCES

Braun. 1993. Hydrogeologic Assessment Report, Stanton Station Ash Ponds. Prepared for Great River Energy Stanton Generating Station. Prepared by Braun Intertec Environmental Inc.

Carlson CG. 1973. Geology of Mercer and Oliver Counties, North Dakota. Bulletin 56 – Part I, for the North Dakota Geological Society. County Ground Water Studies 15 – Part I, for the North Dakota State Water Commission.

GAI (Golder Associates Inc.). 2021a. 2020 Annual Inspection Report–Great River Energy–Stanton Station–Bottom Ash CCR Surface Impoundment. January 2021.

Golder (Golder Associates USA Inc.). 2021b. Coal Combustion Residuals Groundwater Statistical Method Certification, Revision 2, Great River Energy – Stanton Station. November 18, 2021.

Golder. 2022. Annual Groundwater Report – 2021. Great River Energy. Stanton Station. January 2022.

Signature Page

Golder Associates USA Inc.

Gregory Lehn, PhD
Project Geochemist

Sara Harkins, PG (WY)
Senior Geochemist

Todd Stong, PE
Associate and Senior Consultant

REGISTERED PROFESSIONAL ENGINEER
TODD J. STONG
PE-614
DATE 6/6/2022
NORTH DAKOTA

https://golderassociates.sharepoint.com/sites/157762/project files/6 deliverables/reports/8-r-asd_tds_mw-104/8-r-0/21509219-8-r-0-asd_tds_mw-104_06JUN22.docx

Figures

LEGEND

- UPGRADIENT OR SIDEGRADIENT MONITORING WELL
- DOWNGRADIENT MONITORING WELL (BOTTOM ASH IMPOUNDMENT)
- DOWNGRADIENT MONITORING WELL (BOTTOM ASH LANDFILL)
- CLOSED BOTTOM ASH LANDFILL/IMPOUNDMENT FOOTPRINT
- GENERAL DIRECTION OF GROUNDWATER FLOW
- 1705 GROUNDWATER CONTOURS AND ELEVATIONS

NOTE(S)

1. AERIAL IMAGERY OBTAINED FROM UNITED STATES DEPARTMENT OF AGRICULTURE, NATIONAL AGRICULTURE IMAGERY PROGRAM, 2020.
2. GROUNDWATER ELEVATIONS SHOWN FOR MW-9N, MW-102, MW-103, MW-104, MW-1R, MW-7B, MW-7A, MW-105, MW-8B, MW-6B, MW-201, MW-202, AND MW-203 WERE MEASURED IN NOVEMBER 2021.
3. THE NORTH AND CENTER CELLS OF THE BOTTOM ASH IMPOUNDMENT WERE CLOSED BY REMOVAL OF WASTE AND LINER.
4. THE SOUTH CELL OF THE BOTTOM ASH IMPOUNDMENT WAS CLOSED WITH A FINAL COVER OVER PLACED WASTE.
5. THE BOTTOM ASH LANDFILL WAS CLOSED BY CONSOLIDATION OF PLACED WASTE INTO A SMALLER FOOTPRINT AND CONSTRUCTION OF A FINAL COVER
6. GROUNDWATER CONTOURS ARE BASED ON ELEVATION INFORMATION FROM THE SHOWN MONITORING WELLS AND PIEZOMETERS/WELLS NOT PART OF THE MONITORING NETWORKS.

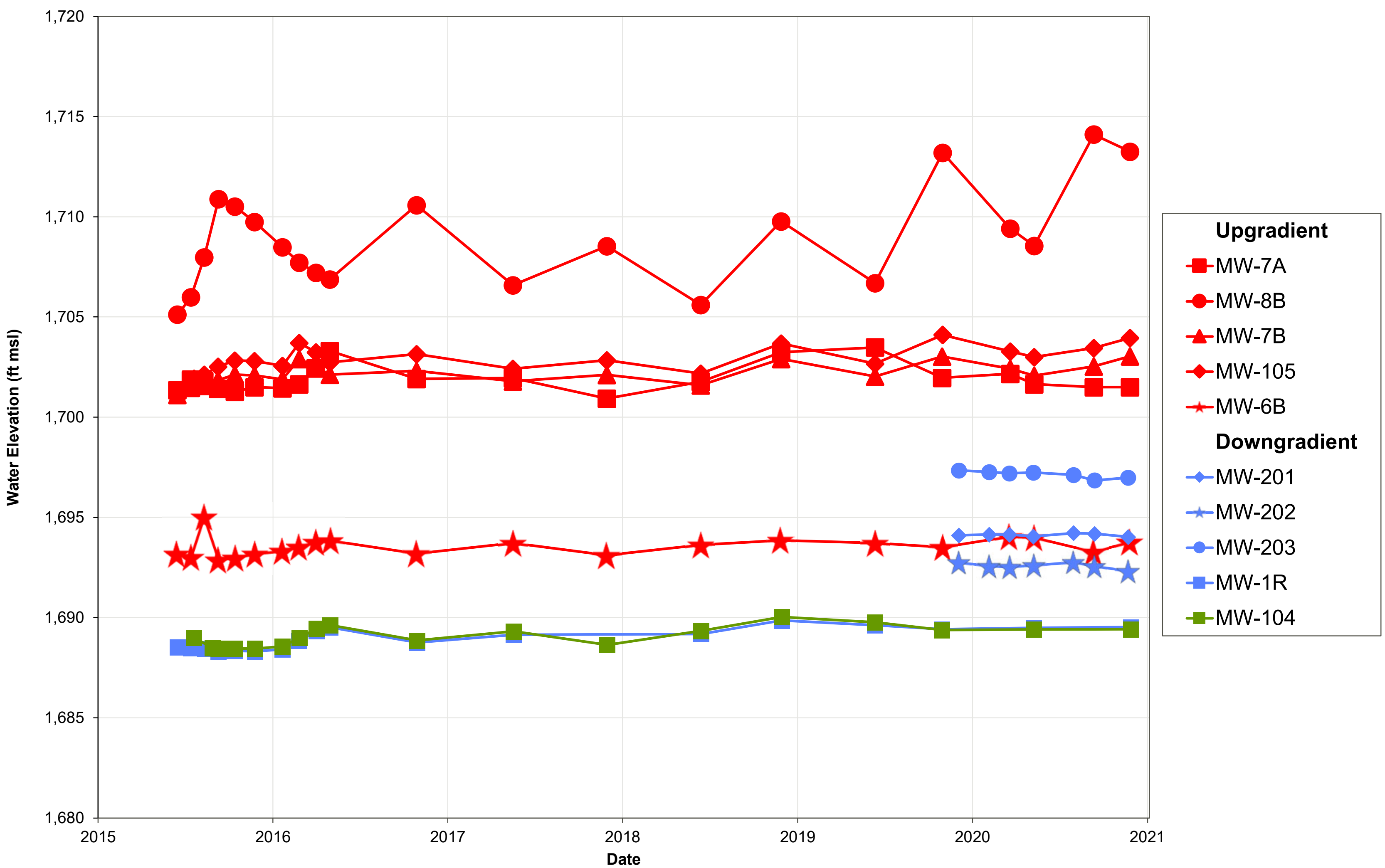
N

0 200 400
1" = 200' FEET

WSP GOLDER

GREAT RIVER ENERGY - STANTON STATION
ALTERNATIVE SOURCE DEMONSTRATION
NOVEMBER 2021 GROUNDWATER CONTOURS AND SAMPLING LOCATIONS
FIGURE 1

PATH: https://golderassociates.sharepoint.com/sites/157704/_vti_history/4096/Project Files/5 Technical Work/6-Water Quality/Q4 2021 CCR ASDs | FILE NAME: CCS Q4 2021 ASD Working Data.xlsm - backup version



CLIENT
Great River Energy - Stanton Station

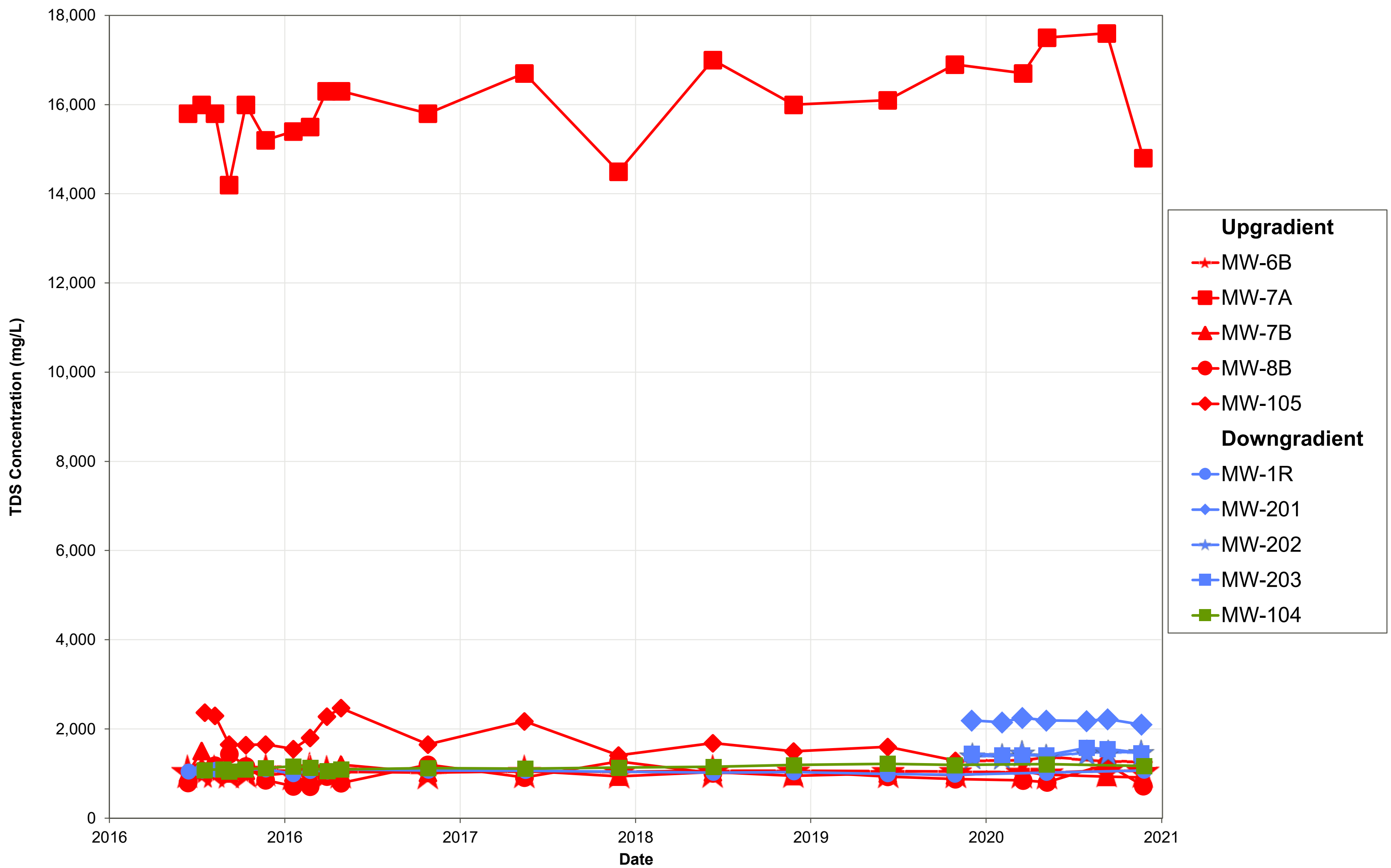
PROJECT
Alternative Source Demonstration

CONSULTANT
WSP GOLDER

TITLE
Time Series of Groundwater Elevations in Monitoring Wells

PROJECT NO.	PHASE	REV.	FIGURE
21509219	1000	0	2

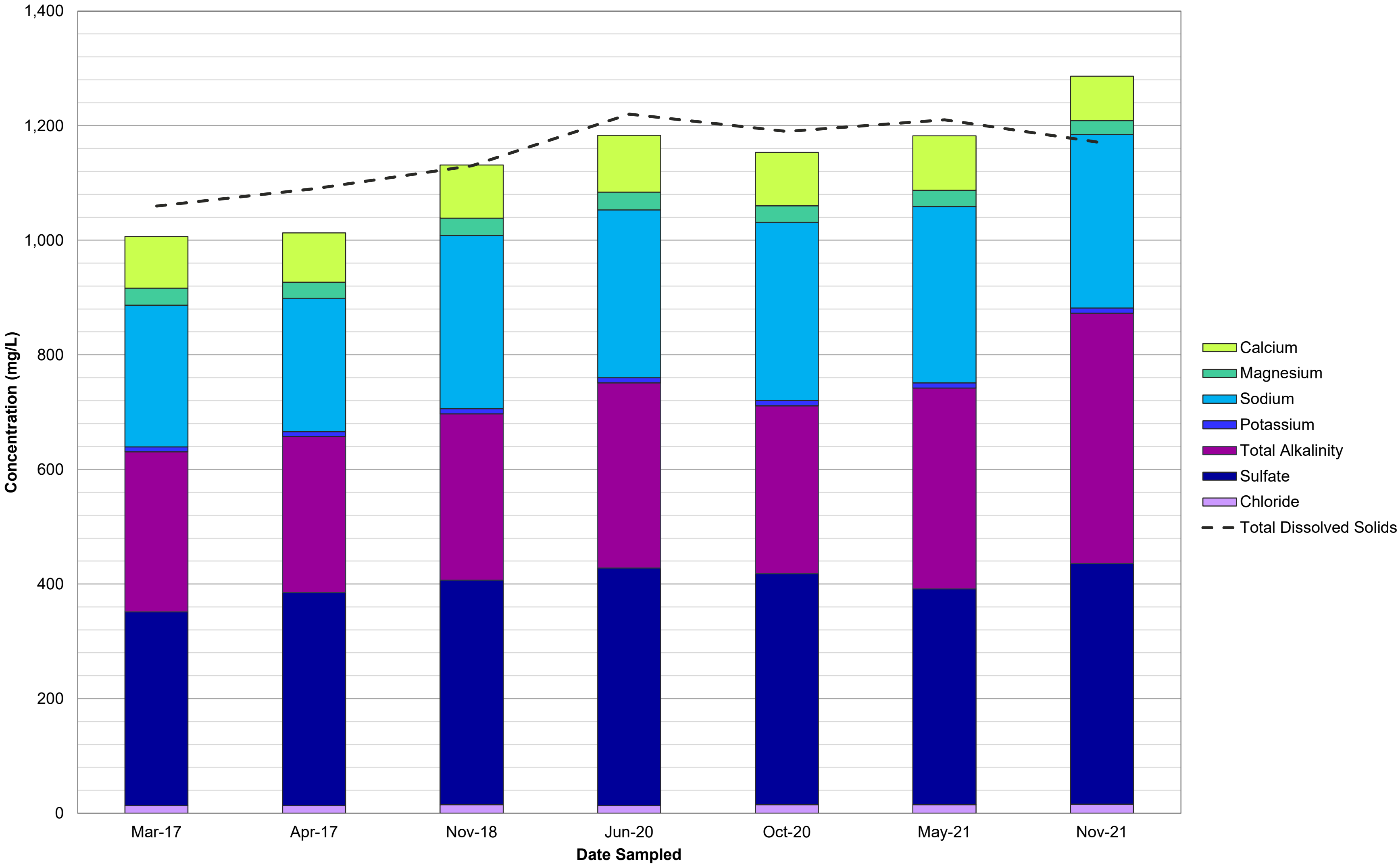
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A



CLIENT	PROJECT
Great River Energy - Stanton Station	Alternative Source Demonstration
CONSULTANT	TITLE
WSP GOLDER	Time Series for TDS Concentrations in Monitoring Wells

PROJECT NO.	PHASE	REV.	FIGURE
21509219	1000	0	3

PATH: https://golderassociates.sharepoint.com/sites/157762/Project Files/5 Technical Work/Water Quality/Q4 2021 ASD - Appendix III SSIs/02_Working Data | FILE NAME: Stanton_CCR - Well Chemistry - Q4 2021.xlsm



Notes:
Data is only shown for samples with complete list of major cations (calcium, magnesium, sodium, and potassium) and anions (sulfate, alkalinity, and chloride).
Based on the circum-neutral pH values observed in groundwater at MW-104, total alkalinity concentrations (as mg $CaCO_3$/L) were converted to bicarbonate concentrations (as mg HCO_3^-/L).
Samples that do not contain total alaklinity and for which only bicarbonate alkalinity values are avialble, bicarbonate alkalinity values as $CaCO_3$/L were converted to as HCO_3^-/L.

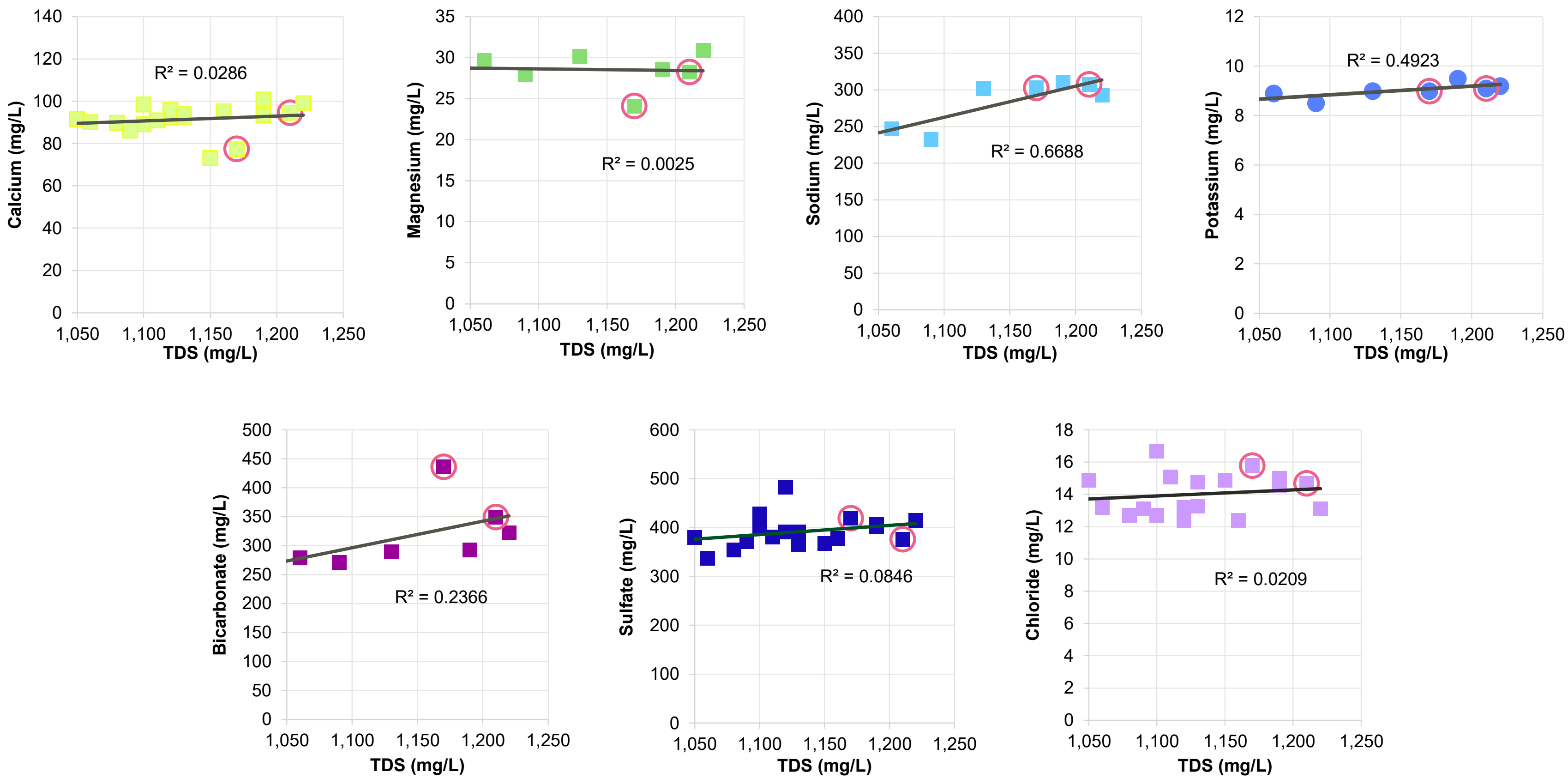
CLIENT
Great River Energy - Stanton Station

CONSULTANT
WSP GOLDER

PROJECT
Alternative Source Demonstration

TITLE
Distribution of Major TDS Components in Monitoring Well MW-104 Samples

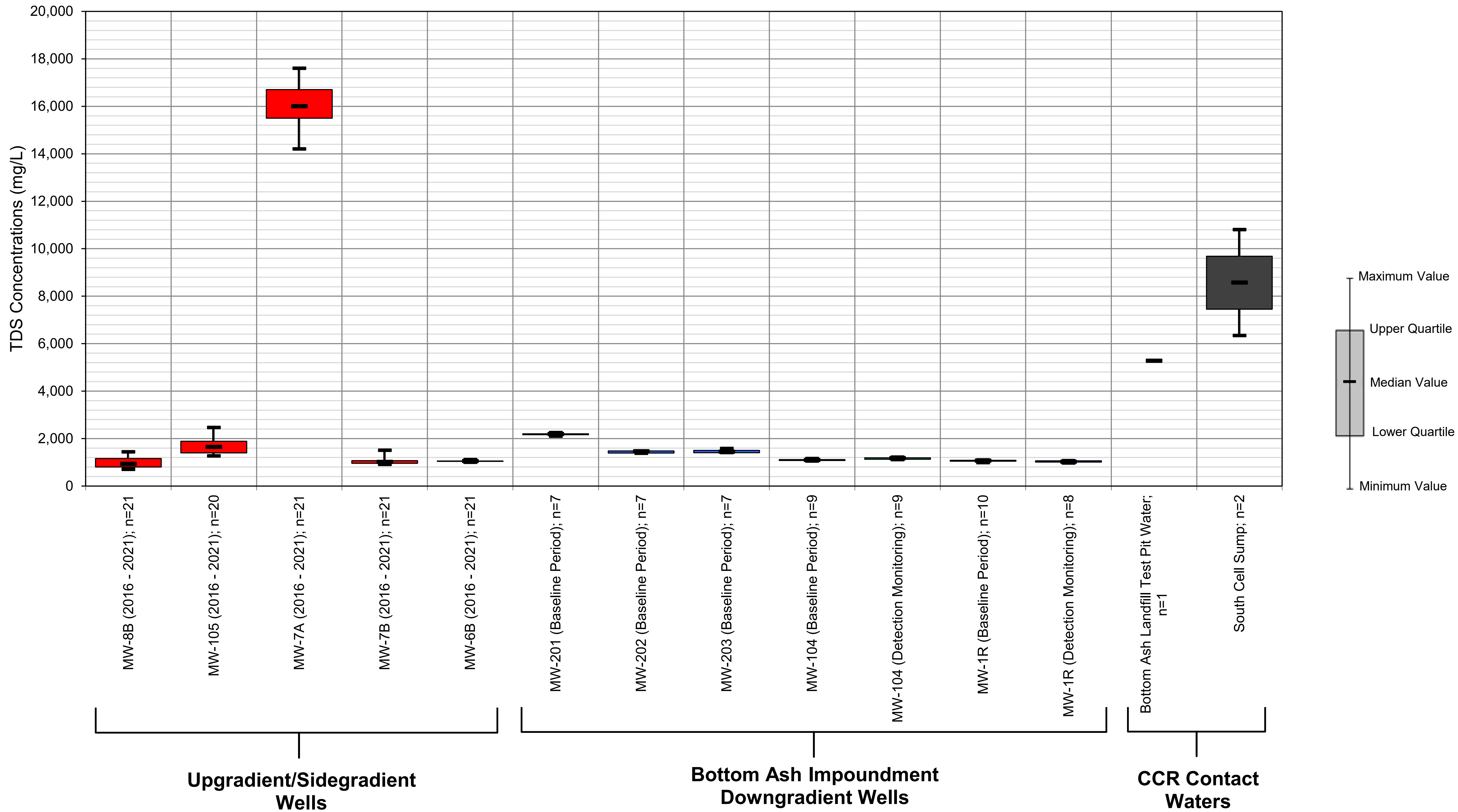
PROJECT NO.	PHASE	REV.	FIGURE
21509219	1000	0	4



Note: Two most recent (Q2 and Q4 2021) sample data is identified by the red circles.

CLIENT	PROJECT
Great River Energy - Stanton Station	Alternative Source Demonstration
CONSULTANT	TITLE
WSP GOLDER	Major Cations and Anions Correlation Charts for Monitoring Well MW-104 Samples

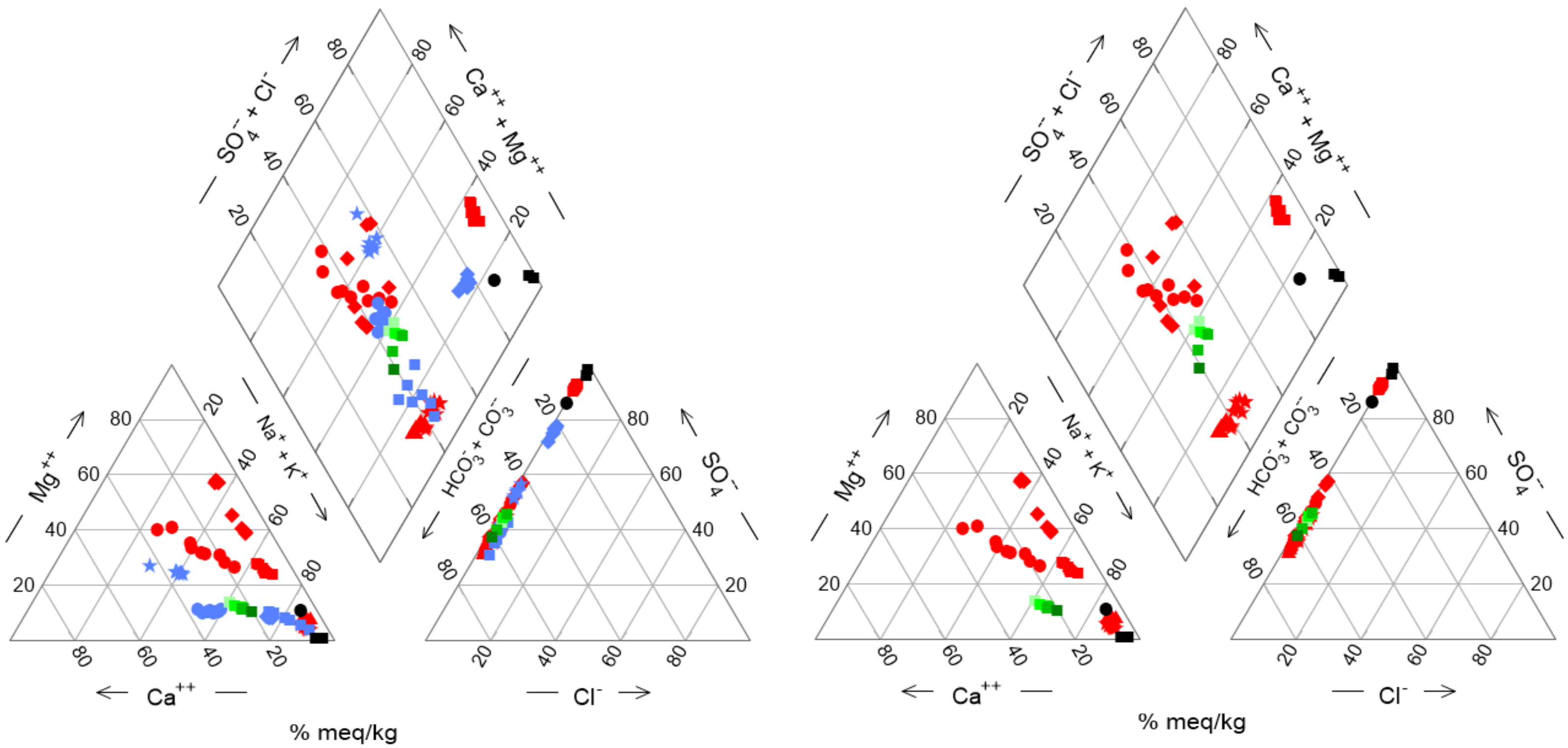
PROJECT NO.	PHASE	REV.	FIGURE
21509219	1000	0	5



Note: The baseline period for downgradient wells MW-104 and MW-1R is from 6/14/2016 to 4/28/2017.

CLIENT Stanton Station	PROJECT Alternative Source Demonstration
CONSULTANT WSP GOLDER	TITLE TDS Concentration Box and Whisker Plot

PROJECT NO.	PHASE	REV.	FIGURE
21451133	1000	0	6



Upgradient/ Side-gradient Wells

- MW–105
- MW–7A
- MW–7B
- MW–8B
- MW–6B

Contact Waters

- Bottom Ash Landfill Test Pit
- South Cell Sump

Downgradient Wells

- MW–1R
- MW–201
- MW–202
- MW–203

Well of Interest

- MW–104 (Mar 2017 and Apr 2017)
- MW–104 (Nov 2018 and Jun 2020)
- MW–104 (Oct 2020 and May 2021)
- MW–104 (Nov 2021)

Note:
Some samples did not have alkalinity measurements so alkalinity was estimated as the difference between major cations (Ca, Mg, Na, K) and major anions (SO4, Cl, F). All dates for the well of interest (MW-104) have alkalinity data. This technique is less precise and should be regarded as a high-level estimate.

CLIENT	PROJECT
Great River Energy - Stanton Station	Alternative Source Demonstration
CONSULTANT	TITLE
WSP GOLDER	Piper Diagram

PROJECT NO.	PHASE	REV.	FIGURE
21509219	1000	0	7

golder.com

APPENDIX G

Detection Monitoring Alternative Source Demonstration – Q2 2022

REPORT

Alternative Source Demonstration for Total Dissolved Solids at Monitoring Well MW-104

Bottom Ash Impoundment - Stanton Station

Submitted to:

Great River Energy

12300 Elm Creek Boulevard
Maple Grove, Minnesota 55369

Submitted by:

WSP USA Inc.

7245 W Alaska Drive, Suite 200, Lakewood, Colorado, USA 80226

+1 303 980-0540

21509219-19-R-0

January 19, 2023

Table of Contents

TABLES

FIGURES

1.0 INTRODUCTION

On behalf of Great River Energy (GRE), WSP USA Inc. (WSP), which acquired Golder Associates USA Inc., performed a statistical evaluation of groundwater geochemistry results for the second quarter (Q2) 2022 groundwater detection monitoring event at Stanton Station's Bottom Ash coal combustion residual (CCR) Surface Impoundment (Bottom Ash Impoundment). The statistical evaluation was performed in accordance with applicable provisions of 40 Code of Federal Regulations (CFR) Part 257, "Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule" (Federal CCR rule), as amended, Chapter 33.1-20-08 of the North Dakota Administrative Code (NDAC) rules pertaining to CCR units (State CCR rule), and as described in the Coal Combustion Residuals Groundwater Statistical Method Certification for Stanton Station, Revision 2 (Golder 2021).

Statistical analyses for the Q2 2021 detection monitoring (Federal Appendix III list and NDAC Appendix I list) sampling results for groundwater at the downgradient monitoring well MW-104 indicated a potential exceedance of the statistical limit for total dissolved solids (TDS) based on the parametric Shewhart-CUSUM (Cumulative Summation) control chart analysis. This potential exceedance was subsequently verified as a statistically significant increase (SSI) following the fourth quarter (Q4) 2021, first quarter (Q1) 2022, and Q2 2022 detection monitoring sampling events.

Although determination of a verified SSI generally indicates that the groundwater monitoring program should transition from detection monitoring to assessment monitoring, 40 CFR Part 257.94(e)(2) and NDAC 33.1-20-08-06(4)(e)(2) allow the owner or operator (i.e., GRE) 90 days from the date of determining a verified SSI to demonstrate a source other than the regulated CCR unit caused the SSI or that the SSI is an indication of an error in sampling, analysis, or statistical evaluation, or natural variability in groundwater quality that was not fully captured during the baseline data collection period.

WSP's review of the hydrological and geologic conditions at the site indicates that the TDS SSI at MW-104 is not an indication of impacts from the Bottom Ash Impoundment. A desktop study of previously collected groundwater quality data and CCR-contact waters from the unit was conducted to assess potential TDS sources. Based upon this review and in accordance with provisions of the Federal CCR Rule and the State CCR Rule, WSP prepared this Alternative Source Demonstration (ASD) for TDS at MW-104. An ASD was initially developed following the Q4 2021 verified SSI (Golder 2022a). Here, WSP assesses and modifies, where needed, the previous ASD report with the statistical evaluation of data collected in Q1 2022 and Q2 2022.

This ASD conforms to the requirements of 40 CFR Part 257.94(e)(2) and NDAC 33.1-20-08-06(4)(e)(2) and provides the basis for concluding that the verified SSI for TDS at MW-104 is not an indication of a release from the Bottom Ash Impoundment. The following sections provide a summary of the CCR units at Stanton Station, geochemical assessment results, and lines of evidence demonstrating an alternate source is responsible for the TDS SSI at MW-104.

2.0 BACKGROUND

2.1 Site Background

Stanton Station was a coal-fired electric generation facility located along the Missouri River in Mercer County, approximately three miles southeast of Stanton, North Dakota. Stanton Station began generating power in 1966 and ceased power production in February 2017.

Stanton Station has two CCR units that are within the purview of the Federal and State CCR rules (see Figure 1):

- Bottom Ash CCR Landfill (Bottom Ash Landfill) located south of the former plant site and west of the Bottom Ash Impoundment.
- Bottom Ash CCR Surface Impoundment (Bottom Ash Impoundment) located south of the former plant site and east of the Bottom Ash Landfill.

2.2 Recent Closure Activities at Site CCR Units

Stanton Station ceased operation in February of 2017 and site deconstruction and restoration activities began shortly thereafter. These activities affected surface water recharge associated with precipitation and runoff and may have affected groundwater conditions (flow regime and chemistry) near Stanton Station and the associated CCR units.

As a part of site deconstruction, the following general activities were completed between the summer of 2017 and 2020:

- The Stanton Station power generating station, associated buildings, and pavement were deconstructed and/or demolished. A majority of the above-grade structures were recycled or taken offsite for disposal; however, a small amount of construction and demolition (C&D) material was disposed of onsite in the Bottom Ash Landfill and Bottom Ash Impoundment, as approved and permitted via the North Dakota Department of Environmental Quality.
- The coal unloading sump (located near monitoring wells MW-104 and MW-1R), which extended below the elevation of anticipated typical groundwater, was taken out of service (i.e., the sump was turned off) and subsequently filled with compacted earthen material.
- Near-surface utilities (piping, duct banks, etc.) were excavated and disposed of as C&D material.
- Other below-grade structures and utilities were either abandoned in place or filled and abandoned depending on the size of the buried structure/utility.

Site restoration work began at the end of the site deconstruction effort and generally involved the following activities:

- Between 2017 and 2019, the remaining bottom ash and economizer ash from the plant and Bottom Ash Impoundment north and center cells, the north and center cell liner systems, and any impacted soils were placed in the south cell of the Bottom Ash Impoundment. The north and center cells of the Bottom Ash Impoundment were closed by removal of CCR and composite liner in the fall of 2019.
- Regrading of the site to promote drainage and vegetative growth started in 2019 and was completed in 2020. As part of the site regrading, a retention pond was re-located, the stormwater pond near the historic plant site was filled in, and drainages were modified to accommodate general site drainage toward the Missouri River.
- Closure of the south cell of the Bottom Ash Impoundment included installation of a sump, adjusting CCR grades, and installing the final composite cover system, which consists of a geomembrane and geosynthetic clay liner overlain with soil to promote vegetative growth. Closure of the south cell of the Bottom Ash Impoundment was partially completed in 2019.
- Final closure of the Bottom Ash Impoundment and Bottom Ash Landfill, including placement of growth medium, infiltration, and topsoil layers was completed in 2020.

- Since 2020 the site has been in post-closure care with no significant site changes and continued establishment of vegetation over the CCR units and surrounding areas.

2.3 Site Geology

Regional geology of the area surrounding Stanton Station is documented in the Hydrogeologic Assessment Report, Stanton Station Ash Ponds (Braun 1993). Stanton Station is located in the Missouri Slope District of the Glaciated Missouri Plateau Section of the Great Plains Province. Subsurface and surficial stratigraphy of Mercer County and the adjacent Oliver County were reviewed in depth by C.G. Carlson for the North Dakota Geological Society (Carlson 1973). Primary near-surface stratigraphic units in the area of Stanton Station include the Tongue River Formation and Cannonball Formation, with named lignite beds prominent near the site.

Near-surface geology at Stanton Station consists of two primary geologic units: the upper alluvial terrace deposits of the Missouri River, and underlying sediments and bedrock belonging to the Bullion Creek Formation, each having variable extents and thicknesses across the site (Braun 1993). Discontinuous seams of coal are located throughout the site, in addition to gravel, sand, silt, and clay.

2.4 Site Hydrogeology

The principal hydrostratigraphic unit and uppermost water-bearing unit near the CCR units consists of alluvial deposits, which includes two subunits: an upper silty sand and clay, and an underlying outwash sand and gravel. Individually, these subunits are laterally heterogeneous and geologic conditions within these subunits can be characterized by interbedded layers of gravel, sand, silt, clay, and coal.

Due to variations in sub-unit thickness throughout the site, groundwater in the uppermost water bearing unit is monitored in both the outwash subunit and the silty sand and clay subunit, with flow generally moving from southwest to northeast towards the Missouri River. Depths from the ground surface to the uppermost water-bearing unit range from 5 to 20 feet in the area around Stanton Station. A map showing recent available groundwater elevations is shown in Figure 1.

Figure 2 displays a time series of the water elevations from the monitoring well network. Groundwater levels have remained relatively stable in the monitoring wells over the monitoring period but do show a slight uptick in Q2 2022.

The groundwater gradient across the site is influenced by the subsurface units, and ranges from 0.002 to 0.01 (Braun 1993). Measured hydraulic conductivities in the region of the Bottom Ash Impoundment range from 1.51×10^{-5} centimeters per second (cm/s, roughly 0.043 feet per day, ft/day) to 2.84×10^{-3} cm/s (roughly 8.1 ft/day) (Braun 1993). The range of groundwater flow velocities measured in June (Q2) 2022 is 0.001 to 0.24 ft/day.

2.5 Groundwater Monitoring Network

A groundwater monitoring well network consisting of upgradient and downgradient monitoring wells is used for monitoring the unit under the Federal and State CCR Rules. The groundwater monitoring network for the Bottom Ash Impoundment was developed for the size, disposal and operational history, anticipated flow direction, and location of adjacent units.

Four upgradient wells (MW-7A, MW-7B, MW-8B, and MW-105) and one side-gradient well (MW-6B) are used to characterize unimpacted background groundwater for the Bottom Ash Impoundment and Bottom Ash Landfill.

These wells are located south and west of the unit and based on groundwater flow directions are not expected to be influenced by the CCR units (Figure 1).

The Bottom Ash Impoundment monitoring network only had two downgradient wells (MW-104, MW-1R) due to previous wells being removed with the adjustment of CCR unit boundaries during site deconstruction and restoration activities. Following the completion of site restoration in 2020, three new downgradient monitoring wells were installed adjacent to the closed south cell of the Bottom Ash Impoundment (MW-201, MW-202, and MW-203). Baseline sampling for the new Bottom Ash Impoundment downgradient wells (detailed in the 2020 annual report, GAI 2021, and Golder 2022b) was completed in 2022 following collection of a minimum of eight independent samples. Baseline statistical analysis was also completed in 2022. The June (Q2) 2022 sampling event was the first detection monitoring event for these new wells. For the Q2 2022 detection monitoring event, both the existing network wells (MW-104 and MW-1R) and the new downgradient wells (MW-201, MW-202, and MW-202) were sampled and evaluated. As discussed in the current groundwater monitoring system certification (GAI 2020): “Once the new monitoring wells [MW-201, MW-202, and MW-203] are installed and detection monitoring started at these new wells, monitoring wells MW-104 and MW-1R will be removed from the groundwater monitoring system (for detection monitoring) as they are no longer close to the waste boundary and will be replaced by the new wells.” Table 1 provides a summary of the upgradient/side-gradient wells, the previous downgradient wells (through Q2 2022), and the new downgradient monitoring wells.

Table 1 : Monitoring Wells Upgradient and Downgradient of the Bottom Ash Impoundment

Location	Monitoring Wells
Background (Upgradient/Side-gradient) Wells	MW-7A
	MW-7B
	MW-8B
	MW-105
	MW-6B
Previous Downgradient Wells (Through Q2 2022)	MW-1R
	MW-104
New Downgradient Wells (Starting Q2 2022)	MW-201
	MW-202
	MW-203

2.6 Summary of Groundwater Conditions

For each of the upgradient, side-gradient, and downgradient monitoring wells, field personnel collected a minimum of eight independent baseline groundwater samples, as required by 40 CFR Part 257.94 and NDAC 33.1-20-08-06(4)(b), for use within the CCR Rule monitoring program. The results of the CCR baseline monitoring were used to develop statistical limits for each constituent at each monitoring well, based on site conditions and parameter specific characteristics such as the data distribution and detection frequency (Golder 2021).

Following completion of the baseline monitoring events, GRE began collecting groundwater samples on a semi-annual basis to support the detection monitoring program. Groundwater samples for detection monitoring are collected at each upgradient, side-gradient, and downgradient monitoring well and analyzed for detection monitoring constituents (Federal CCR Rule Appendix III and NDAC Appendix I). During the detection monitoring program, groundwater analysis results are compared to the calculated statistical limits to determine whether groundwater quality remains consistent or if changes in groundwater quality are observed.

TDS concentrations in groundwater samples collected between June 2016 and June 2022 from the CCR monitoring wells are shown in Figure 3.

TDS concentrations in groundwater at MW-104 ranged between 1,050 and 1,160 milligrams per liter (mg/L) in the nine baseline samples collected as part of the CCR Rule monitoring program. The Shewhart-CUSUM statistical limit for the well-constituent pair was set at 1,254 mg/L.

A summary of individual sampling events of TDS resulting in the identified SSI at well MW-104 is as follows:

- The Q2 2021 detection monitoring event reported a TDS concentration of 1,210 mg/L, with a calculated CUSUM value of 1,306 mg/L that exceeded the statistical limit.
- Verification resampling was conducted during the Q4 2021 detection monitoring event with a measured value of 1,170 mg/L and a calculated CUSUM value of 1,342 mg/L, confirming the SSI for TDS based on the CUSUM value.
- During the Q2 2022 detection monitoring sampling event a TDS value of 1,280 mg/L was measured with a CUSUM value of 1,566 mg/L.
- An additional sampling event in Q1 2022 was conducted at MW-104 while sampling of other monitoring wells was occurring at the site. While not required as part of the detection monitoring program for the Bottom Ash Impoundment, the Q1 2022 detection monitoring results for MW-104 were included with the statistical analysis for the Q2 2022 sampling event at GRE's discretion.
  - Q1 2022 had a TDS value of 1,210 mg/L and a CUSUM value of 1,419 mg/L.

Sampling in Q4 2021, Q1 2022, and Q2 2022 for TDS at MW-104 continues to exceed the statistical limit and confirm an SSI for TDS at MW-104.

3.0 DATA SOURCES

To assess groundwater downgradient of the Bottom Ash Impoundment, WSP reviewed previously collected data and performed supplemental assessment activities. The following sections summarize the data sources used in supplemental assessment activities.

3.1 Site Groundwater

As discussed in Section 2.6, field personnel routinely collect groundwater samples from monitoring wells around the CCR units at Stanton Station and submit them to a certified laboratory for chemical analysis. Groundwater monitoring samples collected between June 2016 and June 2022 were used for this evaluation. Samples were analyzed for field parameters, major cations, major anions, and CCR Rule detection monitoring and assessment monitoring constituents.

3.2 CCR Contact Waters

3.2.1 South Cell Sump

As part of the planned closure process for the Bottom Ash Impoundment, a sump was installed to accommodate dewatering of the south cell. Four water samples taken from the south cell sump were analyzed for field parameters, major cations, major anions, and CCR Rule detection monitoring and assessment monitoring constituents. One sample was collected shortly after consolidation of the north and center cell materials into the south cell (in October 2019) and three samples were collected a few years after materials were consolidated (March to June 2022). The sump water samples represent CCR contact water from the south cell, and therefore are representative of the water that would potentially impact groundwater downgradient of the Bottom Ash Impoundment if there was a release from the unit.

3.2.2 Bottom Ash Landfill Test Pit Water

In addition to monitoring well data, a water sample was collected from below the Bottom Ash Landfill in October 2019 during closure construction. A test pit was excavated through placed bottom ash within the landfill and approximately four feet into the underlying saturated native soil, which was visually identified as clay. Water accumulated in this test pit over a period of approximately 24 hours, was sampled, and analyzed for field parameters, major cations, major anions, and Appendix III and Appendix IV constituents.

Due to the nature of how this sample was collected, it likely represents a mixture of seepage from the Bottom Ash Landfill and shallow groundwater.

4.0 EVALUATION OF POTENTIAL TDS SOURCES

Several potential sources, other than the Bottom Ash Impoundment, could contribute TDS to groundwater at monitoring well MW-104, including upgradient groundwater and surface disturbances from recently removed ash impoundments. This section evaluates the geochemical characteristics of the TDS increases at MW-104 and evaluates these potential sources of TDS to groundwater.

4.1 Geochemistry of TDS at MW-104

Total dissolved solids, the main constituent of interest in this assessment, is the combined amount of all dissolved (filterable) ions, as determined by use of the method specified in 40 CFR part 136. Therefore, the most abundant ions in the groundwater samples are the dominant components of the TDS concentration of a sample. In natural waters, the most abundant cations in groundwater are generally calcium, magnesium, sodium, and potassium, and the most abundant anions are generally sulfate, total alkalinity, and chloride.

An assessment of the major ion concentrations provides an indication of which major ions control the increases in TDS at monitoring well MW-104. Figures 4 displays a stacked bar chart, with a time series of the TDS concentrations and cumulative concentrations of the major cations and anions in groundwater from monitoring well MW-104 between March 2017 and June 2022. Only samples where the full list of major cations and anions were analyzed are shown on Figure 4. The major cations and anions in groundwater at monitoring well MW-104 are primarily sodium, calcium, total alkalinity, and sulfate.

Figure 5 show the correlation statistics (R^2) between each of the major cations and anions and the TDS concentrations to determine which major ions are increasing and contribute to higher TDS concentrations. Sodium, potassium, and sulfate have the best correlations with increasing TDS values (R^2 values of 0.77, 0.47, and 0.29, respectively). Calcium, magnesium, chloride, and total alkalinity concentrations do not correlate with the increases in TDS concentrations (R^2 values of 0.02, 0.09, 0.09 and 0.07, respectively).

4.2 Upgradient Groundwater

As described in Section 2.4 the groundwater gradient in the area around the Bottom Ash Impoundment shows groundwater flows from southwest to northeast, towards the Missouri River. TDS concentrations at monitoring well MW-104 will reflect the concentrations of upgradient groundwater and any additions from potential seepage from the Bottom Ash Impoundment (if occurring).

A wide range of TDS concentrations are observed in the upgradient and side-gradient monitoring wells. The highest upgradient TDS concentrations are observed in groundwater from monitoring well MW-7A, ranging from 14,200 to 17,600 mg/L. The lowest upgradient TDS concentrations are observed in groundwater from monitoring well MW-8B, ranging from 693 to 1,440 mg/L. TDS concentrations at MW-7B, MW-105, and MW-6B range between 914 and 2,470 mg/L.

Figure 6 displays a box and whisker plot showing the ranges of TDS concentrations in upgradient, side-gradient, and downgradient wells in the area around the Bottom Ash Impoundment. Representative CCR contact waters (Bottom Ash Landfill Test Pit Water and South Cell Sump samples) are also presented on the plot for comparison. Given the variability of TDS concentrations in upgradient groundwater, changes in the site hydrology due to closure activities (Section 2.2) could change the relative proportions of upgradient groundwater sources flowing towards monitoring well MW-104 and increase TDS concentrations at MW-104.

Figure 7 shows a ratio plot of sodium/chloride to sulfate/chloride of upgradient and side-gradient groundwater (red), downgradient groundwater (blue), and CCR contact waters (black). Groundwater from monitoring well MW-104 is shown in Figure 7 in varying shades of green to show the change with time, with lighter green representing older samples and darker green representing more recent samples. Figure 7 helps to visualize the relative proportions of major cations and anions that are most strongly correlated to changes in TDS.

The sodium/chloride and sulfate/chloride ratios for monitoring well MW-104 overlap with the ratios for upgradient sources in Figure 7. Groundwater from monitoring well MW-104 has sodium/chloride and sulfate/chloride ratios that plot between upgradient/side-gradient monitoring wells MW-8B/MW-105 and MW-6B/MW-7B, and do not plot near contact water sources.

Based on the results shown and recognized trends in upgradient wells in Figures 2 through 7, the increases in TDS at MW-104 most likely reflect the change in the relative proportions of upgradient groundwater sources (which have variable TDS concentrations) flowing towards MW-104. Theses plots do not indicate that the verified SSI of TDS from well MW-104 is the result of a release from the CCR units, such as a shift towards CCR contact waters.

4.3 Current and Historical Ash Impoundments

The TDS concentrations measured in the four samples from the South Cell Sump of the Bottom Ash Impoundment (6,340 to 11,000 mg/L) are higher than samples collected from monitoring well MW-104 and therefore indicate that seepage (if occurring) from the Bottom Ash Impoundment could increase TDS concentrations in groundwater at MW-104 (Figure 6). However, the presence of the liner system described below for the Bottom Ash Impoundment reduces the likelihood of seepage to groundwater.

The south cell of the Bottom Ash Impoundment has a liner system consisting of (from bottom to top):

- 2 feet or more of compacted clay rich material with a hydraulic conductivity of 1×10^{-7} centimeters per second or less
- 60-mil high density polyethylene geomembrane liner
- 2 feet of protective cover on the floor

The bivariate plot of sodium/chloride to sulfate/chloride (Figure 7) indicates that CCR contact waters in the Bottom Ash Impoundment are sodium and sulfate dominant relative to chloride. If seepage from the Bottom Ash Impoundment was impacting groundwater at MW-104, the groundwater geochemistry would be expected to shift towards higher sodium/chloride and sulfate/chloride ratios, beyond natural variations in upgradient and side-gradient groundwater. Any shifts in major anions and cations at MW-104 is within the range of values seen at different upgradient groundwater sources and not reflective of the CCR contact waters.

Figure 8 shows a time series of TDS, boron, and fluoride concentrations in groundwater from monitoring well MW-104. If contact water is a potential source of increase in TDS in well MW-104 then CCR contact water indicative constituents such as boron and fluoride would also be expected to increase. The June 2022 sampling event contained the highest TDS value of 1,280 mg/L in MW-104, however there has not been a correlating increase in boron (0.69 mg/L) or fluoride concentrations (0.69 mg/L). Therefore, it is unlikely that water from the Bottom Ash Impoundment is the source of the change in TDS concentrations leading to the identification of the SSIs.

5.0 EVIDENCE OF AN ALTERNATIVE SOURCE

Based on the review of potential alternative site sources of TDS presented in this report, primary lines of evidence and conclusions drawn from the evidence used to support this ASD are provided in Table 2.

Table 2: Primary and Supporting Lines of Evidence from ASD Evaluation

Key Line of Evidence	Supporting Evidence	Description and Conclusions
Offsite source of elevated TDS concentrations	Elevated TDS concentrations in groundwater upgradient of the Bottom Ash Impoundment	Figure 6 indicates that high TDS concentrations are present in groundwater in monitoring wells upgradient of the Bottom Ash Impoundment. This upgradient groundwater has high enough TDS concentrations to explain the minor increases observed at MW-104.
	Upgradient groundwater sodium/chloride and sulfate/chloride ratios groundwater at MW-104	The ratio plot (Figure 7) suggests that the sodium/chloride and sulfate/chloride ratios of groundwater from MW-104 overlap with the ratios of upgradient wells.
Hydrogeology	Recent construction upgradient of MW-104 has the potential to alter the groundwater flow regime near MW-104	The removal of the north and center cells of the Bottom Ash Impoundment disturbed the surface and subsurface immediately upgradient of monitoring well MW-104. These construction activities may have altered the hydrological flow regime around monitoring well MW-104 and altered the proportions of upgradient groundwater sources flowing towards MW-104.
Engineering controls	Bottom Ash Impoundment is lined	The Bottom Ash Impoundment has a composite liner system, which decreases the likelihood of seepage from this unit.

Key Line of Evidence	Supporting Evidence	Description and Conclusions
Water Quality	Relative ion abundances in groundwater differ from Bottom Ash Impoundment water	The sodium/chloride and sulfate/chloride ratios of groundwater samples collected from downgradient well MW-104 are not consistent with ratios of potential seepage from the Bottom Ash Impoundment. As presented in Figure 7, groundwater from MW-104 is distinctly different from CCR contact waters. This suggests that the Bottom Ash Impoundment is not the cause of the change in TDS concentrations.
	Absence of other CCR indicator constituents	The timeseries plots of TDS, fluoride, and boron show that boron and fluoride concentrations at MW-104 are not increasing, even for the Q2 2022 sampling event containing the highest measured TDS value in well MW-104.

6.0 CONCLUSIONS

In accordance with 40 CFR Part 257.94(e)(2) and NDAC 33.1-20-08.06.4(e)(2), this ASD has been prepared in response to the identification of a verified SSI for TDS at monitoring well MW-104, following the Q2 2022 sampling event for the Bottom Ash Impoundment at Stanton Station.

Based on review of historical analytical results, recent changes to TDS concentrations in groundwater at MW-104 are likely not a result of seepage from the Bottom Ash Impoundment. The increase in TDS concentrations in groundwater at MW-104 likely reflect variability of upgradient groundwater sources and recent changes to site hydrogeology due to site closure activities. Therefore, no further action (i.e., a transition to assessment monitoring) is warranted, and we recommend that the Bottom Ash Impoundment unit remain in detection monitoring. Upon approval and acceptance of this alternative source demonstration by the NDDEQ, REC intends to remove MW-104 and MW-1R from the detection monitoring network as discussed above and in the current groundwater monitoring system certification.

REFERENCES

Braun. 1993. Hydrogeologic Assessment Report, Stanton Station Ash Ponds. Prepared for Great River Energy Stanton Generating Station. Prepared by Braun Intertec Environmental Inc.

Carlson CG. 1973. Geology of Mercer and Oliver Counties, North Dakota. Bulletin 56 – Part I, for the North Dakota Geological Society. County Ground Water Studies 15 – Part I, for the North Dakota State Water Commission.

GAI (Golder Associates Inc.). 2020. Coal Combustion Residuals Groundwater Monitoring System Certification, Revision 1, Great River Energy – Stanton Station. January 29, 2020. Revision 0 published October 12, 2017.

GAI (Golder Associates Inc.). 2021. 2020 Annual Inspection Report–Great River Energy–Stanton Station–Bottom Ash CCR Surface Impoundment. January 2021.

Golder (Golder Associates USA Inc.). 2021. Coal Combustion Residuals Groundwater Statistical Method Certification, Revision 2, Great River Energy – Stanton Station. November 30, 2021. Revision 0 published October 12, 2017; Revision 1 published January 22, 2020.

Golder. 2022a. Alternative Source Demonstration for Total Dissolved Solids at Monitoring Well MW-104, Great River Energy – Stanton Station. June 6, 2022.

Golder. 2022b. Annual Groundwater Report – 2021. Great River Energy. Stanton Station. January 2022.

Signature Page

WSP USA Inc.

Jennifer Thompson, PhD
Associate Geochemist

Sara Harkins, PG (WY)
Senior Geochemist

Todd Stong, PE
Director

REGISTERED PROFESSIONAL ENGINEER
TODD J.
STONG
PE-6144
DATE 1/19/2023
NORTH DAKOTA

https://golderassociates.sharepoint.com/sites/157762/Project Files/6 Deliverables/Reports/19-R-ASD_TDS_MW-104/19-R-0/21509219-19-R-0-ASD_TDS_104_19JAN23.docx

Figures

LEGEND

- DOWNGRADIENT MONITORING WELL (BOTTOM ASH LANDFILL)
- DOWNGRADIENT MONITORING WELL (BOTTOM ASH IMPOUNDMENT)
- UPGRADIENT OR SIDEGRADIENT MONITORING WELL
- 1690.8 GROUNDWATER ELEVATION (ft) (NOTE 1)
- CLOSED BOTTOM ASH LANDFILL/IMPOUNDMENT FOOTPRINT
- GENERAL DIRECTION OF GROUNDWATER FLOW
- APPROXIMATE GROUNDWATER CONTOURS AND ELEVATIONS (NOTE 1)

NOTE(S)

1. GROUNDWATER CONTOURS ARE BASED ON MAY AND JUNE 2022 ELEVATION INFORMATION FROM THE SHOWN MONITORING WELLS, AS WELL AS MONITORING WELLS AND PIEZOMETERS NOT SHOWN.
2. THE NORTH AND CENTER CELLS OF THE BOTTOM ASH IMPOUNDMENT WERE CLOSED BY REMOVAL OF WASTE AND LINER.
3. THE SOUTH CELL OF THE BOTTOM ASH IMPOUNDMENT WAS CLOSED WITH A FINAL COVER OVER PLACED WASTE.
4. THE BOTTOM ASH LANDFILL WAS CLOSED BY CONSOLIDATION OF PLACED WASTE INTO A SMALLER FOOTPRINT AND CONSTRUCTION OF A FINAL COVER.
5. MONITORING WELLS MW-201, MW-202, AND MW-203 COMPLETED BASELINE DATA COLLECTION IN MAY 2022 AND BEGAN DETECTION MONITORING FOR THE BOTTOM ASH IMPOUNDMENT IN JUNE 2022.

REFERENCE(S)

AERIAL IMAGERY OBTAINED FROM UNITED STATES DEPARTMENT OF AGRICULTURE, NATIONAL AGRICULTURE IMAGERY PROGRAM, 2021.

N

0 250 500
1" = 500' FEET

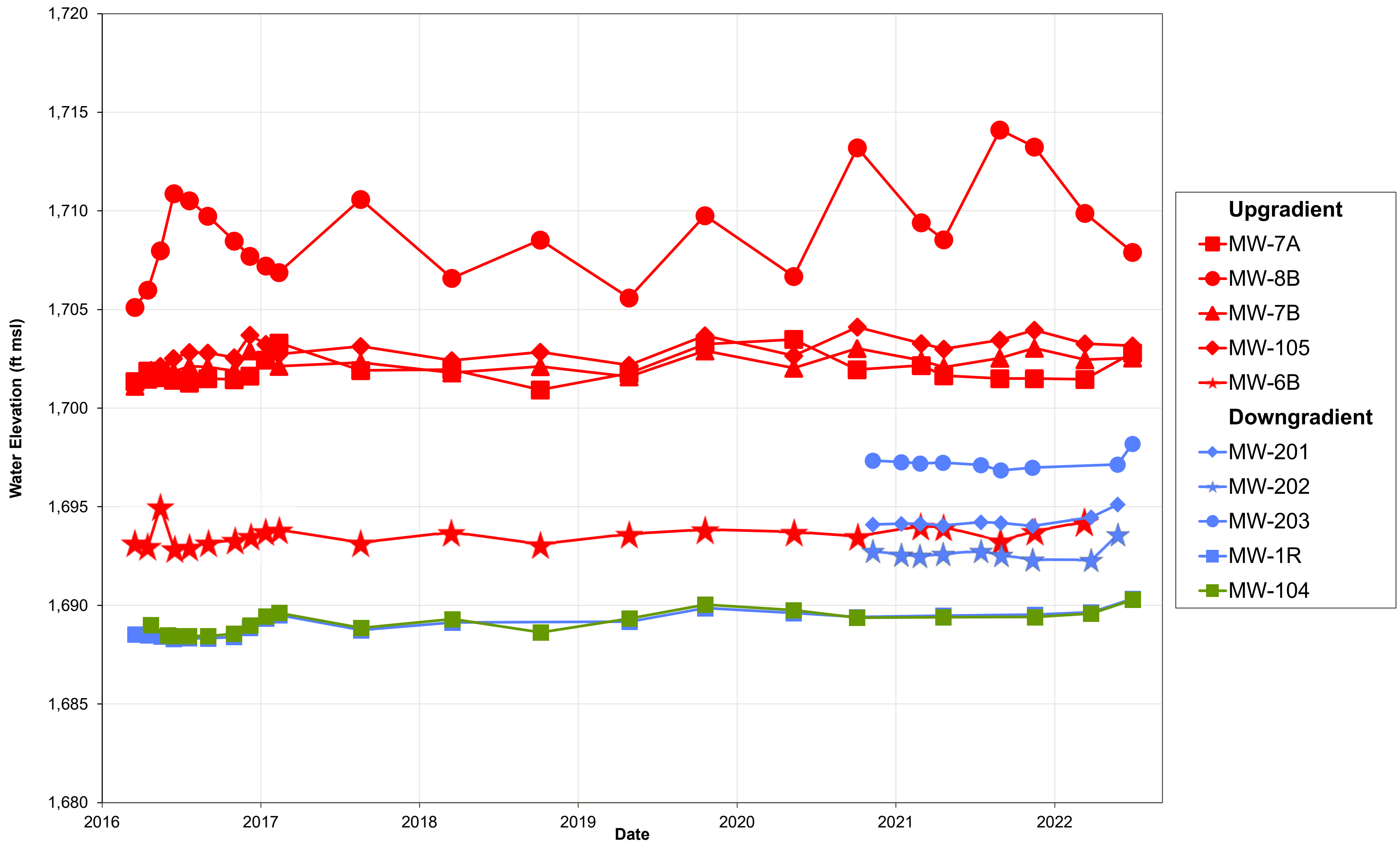
Path: \\golder.gds\complexdata\office\Denver\acad\GREAT RIVER ENERGY\STANTON\99_PROJECTS\21509219\Sampling Figures\ | File Name: Figure 1 - ASD 2022 GW Sampling.dwg

WSP GOLDER

GREAT RIVER ENERGY - STANTON STATION
ALTERNATIVE SOURCE DEMONSTRATION
MAY/JUNE 2022 GROUNDWATER CONTOURS AND SAMPLING LOCATIONS

FIGURE 1

PATH: https://golderassociates.sharepoint.com/sites/157704/_vti_history/4096/Project Files/5 Technical Work/6-Water Quality/Q4 2021 CCR ASDs | FILE NAME: CCS Q4 2021 ASD Working Data.xlsm - backup version

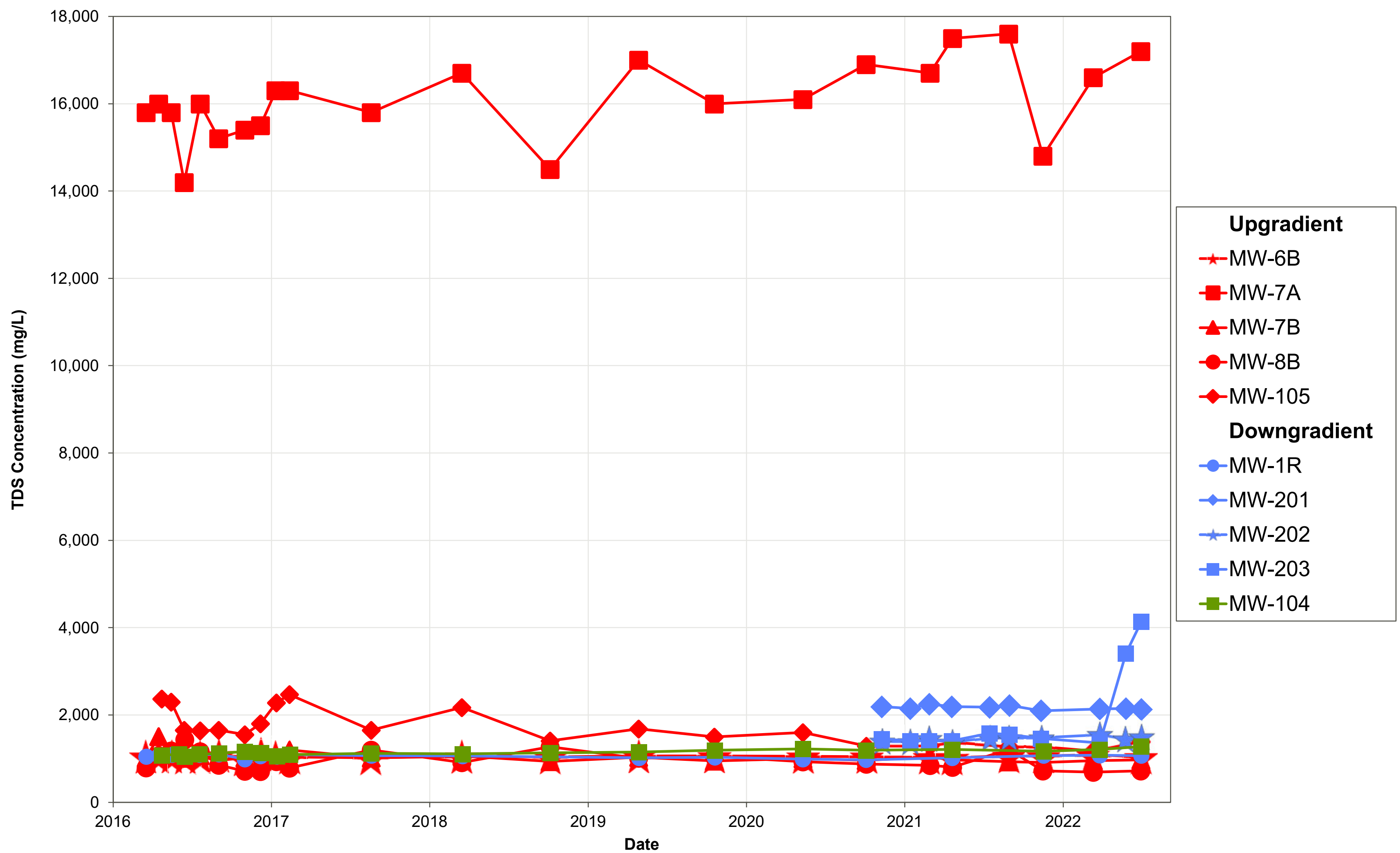


CLIENT	PROJECT
Great River Energy - Stanton Station	Alternative Source Demonstration
CONSULTANT	TITLE
wsp	Time Series of Groundwater Elevations in Monitoring Wells

PROJECT NO.	PHASE	REV.	FIGURE
21509219	1000	0	2

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

PATH: https://golderassociates.sharepoint.com/sites/157762/Project Files/5 Technical Work/Water Quality/Q2 2022 ASD - Appendix III SSIs/02_Working Data | FILE NAME: Stanton_CCR - Well Chemistry - Q2 2022.xlsm



CLIENT
Great River Energy - Stanton Station

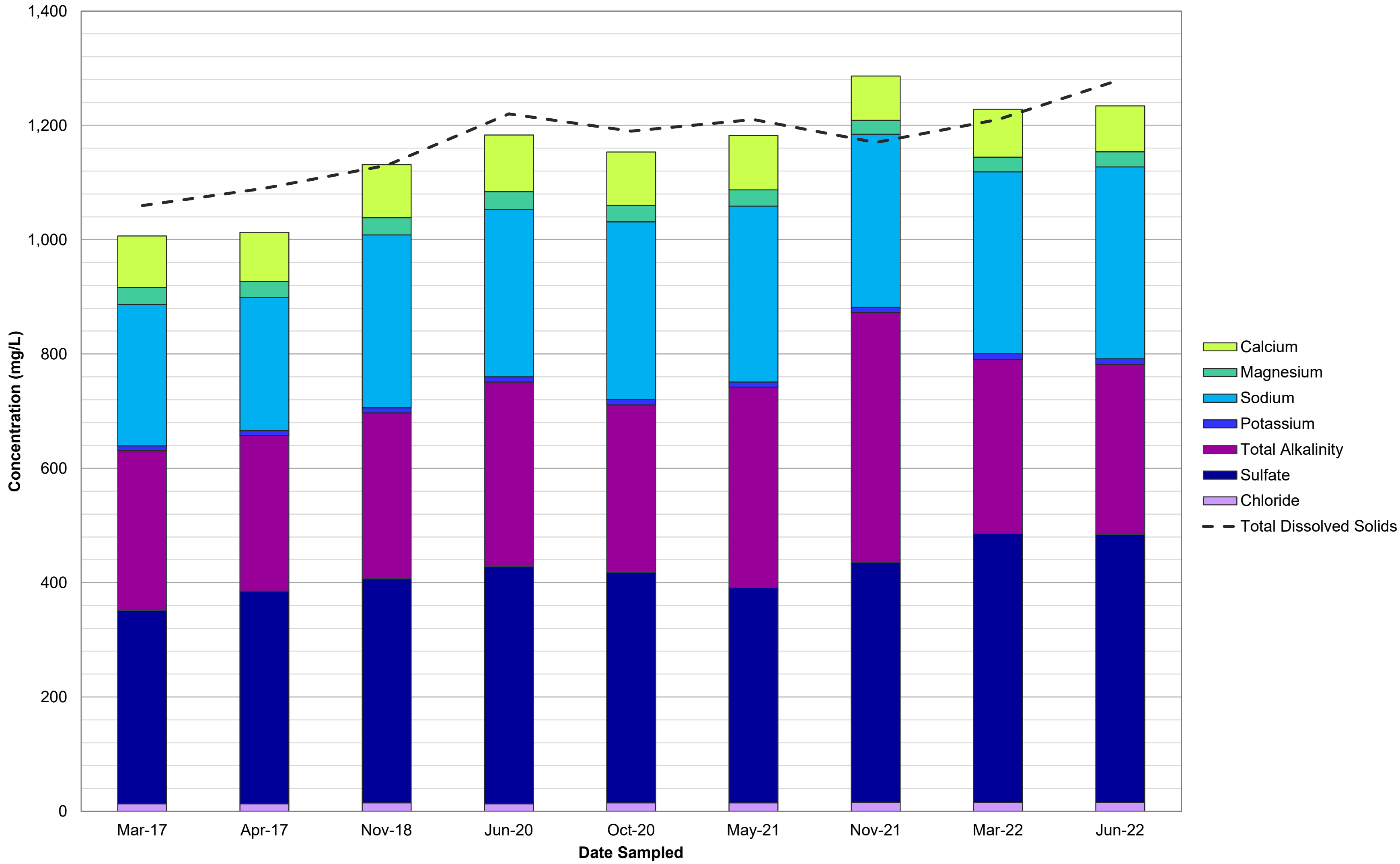
PROJECT
Alternative Source Demonstration

CONSULTANT
wsp

TITLE
Time Series for TDS Concentrations in Monitoring Wells

PROJECT NO.	PHASE	REV.	FIGURE
21509219	1000	0	3

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



Notes:
Data is only shown for samples with complete list of major cations (calcium, magnesium, sodium, and potassium) and anions (sulfate, alkalinity, and chloride).

Total alkalinity values as $CaCO_3$/L were converted to HCO_3^-/L.

In well MW-104, all alkalinity is as bicarbonate alkalinity

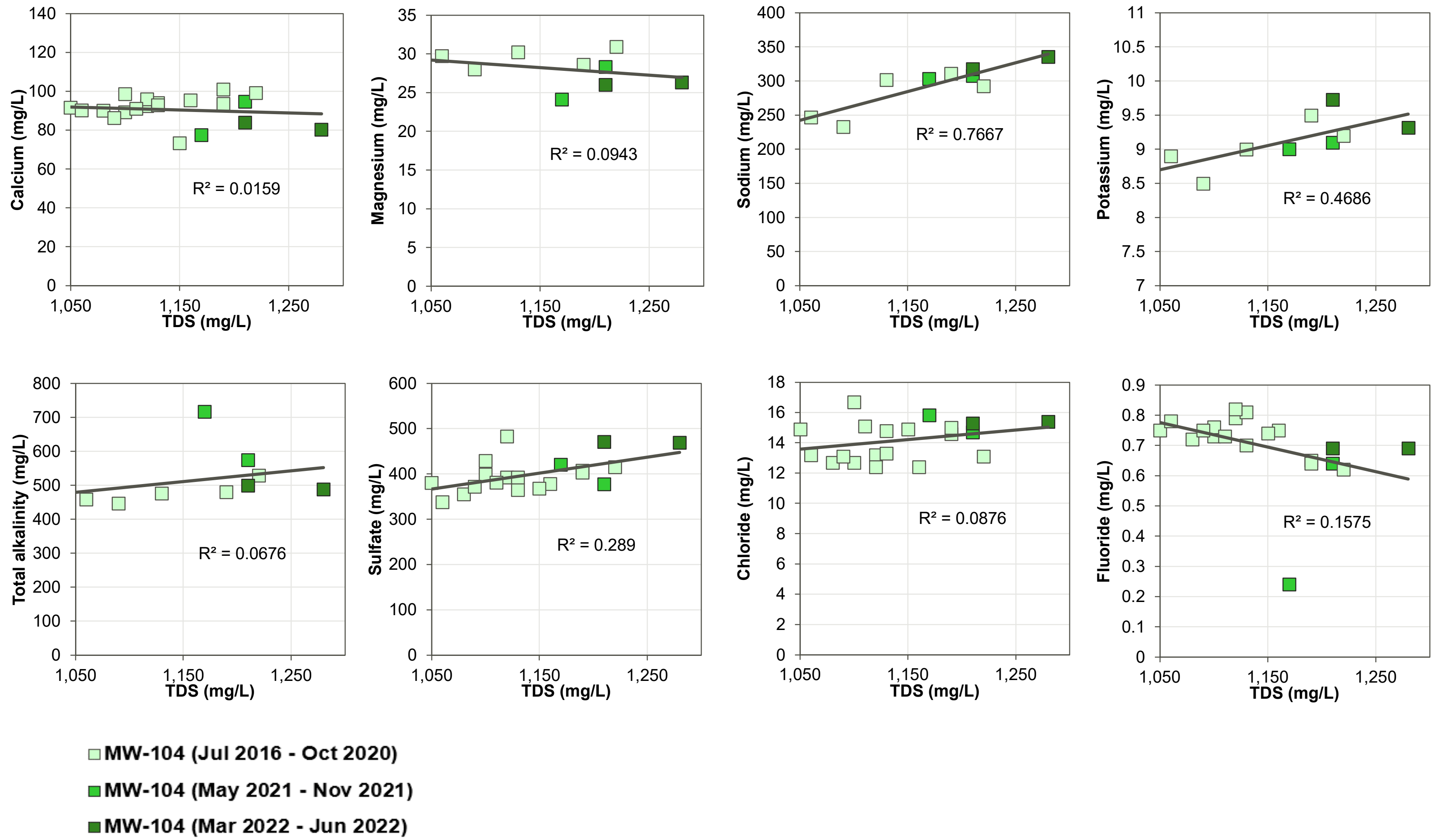
CLIENT
Great River Energy - Stanton Station

PROJECT
Alternative Source Demonstration

CONSULTANT
wsp

TITLE
Distribution of Major TDS Components in Monitoring Well MW-104 Samples

PROJECT NO.	PHASE	REV.	FIGURE
21509219	1000	0	4



Notes:
In well MW-104, all alkalinity is as bicarbonate alkalinity

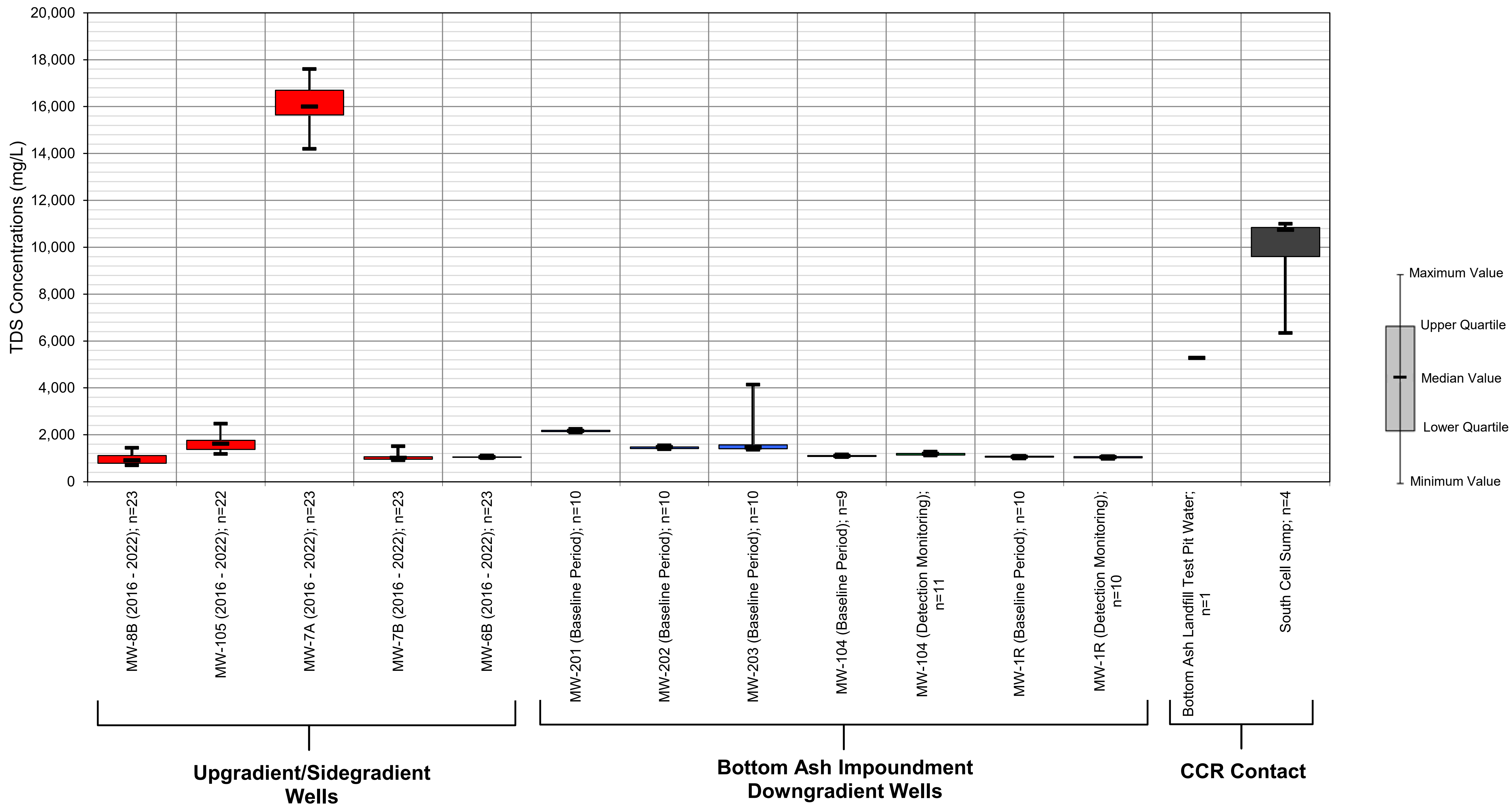
CLIENT
Great River Energy - Stanton Station

PROJECT
Alternative Source Demonstration

CONSULTANT

TITLE
Major Cations and Anions Correlation Charts for Monitoring Well MW-104 Samples

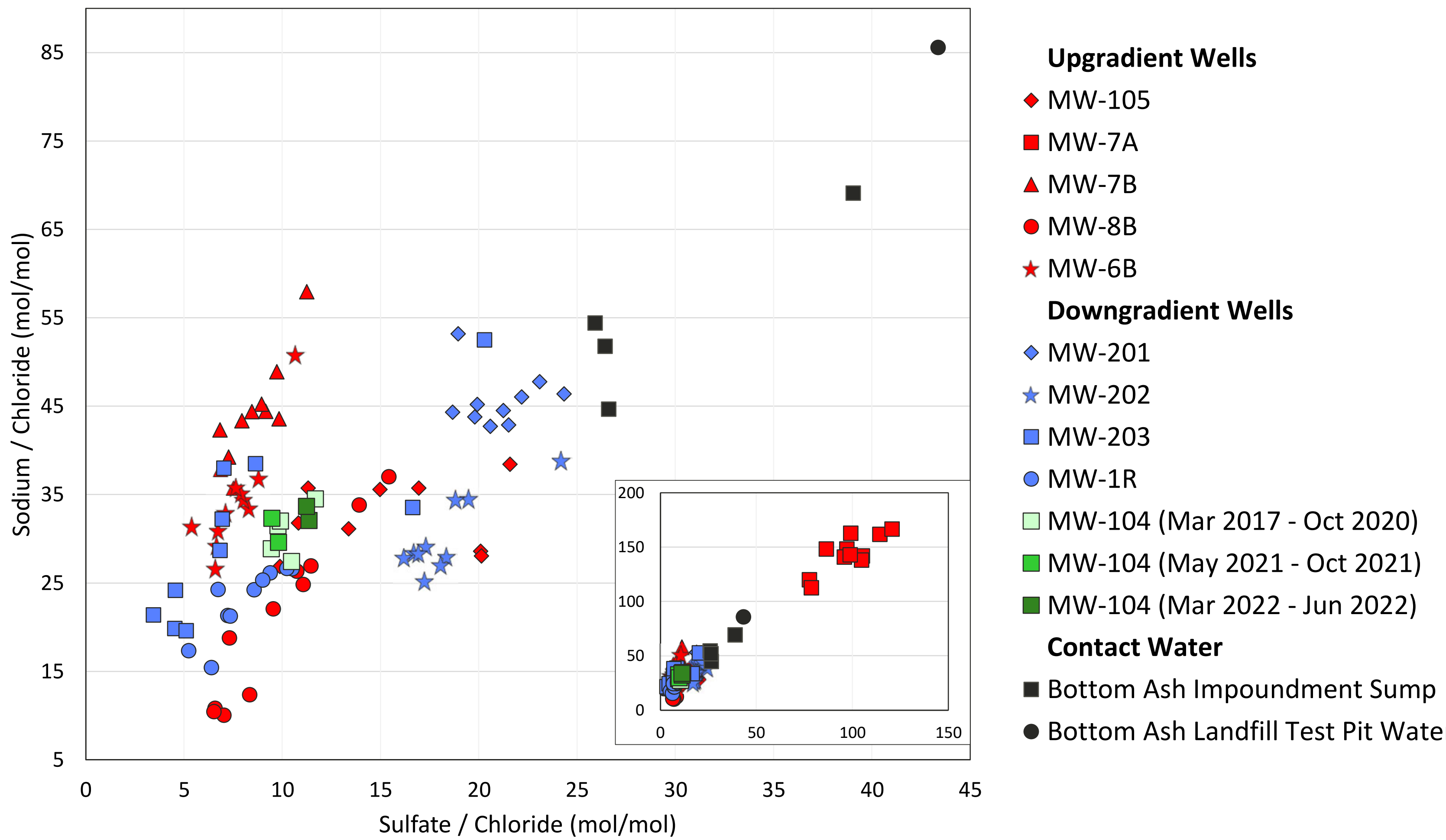
PROJECT NO.	PHASE	REV.	FIGURE
21509219	1000	0	5



Note: The baseline period for downgradient wells MW-104 and MW-1R is from 6/14/2016 to 4/28/2017.

CLIENT	PROJECT
Stanton Station	Alternative Source Demonstration
CONSULTANT: wsp	TITLE: TDS Concentration Box and Whisker Plot

PROJECT NO.	PHASE	REV.	FIGURE
21451133	1000	0	6



CLIENT	PROJECT
Great River Energy - Stanton Station	Alternative Source Demonstration
CONSULTANT	TITLE
wsp	Ratio plot of sodium/chloride to sulfate/chloride

PROJECT NO.	PHASE	REV.	FIGURE
21509219	1000	0	7

CLIENT
Great River Energy - Stanton Station

PROJECT
Alternative Source Demonstration

CONSULTANT
wsp

TITLE
Time Series of TDS, Boron, and Fluoride Concentrations in Groundwater from Monitoring Well MW-104

PROJECT NO.	PHASE	REV.	FIGURE
21509219	1000	0	8

wsp.com

APPENDIX H

Assessment Monitoring Alternative Source Demonstration – Q4 2021

REPORT

Alternative Source Demonstration for Arsenic at Monitoring Well MW-103

Bottom Ash Landfill - Stanton Station

Submitted to:

Great River Energy

12300 Elm Creek Boulevard
Maple Grove, Minnesota 55369

Submitted by:

Golder Associates USA Inc.

7245 W Alaska Drive, Suite 200, Lakewood, Colorado, USA 80226

+1 303 980-0540

21509219-10-R-0

June 24, 2022

Table of Contents

TABLES

FIGURES

1.0 INTRODUCTION

On behalf of Great River Energy (GRE), Golder Associates USA Inc. (Golder), a member of WSP, performed a statistical evaluation of groundwater geochemistry results from the fourth quarter (Q4) 2021 groundwater assessment monitoring event at Stanton Station's coal combustion residual (CCR) Bottom Ash Landfill. The statistical evaluation was performed in accordance with applicable provisions of 40 Code of Federal Regulations (CFR) Part 257, "Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule" (CCR rule), as amended, and as described in the Coal Combustion Residuals Groundwater Statistical Method Certification for Stanton Station, Revision 2 (Golder 2021a).

Statistical analyses of the Q4 2021 Appendix IV assessment monitoring sampling results for groundwater at the downgradient monitoring well MW-103 identified concentrations above the groundwater protection standard (GWPS) for arsenic (0.01 milligrams per liter [mg/L]; 40 CFR 257.95(h)), indicating concentrations at a statistically significant level (SSL).

Although determination of a verified SSL generally indicates that the groundwater monitoring program should transition from assessment monitoring to assessment of corrective measures, 40 CFR Part 257.95(g)(3)(ii) allows the owner or operator (i.e., GRE) 90 days from the date of determining a verified SSL to demonstrate a source other than the regulated CCR facility caused the SSL or that the SSL is an indication of an error in sampling, analysis, or statistical evaluation or natural variability in groundwater quality that was not fully captured during the baseline data collection period.

This technical memorandum was prepared to document the review of the hydrological and geologic conditions and analysis following the identification of the verified arsenic SSL in Q4 2022 at MW-103.

2.0 BACKGROUND

2.1 Site Background

Stanton Station was a coal-fired electric generation facility located along the Missouri River in Mercer County, approximately three miles southeast of Stanton, North Dakota. Stanton Station began generating power in 1966 and ceased power production in February 2017.

Stanton Station has two CCR facilities that are within the purview of the Environmental Protection Agency (EPA) CCR Rule (see Figure 1):

- Bottom Ash CCR Landfill (Bottom Ash Landfill) located south of the former plant site and west of the Bottom Ash Impoundment.
- Bottom Ash CCR Surface Impoundment (Bottom Ash Impoundment) located south of the former plant site and east of the Bottom Ash Landfill.

2.2 Recent Closure Activities at Site CCR Facilities

Stanton Station ceased operation in February 2017 and site deconstruction and restoration activities began shortly thereafter. These activities affected surface water recharge associated with precipitation and runoff and may have affected groundwater conditions (flow regime and chemistry) near Stanton Station and the associated CCR facilities.

As part of site deconstruction, the following general activities were completed between the summer of 2017 and 2020:

- Stanton Station power generating station, associated buildings, and pavement were deconstructed and/or demolished. A majority of the above-grade structures were recycled or taken off site for disposal; however, a small amount of construction and demolition (C&D) material was disposed on site in the Bottom Ash Landfill and Bottom Ash Impoundment, as approved and permitted via the North Dakota Department of Environmental Quality.
- The coal unloading sump (located near monitoring wells MW-103 and MW-1R), which extended below the elevation of anticipated typical groundwater, was taken out of service, and subsequently filled with compacted earthen material.
- Near-surface utilities (piping, duct banks, etc.) were excavated and disposed as C&D material.
- Other below-grade structures and utilities were either abandoned in place or filled and abandoned depending on the size of the buried structure/utility.

Site restoration work began at the end of the site deconstruction effort and generally involved the following activities:

- Between 2017 and 2019, the remaining bottom ash and economizer ash from the plant and Bottom Ash Impoundment (north and center cells), the north and center cell liner systems, and any impacted soils were placed in the south cell of the Bottom Ash Impoundment. The north and center cells of the Bottom Ash Impoundment were closed by removal of CCR and composite liner in the fall of 2019.
- Regrading of the site to promote drainage and vegetative growth started in 2019 and was completed in 2020. As part of the site regrading, a retention pond was relocated, the stormwater pond near the historic plant site was filled in, and drainages were modified to accommodate general site drainage toward the Missouri River.
- Closure of the south cell of the Bottom Ash Impoundment included installation of a sump, adjusting CCR grades, and installing the final composite cover system, consisting of a geomembrane and geosynthetic clay liner overlain with soil to promote vegetative growth. Closure of the south cell of the Bottom Ash Impoundment was partially completed in 2019.
- Final closure of the Bottom Ash Impoundment and Bottom Ash Landfill, including placement of growth medium, infiltration, and topsoil layers was completed in 2020.
- Since 2020 the site has been in post-closure care with no significant site changes and continued establishment of vegetation over the CCR facilities and surrounding areas.

2.3 Site Geology

Regional geology of the area surrounding Stanton Station is documented in the Hydrogeologic Assessment Report, Stanton Station Ash Ponds (Braun 1993). Stanton Station is located in the Missouri Slope District of the Glaciated Missouri Plateau Section of the Great Plains Province. Subsurface and surficial stratigraphy of Mercer County and the adjacent Oliver County were reviewed in depth by C.G. Carlson for the North Dakota Geological Society (Carlson 1973). Primary near-surface stratigraphic units in the area of Stanton Station include the Tongue River Formation and Cannonball Formation, with named lignite beds prominent near the site.

Near-surface geology at Stanton Station consists of two primary geologic units: the upper alluvial terrace deposits of the Missouri River, and underlying sediments and bedrock belonging to the Bullion Creek Formation, each having variable extents and thicknesses across the site (Braun 1993). Discontinuous seams of coal are located throughout the site, in addition to gravel, sand, silt, and clay.

2.4 Site Hydrogeology

The principal hydrostratigraphic unit and uppermost water-bearing unit near the CCR facilities consists of alluvial deposits, which includes two subunits: an upper silty sand and clay, and an underlying outwash sand and gravel. Individually, these subunits are laterally heterogeneous and geologic conditions within these subunits can be characterized by interbedded layers of gravel, sand, silt, clay, and coal.

Due to variations in subunit thickness throughout the site, groundwater in the uppermost water-bearing unit is monitored in both the outwash subunit and the silty sand and clay subunit, with flow generally moving from southwest to northeast towards the Missouri River. Depths from the ground surface to the uppermost water-bearing unit range from 5 to 20 feet in the area around Stanton Station. A map showing recent available groundwater elevations is shown in Figure 1.

Figure 2 displays a time series of the water elevations from the monitoring well network. Groundwater levels have remained relatively stable in the monitoring wells over the monitoring period

The groundwater gradient across the site is influenced by the subsurface units, and ranges from 0.002 to 0.01 (Braun 1993). As presented in Golder (2022), measured hydraulic conductivities in the region of the Bottom Ash Landfill range from 1.05 feet per day (ft/day) to 40 ft/day. The range of groundwater flow velocities measured in November (Q4) 2021 is 0.04 to 1.33 ft/day.

2.5 Groundwater Monitoring Network

The groundwater monitoring network for the Bottom Ash Landfill was developed for the size, disposal and operational history, anticipated flow direction, and location of adjacent facilities. Based on these factors, a monitoring well network consisting of upgradient and downgradient monitoring wells is used for monitoring the unit under the CCR Rule.

Four upgradient wells (MW-7A, MW-7B, MW-8B, and MW-105) and one side-gradient well (MW-6B) are used to characterize groundwater upgradient of the Bottom Ash Landfill and Bottom Ash Impoundment. These wells are south and west of the Bottom Ash Landfill and Bottom Ash Impoundment and based on groundwater flow directions that are not expected to be influenced by the CCR facilities (Figure 1).

The Bottom Ash Landfill monitoring network has three downgradient wells (MW-102, MW-103, and MW-9N).

Table 1: Monitoring Wells Upgradient and Downgradient of the Bottom Ash Landfill

Location	Monitoring Wells
Upgradient/Side-gradient Wells	MW-7A
	MW-7B
	MW-8B
	MW-105
	MW-6B (side-gradient)
Bottom Ash Landfill Downgradient Wells	MW-102
	MW-9N
	MW-103

2.6 Summary of Groundwater Conditions

Between June 2016 and July 2017, field personnel collected a minimum of eight independent baseline groundwater samples from MW-7A, MW-7B, MW-8B, MW-105, MW-6B, MW-102, MW-9N, and MW-103, as required by 40 CFR Part 257.94, for use within the CCR Rule monitoring program. The results of the CCR baseline monitoring were used to develop statistical limits for each constituent at each monitoring well based on site conditions and parameter specific characteristics such as the data distribution and detection frequency (Golder 2021a).

Following completion of the baseline monitoring events for MW-7A, MW-7B, MW-8B, MW-105, MW-6B, MW-102, MW-9N, and MW-103, GRE began collecting groundwater samples on a semi-annual basis to support the detection monitoring program. Groundwater samples for detection monitoring are collected at each upgradient and downgradient monitoring well and analyzed for 40 CFR Part 257 Appendix III constituents. During the detection monitoring program, groundwater analysis results were compared to the calculated statistical limits to determine whether groundwater quality remains consistent or if changes in groundwater quality are observed.

During detection monitoring, alternative source demonstrations (ASDs) were developed for statistically significant increases (SSIs) for the following constituent-well pairs:

- Chloride at MW-103 and MW-9N (initially prepared in Golder 2020a and updated in Golder 2020b and Golder 2021b)
- Fluoride at MW-103 (initially prepared in Golder 2020c and updated in Golder 2020d and Golder 2021b)
- TDS at MW-103 (Golder 2021b)

No alternative source was identified for a boron SSI at MW-103 (Golder 2021b). As a result, the monitoring network around the Bottom Ash Landfill transitioned into assessment monitoring and GRE began collecting groundwater samples for the assessment monitoring program on a quarterly basis.

Arsenic concentrations in four quarterly assessment monitoring samples collected between Q1 2021 and Q4 2021 at MW-103 ranged between 0.0124 and 0.0169 mg/L. Figure 3 presents a time series of arsenic concentrations in upgradient and downgradient monitoring wells around the Bottom Ash Landfill during the baseline, detection, and assessment monitoring periods. A statistical comparison of the arsenic concentrations was performed, and arsenic was identified at an SSL over the GWPS (0.01 mg/L).

3.0 DATA SOURCES

To assess groundwater downgradient of the Bottom Ash Landfill, Golder reviewed previously-collected data and performed supplemental assessment activities. The following sections summarize the data sources used in supplemental assessment activities.

3.1 Site Groundwater

As discussed in Section 2.6, field personnel routinely collect groundwater samples from monitoring wells around the CCR facilities at Stanton Station and submit them to a certified laboratory for chemical analysis. Groundwater monitoring samples collected between June 2016 and November 2021 were used for this evaluation. Samples were analyzed for field parameters, major cations, major anions, and Appendix III and Appendix IV constituents.

3.2 CCR Contact Waters

3.2.1 Bottom Ash Landfill Test Pit Water

In addition to monitoring well data, a water sample was collected from below the Bottom Ash Landfill in October 2019 during closure construction. A test pit was excavated through placed bottom ash within the landfill and approximately four feet into the underlying saturated native soil, which was visually identified as clay. Water accumulated in this test pit over a period of approximately 24 hours, was sampled, and analyzed for field parameters, major cations, major anions, and Appendix III and Appendix IV constituents.

Due to the nature of how this sample was collected, it likely represents a mixture of seepage from the Bottom Ash Landfill and shallow groundwater.

3.2.2 South Cell Sump

As part of the planned closure process for the Bottom Ash Impoundment, a sump was installed to accommodate south cell dewatering. Two water samples taken from the south cell sump were analyzed for field parameters, major cations, major anions, and Appendix III and Appendix IV constituents. One sample was collected shortly after consolidation of the north and center pond materials into the south cell (in October 2019) and one sample was collected a few years after materials were consolidated (March 2022).

The sump water samples represent CCR contact water from the south cell, which is considered an analog for Bottom Ash Landfill contact water.

3.2.3 Short Term Leach Testing

Short-term leach testing of the site materials by the synthetic precipitation leaching procedure (SPLP) was performed by EPA Method 1312 (EPA 2008). The SPLP simulates the interaction between a solid and meteoric water, which provides a screening-level estimate of ash effluent water quality. SPLP leachates were analyzed for major cations, major anions, and Appendix III and Appendix IV constituent concentrations.

Site materials were collected by site personnel between 2011 and 2019. Details about the collection procedure are listed by material type below:

- Two bottom ash composite samples collected in 2011
- One bottom ash sample collected in June 2019
- One coal sample collected in June 2019

4.0 EVALUATION OF POTENTIAL ALTERNATIVE SOURCES

This section evaluates the geochemical characteristics of groundwater around the Bottom Ash Landfill and evaluates potential sources of arsenic to groundwater at MW-103.

4.1 Sampling Causes

Field sheets from the baseline, detection, and assessment monitoring sampling events were reviewed for potential sampling related causes that could result in changes in concentration and/or provide indications of potential error in the analysis. Potential causes could include sample mislabeling, sample turbidity, changes in sampling technique, and other issues and/or anomalies noted by field staff. The information reviewed did not provide any indication of mislabeling, changes in sampling technique, or other issues and/or anomalies noted by field staff. A turbidity of approximately 38 Nephelometric Turbidity Units (NTU) was noted during purging well MW-103 for first quarter (Q1) 2021 sample event, which is higher than the turbidity values recorded for other sampling events for this well (typically 1 to 10 NTU). However, the higher arsenic concentrations were also observed in samples with lower turbidity values (Figure 4). The increase in turbidity seen during the Q1 2021 sample cannot fully explain the concentration changes.

To inspect the sampling equipment for potential indication of damage, the dedicated low-flow bladder pump was removed from MW-103 for visual inspection in Q4 2020. An orange-brown material was noted on the pump and tubing (Figure 5). Additionally, a downhole video survey was conducted to inspect the well condition. Material along the well casing was noted during the well survey, particularly concentrated in the areas adjacent to the slots on the well screen (Figure 6). A sample of the material was collected and submitted for mineralogical testing at the SGS Minerals Laboratory in Lakefield, Ontario, Canada. A summary of the mineralogical composition is presented in Table 2. To date, the presence of the orange-brown material alone does not indicate an alternative source of the arsenic in groundwater at MW-103.

Table 2: Mineralogical Composition of Material Recovered from MW-103

Mineral Name	Mineral Formula	Mineral Abundance (%)
Calcite	CaCO3	44.4
Quartz	SiO2	13.9
Dolomite	(Ca,Mg)CO3	2.6
Albite	NaAlSi3O8	2.4
K-Feldspar	KAlSi3O8	1.4
Muscovite	KAl2(AlSi3O10)(F,OH)2	1.2
Amorphous Content	Unable to identify	33.7

4.2 Laboratory Causes

Following receipt of the laboratory data packages for each sampling event, the data is reviewed for indications of any laboratory errors, anomalies, or contamination that could influence reported concentrations. This review included the laboratory analytical results, methods, calibration, dilutions, potential interferences, qualifiers, potential transcription errors, and quality control sample results. No laboratory causes that could indicate a potential alternative source were identified.

4.3 Statistical Evaluation Causes

The statistical approach and analyses were reviewed to confirm the verified SSL were not due to an error in the analysis or reflection of the limitation(s) of the selected methods. Additionally, the statistical independence of the dataset, outliers, false-positives, and non-detect processing was reviewed. No errors were found in the statistical analysis, and the evaluation concluded that appropriate statistical tests are being applied.

4.4 Natural Variation

Site water quality data was reviewed for indications that the SSL is reflective of natural variability in groundwater quality. This could include variability that was not fully captured in the upgradient/side-gradient wells or this could be variability related to site conditions such as: geological influences, changes in upgradient quality, changes in water levels, and changes in recharge and/or flow paths.

Figure 7 shows a box and whisker plot for arsenic concentrations for upgradient, side-gradient, downgradient monitoring wells, and CCR contact waters. Concentrations of arsenic in upgradient and side-gradient monitoring wells are lower than downgradient well MW-103. For this reason, upgradient water sources are unlikely to explain the elevated arsenic concentrations observed in MW-103.

4.5 Alternative Sources

A Piper diagram (Figure 8) was constructed to evaluate the data for indications of potential alternative sources for the elevated arsenic concentrations. The Piper diagram does not conclusively indicate a potential alternative source. On the piper diagram, groundwater samples from MW-103 generally plot in a different area than the bottom ash SPLP leachates, the coal SPLP leachate, the Bottom Ash Landfill test pit water, and the Bottom Ash Impoundment south cell sump water. Groundwater major ion signatures in samples from MW-103 do not appear to be migrating toward the major ion signatures of the potential CCR sources. However, an alternative source cannot be identified at this time.

5.0 CONCLUSIONS AND FUTURE WORK

In accordance with 40 CFR Part 257.95(g)(3), this ASD has been prepared in response to the identification of an SSL for arsenic at monitoring well MW-103, following the Q4 2021 sampling event for the Bottom Ash Landfill at Stanton Station.

At this time, insufficient evidence is available to make conclusive statements about an alternative source for arsenic at MW-103. However, the following statements can be made:

- Site deconstruction and restoration activities have likely affected surface water recharge associated with precipitation and runoff and may have affected groundwater conditions (flow regime and chemistry) near the Bottom Ash Landfill. Concentrations of arsenic in upgradient monitoring wells are lower than in MW-103. Therefore, without more information, changes in the groundwater flow regime cannot be used to attribute the increase in arsenic concentrations observed in MW-103 to an upgradient source
- Higher turbidity was observed in several samples from MW-103 and an orange-brown precipitate and/or sediment was noted during a survey of well MW-103. While no well integrity issue could be identified, this mineral precipitation may be further investigated as a potential source of arsenic.
- Piper diagram was compiled with existing information to evaluate relative concentrations at MW-103 in relation to potential sources. On the piper diagram, the most recent samples taken at MW-103 do not appear to be migrating toward the major ion signatures of the potential sources (Bottom Ash SPLP, coal SPLP, Bottom Ash Landfill test pit water). Ultimately, the piper diagram does not provide conclusive evidence of an alternative source for arsenic at MW-103.

Since the information above cannot be used at this time to definitively identify an alternative source of the verified SSL of arsenic at MW-103, the Bottom Ash Landfill is required to initiate an assessment of corrective measures (ACM) per 40 CFR 257.95.g.4.

To further investigate potential alternative sources of causes for the elevated arsenic concentrations in well MW-103 samples, the following activities are ongoing:

- Drilling of additional monitoring wells and sampling of upgradient and downgradient materials to determine the nature and extent of the impacts of arsenic.
- Geochemical characterization of upgradient and downgradient soil by SPLP and sequential extraction to assist in determining if naturally occurring arsenic in site soil may be a potential source of elevated arsenic in groundwater at MW-103.
- Geochemical characterization of coal materials by SPLP and sequential extraction to assist in determining if arsenic concentrations at MW-103 can be attributed to impacts from the historical coal yard operations and/or coal buried at the site
- Geochemical characterization of CCR materials from the Bottom Ash Landfill by SPLP and sequential extraction to assist in understanding the signature of CCR contact waters.

This additional information will be used to characterize the nature and extent of the arsenic identified at MW-103 and may be used to update this ASD if applicable.

REFERENCES

Braun. 1993. Hydrogeologic Assessment Report, Stanton Station Ash Ponds. Prepared for Great River Energy Stanton Generating Station. Prepared by Braun Intertec Environmental Inc.

Carlson CG. 1973. Geology of Mercer and Oliver Counties, North Dakota. Bulletin 56 – Part I, for the North Dakota Geological Society. County Ground Water Studies 15 – Part I, for the North Dakota State Water Commission.

Golder (Golder Associates USA Inc.). 2020a. Alternative Source Demonstration for Chloride in Monitoring Wells MW-9N and MW-103, Great River Energy – Stanton Station. January 2.

Golder. 2020b. Alternative Source Demonstration Review for Chloride at Stanton Station. June 15.

Golder. 2020c. Alternative Source Demonstration for Fluoride in Monitoring Well MW-103, Great River Energy – Stanton Station. January 2.

Golder. 2020d. Alternative Source Demonstration Review for Fluoride at Stanton Station. June 15.

Golder. 2021a. Coal Combustion Residuals Groundwater Statistical Method Certification, Revision 2, Great River Energy – Stanton Station. November 18, 2021.

Golder. 2021b. Alternative Source Demonstration Evaluation for the Bottom Ash Landfill at Stanton Station. January 5.

Golder. 2022. Annual Groundwater Report – 2021. Great River Energy. Stanton Station. January 2022.

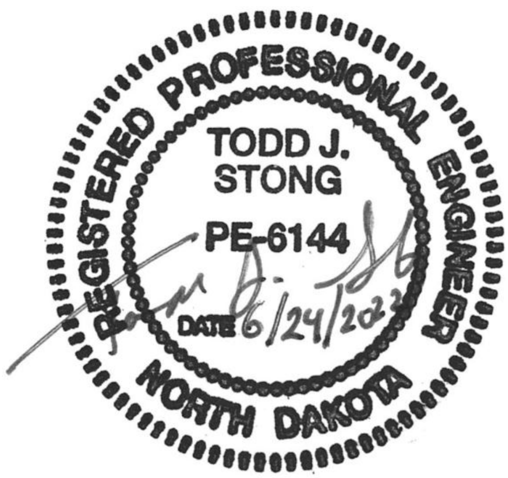
Signature Page

Golder Associates USA Inc.

Gregory Lehn, PhD
Project Geochemist

Sara Harkins, PG (WY)
Senior Geochemist

Todd Stong, PE
Associate and Senior Consultant



https://golderassociates.sharepoint.com/sites/157762/project files/6 deliverables/reports/10-r-asd_as_mw-103/10-r-0/21509219-10-r-0_asd_arsenic_mw-103_23jun22.docx

Figures

LEGEND

- UPGRADIENT OR SIDEGRADIENT MONITORING WELL
- DOWNGRADIENT MONITORING WELL (BOTTOM ASH IMPOUNDMENT)
- DOWNGRADIENT MONITORING WELL (BOTTOM ASH LANDFILL)
- CLOSED BOTTOM ASH LANDFILL/IMPOUNDMENT FOOTPRINT
- GENERAL DIRECTION OF GROUNDWATER FLOW
- 1705 GROUNDWATER CONTOURS AND ELEVATIONS

NOTE(S)

1. AERIAL IMAGERY OBTAINED FROM UNITED STATES DEPARTMENT OF AGRICULTURE, NATIONAL AGRICULTURE IMAGERY PROGRAM, 2020.
2. GROUNDWATER ELEVATIONS SHOWN FOR MW-9N, MW-102, MW-103, MW-104, MW-1R, MW-7B, MW-7A, MW-105, MW-8B, MW-6B, MW-201, MW-202, AND MW-203 WERE MEASURED IN NOVEMBER 2021.
3. THE NORTH AND CENTER CELLS OF THE BOTTOM ASH IMPOUNDMENT WERE CLOSED BY REMOVAL OF WASTE AND LINER.
4. THE SOUTH CELL OF THE BOTTOM ASH IMPOUNDMENT WAS CLOSED WITH A FINAL COVER OVER PLACED WASTE.
5. THE BOTTOM ASH LANDFILL WAS CLOSED BY CONSOLIDATION OF PLACED WASTE INTO A SMALLER FOOTPRINT AND CONSTRUCTION OF A FINAL COVER
6. GROUNDWATER CONTOURS ARE BASED ON ELEVATION INFORMATION FROM THE SHOWN MONITORING WELLS AND PIEZOMETERS/WELLS NOT PART OF THE MONITORING NETWORKS.

N

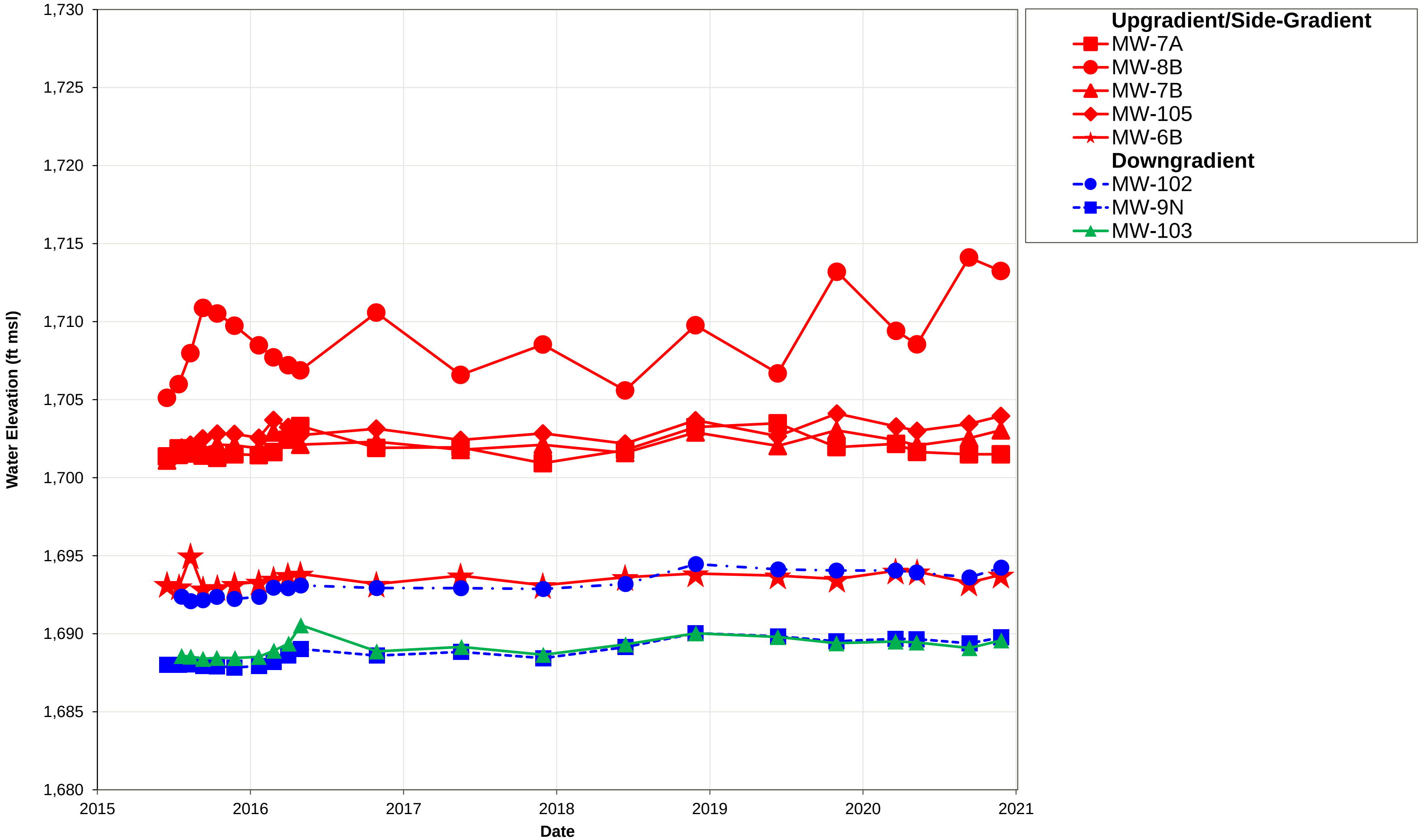
0 200 400
1" = 200' FEET

Path: \\golder.gds\complextdata\office\Denver\acad\GREAT RIVER ENERGY\STANTON\99_PROJECTS\1894121\Annual Monitoring Reports\ | File Name: 1894121_2021 WO-StantonCCR_Q4_26MAY22.dwg

WSP GOLDER

GREAT RIVER ENERGY - STANTON STATION
ALTERNATIVE SOURCE DEMONSTRATION
NOVEMBER 2021 GROUNDWATER CONTOURS AND SAMPLING LOCATIONS
FIGURE 1

PATH: https://golderassociates.sharepoint.com/sites/157704/_vti_history/4096/Project Files/5 Technical Work/6 -Water Quality/Q4 2021 CCR ASDs | FILE NAME: CCS Q4 2021 ASD Working Data.xlsm - backup version



CLIENT
Great River Energy - Stanton Station

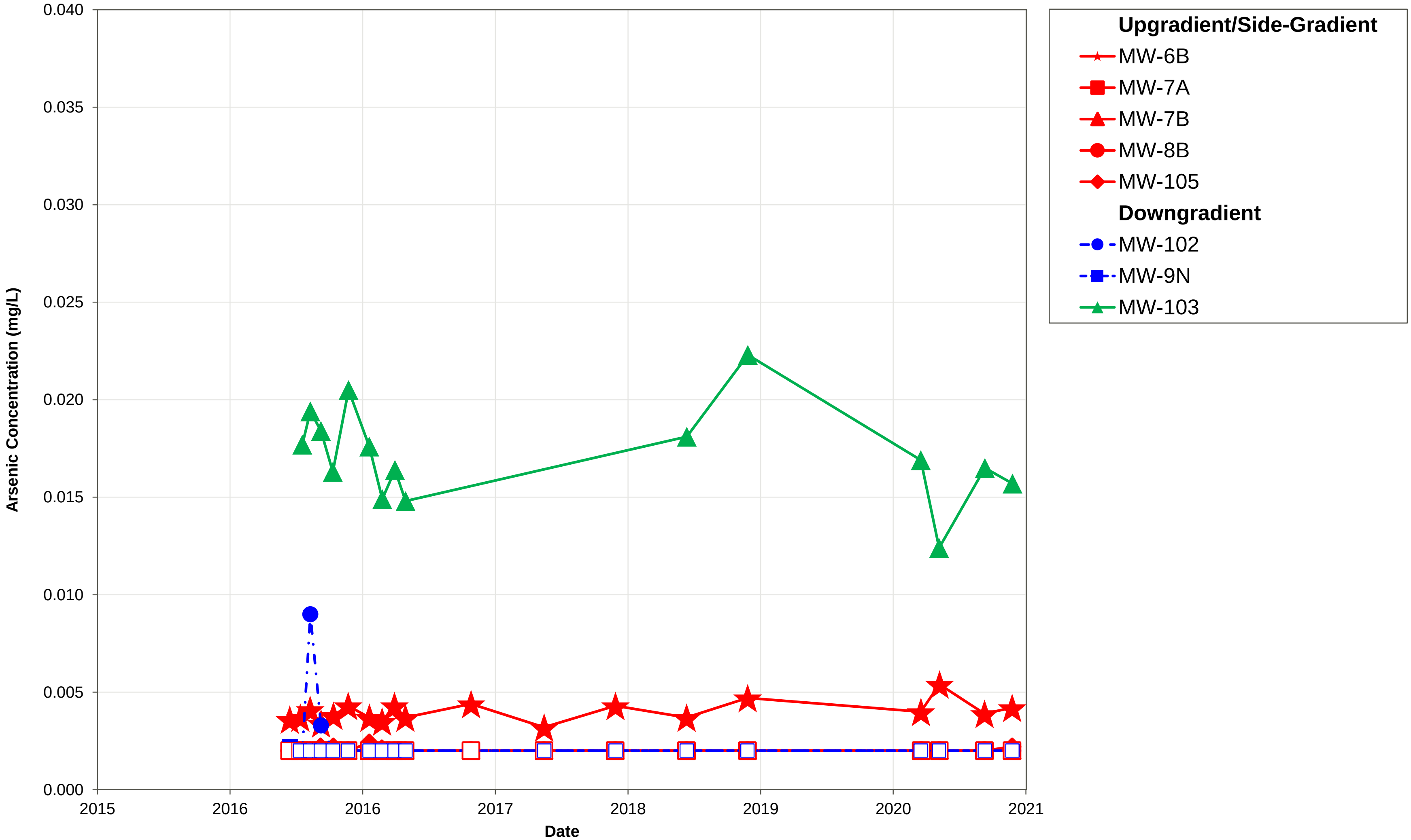
PROJECT
Alternative Source Demonstration

CONSULTANT
WSP GOLDER

TITLE
Time Series of Groundwater Elevations in Monitoring Wells

PROJECT NO.	PHASE	REV.	FIGURE
21509219	1000	0	2

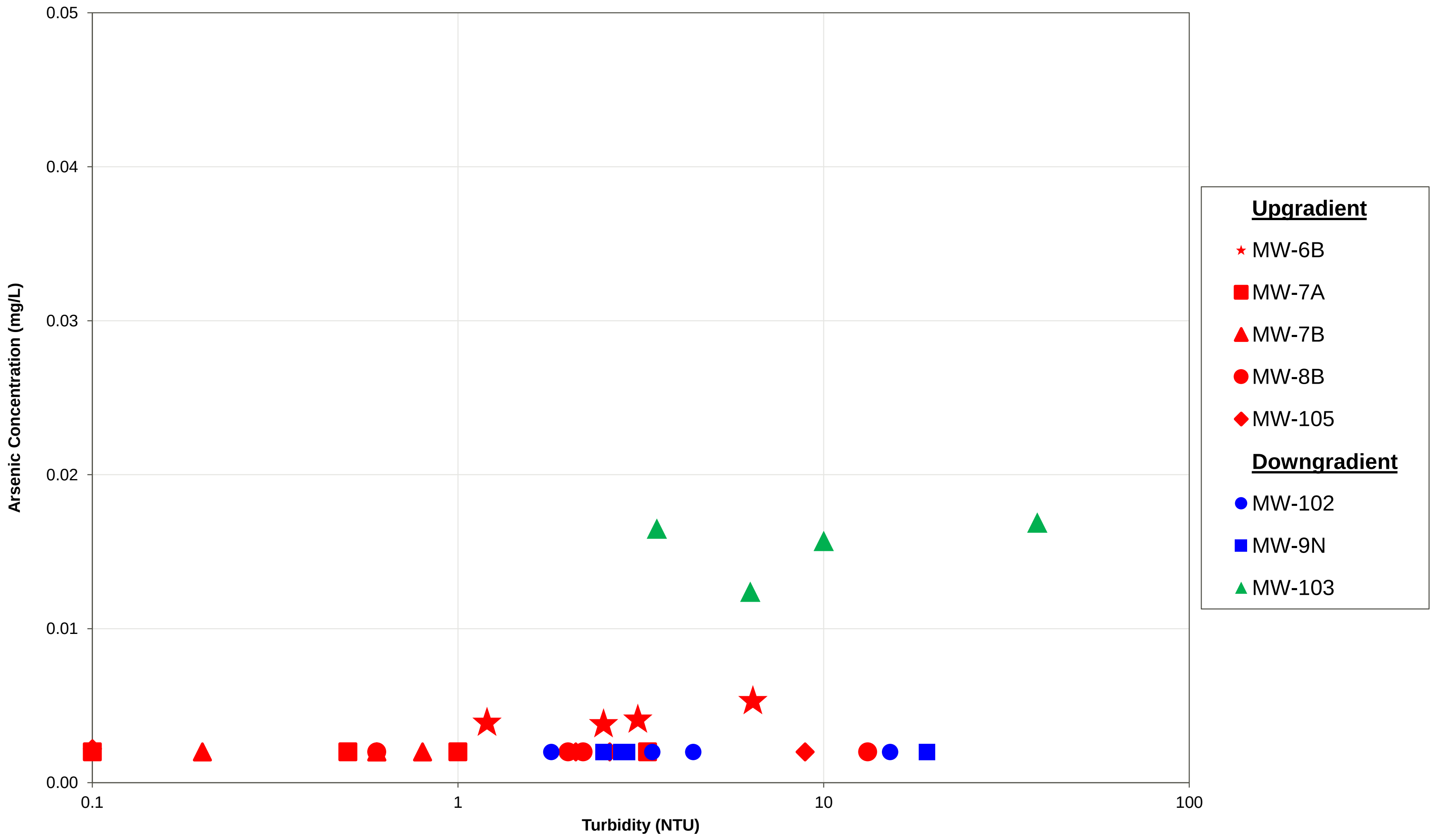
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A



Note: For samples with values measured below the detection limit, the value was plotted with an open symbol (white) at the detection limit.

CLIENT	PROJECT
Great River Energy - Stanton Station	Alternative Source Demonstration
CONSULTANT	TITLE
WSP GOLDER	Time Series for Arsenic Concentrations in Monitoring Wells

PROJECT NO.	PHASE	REV.	FIGURE
21509219	1000	0	3



Note: For samples with values measured below the detection limit, the sample was plotted at the detection limit

CLIENT
Great River Energy - Stanton Station

PROJECT
Alternative Source Demonstration

CONSULTANT
WSP GOLDER

TITLE
Arsenic Concentrations versus Turbidity in Groundwater Samples in Monitoring Wells

PROJECT NO.	PHASE	REV.	FIGURE
21509219	1000	0	4

PATH: https://golderassociates.sharepoint.com/sites/157762/Project Files/5 Technical Work/Water Quality/Q4 2021 ASD SSL/01_W orking Data | FILE NAME: Stanton_CCR - Working Data- Q4 2021.xlsm

CLIENT	PROJECT
Great River Energy - Stanton Station	Alternative Source Demonstration

CONSULTANT: WSP GOLDER

TITLE: Photographs of Low-Flow Bladder Pump from MW-103

PROJECT NO.	PHASE	REV.	FIGURE
21509219	1000	0	5

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

PATH: https://golderassociates.sharepoint.com/sites/157762/Project Files/5 Technical Work/Water Quality/Q4 2021 ASD SSL/01_W orking Data | FILE NAME: Stanton_CCR - Working Data- Q4 2021.xlsm

CLIENT	PROJECT
Great River Energy - Stanton Station	Alternative Source Demonstration

CONSULTANT

WSP GOLDER

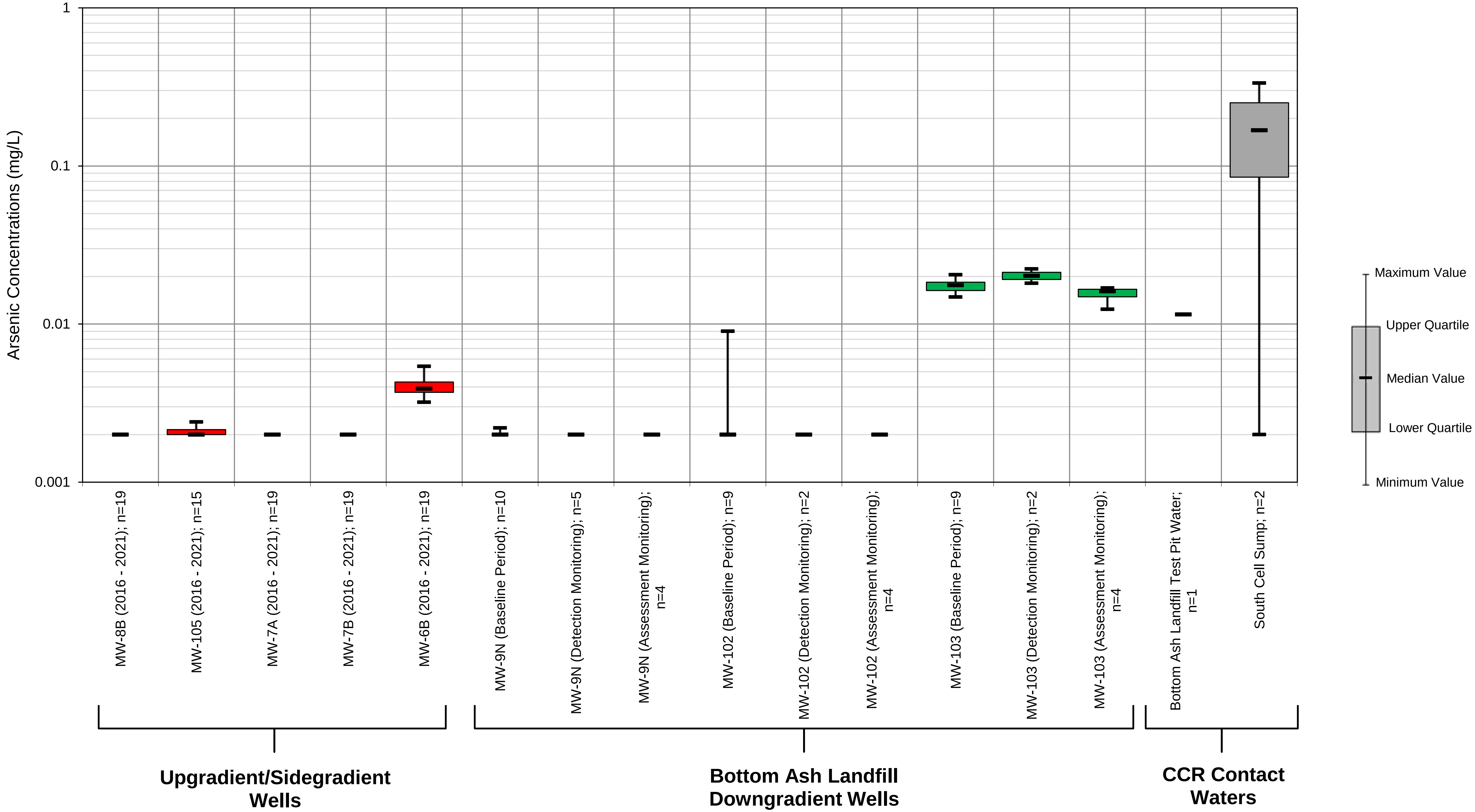
TITLE

Screenshots of Sediment in MW-103 from Survey Video

PROJECT NO.	PHASE	REV.	FIGURE
21509219	1000	0	6

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

PATH: C:\Users\golehn\Golder Associates\21509219, GRE Stanton 2022 - Water Quality\Q4 2021 ASD SSL\01_Working Data | FILE NAME: Stanton_Box and Whisker.xlsm



Note: For concentrations measured below the detection limit, the detection limit was used

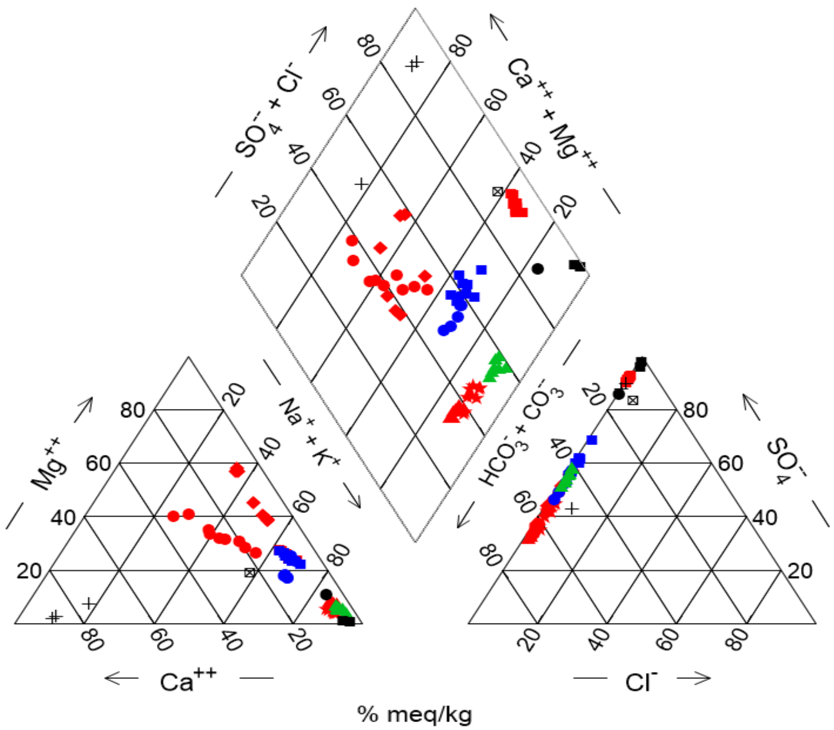
CLIENT
Great River Energy - Stanton Station

CONSULTANT
WSP GOLDER

PROJECT
Alternative Source Demonstration

TITLE
Box and Whisker Plot of Arsenic Concentrations

PROJECT NO.	PHASE	REV.	FIGURE
21451133	1000		7



Upgradient/ Side-gradient Wells

- MW–105
- MW–7A
- MW–7B
- MW–8B
- MW–6B

Contact Waters

- Bottom Ash SPLP
- Coal SPLP
- Bottom Ash Landfill Test Pit
- South Cell Sump

Downgradient Wells

- MW–102
- MW–9N
- MW–103

Note:
Some samples did not have alkalinity measurements so alkalinity was estimated as the difference between major cations (Ca, Mg, Na, K) and major anions (SO4, Cl, F). This technique is less precise and should be regarded as a high-level estimate. All dates for the well of interest (MW-103) have alkalinity data.

CLIENT Great River Energy - Stanton Station	PROJECT Alternative Source Demonstration
CONSULTANT wsp GOLDER	TITLE Piper Diagram
	PROJECT NO. 21509219 · PHASE 1000 · REV. 0 · FIGURE 8

APPENDIX I

Assessment of Corrective Measures – Bottom Ash Landfill

FILE: Great River Energy-Stanton-(Ponds & Landfill) (0043)

September 16, 2022

Cassie Johnston **via e-mail**
Great River Energy
12300 Elm Creek Blvd N
Maple Grove MN 55369-4718

Dear Ms. Johnston:

On September 8, 2022, the North Dakota Department of Environmental Quality (Department) received a letter, via e-mail, from Golder Associates USA Inc. (Golder) on behalf of Great River Energy (GRE) requesting a 60-day extension to the 90-day deadline for completing an assessment of corrective measures (ACM). An ACM is being developed for arsenic at groundwater monitoring well MW-103 associated with the Bottom Ash Landfill at GRE – Stanton Station, regulated by the Department under Permit 0043.

Following statistical evaluation of the second quarter 2020 monitoring event, statistically significant increases for boron and total dissolved solids at MW-103 were identified. As a result, the Bottom Ash Landfill groundwater monitoring program transitioned from detection monitoring to assessment monitoring in the first quarter of 2021. Four independent measurements were completed to conduct comparative statistics for the assessment monitoring program.

During the initial assessment monitoring comparative statistical analysis, arsenic was identifed as a statistically significant level (SSL) above the groundwater protection standard. A notification identifying the SSL was prepared and submitted to the Department on April 27, 2022, and an alternative source demonstation was started. The alternative source demonstration was completed on June 24, 2022 and concluded that there was insufficient evidence available to make conclusive statements about an alternative source for arsenic at MW-103.

A site investigation plan was also developed to help characterize the nature and extent of arsenic above the groundwater protection standard. The plan included the construction of five additional groundwater monitoring wells. One groundwater monitoring well was added upgradient of the Bottom Ash Landfill, but downgradient of the existing upgradient groundwater monitoring wells. Four groundwater monitoring wells were installed near MW-103 to help define the downgradient extent of the elevated arsenic concentrations in the assumed direction of groundwater flow. These groundwater monitoring wells were sampled twice.

The initial nature and extent site investigation conducted in May 2022 was developed based on available information pertaining to groundwater flow direction and gradient to the northeast. The installation of new groundwater monitoring wells has improved the understanding of the nature and extent of the elevated arsenic concentrations, and has identified areas where additional information is needed to better define the nature and extent of the elevated arsenic concentrations. Golder reccomended that additional site investigation be completed to help fill in missing information to support the ACM and remedy selection.

The additional site investigation proposes to install four additional groundwater monitoring wells in the north/northwest areas and one additional well south of MW-103 MW-211. A proposed timeline, including past and future deadlines was included in the request.

The Department has reviewed and hereby approves the 60-day extension to complete the Assessment of Corrective Measures. Based on the results of the Assessment of Corrective Measures, and as soon as feasible, GRE must select a remedy. Thirty days prior to selection of the remedy, GRE must discuss the results of the Assessment of Corrective Measures in a public meeting with interested and affected parties. Please keep the Department informed during this process and of the schedule for the public meeting.

After completion of the public meeting, and selection of a remedy, a final report will be developed following North Dakota Administrative Code Subsection Subsection 33.1-20-08-06(7). The remedy must be initiated within 90 days of selection.

Please contact Lexi Craig at 701-328-5171 or acraig@nd.gov with questions regarding this letter.

Sincerely,

Diana A. Trussell

Diana A. Trussell, Manager
Solid Waste Program
Division of Waste Management

DAT:AAC
Enc.
c/by e-mail: Sara Harkins, Golder Associates USA, Inc.
Erin Hunter, Golder Associates USA, Inc.
Craig Schuettpelz, Golder Associates USA, Inc.
Todd Stong, Golder Associates USA, Inc.
Erik Heinen, Great River Energy
Lexi Craig, NDDEQ
Anthony Quach, NDDEQ

REPORT

Assessment of Corrective Measures

Great River Energy, Stanton Station, Closed Bottom Ash Landfill

Submitted to:

Great River Energy

12300 Elm Creek Blvd., Maple Grove, Minnesota, 55369

Submitted by:

Golder Associates USA Inc.

7245 W Alaska Drive, Suite 200, Lakewood, Colorado, USA 80226

+1 303 980 0540

21509219-18-R-0

November 21, 2022

Table of Contents

TABLES

FIGURES

APPENDICES

APPENDIX A
Bottom Ash Landfill Closure Drawings

APPENDIX B
May 2022 Boring Logs and Well Completion Information

APPENDIX C
Analytical Results from May 2022 Nature and Extent Wells

APPENDIX D
Soil Testing Analytical Results

1.0 INTRODUCTION

In accordance with the United States Environmental Protection Agency (USEPA) Coal Combustion Residuals (CCR) Rule 40 Code of Federal Regulations (CFR) Part 257 and the North Dakota Department of Environmental Quality (NDDEQ) CCR Rule found at North Dakota Administrative Code (NDAC) Title 33.1 Article 20 Chapter 08, Golder Associates USA Inc. (Golder), a member of WSP, has prepared this assessment of corrective measures (ACM) report for the Bottom Ash Landfill at Great River Energy's (GRE) Stanton Station. This ACM has been prepared to evaluate potential groundwater corrective measures to address a statistically significant level (SSL) of arsenic in groundwater at the Bottom Ash Landfill identified at monitoring well MW-103.

The SSL for arsenic at MW-103 was identified on March 28, 2022, when Assessment Monitoring statistics were completed following the fourth quarter (Q4) 2021 sampling and testing event. A notification identifying the SSL for arsenic was prepared and both posted online and submitted to the NDDEQ on April 27, 2022 (within 30 days of identifying the SSL). The ACM was initiated on June 24, 2022, within 90 days of identifying the SSL for arsenic. A 60-day extension approved by the NDDEQ on September 16, 2022, altered the deadline for completion of the ACM to November 21, 2022.

1.1 Purpose

The purpose of this ACM is to identify potential corrective measures to prevent further releases, to remediate any identified releases, and to restore the affected area to original conditions for groundwater at the Bottom Ash Landfill. In particular, the ACM evaluates corrective measure(s) alternatives for groundwater corrective action at the site given the site conditions and constituent(s) of concern. Based on the results of the ACM, further evaluation may be performed, site-specific studies completed, and a final long-term corrective action plan will be developed and implemented pursuant to 40 CFR 257.97 and -98 and NDAC 33.1-20-08-06(6) and (7). This process is typically iterative and may be composed of multiple steps to analyze the effectiveness of corrective measures to address the potential migration of CCR constituents in groundwater at the Bottom Ash Landfill.

Both the Federal and State rules indicate that corrective measure assessments should include an analysis of the effectiveness of potential corrective measures addressing the following as stated in 40 CFR 257.96(c) and NDAC 33.1-20-08-06(6)(c):

- Performance of potential remedies
- Reliability of potential remedies
- Ease of implementation of potential remedies
- Potential impacts of potential remedies, including safety impacts, cross-media impacts, and control of exposure to any residual contamination
- Time required to begin and complete the remedy
- Any institutional requirements that may substantially affect implementation of the selected remedy, such as state or local permit requirements
- Other environmental or public health requirements that may substantially affect implementation of the selected remedy

These evaluation criteria were considered for each potential remedy and are discussed in more detail in the following sections. Once potential corrective measures are identified, they will be further evaluated, and a remedy will be selected using the criteria outlined in 40 CFR 257.97 and -98 and NDAC 33.1-20-08-06(6) and (7).

1.2 Site Background

Stanton Station was a coal-fired electric generation facility located along the Missouri River in Mercer County, approximately three miles southeast of Stanton, North Dakota. Stanton Station began generating power in 1966 and ceased power production in February 2017. Demolition of the industrial site was finished in 2019, with site restoration completed in 2020. CCRs were managed in composite-lined surface water impoundment cells and dry waste facilities regulated and permitted by the NDDEQ in accordance with NDAC Article 33.1-20, Solid Waste Management and Land Protection.

Stanton Station has two CCR units in the purview of the Federal and State CCR rules:

- Bottom Ash CCR Landfill (Bottom Ash Landfill)
- Bottom Ash CCR Surface Impoundment (Bottom Ash Impoundment)

Locations of the two CCR units, and the Bottom Ash Landfill groundwater monitoring wells are shown in Figure 1. This ACM pertains only to the Bottom Ash Landfill.

1.3 Site Closure and Restoration

Site restoration activities began in the summer of 2019 and were completed in the summer of 2020. These activities primarily included closure of the Bottom Ash Landfill and Bottom Ash Impoundment as well as re-grading the site to promote drainage and vegetative growth.

The north and center cells of the Bottom Ash Impoundment were closed by removal of CCR and liner systems in the fall of 2019. The west half of the permitted Bottom Ash Landfill footprint (where active disposal had not historically occurred) was also closed by removal of CCR and impacted soil in the fall of 2019. The south cell of the Bottom Ash Impoundment and the east side of the Bottom Ash Landfill were closed in 2020 with permitted wastes remaining in-place and in accordance with the final cover designs outlined in their respective Closure and Post-Closure Plans (Golder 2019a and Golder 2019b). The closure process included placement of a cover system designed to minimize infiltration and erosion and to meet or exceed the requirements of 40 CFR 257.102(d)(3)(ii) and NDAC 33.1-20-08-07(3)(d)(3)(b).

The activities described above along with other activities associated with site closure and restoration affected both the hydrology and hydrogeology of the site. Specifically, construction of engineered covers and site grading to promote surface water drainage reduced surface water recharge in the area around the CCR units. These changes to surface water hydrology along with other site changes such as the removal of surface water impoundments (north and center cells of the Bottom Ash Impoundment and site non-CCR stormwater impoundments) and removal of pumped plant sumps also likely affected site hydrogeology near the CCR units and across the former Stanton Station site. Changes to the site near surface hydrogeology likely affect infiltration through CCR and soils, flow rates, and flow direction. Changes to groundwater chemistry downgradient of the site closure and restoration areas are anticipated to occur while the natural systems reach new equilibrium conditions following construction. These changes complicate the interpretation of groundwater data and make it difficult to identify the cause of groundwater changes with certainty.

1.3.1 Bottom Ash Landfill Closure and Cover Construction

Documentation of the closure and cover construction at the Bottom Ash Landfill was included in the CQA report provided to the NDDEQ (Golder 2021b). Construction activities associated with the closure of the Bottom Ash Landfill included consolidation (i.e., reduction in areal size) of the footprint, containment berm construction, waste compaction, and construction of a final cover system. Each construction activity included construction quality assurance testing and monitoring and was overseen by a professional engineer licensed in the state of North Dakota. Construction drawings for the Bottom Ash Landfill closure are included as Appendix A.

Partial Closure by Removal

At the time of closure, the majority of historical bottom ash was placed in the east half of the original permitted landfill footprint. To consolidate the Bottom Ash Landfill footprint, bottom ash and potentially impacted soil was removed from the west side of the original permitted landfill footprint and placed within the consolidated Bottom Ash Landfill footprint. Verification of removal of bottom ash from the west side was performed and overseen by a professional engineer licensed in the state of North Dakota (Golder 2021b).

Containment Berm

A containment berm was constructed along the west side of the consolidated Bottom Ash Landfill footprint to provide an edge to the reduced landfill footprint that was keyed into the underlying natural soils, to contain runoff during construction, and to serve as a tie-in location for the final cover system. Embankment fill material consisted of clay materials and was compacted to a minimum of 95% maximum dry density as determined by ASTM D698 (standard Proctor).

Waste Re-Grading

Prior to placement of the cover components, the waste in the Bottom Ash Landfill was compacted to a firm and unyielding surface. Waste slopes were re-graded to between 3% and 6% to direct stormwater off and away from the closed and covered landfill and to reduce erosion.

Final Cover

The final cover over the Bottom Ash Landfill included an infiltration layer and a topsoil layer as described below.

- Infiltration layer construction involved hauling and placing material to obtain the design thickness of a minimum of 18 inches over the area receiving final cover. Infiltration layer material consisted of clay materials and was compacted to a minimum of 95% maximum dry density as determined by ASTM D698 (standard Proctor). Three hydraulic conductivity tests of thin-wall samples of the infiltration layer were conducted, indicating values between 7 x 10^{-8} cm/sec and 8 x 10^{-8} cm/sec. This hydraulic conductivity is significantly lower than the underlying natural soil and the project requirements (less than or equal to 3 x 10^{-6} cm/sec).
- The 18-inch infiltration layer was overlain by a minimum of 6 inches of topsoil. The topsoil was tested for agricultural properties including sodium adsorption ratio, electrical conductivity, and organic matter. Each collected sample met the project specifications to allow for successful vegetative cover growth.

Following closure of the Bottom Ash Landfill and Bottom Ash Impoundment, an updated post-closure care plan was prepared for the site in 2022 (Golder 2022). Maintenance will be provided on the final cover system for the required post-closure care period so that the integrity and effectiveness of the final cover system is maintained. Maintenance activities will include, as needed, repairs to the final cover to correct any effects related to settlement, subsidence, erosion, or other events, and will be performed to prevent run-on or run-off from eroding or otherwise damaging the final cover.

2.0 SITE CONDITIONS

The Stanton Station site is located along the Missouri River, and the general area is primarily characterized by the presence of glacial deposits, with alluvial deposits dominating near-surface geology adjacent to the Missouri River. The following sections detail the regional and site geology and hydrogeology.

2.1 Regional and Site Geology

Regional geology of the area surrounding Stanton Station is documented in the Hydrogeologic Assessment Report, Stanton Station Ash Ponds (Braun 1993). Physiographically, Stanton Station is located in the Missouri Slope District of the Glaciated Missouri Plateau Section of the Great Plains Province. Subsurface and surficial stratigraphy of Mercer County and the adjacent Oliver County were reviewed in depth by C.G. Carlson for the North Dakota Geological Society (Carlson 1973). Primary near-surface stratigraphic units in the area of Stanton Station include the Tongue River Formation and Cannonball Formation, with named lignite beds prominent in the vicinity of the site.

Near-surface geology at Stanton Station consists of two primary geologic units: the upper alluvial terrace deposits of the Missouri River, and underlying sediments and bedrock belonging to the Bullion Creek Formation, each of which have varying extents and thicknesses across the site (Braun 1993).

2.2 Site Hydrogeology

The principal hydrostratigraphic unit and uppermost water-bearing unit in the vicinity of the Bottom Ash Landfill and the Bottom Ash Impoundment consists of alluvial deposits, which include two subunits: an upper silty sand and clay, and an underlying outwash sand and gravel. Individually, these subunits are laterally heterogeneous and geologic conditions within these subunits can be characterized by interbedded layers of gravel, sand, silt, clay, and coal.

Due to variations in subunit thickness throughout the site, groundwater in the uppermost water bearing unit is monitored in both the outwash subunit and the silty sand and clay subunit, with flow generally moving from southwest to northeast towards the Missouri River. Depths from the ground surface to the uppermost water-bearing unit range from 5 to 20 feet in the area around Stanton Station.

2.3 Groundwater Flow Conditions

The groundwater gradient across the site is influenced by the subsurface units (Braun 1993). Hydraulic conductivities measured from site wells in the upper silty sand unit ranged from a minimum of 1.5×10^{-5} centimeters per second (cm/sec), or approximately 0.04 feet per day (ft/day), to 2.8×10^{-3} cm/sec, or approximately 7.9 ft/day (Braun 1993). The shallow groundwater at Stanton Station generally flows to the northeast, towards the Missouri River.

The groundwater flow rate across each facility was estimated with the equation $V_s = k \times \frac{i}{n_e}$, where:

- V_s is the groundwater flow rate in feet per day (ft/day).
- k is the hydraulic conductivity in ft/day, estimated from slug testing results from site wells.

- i is the hydraulic gradient in feet per feet (ft/ft), calculated based on groundwater elevations for the presented monitoring events.
- n_e is the effective porosity, a unitless parameter, estimated to be 0.25 for a silt/sand (Duffield 2007), reflective of site soils.

The range of groundwater flow velocities calculated for the units during the November (Q4) 2021 and May/June (Q2) 2022 monitoring sampling events are shown below. The groundwater flow rates are presented below based on a range of measured hydraulic conductivity (k) values from 0.04 ft/day to 7.9 ft/day.

- November (Q4) 2021: 0.0014 to 0.26 ft/day, based on a gradient of 0.008 ft/ft
- May/June (Q2) 2022: 0.0013 to 0.23 ft/day, based on a gradient of 0.007 ft/ft

3.0 GROUNDWATER MONITORING SUMMARY

3.1 Groundwater Monitoring Program

The CCR groundwater monitoring system at Stanton Station is designed to identify potential impacts from the Bottom Ash Landfill. The Bottom Ash Landfill monitoring wells are installed and screened at appropriate locations and depths to obtain groundwater samples from the uppermost water bearing unit. The number and spacing of the downgradient monitoring wells were selected based on the hydrogeologic conditions at the site and the areal extent of the CCR unit, such that impacts to groundwater quality in the uppermost water bearing unit can be detected along potential flow pathways if they were to occur. The groundwater monitoring system is described in depth in the Coal Combustion Residuals Groundwater Monitoring System Certification, Revision 1 (Golder 2020).

3.2 Site-Specific Groundwater Protection Standards (GWPS)

Site-specific groundwater protection standards (GWPS) provided in Table 1 were established for statistical comparison with assessment monitoring results. Site-specific GWPS were developed from upgradient and side-gradient background locations (MW-8B, MW-7A, MW-7B, MW-105, and MW-6B), with data collected between the start of the CCR monitoring program in 2016 and Q4 2021.

Per 40 CFR 257.95(h) and NDAC 33.1-20-08-06(5)(h), the site-specific GWPS must fall within one of the following categories:

- For constituents for which a maximum contaminant level (MCL) has been established by the USEPA (40 CFR 141.62 and 141.66), the MCL for that constituent will be the site-specific GWPS.
- For the following constituents, the following alternative specified limits (ASL) apply:
  - Cobalt – 0.006 milligrams per liter (mg/L)
  - Lead – 0.015 mg/L
  - Lithium – 0.04 mg/L
  - Molybdenum – 0.1 mg/L
- For constituents where the background baseline concentration is higher than the specified levels noted above, a statistical limit determined from the background baseline data will be the site-specific GWPS.

Based on the pooled background dataset, the MCL or ASL (as indicated above) were set as the site-specific GWPS for the assessment monitoring constituents, with the exception of lithium.

All measured concentrations of lithium from the upgradient and side-gradient background locations collected to date are greater than the ASL. The pooled background dataset for lithium displayed a non-normal distribution, resulting in a GWPS of 0.325 mg/L as the highest value in the pooled background dataset, as shown in Table 1.

3.3 Assessment Monitoring SSLs

During Assessment Monitoring sampling events, groundwater samples were collected and analyzed for the assessment monitoring parameters to meet the requirements of 40 CFR 257.95(b) and NDAC 33.1-20-08-06(5). Analytical data from both the annual and semi-annual Assessment Monitoring events have been statistically analyzed pursuant to 40 CFR 257.93(f) and NDAC 33.1-20-08-06(3)(f), using the methods for Assessment Monitoring described in detail in the Coal Combustion Residuals Groundwater Statistical Methods Certification, Revision 2 (Golder 2021a).

Statistical analysis of the assessment monitoring results from groundwater sampling and analysis of the wells downgradient of the Bottom Ash Landfill (MW-102, MW-9N, and MW-103) was performed to evaluate if detected constituent concentrations were SSLs relative to the site-specific GWPS using a confidence interval approach.

A confidence (α) of 95% was used for calculating the parametric Upper Confidence Limit (UCL) and Lower Confidence Limit (LCL) of the compliance data. For determination of SSLs, the LCL is of primary interest. A confidence interval is only considered statistically above the associated GWPS if both the UCL and LCL exceed the GWPS. If only the UCL exceeds the GWPS while the LCL remains below the GWPS, the results of the test are considered inconclusive. The Unified Guidance recommends results of this category to be interpreted as “in compliance” and not consider the results to represent an SSL. If both the UCL and LCL are below the GWPS, the data are considered not statistically significant.

An SSL was identified for arsenic at MW-103 following the Q4 2021 Assessment Monitoring sampling event. Following identification of the SSL, an alternative source demonstration (ASD) was evaluated, with insufficient evidence found to conclusively document an alternate source for arsenic at MW-103. On June 24, 2022, GRE initiated an assessment of corrective measures for the Bottom Ash Landfill based on the SSL for arsenic at MW-103.

NDAC subdivision 33.1-20-08-06(6)(a) states: “The assessment of corrective measures must be completed within 90 days, unless the owner or operator demonstrates the need for additional time to complete the assessment of corrective measures due to site-specific conditions or circumstance and obtains approval by the department. The 90-day deadline to complete the assessment of corrective measures may be extended for no longer than 60 days.” Similarly, 40 CFR 257.96(a) allows the 90-day deadline for an assessment of corrective measures to be extended for no longer than 60 days. Golder requested, and received, a 60-day extension to the deadline for completion of the ACM to allow for additional nature and extent evaluation, including survey, additional water quality sampling and testing, and installation of additional wells north and northwest of MW-103. A better understanding of the nature and extent of the elevated arsenic levels will aid in evaluating potential corrective measures for both source control and groundwater improvement. Survey and additional water quality sampling and testing was completed within the 60-day extension; however, the additional wells could not be drilled within this time frame. Although efforts were made to contract with multiple drillers during the 60-day extension window, drill rig availability and weather conditions have delayed installation of additional wells, now scheduled for December 2022. The additional information obtained from these wells will be used in future remedy selection.

4.0 NATURE AND EXTENT INVESTIGATION

4.1 Field Investigation Activities

After identifying arsenic as an SSL at MW-103, a site investigation plan was developed to help characterize the nature and extent of arsenic above the GWPS per 40 CFR 257.95(g)(1) and NDAC 33.1-20-08-06(5)(g)(1). The initial nature and extent characterization was evaluated based on available information pertaining to groundwater flow direction and gradient.

4.1.1 Property Boundary Well Installation

A monitoring well was installed at the downgradient property boundary adjacent to the Missouri River (MW-PB1) in the direction of groundwater flow. This well is being sampled per the schedule established for Assessment Monitoring.

4.1.2 May 2022 Nature and Extent Well Installation

Following the SSL identification, additional monitoring wells have been installed to determine the horizontal extent of impacts of the identified constituent. Five wells, MW-210, MW-211, MW-212, MW-213, and MW-214, were installed and developed in May 2022, and are shown in Figure 2. Wells were placed approximately 100 feet to the west (MW-211) and east (MW-212) of MW-103. Additionally, wells were placed in the downgradient direction of groundwater flow, approximately 250 feet (MW-210) and 500 feet (MW-213) to the northeast of MW-103. One additional upgradient well (MW-214) was drilled to the southwest of the Bottom Ash Landfill, approximately 250 feet from the Bottom Ash Landfill footprint between Highway 200A and an active rail line.

In addition to the initial round of wells installed for delineating the nature and extent of arsenic in groundwater, a borehole (BH-1) was drilled through the cover of the closed Bottom Ash Landfill to collect a sample of the deposited bottom ash for characterization. Precautions were taken during drilling to minimize disturbance of the cover system, to sample the bottom ash, and to backfill the borehole and repair the cover system following drilling. Excess bottom ash collected during drilling was redeposited within the borehole, and the borehole was sealed with 2 feet of bentonite overlain with 18 inches of soil.

Boring logs and well completion information for these nature and extent wells is included in Appendix B.

4.1.3 Stratigraphic Cross Sections

Stratigraphic cross sections were compiled based on boring information from current site monitoring wells, new nature and extent wells, and historical borings and monitoring wells across the site (Figure 3 to Figure 5). Note that boring information has been projected to applicable sections and that historical borings may not match existing surface grades due to changes in site geometry since those borings were completed.

Figure 3 provides a plan view showing the locations of the referenced boreholes and two stratigraphic sections. Figure 4 presents a section along the downgradient (north) boundary of the Bottom Ash Landfill. Figure 5 presents a section across the Bottom Ash Landfill and MW-103, approximately in-line with the groundwater flow direction.

The cross sections shown in Figures 4 and 5 illustrate the site geologic variability in the near surface soils that was briefly described in Section 2.0. Each geologic section is summarized in more detail below:

- West to East Cross Section (Figure 4):
  - The near-surface geology on the north side of the Bottom Ash Landfill is generally in line with the site-wide geologic description, with a lower-permeability zone of silty and clayey soils underlain by more continuous sand and gravel between 15 and 20 feet below ground surface.
  - Sand and gravel seams exist in the near subsurface, but these seams appear to be discontinuous based on field investigations.
  - A near-surface coal seam is present along the east downgradient side of the Bottom Ash Landfill. Apparently discontinuous coal seams are noted in the near-surface to the west and east of MW-211. Coal was noted in the MW-9N, MW-103, MW-212, and MW-104 borings, but not within the boring at MW-211.
- Southwest to Northeast Cross Section (Figure 5):
  - The geology near the Bottom Ash Landfill is generally consistent with the site-wide geologic description, with a lower-permeability zone of silty and clayey soils underlain by a more continuous sand and gravel layer.
  - Sand and gravel become more prevalent downgradient of the Bottom Ash Landfill, nearer to the Missouri River.
  - As noted previously, coal was noted in the MW-103 boring.

4.1.4 Groundwater Sampling and Analysis

Pursuant to 40 CFR 257.96(b) and NDAC 33.1-20-08-06(6)(b), groundwater at the Bottom Ash Landfill continues to be monitored in accordance with the Assessment Monitoring program. Groundwater samples were collected from the site wells in June 2022 and analyzed for both the detection monitoring and assessment monitoring analytes.

Additionally, samples were collected from the recently installed nature and extent wells in May, July, and September 2022 and analyzed for the detection monitoring and assessment monitoring analytes. Analytical results from the samples collected in May, July, and September for the recently installed nature and extent wells are presented in Appendix C.

4.1.5 Solids Sampling and Analysis

As part of the drilling program for the nature and extent wells, solids samples were collected at each installed well and analyzed via the sequential extraction procedure (SEP; Tessier et al. 1979) and the synthetic precipitation leaching procedure (SPLP) using a modified 4:1 solid to liquid ratio. The modified 4:1 SPLP follows recommendations from the NDDEQ for ash analysis. Analytical reports for the solids testing are included in Appendix D.

Samples were collected and analyzed as follows:

- MW-210
  - Soil was collected during drilling at MW-210 below the encountered groundwater level and analyzed via SEP and modified SPLP.
- MW-211
  - Two soil samples were collected at MW-211 from approximately 0 to 5 feet below ground surface and 14 to 25 feet below ground surface and analyzed via SEP.
- MW-212
  - Soil was collected during drilling at MW-212 below the encountered groundwater level and analyzed via SEP.
  - Coal collected between approximately 2.0 and 2.5 feet below ground surface during drilling at MW-212 was analyzed via SEP and modified SPLP.
- MW-213
  - Soil was collected during drilling at MW-213 below the encountered groundwater level and analyzed via SEP.
- MW-214 (upgradient)
  - Soil was collected during drilling at MW-214 below the encountered groundwater level and analyzed via SEP and modified SPLP.
- BH-1
  - Bottom ash collected during drilling at BH-1 was analyzed via SEP and modified SPLP.

4.2 Preliminary Results

The results of the laboratory-measured arsenic concentrations for the existing Bottom Ash Landfill monitoring wells and new nature and extent monitoring wells from May and June 2022 are shown in Figure 2 and summarized below.

- Arsenic concentrations near or above the GWPS (0.01 mg/L) were identified in monitoring wells MW-103 and MW-211 downgradient from the Bottom Ash Landfill. While the June analytical result for MW-103 was just below the GWPS, the result remains an SSL based on the calculated 95% confidence interval.
- Arsenic concentrations near or below the reporting detection limit (0.002 mg/L) were identified in monitoring wells MW-102, MW-9N, MW-104, MW-1R, MW-210, MW-213, and MW-PB1 downgradient of the Bottom Ash Landfill. Downgradient monitoring well MW-212 had an arsenic concentration between the reporting detection limit and GWPS.
- Arsenic concentrations in background monitoring wells upgradient/sidegradient of the Bottom Ash Landfill including MW-214, MW-105, MW-7A, MW-7B, MW-8B, and MW-6B (not all of which are shown in Figure 2) were near or below the reporting detection limit (0.002 mg/L).

Preliminary observations from the initial site investigation include:

- The west and east extent of arsenic concentrations above the GWPS appears to be constrained to the area near MW-211 and MW-103.
- The north and south extents of arsenic concentrations in groundwater require further delineation.

4.3 Additional Field Investigation

As discussed above, the initial nature and extent site investigation conducted in May 2022 was developed based on available information with respect to groundwater flow direction and gradient downgradient of the Bottom Ash Landfill monitoring wells (MW-102, MW-9N, and MW-103). The installation of new nature and extent monitoring wells and collection of water quality samples has improved the understanding of the nature and extent of the elevated arsenic concentrations. Based on information collected from wells installed as part of the May 2022 nature and extent investigation, the area north and northwest of MW-103 not previously investigated has been identified in the potential downgradient flow path. Additional nature and extent wells were proposed as part of the 60-day extension request to the NDDEQ but drilling contractor availability has delayed installation of these new wells. As such, information from these new wells will be incorporated into subsequent reporting and used in evaluating corrective measures and remedy selection.

The additional site investigation is proposed to include installation of four additional nature and extent monitoring wells (MW-215 through MW-218) in the areas north and northwest of MW-211 and MW-103, and the installation of one additional nature and extent monitoring well (MW-219) south of MW-211 and MW-103. Installation and sampling of these wells will assist in evaluating the horizontal extents of arsenic concentrations above the GWPS. Proposed locations for the additional monitoring wells are shown in Figure 6.

In addition to the five nature and extent wells to be installed in late 2022, two additional nature and extent wells (MW-220 and MW-221) have been proposed to evaluate the potential vertical extent of the arsenic concentrations above the GWPS. Based on past hydrogeologic investigations at the site (Braun 1993), vertical gradient is anticipated to be negligible. However, the proposed wells are intended to constrain vertical groundwater movement.

5.0 ASSESSMENT OF CORRECTIVE MEASURES

5.1 Objectives of the Corrective Measures

Potential corrective measures are evaluated using the criteria listed in 40 CFR 257.96(c) and NDAC 33.1-20-08-06(6)(c), including performance, reliability, ease of implementation, potential impacts, remedy duration, and institutional and public health requirements.

In addition, the following criteria listed in 40 CFR 257.97(b) and NDAC 33.1-20-08-06(7)(b) must be met by the selected corrective measure:

- Protect human health and the environment.
- Attain applicable GWPS as specified pursuant to 40 CFR 257.95(h) and NDAC 33.1-20-08-06(5)(h).
- Control the source(s) of release(s) to reduce or eliminate, to the maximum extent feasible, further releases of assessment monitoring constituents to the environment.

- 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 disturbance of sensitive ecosystems.
- Comply with standards for management of wastes as specified in 40 CFR 257.98(d) and NDAC 33.1-20-08-06(8)(d).

The corrective measures evaluated as a part of this ACM are not intended to be an exhaustive list of all possible corrective measures but are focused on corrective measures that are anticipated to be technically feasible and that will likely perform satisfactorily at the site.

Section 5.2 discusses corrective measures primarily associated with source control and Section 5.3 discusses corrective measures primarily associated with groundwater remediation.

5.2 Source Control Corrective Measures

As listed above, the selected remedy should control the source(s) of release(s) to reduce or eliminate, to the maximum extent feasible, further releases of assessment monitoring constituents to the environment. An ASD was evaluated for arsenic (see Section 3.3), with insufficient evidence found to date to conclusively document an alternative source other than the Bottom Ash Landfill. Therefore, source control corrective measures are focused on the CCR within the Bottom Ash Landfill.

Prior to the initiation of Assessment Monitoring and the ACM, the Bottom Ash Landfill was closed with an engineered final cover placed over waste left in place. Closure was completed in accordance with the closure plan and was described above in Section 1.3. Although closure was performed prior to initiation of Assessment Monitoring and the ACM, an evaluation of the previously conducted closure as a source control measure is provided below, indicating why the steps previously taken are considered an appropriate source control measure.

The closure of the Bottom Ash Landfill provides the primary source control measure to reduce the potential for migration of CCR constituents to groundwater. If over the course of corrective action implementation and monitoring, the previously implemented closure measures are determined to be inadequate, additional source control measures will be further evaluated and implemented. A thorough evaluation of additional future source control measures is not included in this ACM, but two potential options include:

- Closure by removal of CCR from the Bottom Ash Landfill
- In situ stabilization of all or portions of the CCR within the Bottom Ash Landfill

Table 2 provides a summary of the source control measures compared to the evaluation criteria described in both the Federal and State rules and listed in Section 1.1, as applied to site conditions.

5.2.1 Bottom Ash Landfill Closure

As noted in Section 1.3, closure of the Bottom Ash Landfill was completed in 2020. Closure was completed in accordance with the Bottom Ash Landfill closure plan (Golder 2019a), prior to initiating both Assessment Monitoring and the ACM. The closure process included placement of a cover system designed to minimize infiltration and erosion and to meet or exceed the requirements of 40 CFR 257.102(d)(3)(ii) and NDAC 33.1-20-08-07(3)(d)(3)(b). The closure of the Bottom Ash Landfill provides a source control measure that reduces the potential for migration of CCR constituents to groundwater.

The effectiveness of closure of the Bottom Ash Landfill for source control relies on:

1) Not having continued significant interaction between the groundwater and placed CCR, and

2) The final cover being an engineered cover designed to minimize the potential for precipitation to infiltrate through the cover and into the waste. In particular, and per the regulatory requirements, the permeability of the final cover must be less than or equal to the permeability of the bottom liner or natural subsoils present, or a permeability no greater than 1 x 10^{-5} cm/sec.

Despite the expected performance of the closed Bottom Ash Landfill, groundwater quality impacts from the historical Bottom Ash Landfill operation may still be identified in the downgradient monitoring wells. Prior to engineered cover construction in 2020, precipitation on the Bottom Ash Landfill was able to percolate through the bottom ash into the underlying subsoil and move downgradient. Construction of the engineered soil cover significantly reduces the potential precipitation infiltration, but residual water within the bottom ash and historical percolation to the groundwater will take time to pass through the site.

Groundwater Interaction

The Bottom Ash Landfill is constructed in the area of a former CCR impoundment and was designed and constructed as an unlined landfill for disposal of bottom ash. In the 1990s, the former CCR impoundment was closed by removal of waste and the base and containment perimeter berms of the Bottom Ash Landfill were prepared. Per the 1994 design report for construction and operation of the Bottom Ash Landfill (Stone & Webster 1994), prior to placement of bottom ash into the landfill, the report indicates: “If the area of the landfill planned for initial bottom ash disposal is not dry, a layer of fill will be placed over that area to facilitate bottom ash disposal.” The design intent and operation plan were to place fill so that the base of CCR placement in the Bottom Ash Landfill would be above groundwater/wet soil.

As-built grades of the conditions prior to waste placement reflective of this fill placement are not available. However, grades following closure by removal of the former CCR impoundment are available (November 1997). Bottom Ash Landfill floor grades surveyed after closure by removal of the former CCR impoundment but prior to fill placement appear to be between approximate elevation 1698 feet in the middle of the east side to approximate elevation 1702 feet around the perimeter. Groundwater elevations across the Bottom Ash Landfill are at an approximate elevation of 1700 feet along the south side of the unit and between 1695 and 1690 feet along the north side of the unit. A comparison of the closure by removal grades and typical groundwater elevations indicates that, even without the fill placement planned as part of the 1994 construction documents, the floor of the Bottom Ash Landfill is not anticipated to be in continued significant interaction with groundwater.

During final cover construction, a test pit was excavated through the Bottom Ash Landfill to evaluate if there was any free water in the bottom ash that could be sampled and tested. The test pit was excavated October 3, 2019 through the Bottom Ash Landfill and did not identify any free water within the bottom ash.

Based on the information reviewed above, the CCR within the Bottom Ash Landfill is not anticipated to be in continued significant interaction with groundwater.

Engineered Final Cover

Construction of a final cover over exposed CCR prevents source material release due to stormwater erosion or fugitive dust and reduces the potential for leachate generation by minimizing the infiltration of precipitation into the underlying CCRs. The base of the Bottom Ash Landfill consists of natural soil with an estimated hydraulic conductivity of 3 x 10^{-6} cm/sec. The constructed final cover infiltration layer has a measured hydraulic conductivity of approximately 7 x 10^{-8} cm/sec, or less. Therefore, the installed final cover, which has a lower permeability than the base of the Bottom Ash Landfill, meets regulatory requirements and indicates that the cover is anticipated to significantly reduce the potential for precipitation to infiltrate through the cover into the bottom ash.

Due to the engineering properties of the final cover, and information indicating that groundwater is not anticipated to have continued significant interaction with placed CCR, the closure of the Bottom Ash Landfill is anticipated to perform well as a source control.

Table 2 includes a comparison of closure with an engineered cover to the requirements of 40 CFR 257.96(c) and NDAC 33.1-20-08-06(6)(c).

5.2.2 Closure by Removal

Closure by removal involves removal of the placed engineered final cover and excavation of all CCR and CCR impacted soil from the Bottom Ash Landfill. Excavated CCR and CCR impacted soil would be transported to a permitted CCR landfill.

Advantages of removal over the current source control of a covered landfill include:

- Eliminate the potential for future contamination to occur due to failure of the cover system and/or an increase in groundwater that allows for significant interaction between groundwater and placed CCR.
- Closure by removal could reduce the required post-closure monitoring period following implementation if each of the assessment monitoring parameters returned to concentrations below the GWPS.

Disadvantages of removal over the current source control of a covered landfill include:

- Closure by removal would require destruction of the existing cover system and require associated permitting efforts for establishing a separate CCR landfill.
- Increase in overall risk to workers, surrounding community and the environment due to factors such as fugitive dust, heavy construction equipment operation and emissions, and potential spills and safety hazards associated with transport to the new site.
- Over-excavation during closure by removal can re-mobilize any constituents in contact with groundwater, creating new impacts to groundwater or exacerbating existing impacts through changes to the aquifer characteristics.

The removal of the engineered cover and CCR associated with the Bottom Ash Landfill is not likely to be lower risk than the current source control corrective measure of closure with CCR in place.

Table 2 includes a comparison of closure by removal to the requirements of 40 CFR 257.96(c) and NDAC 33.1-20-08-06(6)(c).

5.2.3 In Situ Stabilization

In situ stabilization (ISS) is a technique where CCR is mixed with additives to solidify the material in place and reduce future dissolution of CCR compounds from the stabilized material. Typical additives include Portland cement, with solidification completed in-situ using large diameter augers.

Advantages of ISS over the current source control of a covered landfill include:

- This alternative would isolate and secure the source in a bound matrix, with the potential to allow concentrations of target constituents with SSLs in downgradient groundwater to decline through monitored natural attenuation below applicable standards over time.

Disadvantages of ISS over the current source control of a covered landfill include:

- In place closure of the Bottom Ash Landfill is complete, including cover installation. ISS would require removal or destruction of the existing cover system and require associated permitting efforts.
- Reliability of ISS is dependent on the ability for the injected material to solidify the matrix and change the permeability of the subsurface.
- While ISS could work to stabilize arsenic as the constituent of concern, ISS can increase the mobility of non-target metals within the aquifer based on interaction with the stabilization amendments. ISS treatment can also result in undesirably high pH levels if the buffering capacity of the system is not maintained. Pilot testing would be required to determine secondary impacts to groundwater chemistry based on the addition of the ISS amendments to the aquifer.

The use of ISS may be viable for targeted zones of the Bottom Ash Landfill (such as portions of the lowermost placed CCR) but is not likely to be a lower risk alternative for source control over the closure already implemented.

Table 2 includes a comparison of ISS to the requirements of 40 CFR 257.96(c) and NDAC 33.1-20-08-06(6)(c).

5.3 Groundwater Remediation Corrective Measures

A summary of the potential groundwater remediation corrective measures evaluated as part of this ACM is included in the following sections. Corrective measures discussed in this ACM are being evaluated to address the SSL for arsenic in groundwater downgradient of the Bottom Ash Landfill waste boundary. Based on site-specific information, knowledge of remedial alternatives, and site conditions at the Bottom Ash Landfill, the following remedies, individually or in combination, are being evaluated using the criteria specified in 40 CFR 257.96(c) and NDAC 33.1-20-08-06(6)(c):

- Monitoring Natural Attenuation and Enhanced Monitored Natural Attenuation
- Hydraulic Containment (Groundwater Pump and Treat)
- Geochemical Approaches (In-Situ Injection)
- Permeable Reactive Barriers
- Phytoremediation

Following this assessment of corrective measures, additional information will be gathered to further evaluate the identified potential corrective measures and determine which option(s) should be implemented at the site that meets the criteria specified in 40 CFR 257.97(b) and NDAC 33.1-20-08-06(7)(b). Table 3 provides a summary of each of the remedial technologies described below compared to the evaluation criteria described in both the Federal and State rules and listed in Section 1.1, as applied to site conditions.

5.3.1 Monitored Natural Attenuation and Enhanced Monitored Natural Attenuation

The USEPA (2015) 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 timeframe that is reasonable compared to that offered by other more active methods. The 'natural remediation processes' that are at work in such a remediation approach include a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil or groundwater. These in situ processes include biodegradation; dispersion; dilution; sorption; volatilization; radioactive decay; and chemical or biological stabilization, transformation, or destruction of contaminants.

Attenuation mechanisms for inorganic constituents, like arsenic, can be physical and/or chemical. Physical methods include dilution, dispersion, and related processes. Chemical mechanisms for inorganic constituents include adsorption to oxyhydroxides of iron, aluminum, manganese, and other metals, and coprecipitation with common minerals such as iron sulfides or carbonates.

USEPA guidance for MNA requires an evaluation of the potential for successful remediation for each constituent of interest, by the following phased approach:

- Tier 1 – Assessment of groundwater plume stability and constituent attenuation based on statistical analysis and geochemical testing.
- Tier 2 – Identification of the attenuation mechanisms occurring at each location and estimation of the timeframe required for attenuation based on site-specific groundwater and aquifer solids characterization data, including sequential extraction.
- Tier 3 – Assessment of capacity in the aquifer system to attenuate the plume and confirmation of long-term plume stability through geochemical modeling.
- Tier 4 – Design of an MNA performance monitoring program to demonstrate that MNA is progressing as predicted, verify plume stability, identify toxic and/or mobile transformation products (if any), optimize monitoring well locations, and verify attainment of MNA remediation objectives.

A successful MNA approach requires a good understanding of hydrogeologic conditions and long-term monitoring of site conditions. MNA is a relatively slow remedy when used in isolation and as such is frequently used in combination with other remedies, including source control.

MNA can be enhanced using low-energy, in-situ techniques to stimulate or increase the attenuation of contaminants or reduce contaminant loading. Options for MNA enhancements include increasing the attenuation capacity of the aquifer, decreasing the mobility of contaminants, and/or increasing the stability of immobilized contaminants (ITRC 2010).

MNA and/or enhanced MNA are potentially effective means of remediating arsenic downgradient of the Bottom Ash Landfill. The effectiveness of an MNA approach is dependent on site-specific conditions. Further geochemical evaluation and groundwater modeling is required to evaluate remedial timeframes. Table 3 includes a comparison of MNA and enhanced MNA to the requirements of 40 CFR 257.96(c) and NDAC 33.1-20-08-06(6)(c).

5.3.2 Hydraulic Containment (Groundwater Pump and Treat)

Hydraulic containment can be used to control potential hazards through reduction of risk exposure pathways. Pump and treat is one form of hydraulic containment. Pump and treat refers to the use of groundwater extraction to artificially induce a hydraulic gradient for capture or control of the migration of impacted groundwater and is considered as a viable remedial technology at many sites (USEPA 1996). A pump and treat approach uses extraction wells, subsurface drains, or trenches to capture groundwater, which then may require above-ground treatment and permitted discharge to a receiving water body or reinjection into the aquifer, depending on the discharge permit and other regulatory requirements. A pump and treat approach may also be coupled with vertical barrier walls to more effectively direct water to the wells.

Extraction technologies are more efficient for mobile constituents which are not readily attenuated by other mechanisms such as precipitation or adsorption. As such, given the chemical behavior of arsenic and site hydrogeologic heterogeneity, the technical feasibility of clean-up of arsenic to the site GWPS using pump and treat as the sole corrective measure is uncertain and bench-scale and/or pilot-scale testing would be necessary to determine the extraction potential for arsenic given different treatment technologies. Table 3 includes a comparison of hydraulic containment (groundwater pump and treat) to the requirements of 40 CFR 257.96(c) and NDAC 33.1-20-08-06(6)(c).

5.3.3 Geochemical Approaches (In Situ Injection)

Subsurface in situ injections of reagents are a remediation technology that can be used for inorganic constituents. In situ injections for inorganic constituents may be applied in three modes that influence solubility, mobility, and/or toxicity of inorganic constituents:

(i) Oxidation-reduction potential (redox) manipulation
(ii) Adsorption to aluminum, iron oxyhydroxides, other metal oxyhydroxides, or various sulfate compounds under oxidizing groundwater conditions
(iii) Adsorption to, or coprecipitation with, iron or other metal sulfides under reducing conditions

In-situ injection requires understanding of the subsurface transport characteristics and (geo)chemical characteristics of the aquifer, and a thorough understanding of the reaction kinetics to derive appropriate reagent dosing for the subsurface. Often this technology is field-evaluated in a relatively small area (i.e., pilot tested) to bolster the understanding of these factors prior to remedial selection, design, and/or implementation.

Arsenic can be immobilized under different combinations of pH and redox conditions. A variety of pH and/or redox-altering technologies are available which can incorporate biological processes, chemical oxidants and reductants, and/or mechanical processes such as air sparging. These processes can be used to decrease the mobility of these constituents.

Chemical injection can be utilized to alter groundwater conditions to reduce metal mobility. Reactive chemicals are introduced into soil and groundwater to trigger rapid and complete metal precipitation. This may involve pH adjustment to higher levels while maintaining adequate buffering capacity within the groundwater to limit the upper extent of the pH range, as solubility begins to increase above pH 10 SU.

Routine collection of additional data, including measurements of total alkalinity, would be preferable post-treatment for ensuring that conditions remain favorable for low solubility of the contaminant of concern. Adjustment of pH within the aquifer would be anticipated to occur relatively quickly, with long-term monitoring required, similar to the considerations necessary for MNA.

Table 3 includes a comparison of in situ injection to the requirements of 40 CFR 257.96(c) and NDAC 33.1-20-08-06(6)(c).

5.3.4 Permeable Reactive Barriers

Permeable reactive barriers (PRBs) typically involve the installation of a subsurface zone of material intended to remove constituents of interest as groundwater flows through the installed area. PRBs can be installed in downgradient locations using conventional excavation methods or a one-pass trenching method. Excavated trenches are backfilled with reactive media to create a zone that interacts with constituents as they passively flow through the PRB with the groundwater (ITRC 2011). PRB systems can be constructed as continuous "walls" or as "funnel-and-gate" systems where impermeable slurry walls create a "funnel" that directs groundwater to permeable "treatment gates" filled with reactive materials. Funnel-and-gate configurations can reduce the required treatment area, allowing the system to be more readily maintained. PRBs are typically keyed into an underlying low-permeability unit.

PRBs may present a viable alternative for in-situ treatment of arsenic. PRBs often are constructed of reactive materials such as zero valent iron (ZVI), zeolites, and granular activated carbon. Zeolites can be used to promote ionic exchange and/or sorption, while activated carbon can be used to induce and/or sustain reducing conditions within the aquifer. Constituents of interest interact with the reactive materials via precipitation or sorption, dependent on the chemical properties of both the chosen reactive material and the constituents of interest. While installation of a PRB could work to stabilize arsenic as the constituent of concern, materials used for PRB construction can increase the mobility of non-target metals within the aquifer based on interaction with the amendments. Pilot testing would be required to determine secondary impacts to groundwater chemistry based on the addition of the PRB amendments to the aquifer.

Table 3 includes a comparison of PRBs to the requirements of 40 CFR 257.96(c) and NDAC 33.1-20-08-06(6)(c).

5.3.5 Phytoremediation

Phytoremediation uses plants to degrade, immobilize, or contain constituents of interest in soil, groundwater, surface water, and sediments. Phytoremediation includes plant-based technologies and applications that enhance the environmental goals for a given site and can include a variety of applications for hydraulic control, nutrient management, sediment control, and slope stabilization (Goldemund and Gestler 2019). Phytoremediation can be a viable alternative for areas with relatively low levels of constituents in shallow soils or groundwater.

The Interstate Technology and Regulatory Council (ITRC 2009) lists the main mechanisms involved in the phytoremediation for inorganic constituents as:

- Phytosequestration, or the ability of plants to sequester constituents within the rhizosphere, an area a few millimeters from the root surface. Phytosequestration is considered a containment mechanism.
- Phytohydraulics, or the ability of plants to capture and evaporate water. Phytohydraulics provides hydraulic control of the groundwater plume through plant root uptake and is considered a containment mechanism.
- Phytoextraction, or the process of constituent uptake into a plant. Phytoextraction is remediation through removal of the constituent of interest.

Typically, a combination of phytoremediation mechanisms acts in concert to achieve successful remediation outcomes for inorganic constituents.

The effectiveness of groundwater remediation using traditional phytoremediation approaches can be limited by compacted soil conditions that impede root penetration and depths to targeted groundwater. Depending on plant type, many root systems for plants used in traditional phytoremediation approaches focus on the upper 1 to 2 feet from the ground surface (ITRC 2011), while groundwater downgradient of the Bottom Ash Landfill is within 20 feet of the surface. In addition to traditional phytoremediation approaches, engineered approaches such as the TreeWell® System, a proprietary system developed by Applied Natural Sciences, can be used to bypass the constraints of a traditional system, through promoting downward root growth, encouraging constituent treatment and focusing groundwater extraction from a target depth within the aquifer (Gatliff et al. 2016; Goldemund and Gestler 2019).

Table 3 includes a comparison of phytoremediation to the requirements of 40 CFR 257.96(c) and NDAC 33.1-20-08-06(6)(c).

6.0 NEXT STEPS/REMEDY SELECTION

The purpose of this ACM is to identify potential corrective measure(s) for groundwater using the criteria outlined in 40 CFR 257.96 and NDAC 33.1-20-08-06(5). For source control, the engineered soil cover over the Bottom Ash Landfill is a previously implemented source control corrective measure (implemented prior to Assessment Monitoring or the ACM). If over the course of corrective action implementation and monitoring, the previously implemented source control measure is determined to be inadequate, additional source control measures may be evaluated and implemented.

For groundwater remediation, several potential corrective measures were evaluated and may be viable for remediation of arsenic downgradient of the Bottom Ash Landfill. Additional information will be gathered to further evaluate these potential corrective measures and determine which option(s) should be implemented at the site. The following sections present the additional data gathering, schedule, reporting, and next steps that will support remedy selection and corrective action implementation. The items discussed below are focused on those actions planned for the next approximately 7 months (until the first Semi-Annual Corrective Measures Remedy Selection Progress Report, July 2023). Remedy selection is anticipated within one or two years of this ACM report, dependent upon the findings of additional data gathering and option evaluation/testing.

6.1 Additional Data Gathering

Collection and evaluation of additional data are necessary to refine the conceptual site model, further characterize the nature and extent of groundwater impacts, and to further evaluate the feasibility of each potential corrective measure described in this document such that an appropriate groundwater corrective measure or combination of corrective measures may be selected.

6.1.1 Continuing Nature and Extent Investigation

As discussed in Section 4.3, drilling associated with additional nature and extent wells is scheduled for December 2022. Following installation, the newly installed wells will be developed to allow for collection of groundwater samples in 2023. The planned wells will help to further refine the horizontal and vertical extent of arsenic above the GWPS.

A Q4 2022 groundwater sample will be collected from the existing program wells and the nature and extent wells installed in May 2022. A first quarter (Q1) 2023 and second quarter (Q2) 2023 sample are planned for collection from these same wells and from the proposed additional nature and extent wells to be installed in December 2022.

Based on information gathered during the ASD investigation, the groundwater major ion signatures in samples from MW-103 do not appear to be migrating towards the major ion signatures of the potential CCR sources, indicating the potential for an as-yet identified alternate source separate from the Bottom Ash Landfill. Continued evaluation of potential sources, including coal identified in downgradient nature and extents wells, bottom ash from the unit, and upgradient site soils will continue to be investigated so that appropriate corrective measures are selected and implemented.

6.1.2 Hydraulic Testing

Following installation of the next round of nature and extent wells, in-situ hydraulic conductivity testing will be conducted at selected site wells. In-situ hydraulic conductivity testing information collected from the selected wells will contribute to the understanding of the hydrologic flow regime to assist in evaluating potential corrective measures. Understanding of the in-situ hydraulic conductivity is critical for each potential corrective measure, as the hydraulic conductivity impacts movement within the aquifer.

6.1.3 Geochemistry Evaluation

A geochemical evaluation, including Tier I MNA evaluation as described in Section 5.3.1, will be conducted over the upcoming months to determine the attenuation capacity and stability of the aquifer materials and potential attenuation mechanisms within the aquifer. The capacity and available mechanisms of the aquifer to attenuate arsenic will impact the effectiveness of any selected remedy, specifically for in situ injection or the implementation and installation of a PRB. If the Tier 1 MNA evaluation indicates favorable conditions exist for natural attenuation within the site aquifer, Tier 2/3 MNA evaluations will begin.

6.1.4 Ongoing Desktop Analysis

For each of the potential corrective measures, continued desktop analysis will be conducted to further characterize the feasibility of the measures, identify any site-specific knowledge gaps, and to gather information pertaining to the site aquifer. As additional information is gathered and evaluated, certain corrective measures may become more likely to succeed than others, and subsequent efforts will focus on the most promising corrective measures.

6.2 Schedule and Reporting

Per NDAC 33.1-20-08-06(6)(d), this ACM will be provided to the NDDEQ for review and approval. The ACM will be placed in the facility's operating record in accordance with 40 CFR 257.96(d) and NDAC 33.1-20-08-06(6)(d). Following finalization of the ACM, the 2022 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) is due January 31, 2023. As required in 40 CFR 257.96(a) and NDAC 33.1-20-08-06(6)(a), a copy of this demonstration and the certification of the demonstration by a qualified professional engineer licensed in the state of North Dakota will be included within the Annual Report. The Annual Report will also include discussion of actions taken between finalization of this demonstration and the end of 2022.

Remedy selection will occur as soon as feasible. Selection of a final remedy depends on a thorough evaluation and testing of the corrective action options to confirm the selected options are effective. Selected corrective actions must meet the standards described in Section 5.1. A semi-annual report will be prepared describing the progress to select and design a remedy, per 40 CFR 257.97(a) and NDAC 33.1-20-08-06(7)(a). The first semi-annual report will be completed by July 31, 2023. A schedule for items anticipated to be completed in the next approximately seven months is included below:

Task Description	Estimated Completion Date
■ Groundwater Sampling	Nov/Dec 2022
■ Drilling, Development, and Soil Sampling – Additional Nature and Extent Wells	Dec 2022 – Feb 2023
■ Geochemistry Evaluation (including Tier I MNA Evaluation)	Dec 2022 – Feb 2023
■ 2022 Annual Groundwater Monitoring and Corrective Action Report	Jan 2023
■ Groundwater Sampling	Mar 2023
■ In Situ Hydraulic Conductivity Testing	Apr – Jun 2023
■ Groundwater Sampling	Jun 2023
■ Ongoing Desktop Analysis	Dec 2022 – June 2023
■ First Semi-Annual Corrective Measures Remedy Selection Progress Report	Jul 2023

Prior to the final selection of a corrective measure, a public meeting will be scheduled a minimum of 30 days before the selection of the remedy to present the results of the corrective measures assessment, including additional information still to be gathered. Upon selection of a remedy, a final report will be prepared describing the selected remedy and how the remedy meets the standards described in Section 5.1. The final remedy selection report must be certified by a qualified professional engineer licensed in the state of North Dakota per 40 CFR 257.97(a), and approved by the NDDEQ per NDAC 33.1-20-08-06(7)(a). Once the remedy has been selected and approved by the NDDEQ, the implementation of the remedy will be initiated in accordance with 40 CFR 257.98 and NDAC 33.1-20-08-06(8).

Certification

This Assessment of Corrective Measures has been prepared in compliance with applicable requirements of the Federal CCR Rule (CFR 257.96) and the NDDEQ CCR Rule (NDAC 33.1-20-08).

Golder Associates USA Inc.

Erin L. Hunter, PhD
Senior Consultant

Todd J. Stong, PE
Director

ELH/TJS/rm

I certify to the best of my knowledge, information, and belief, that this ACM for arsenic at the Bottom Ash Landfill meets the applicable requirements of 40 CFR part 257.96 and NDAC 33.1-20-08.

REGISTERED PROFESSIONAL ENGINEER
TODD J. STONG
PE-6144
DATE 11/21/2022
NORTH DAKOTA

Todd J. Stong, PE

North Dakota Registered Professional Engineer No. PE-6144

https://golderassociates.sharepoint.com/sites/157762/project files/6 deliverables/reports/18-r-assessment_of_corrective_measures/18-r-0/21509219-18-rpt-0-stanton_acm_2022_21nov22.docx

7.0 REFERENCES

Braun (Braun Intertec Environmental Inc.). 1993. Hydrogeologic Assessment Report, Stanton Station Ash Ponds. Prepared for Great River Energy Stanton Generating Station.

Carlson CG. 1973. Geology of Mercer and Oliver Counties, North Dakota. Bulletin 56 – Part 1, for the North Dakota Geological Society. County Ground Water Studies 15 – Part 1, for the North Dakota State Water Commission.

Gatliff Edward, Linton James P, Riddle Douglas J, and Thomas Paul R. 2016. Phytoremediation of Soil and Groundwater. Pages 589-608, Bioremediation and Bioeconomy.

Goldemund Herwig, and Gestler Ron. 2019. Phytoremediation Using TreeWell® Technology: An Innovative Approach to Groundwater Remediation at CCR Sites. 2019 World of Coal Ash Conference.

Golder (Golder Associates Inc.). 2019a. Closure and Post-Closure Plan, Revision 1, Bottom Ash CCR Landfill – Stanton Station. September 2019

Golder. 2019b. Closure and Post-Closure Plan, Revision 1, Bottom Ash CCR Surface Impoundment – Stanton Station. September 2019.

Golder. 2020. Coal Combustion Residuals Groundwater Monitoring System Certification, Revision 1, Great River Energy – Stanton Station. January 29, 2020.

Golder (Golder Associates USA Inc.). 2021a. Coal Combustion Residuals Groundwater Statistical Method Certification, Revision 2, Great River Energy – Stanton Station. November 30, 2021.

Golder. 2021b. Construction Quality Assurance Documentation and Certification, Bottom Ash Impoundment and Landfill - Great River Energy – Stanton Station. December 17, 2021.

Golder. 2022. Post-Closure Care Plan, Permit Number 0043 - Great River Energy – Stanton Station. June 24, 2022.

ITRC (Interstate Technology & Regulatory Council). 2009. Phytotechnology Technical and Regulatory Guidance and Decision Trees, Revised. ITRC Phytotechnologies Team. Tech Reg Update, February 2009.

ITRC. 2010. A Decision Framework for Applying Monitored Natural Attenuation Processes to Metals and Radionuclides in Groundwater. ITRC Attenuation Processes for Metals and Radionuclides Team. December 2010.

ITRC. 2011. Permeable Reactive Barrier: Technology Update. PRB-5. PRB: Technology Update Team. June 2011.

Stone & Webster Engineering Corporation. 1994. Design Report, Stanton Station Ash Pond Modifications. April 25, 1994.

Tessier A, Campbell PGC, and Bisson M. 1979. Sequential extraction procedure for the speciation of particulate trace metals. Analytical Chemistry, Volume 51, No. 7, pages 844-851. June 1, 1979. Accessed online at: https://doi.org/10.1021/ac50043a017

USEPA (United States Environmental Protection Agency). 1996. Pump-and-Treat Ground-Water Remediation: A Guide for Decision Makers and Practitioners. United States Environmental Protection Agency Office of Research and Development. EPA/625/R-95/005. July 1996.

USEPA. 2015. Use of Monitored Natural Attenuation for Inorganic Contaminants in Groundwater at Superfund Sites. United States Environmental Protection Agency Office of Solid Waste and Emergency Response Directive. August 2015.

Tables

Table 1: Stanton Station Site-Specific Groundwater Protection Standards

Parameter	Units	GWPS
Appendix IV		
Antimony, Total	mg/L	0.006
Arsenic, Total	mg/L	0.01
Barium, Total	mg/L	2
Beryllium, Total	mg/L	0.004
Cadmium, Total	mg/L	0.005
Chromium, Total	mg/L	0.1
Cobalt, Total	mg/L	0.006
Fluoride	mg/L	4
Lead, Total	mg/L	0.015
Lithium, Total	mg/L	0.325
Mercury, Total	mg/L	0.002
Molybdenum, Total	mg/L	0.1
Radium-226 + Radium-228	pCi/L	5
Selenium, Total	mg/L	0.05
Thallium, Total	mg/L	0.002

Notes:

mg/L: milligrams per liter

pCi/L: picocuries per liter

GWPS: Groundwater Protection Standard

The site-specific GWPS for Lithium was derived from the pooled site upgradient lithium values.

Table 2: Source Control Corrective Measures Comparison

Corrective Measure	Performance	Reliability	Ease of Implementation	Potential Impacts	Time to Begin and Complete	Permitting / Institutional Requirements	Other Environmental or Public Health Requirements
Closure In-Place with Cover	Performance is reliant on the not having significant sustained interaction with groundwater and placed CCR, and the final cover being an engineered cover designed to minimize the potential for precipitation to infiltrate through the cover and into the CCR.	Reliability of closure in-place with a cover is dependent on the continued performance of the cover system during the post-closure period, and groundwater not rising to the point of significant interaciton with the CCR.	Implementation was completed in 2020. However, detailed design was required, along with permit updates with the NDDEQ. Implementation required extensive earthworks construction for reducing the footprint and installing the final cover.	Failure of the cover system could allow more infiltration through the CCR than desired..	Begun in 2019 and completed in 2020 prior to initiating assessment monitoring or the assessment of corrective measures.	Previously permitted and approved by the NDDEQ. Deed restrictions have previously been placed based on the current site closure configuration.	Prior to completion, construction disruptions occurred. Little to no additional disruptions are anticipated unless changes are made to the existing closed landfill.
Closure by Removal	Closure by removal removes the source and eliminates the potential for future contamination to occur due to failure of the cover system or an groundwater interaction.	Reliability for closure by removal is dependent on complete removal of source material and impacted material.	In order to implement closure by removal of the current landfill, a new landfill would need to be designed, permitted with the NDDEQ, and constructed prior to removal of material from the existing landfill.	Increase in overall risk to workers, surrounding community and the environment due to factors such as fugitive dust, heavy construction equipment operation and emissions, and potential spills and safety hazards associated with transport to the new site.	Time to begin is constrained by the need to investigate a site, design, permit, and construct a new CCR landfill, which can take upwards of 2 years. Construction of a new landfill is required prior to removal of material from the existing landfill, which may take an additional 6 to 12 months based on the current volume of CCR.	A new landfill permit will be required.	Significant disruptions will be made to the current site configuration, along with significant construction activity for developing a new landfill, remvoing CCR, and hauling CCR to the new landfill.
In-Situ Stabilization	In-situ stabilization would isolate/secure the source in a bound matrix and reduce the potential for constiuents of concern to leach from the stabilized source material. The performance will depend upon the ability to mix and the properties of the stabilized source material.	Reliability of in-situ stabilization is dependent on the ability for the injected material to solidify the matrix and change the permeability of the subsurface. For arsenic, in-situ stabilization can be a reliable corrective measure for groundwater.	Implementation requires a detailed design effort with bench scale testing to determine appropriate amendments based on the source material and aquifer properties.	In-situ stabilization may result in the stabilization of arsenic the constituent of concern, but can increase the solubility of non-target metals within the aquifer. Treatment can also result in undesirably high pH levels if the buffering capacity of the system is not maintained.	Time to begin and complete in-situ stabilization would be dependent on the availability of specialized contractors and equipment, and may take several years.	Deed restrictions have previously been placed based on site closure. No other institutional requirements are anticipated.	Pilot testing would be required to determine impacts to groundwater chemistry based on addition of the ISS components. Following installation, the remedy is passive.

Table 3: Groundwater Remediation Corrective Measures Comparison

Corrective Measure	Performance	Reliability	Ease of Implementation	Potential Impacts	Time to Begin and Complete	Permitting / Institutional Requirements	Other Environmental or Public Health Requirements
Monitored Natural Attenuation and Enhanced Monitored Natural Attenuation	Assuming available capacity, MNA can provide continued effective performance in reducing constituent concentrations.	Reliability is dependent on aquifer conditions that favor arsenic attenuation or can be enhanced, and that sufficient attenuation capacity exists within the aquifer. MNA is reliable and can either be used as a stand-alone corrective measure for groundwater impacted by arsenic, or in combination with other technologies.	Little to no effort required for physical implementation of standard MNA, but moderate to complex effort required to fully and accurately implement and document as a corrective measure. Enhanced MNA may require additional installation requirements, including well installation. Additional data is needed to demonstrate that the aquifer has sufficient attenuation capacity to meet the stated site objectives within a reasonable time frame.	No known impacts. MNA relies on the natural processes and existing geologic materials within the aquifer to reduce constituent concentrations, toxicity, and mobility without disturbing the installed cover or subsurface materials.	Evaluation for MNA can begin immediately, but substantial completion of evaluation and demonstration of attenuation mechanisms may require up to 2 years. Long-term monitoring and reporting are likely required.	No additional requirements, as deed restrictions have previously been placed due to site closure.	Little to no physical disruption to remediation areas and no adverse construction impacts are expected.
Hydraulic Containment (Groundwater Pump and Treat)	Pump and treat can effectively provide hydraulic control throughout the operational life of the system. Performance is contingent on routine groundwater assessment throughout the pumping process, and may not be quickly effective. Performance is additionally predicated on disposal of treated water and/or waste treatment sludge. Pump and treat can be less effective for inorganic compounds, like arsenic.	Generally reliable for hydraulic control of the groundwater plume and migration of contaminants of interest.	Implementation is easy to moderate, as a proven approach. Additional extraction wells and trenches would need to be installed.	Potential impacts are related to the operation of an on-site, above-ground water treatment facility and associated infrastructure for treatment and conveyance of impacted groundwater. Pumping may unintentionally alter geochemistry of the aquifer, in addition to the intended alteration of hydraulic flow pathways.	Extraction wells and trenches can be installed relatively quickly (generally within 6 to 12 months), but additional aquifer testing, overall system design, installation, and optimization, and permit approvals may be required, with lead times up to 2 years. Time for construction of any water treatment components may be variable depending on the scale of the chosen treatment process. Treatment timeline may extend for multiple years.	Depending on the effluent management strategy, a groundwater extraction permit and/or a NPDES discharge permit may be required, or an underground injection control (UIC) permit may be required if groundwater reinjection is chosen. Deed restrictions have previously been enacted based on site closure.	Above ground treatment components may be required for extended periods of time, resulting in waste residuals requiring management and disposal.
Geochemical Approaches (In-Situ Injection)	In-situ injection can rapidly alter aquifer conditions, resulting in geochemical immobilization of constituents of concern. Continued monitoring is required to ensure that aquifer conditions remain favorable for containing constituents of interest while not resulting in mobilization of other metals.	Approach is reliable if injected materials can be evenly distributed throughout the aquifer, permeability of the aquifer materials is adequate to allow for distribution, and available volume of appropriate receptors exists within the aquifer.	Moderate. May require installation of additional infrastructure for injection (additional wells for injection or other means of injection). Bench and pilot testing may be required to optimize implementation.	Minimal negative impacts are anticipated if the remedy works as designed. Additional constituents may be mobilized as an unintended consequence if appropriate steps are not taken prior to remedy implementation.	Optimization via bench-scale and pilot testing is required prior to implementation, and may require up to 2 years. Additional wells can be installed relatively quickly following pilot testing. Completion time would be variable based on attenuation mechanisms within the aquifer and distribution of injected materials within the treatment area.	An underground injection control (UIC) permit may be required for in-situ injections in order to implement this corrective measure. Deed restrictions have previously been enacted based on site closure.	None anticipated. Potential for mobilization of additional redox-sensitive components. Additional infestation of downgradient receptors is necessary. Remedy is passive following installation.

Table 3: Groundwater Remediation Corrective Measures Comparison

Corrective Measure	Performance	Reliability	Ease of Implementation	Potential Impacts	Time to Begin and Complete	Permitting / Institutional Requirements	Other Environmental or Public Health Requirements
Permeable Reactive Barriers (PRBs)	PRBs may have a limited reactive lifespan, dependent in part on the characteristics of the aquifer and the chosen reactive material. Without replacement of the reactive material within the PRB, extended performance of the corrective measure may not be possible. Additional testing may be required to select an appropriate sorptive media. PRBs also require vertical installation to key into low permeability zones and horizontal extents wide enough to prevent impacted groundwater from going around and/or under the PRB.	PRBs are a reliable corrective measure, but loss of reactivity over time may require re-installation depending on the length of time to reach the required GWPS. Reliability may be improved based on the ease of access to intercept the flow of groundwater. Additional data collection, may be needed to characterize the attenuation mechanisms present within the aquifer and select an appropriate reactive media.	Implementation is moderate to difficult. Based on differentiation of the stratigraphic units, may require additional drilling for confirmation of an appropriate confining unit for constraining hydraulic movement. Trenching is necessary for installation.	Dependent on the materials used for PRB, mobilization of additional constituents may occur based on changing conditions within the aquifer. Short-term impacts may occur during construction of the PRB, but can be mitigated through appropriate planning. Positive impacts include reduction in the volume, mobility, or toxicity of the constituent of interest through precipitation within the reactive media.	Installation of a PRB can be accomplished in roughly 1 year, depending on the final location and configuration. Bench- and/or pilot-scale testing would be necessary prior to design and construction of the remedy, which may take up to 2 years.	Deed restrictions have previously been placed based on site closure. No other institutional requirements are anticipated.	Following installation, PRBs are a passive remedy. Certain treatment media have the potential to mobilize additional naturally-occurring constituents downgradient of the PRB.
Phytoremediation	Once established, phytoremediation can effectively provide hydraulic containment, and provide potential reduction of constituents of interest through immobilization, uptake, and/or sequestration within the biomass. It may take between 3 and 5 years following planting for the system to begin performing. Phytoremediation may be limited by site climate conditions and depth to groundwater.	When implemented as an engineered system, phytoremediation must account for the characteristics of the aquifer, including the hydraulic conductivity, flow velocity, depth to impacted groundwater, and other factors. Reliability is dependent on careful design of the system.	Implementation is easy to moderate. Trees must be installed to appropriate depths to intercept impacted groundwater. Once established, trees are self-maintaining with no required external energy requirements and little maintenance.	Minimal anticipated negative impacts. Positive impacts include enhanced aesthetics, additional wildlife habitat, and minimal energy usage.	Optimization via groundwater modeling is required, which may take between 6 and 9 months. Installation is relatively short and can be substantially completed within a few months. Hydraulic control may take between 3 and 5 years following planting, but system performance is anticipated to improve over time.	Deed restrictions have previously been placed based on site closure. No other institutional requirements are anticipated.	None anticipated. Following installation, remedy is passive and does not require external energy.

Figures

LEGEND

- BOTTOM ASH LANDFILL DOWNGRADIENT MONITORING WELL
- UPGRADIENT MONITORING WELL
- 0.0097 / 1690.8 — ARSENIC CONCENTRATION (mg/L) - (NOTE 5) GROUNDWATER ELEVATION (ft) - (NOTE 4)
- CLOSED BOTTOM ASH LANDFILL/IMPOUNDMENT FOOTPRINT
- GENERAL DIRECTION OF GROUNDWATER FLOW
- APPROXIMATE GROUNDWATER CONTOURS AND ELEVATIONS (NOTE 4)

NOTE(S)

1. THE BOTTOM ASH LANDFILL WAS CLOSED BY CONSOLIDATION OF PLACED WASTE INTO A SMALLER FOOTPRINT AND CONSTRUCTION OF A FINAL COVER.
2. THE NORTH AND CENTER CELLS OF BOTTOM ASH IMPOUNDMENT WERE CLOSED BY REMOVAL OF WASTE AND LINER.
3. THE SOUTH CELL OF THE BOTTOM ASH IMPOUNDMENT WAS CLOSED WITH A FINAL COVER OVER PLACED WASTE.
4. GROUNDWATER CONTOURS ARE BASED ON MAY AND JUNE 2022 ELEVATION INFORMATION FROM THE SHOWN MONITORING WELLS, AS WELL AS MONITORING WELLS AND PIEZOMETERS NOT SHOWN.
5. ARSENIC CONCENTRATIONS ARE BASED ON LAB RESULTS FROM SAMPLES COLLECTED MAY AND JUNE 2022.

REFERENCE(S)

AERIAL IMAGERY OBTAINED FROM UNITED STATES DEPARTMENT OF AGRICULTURE, NATIONAL AGRICULTURE IMAGERY PROGRAM, 2021.

N

0 250 500
1" = 500' FEET

Path: \\golder.gds\complexdata\office\Denver\acad\GREAT RIVER ENERGY\STANTON\99_PROJECTS\21509219\ACM\ | File Name: Figure 1.dwg

WSP GOLDER

GREAT RIVER ENERGY - STANTON STATION

BOTTOM ASH LANDFILL MONITORING WELL NETWORK

FIGURE 1

LEGEND

- BOTTOM ASH LANDFILL DOWNGRADIENT MONITORING WELL
- NATURE AND EXTENT WELL (NOTE 4)
- OTHER SITE MONITORING WELL/BOREHOLE
- UPGRADIENT MONITORING WELL
- 0.0023 / 1702.7 — ARSENIC CONCENTRATION (mg/L) - (NOTE 2) / GROUNDWATER ELEVATION (ft) - (NOTE 1)
- CLOSED BOTTOM ASH LANDFILL FOOTPRINT
- GENERAL DIRECTION OF GROUNDWATER FLOW
- APPROXIMATE GROUNDWATER CONTOURS AND ELEVATIONS (NOTE 1)

NOTE(S)

1. GROUNDWATER CONTOURS ARE BASED ON MAY AND JUNE 2022 ELEVATION INFORMATION FROM THE SHOWN MONITORING WELLS, AS WELL AS MONITORING WELLS AND PIEZOMETERS NOT SHOWN.
2. ARSENIC CONCENTRATIONS ARE BASED ON LAB RESULTS FROM SAMPLES COLLECTED MAY AND JUNE 2022.
3. BH-1 IS THE LOCATION WHERE A SAMPLE OF CCR SOLIDS FROM THE BOTTOM ASH LANDFILL WAS COLLECTED.
4. NATURE AND EXTENT WELLS MW-210 THROUGH MW-214 WERE INSTALLED MAY 2022. MW-PB1 WAS INCORPORATED INTO THE NATURE AND EXTENT EVALUATION AS A FACILITY BOUNDARY WELL.

REFERENCE(S)

AERIAL IMAGERY OBTAINED FROM UNITED STATES DEPARTMENT OF AGRICULTURE, NATIONAL AGRICULTURE IMAGERY PROGRAM, 2021.

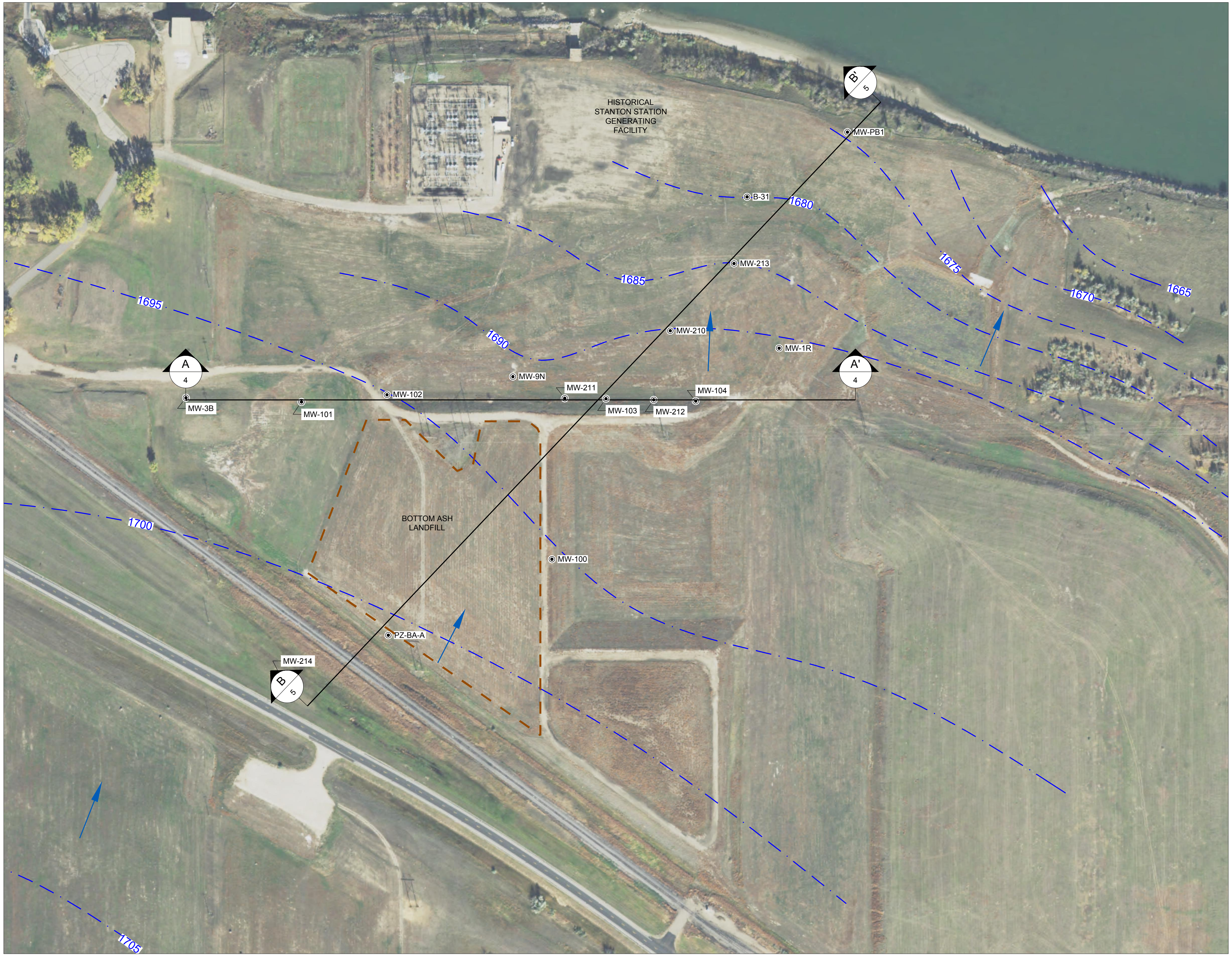
Path: \\golder.gds\complexdata\office\Denver\acad\GREAT RIVER ENERGY\STANTON\99_PROJECTS\21509219\ACM\ | File Name: Figure 2+6a.dwg

WSP GOLDER

GREAT RIVER ENERGY - STANTON STATION

ARSENIC SSL NATURE AND EXTENT

FIGURE 2



LEGEND

- BORING LOCATIONS
- CLOSED BOTTOM ASH LANDFILL FOOTPRINT
- GENERAL DIRECTION OF GROUNDWATER FLOW
- APPROXIMATE GROUNDWATER CONTOURS AND ELEVATIONS (NOTE 1)

NOTE(S)

1. GROUNDWATER CONTOURS ARE BASED ON MAY AND JUNE 2022 ELEVATION INFORMATION FROM THE SHOWN MONITORING WELLS, AS WELL AS MONITORING WELLS AND PIEZOMETERS NOT SHOWN.

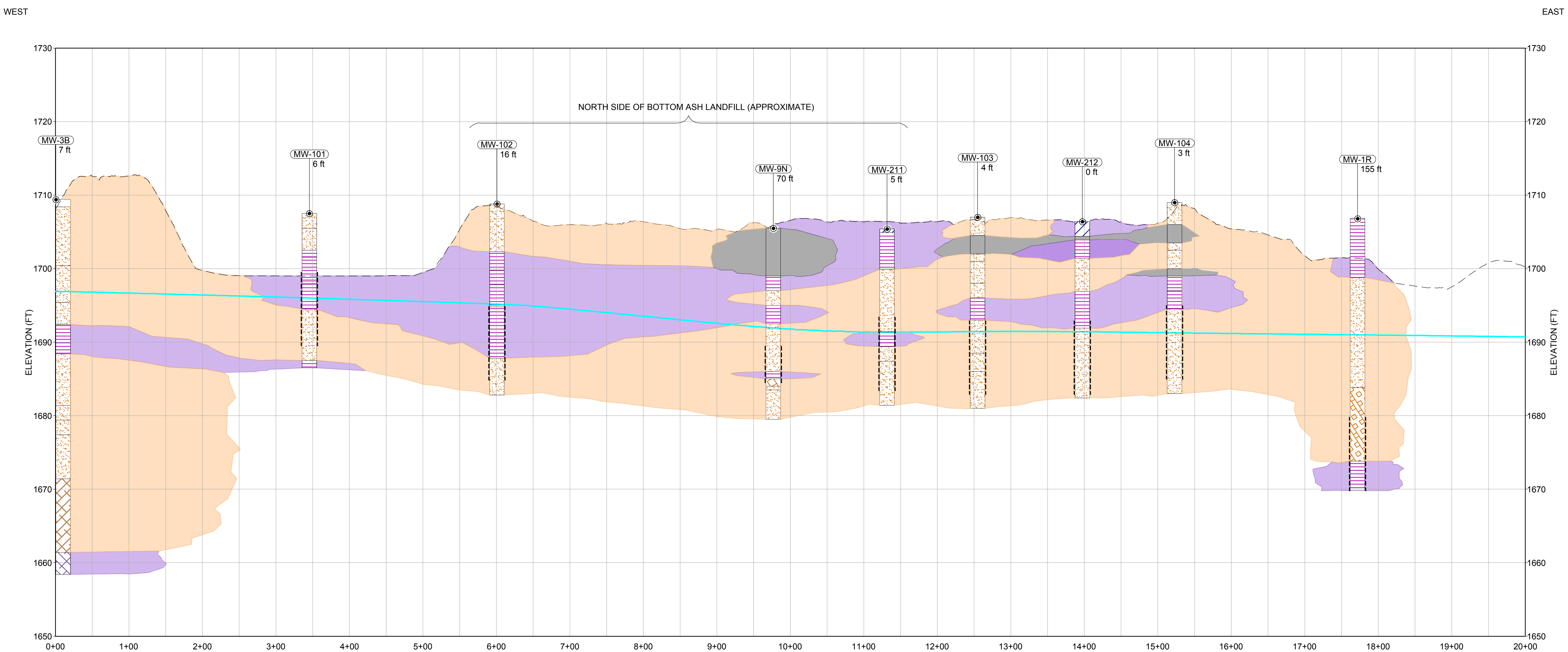
REFERENCE(S)

AERIAL IMAGERY OBTAINED FROM UNITED STATES DEPARTMENT OF AGRICULTURE, NATIONAL AGRICULTURE IMAGERY PROGRAM, 2021.

WSP GOLDER

GREAT RIVER ENERGY - STANTON STATION
LOCATIONS OF STRATIGRAPHIC SECTIONS

FIGURE 3



SCALE 1"=150' A SECTION WEST TO EAST
VERT. SCALE 10:1 3

GEOLOGY LEGEND

LOW PERMEABILITY MATERIALS — CLAY, CLAY LINER, SILT, SILTSTONE/ SHALE

HIGH PERMEABILITY MATERIALS — SAND, SANDSTONE, SAND WITH GRAVEL, GRAVEL

OTHER — COAL, CCR

LEGEND

- EXISTING TOPOGRAPHY (REFERENCE 1)
- APPROXIMATE GROUNDWATER SURFACE (NOTE 4)
- ACTIVE WELL/PIEZOMETER SCREENED INTERVAL
- MW-101 6 ft — DISTANCE BORING PROJECTED TO SECTION (NOTES 1 AND 2)

NOTE(S)

1. HISTORIC BORING INFORMATION IS BASED ON INFORMATION PROVIDED BY GREAT RIVER ENERGY. THE ELEVATIONS OF BORINGS ARE APPROXIMATE AND BORING INFORMATION HAS BEEN PROJECTED TO APPLICABLE SECTIONS.
2. TOP OF BORING MAY NOT MATCH EXISTING TOPOGRAPHY DUE TO BORINGS BEING PROJECTED TO STRATIGRAPHIC SECTION AND SITE CHANGES BETWEEN BORING DATE AND DATE OF EXISTING TOPOGRAPHY.
3. INTERPRETATION BETWEEN MATERIAL TYPE BOUNDARIES WERE DRAWN BASED ON BORING INFORMATION OBSERVATIONS. THESE BOUNDARIES ARE SHOWN FOR INFORMATION ONLY.
4. GROUNDWATER CONTOURS ARE BASED ON MAY AND JUNE 2022 ELEVATION INFORMATION FROM THE SHOWN MONITORING WELLS, AS WELL AS MONITORING WELLS AND PIEZOMETERS NOT SHOWN.

REFERENCE(S)

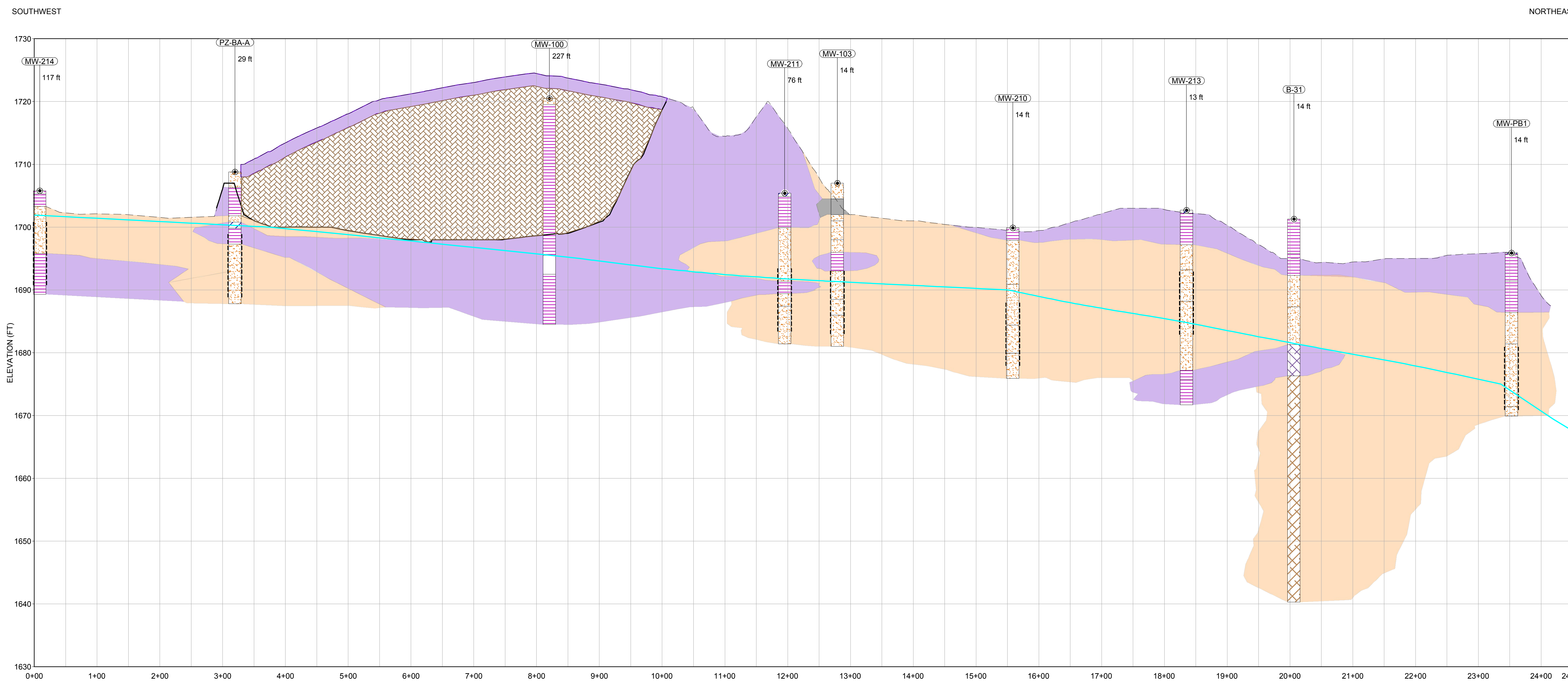
1. EXISTING TOPOGRAPHY FROM STANTON STATION RESTORATION POST-CONSTRUCTION SURVEY TAKEN IN 2020.

WSP GOLDER

GREAT RIVER ENERGY - STANTON STATION
STRATIGRAPHIC SECTION A

FIGURE 4

Path: \\golder.gds\complex\data\office\Denver\acad\GREAT RIVER ENERGY\STANTON\99_PROJECTS\21509219\ACM\ | File Name: Figure 3-5.dwg



SCALE 1"=160' B SECTION SOUTHWEST TO NORTHEAST
VERT. SCALE 10:1 3

GEOLOGY LEGEND

LOW PERMEABILITY MATERIALS — HIGH PERMEABILITY MATERIALS — OTHER

CLAY, CLAY LINER, SILT, SILTSTONE/ SHALE, SAND, SANDSTONE, SAND WITH GRAVEL, GRAVEL, COAL, CCR

LEGEND

- EXISTING TOPOGRAPHY (REFERENCE 1)
- APPROXIMATE GROUNDWATER SURFACE (NOTE 3)
- APPROXIMATE BASE OF BOTTOM ASH LANDFILL (NOTE 5)
- ACTIVE WELL/PIEZOMETER SCREENED INTERVAL
- MW-101 6 ft — DISTANCE BORING PROJECTED TO SECTION (NOTES 1 AND 2)

NOTE(S)

1. HISTORIC BORING INFORMATION IS BASED ON INFORMATION PROVIDED BY GREAT RIVER ENERGY. THE ELEVATIONS OF BORINGS ARE APPROXIMATE AND BORING INFORMATION HAS BEEN PROJECTED TO APPLICABLE SECTIONS.
2. TOP OF BORING MAY NOT MATCH EXISTING TOPOGRAPHY DUE TO BORINGS BEING PROJECTED TO STRATIGRAPHIC SECTION AND SITE CHANGES BETWEEN BORING DATE AND DATE OF EXISTING TOPOGRAPHY.
3. INTERPRETATION BETWEEN MATERIAL TYPE BOUNDARIES WERE DRAWN BASED ON BORING INFORMATION OBSERVATIONS. THESE BOUNDARIES ARE SHOWN FOR INFORMATION ONLY.
4. GROUNDWATER CONTOURS ARE BASED ON MAY AND JUNE 2022 ELEVATION INFORMATION FROM THE SHOWN MONITORING WELLS, AS WELL AS MONITORING WELLS AND PIEZOMETERS NOT SHOWN.
5. BASE OF BOTTOM ASH LANDFILL APPROXIMATED FROM NOVEMBER 13, 1997 TOPOGRAPHY. ACTUAL BASE OF BOTTOM ASH LANDFILL MAY BE HIGHER.

REFERENCE(S)

1. EXISTING TOPOGRAPHY FROM STANTON STATION RESTORATION POST-CONSTRUCTION SURVEY TAKEN IN 2020.

WSP GOLDER

GREAT RIVER ENERGY - STANTON STATION
STRATIGRAPHIC SECTION B

FIGURE 5

LEGEND

- BOTTOM ASH LANDFILL DOWNGRADIENT MONITORING WELL
- NATURE AND EXTENT WELL (NOTE 4)
- OTHER SITE MONITORING WELL/BOREHOLE
- UPGRADIENT MONITORING WELL
- PROPOSED ADDITIONAL NATURE AND EXTENT WELLS (NOTE 5)
- 0.0023 / 1702.7 — ARSENIC CONCENTRATION (mg/L) - (NOTE 2) GROUNDWATER ELEVATION (ft) - (NOTE 1)
- CLOSED BOTTOM ASH LANDFILL FOOTPRINT
- GENERAL DIRECTION OF GROUNDWATER FLOW
- APPROXIMATE GROUNDWATER CONTOURS AND ELEVATIONS (NOTE 1)

NOTE(S)

1. GROUNDWATER CONTOURS ARE BASED ON MAY AND JUNE 2022 ELEVATION INFORMATION FROM THE SHOWN MONITORING WELLS, AS WELL AS MONITORING WELLS AND PIEZOMETERS NOT SHOWN.
2. ARSENIC CONCENTRATIONS ARE BASED ON LAB RESULTS FROM SAMPLES COLLECTED MAY AND JUNE 2022.
3. BH-1 IS THE LOCATION WHERE A SAMPLE OF CCR SOLIDS FROM THE BOTTOM ASH LANDFILL WAS COLLECTED.
4. NATURE AND EXTENT WELLS MW-210 THROUGH MW-214 WERE INSTALLED MAY 2022. MW-PB1 WAS INCORPORATED INTO THE NATURE AND EXTENT EVALUATION AS A FACILITY BOUNDARY WELL.
5. MW-220 AND MW-221 ARE PLANNED TO BE SCREENED AT LOWER ELEVATIONS TO EVALUATE POTENTIAL VERTICAL NATURE AND EXTENT NEAR MW-103.

REFERENCE(S)

AERIAL IMAGERY OBTAINED FROM UNITED STATES DEPARTMENT OF AGRICULTURE, NATIONAL AGRICULTURE IMAGERY PROGRAM, 2021.

WSP GOLDER

GREAT RIVER ENERGY - STANTON STATION
PROPOSED ADDITIONAL NATURE AND EXTENT WELLS

FIGURE 6

APPENDIX A

Bottom Ash Landfill Closure Drawings

GREAT RIVER ENERGY - STANTON STATION
SCOPE OF WORK E
BOTTOM ASH LANDFILL CLOSURE

Prepared for:

GREAT RIVER ENERGY.

Stanton Station
Stanton, North Dakota

Prepared by:

GOLDER

Golder Associates Inc.
7245 W Alaska Dr., Suite 200
Lakewood, Colorado USA 80226

NORTH AND CENTER CELLS CLOSURE DRAWING SET		
DRAWING NO.	TITLE	REVISION
E1	TITLE SHEET	0
E2	GENERAL NOTES AND QUANTITIES	0
E3	EXISTING CONDITIONS	0
E4	TOP OF WASTE AND WEST CONTAINMENT BERM	0
E5	TOP OF FINAL COVER	0
E6	SECTIONS	0
E7	DETAILS	0

ADDITIONAL OVERALL SITE INFORMATION IS INCLUDED ON DRAWINGS 1 THROUGH 7

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2019-07-19	ISSUED FOR CONSTRUCTION	MRS	MRS	RFS	TJS

SEAL

REGISTERED PROFESSIONAL ENGINEER TODD J. STONG PE-6144 NORTH DAKOTA DATE 7/19/19

CLIENT
GREAT RIVER ENERGY
STANTON STATION
STANTON, NORTH DAKOTA

CONSULTANT
GOLDER
GOLDER ASSOCIATES INC.
7245 W ALASKA DR., SUITE 200
LAKEWOOD, COLORADO
USA
(303) 980-0540
www.golder.com

PROJECT
STANTON SITE RESTORATION
BOTTOM ASH LANDFILL CLOSURE

TITLE
TITLE SHEET

PROJECT NO. 1775717 REV. 0 E1 of E7 DRAWING E1

PROJECT DESCRIPTION

THE BOTTOM ASH LANDFILL CLOSURE CONSTRUCTION SCOPE OF WORK CONSISTS OF REGRADING IN-PLACE AND CONSOLIDATING COAL COMBUSTION RESIDUALS AND OTHER APPROVED CONSTRUCTION AND DEMOLITION MATERIAL PLACED WITHIN THE BOTTOM ASH LANDFILL TO BETWEEN 3% AND 15% GRADES, CONSTRUCTING A CONTAINMENT BERM ON THE WEST SIDE OF THE LANDFILL FOOTPRINT, PLACING INFILTRATION LAYER AND TOPSOIL AS REQUIRED TO COVER THE LANDFILL AND DIRECT SURFACE WATER OFF OF THE FINAL COVERED LANDFILL.

BOTTOM ASH LANDFILL CLOSURE GENERAL NOTES AND SPECIFICATIONS

1. BOTTOM ASH AND OTHER SOIL-LIKE MATERIALS DEPOSITED IN THE BOTTOM ASH LANDFILL SHALL BE PLACED AND COMPACTED TO PRODUCE A FIRM AND UNYIELDING TOP OF WASTE SURFACE. THESE MATERIALS SHALL BE MOISTURE-CONDITIONED DURING PLACEMENT.

2. THE LOCATION OF THE CONSTRUCTION AND DEMOLITION MATERIAL DISPOSAL AREA IN THE BOTTOM ASH LANDFILL SHOWN ON THE DRAWINGS IS APPROXIMATE AND SHALL BE CONFIRMED WITH THE OWNER'S REPRESENTATIVE.

3. CONSTRUCTION OF THE CONSTRUCTION AND DEMOLITION DISPOSAL AREA IN THE BOTTOM ASH LANDFILL IS CONSIDERED INCIDENTAL TO COMPLETION OF THE OVERALL STANTON STATION SITE RESTORATION PROJECT. THE CONSTRUCTION AND DEMOLITION DISPOSAL AREA SHALL BE APPROXIMATELY 10 FEET DEEP (FROM EXISTING TOPOGRAPHY AND SHALL HAVE SLOPES NO STEEPER THAN 3H:1V. CELLS SHALL NOT BE EXCAVATED BELOW ELEVATION 1705 FEET AND CONSTRUCTION AND DEMOLITION DEBRIS SHALL NOT BE PLACED ABOVE ELEVATION 1720 FEET. THE MAXIMUM SIZE OF THE CONSTRUCTION AND DEMOLITION DISPOSAL AREA SHALL NOT EXCEED 2 ACRES IN SIZE AT ANY TIME. LARGE CONSTRUCTION AND DEMOLITION MATERIALS SHALL BE BROKEN DOWN INTO PIECES LESS THAN APPROXIMATELY 1 FOOT BY 1 FOOT IN SIZE.

4. CONSTRUCTION AND DEMOLITION MATERIAL SHALL BE COMPACTED AS MUCH AS PRACTICAL (APPROXIMATELY 4 TO 6 PASSES OF HEAVY EQUIPMENT) PRIOR TO BEING COVERED WITH BOTTOM ASH OR OTHER SOIL-LIKE MATERIALS TO ACHIEVE FINAL TOP OF WASTE GRADES.

5. CONTRACTOR IS RESPONSIBLE FOR PROVIDING WRITTEN DOCUMENTATION (DISPOSAL FORM) OF MATERIAL DISPOSED OF WITHIN THE CONSTRUCTION AND DEMOLITION AREA OF THE BOTTOM ASH LANDFILL AND/OR SOUTH CELL. THIS DISPOSAL FORM SHALL INCLUDE INFORMATION ON THE NATURE OF THE CONSTRUCTION AND DEMOLITION MATERIAL, WHERE IT IS BEING PLACED, AND THE APPROXIMATE QUANTITY OF MATERIAL (IN TONS).

6. BOTTOM ASH ON THE FLOOR OF THE EXISTING WEST PORTION OF THE BOTTOM ASH LANDFILL SHALL BE REMOVED AND PLACED IN THE BOTTOM ASH LANDFILL FOOTPRINT AS SHOWN IN THESE DRAWINGS. REMOVAL OF BOTTOM ASH IN THIS AREA SHALL BE VERIFIED BY THE OWNER'S REPRESENTATIVE IN WRITING PRIOR TO THE WORK BEING COMPLETED.

7. THE WEST CONTAINMENT BERM OF THE PROPOSED BOTTOM ASH LANDFILL FOOTPRINT INCLUDED IN THESE DRAWINGS SHALL NOT BE CONSTRUCTED ON SOFT OR SATURATED SOIL. SUBCUT MAY BE REQUIRED SO AS TO PROVIDE A FIRM AND UNYIELDING BASED FOR BERM CONSTRUCTION.

8. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING CONTACT WATER WITHIN THE BOTTOM ASH LANDFILL FOOTPRINT. TEMPORARY CONTACT WATER MANAGEMENT BERMS MAY BE REQUIRED DURING CONSTRUCTION TO CONTAIN WATER WITHIN THE LANDFILL. CONTRACTOR TO FOLLOW PROJECT REQUIREMENTS FOR DISCHARGE OF THIS WATER.

9. THE APPROXIMATE DISTANCE FROM THE TOPSOIL BORROW AREA TO THE BOTTOM ASH LANDFILL CLOSURE EXTENTS IS 0.5 MILES ONE-WAY.

10. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING HAUL ROADS BETWEEN THE BOTTOM ASH LANDFILL, RIVER, WATER SOURCE, DEPOSITION LOCATIONS, WATER DISCHARGE LOCATIONS, AND BORROW AREAS TO PROVIDE ADEQUATE ACCESS THROUGHOUT CONSTRUCTION.

11. CONTRACTOR IS RESPONSIBLE FOR ALL DEWATERING REQUIRED TO COMPLETE THE WORK.

12. IN ORDER TO DISCHARGE WATER DURING CONSTRUCTION, THE CONTRACTOR MUST COMPLETE THE FOLLOWING STEPS:
    a. CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE AT LEAST FIVE (5) BUSINESS DAYS PRIOR TO DISCHARGE TO ALLOW FOR WATER SAMPLING/TESTING.
    b. BASED ON WATER TESTING RESULTS, CONTRACTOR WILL BE NOTIFIED BY THE OWNER'S REPRESENTATIVE TO DISCHARGE WATER TO ONE (1) OF TWO (2) LOCATIONS:
        i. TO THE MISSOURI RIVER THROUGH A SEDIMENT FILTER BAG USING AN EXISTING OUTFALL LOCATION APPROVED BY THE OWNER'S REPRESENTATIVE.
        ii. TO THE SOUTH CELL OF THE BOTTOM ASH IMPOUNDMENT WHERE THE OWNER WILL PERIODICALLY PUMP AND HAUL OFFSITE FOR DISPOSAL OR TREAT AND DISCHARGE.
    c. RECORD THE VOLUME OF WATER BEING DISCHARGED TO EACH LOCATION AND REPORT ON A WEEKLY BASIS TO THE OWNER'S REPRESENTATIVE.

ABBREVIATIONS

AC	ACRE
BAL	BOTTOM ASH LANDFILL
CCR	COAL COMBUSTION RESIDUAL
C&D	CONSTRUCTION AND DEMOLITION
℄	CENTERLINE
CY	CUBIC YARD
DWG	DRAWING
EL.	ELEVATION
ft	FEET
GOLDER	GOLDER ASSOCIATES INC.
GRE	GREAT RIVER ENERGY
HDPE	HIGH DENSITY POLYETHYLENE
in	INCH
LF	LINEAR FOOT
MIN.	MINIMUM
NTS	NOT TO SCALE
SF	SQUARE FOOT
SOW	SCOPE OF WORK
TYP.	TYPICAL

REFERENCES

1. SITE LOCATION: T144N, R84W, MERCER COUNTY, NORTH DAKOTA.

2. AERIAL IMAGE IS A COMBINATION OF IMAGERY OBTAINED FROM THE UNITED STATES DEPARTMENT OF AGRICULTURE NATIONAL AERIAL IMAGE PROGRAM, ACQUIRED IN 2018, AND IMAGERY PROVIDED BY GRE, ACQUIRED IN JUNE 2018.

3. EXISTING GROUND TOPOGRAPHY IS FROM AN AERIAL SURVEY PERFORMED BY KBM, INC. ON APRIL 27, 2001 (SITE WIDE), A GROUND SURVEY PERFORMED BY INTERSTATE ENGINEERING IN 2014 (BOTTOM ASH IMPOUNDMENT AND LANDFILL AREA), A GROUND SURVEY PERFORMED BY INTERSTATE ENGINEERING IN 2017 (COAL PILE AREA), AND A GROUND SURVEY PERFORMED BY INTERSTATE ENGINEERING IN 2018.

BID ITEM QUANTITIES

TYPE	LOCATION/PURPOSE	SIZE	QUANTITY	NOTES
UNSUITABLE MATERIAL	BOTTOM ASH LANDFILL	N/A	4,800 CY	INCLUDES SOME ORGANICS
BOTTOM ASH REGRADING	BOTTOM ASH LANDFILL	N/A	12,700 CY	
CUT TO EMBANKMENT FILL	BOTTOM ASH LANDFILL WEST CONTAINMENT BERM	N/A	3,000 CY	INCLUDES USE OF EMBANKMENT FILL FOR KEY BELOW EXISTING GROUND AND FOR CONSTRUCTION OF BERM ABOVE EXISTING GROUND
CUT TO INFILTRATION LAYER	BOTTOM ASH LANDFILL FINAL COVER	N/A	23,600 CY	
FERTILIZER	BOTTOM ASH LANDFILL FINAL COVER	N/A	10.0 AC	
TOPSOIL (BORROW)	BOTTOM ASH LANDFILL FINAL COVER	N/A	9,400 CY	
SEED AND MULCH (FINAL COVER MIX)	BOTTOM ASH LANDFILL FINAL COVER	N/A	11.0 AC	
SILT FENCE EROSION CONTROLS	BOTTOM ASH LANDFILL	36 in	1,400 LF	

* QUANTITIES PRESENTED MAY NOT ACCOUNT FOR WASTE, SHRINK, SWELL, OR OTHER ADDITIONAL QUANTITY REQUIRED TO COMPLETE THE WORK.
* ITEMS ABOVE REFLECT QUANTITIES TO BE MEASURED AS DESCRIBED IN THE MEASURE AND PAYMENT.
* ADDITIONAL MATERIALS REQUIRED TO COMPLETE THE WORK MAY NOT BE SHOWN IN THIS TABLE (SEE MEASURE AND PAYMENT)

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2019-07-19	ISSUED FOR CONSTRUCTION	MRS	MRS	RFS	TJS

SEAL

REGISTERED PROFESSIONAL ENGINEER
TODD J. STONG
PE-6144
DATE 7/19/19
NORTH DAKOTA

CLIENT
GREAT RIVER ENERGY
STANTON STATION
STANTON, NORTH DAKOTA

CONSULTANT

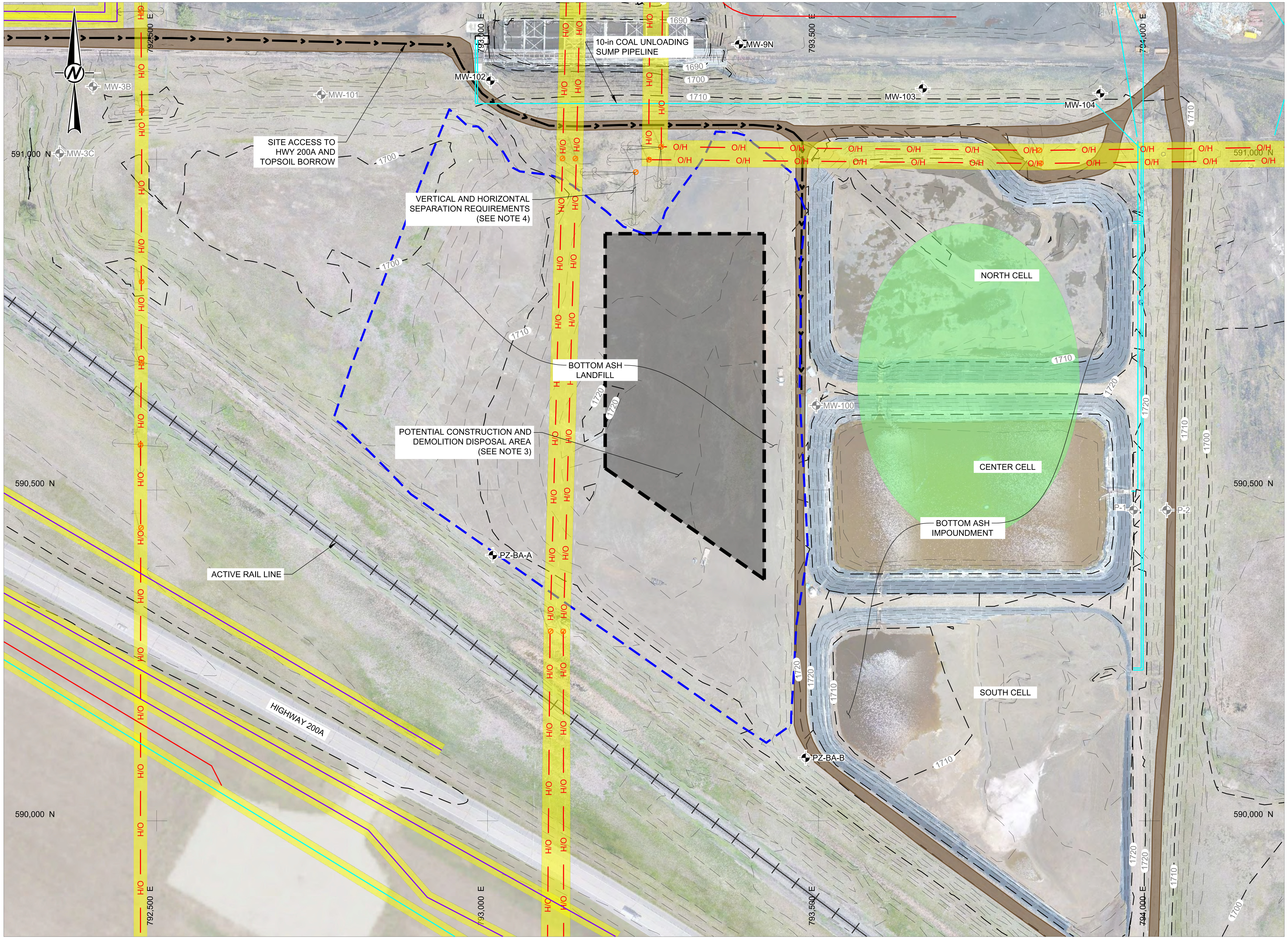
GOLDER

GOLDER ASSOCIATES INC.
7245 W ALASKA DR., SUITE 200
LAKEWOOD, COLORADO
USA
(303) 980-0540
www.golder.com

PROJECT
STANTON SITE RESTORATION
BOTTOM ASH LANDFILL CLOSURE

TITLE
GENERAL NOTES AND QUANTITIES

PROJECT NO. 1775717 | REV. 0 | E2 of E7 | DRAWING E2



LEGEND

- 3600 EXISTING GROUND TOPOGRAPHY (REFERENCES 3 AND 4)
- CONSTRUCTION AND DEMOLITION DISPOSAL AREA (APPROXIMATE) (NOTE 3)
- BOTTOM ASH LANDFILL CLOSURE EXTENTS (APPROXIMATE)
- POTENTIAL TOPSOIL BORROW AREA HAUL ROUTE (0.5 MILES ONE-WAY)
- EXISTING POWER POLES
- WATER PIPING (BURIED) (NOTE 1)
- ELECTRICAL (BURIED) (NOTE 1)
- O/H OVERHEAD ELECTRIC LINE (NOTES 1 AND 4)
- COMMUNICATIONS (BURIED) (NOTE 1)
- ACTIVE UTILITY (NOTE 1)
- MW-10 MONITORING WELLS/PIEZOMETERS (NOTE 2)
- MW-10 MONITORING WELLS/PIEZOMETERS TO BE ABANDONED (BY OTHERS)
- EXISTING ACCESS ROAD
- ACTIVE RAIL LINE
- INFILTRATION LAYER AND EMBANKMENT FILL SOURCE (NOTE 5)

NOTE(S)

1. LOCATIONS AND DIMENSIONS OF EXISTING UTILITIES ARE APPROXIMATE AND ARE BASED ON DESIGN DRAWINGS AND/OR AS-BUILT INFORMATION PROVIDED BY GRE AND SHOULD BE FIELD VERIFIED BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING UTILITIES WHEN PERFORMING WORK NEAR MARKED LINES.
2. CARE SHALL BE TAKEN WHEN WORKING NEAR EXISTING MONITORING WELLS/PIEZOMETERS. ANY DAMAGE TO MONITORING WELLS/PIEZOMETERS IS THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.
3. CONSTRUCTION OF THE CONSTRUCTION AND DEMOLITION DISPOSAL AREA IN THE BOTTOM ASH LANDFILL IS CONSIDERED INCIDENTAL TO COMPLETION OF THE OVERALL STANTON STATION SITE RESTORATION PROJECT. THE CONSTRUCTION AND DEMOLITION DISPOSAL AREA SHALL BE APPROXIMATELY 10 FEET DEEP (FROM EXISTING TOPOGRAPHY) AND SHALL HAVE SLOPES NO STEEPER THAN 3H:1V. CELLS SHALL NOT BE EXCAVATED BELOW ELEVATION 1705 FEET AND CONSTRUCTION AND DEMOLITION DEBRIS SHALL NOT BE PLACED ABOVE ELEVATION 1720 FEET. THE MAXIMUM SIZE OF THE CONSTRUCTION AND DEMOLITION DISPOSAL AREA SHALL NOT EXCEED 2 ACRES IN SIZE AT ANY TIME. LARGE CONSTRUCTION AND DEMOLITION MATERIALS SHALL BE BROKEN DOWN INTO PIECES LESS THAN APPROXIMATELY 1 FOOT BY 1 FOOT IN SIZE.
4. CONTRACTOR SHALL TAKE CARE WHEN WORKING NEAR ACTIVE OVERHEAD ELECTRIC LINES. APPROPRIATE VERTICAL AND HORIZONTAL OFFSETS FROM OVERHEAD POWER LINES, GUY WIRES, AND POLES/STRUCTURES SHALL BE MAINTAINED (A MINIMUM OF TWENTY (20) FEET VERTICAL AND TEN (10) FEET HORIZONTAL) AS DIRECTED BY THE OWNING UTILITY.
5. EMBANKMENT FILL AND INFILTRATION LAYER MATERIAL WILL COME DIRECTLY FROM SCOPE OF WORK D (NORTH AND CENTER CELLS CLOSURE) GENERAL CUT.

REFERENCE(S)

1. SITE LOCATION: T144N, R84W, MERCER COUNTY, NORTH DAKOTA.
2. AERIAL IMAGE IS A COMBINATION OF IMAGERY OBTAINED FROM THE UNITED STATES DEPARTMENT OF AGRICULTURE NATIONAL AERIAL IMAGE PROGRAM, ACQUIRED IN 2018, AND IMAGERY PROVIDED BY GRE, ACQUIRED IN JUNE 2018.
3. EXISTING GROUND TOPOGRAPHY IS FROM AN AERIAL SURVEY PERFORMED BY KBM, INC. ON APRIL 27, 2001 (SITE WIDE), A GROUND SURVEY PERFORMED BY INTERSTATE ENGINEERING IN 2014 (BOTTOM ASH IMPOUNDMENT AND LANDFILL AREA), A GROUND SURVEY PERFORMED BY INTERSTATE ENGINEERING IN 2017 (COAL PILE AREA), AND A GROUND SURVEY PERFORMED BY INTERSTATE ENGINEERING IN 2018.
4. EXISTING GROUND TOPOGRAPHY CONTOUR INTERVAL IS TWO (2) FEET.

0 80 160
1" = 80' FEET

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2019-07-19	ISSUED FOR CONSTRUCTION	MRS	MRS	RFS	TJS

SEAL

REGISTERED PROFESSIONAL ENGINEER TODD J. STONG PE-6144 NORTH DAKOTA DATE 7/19/19

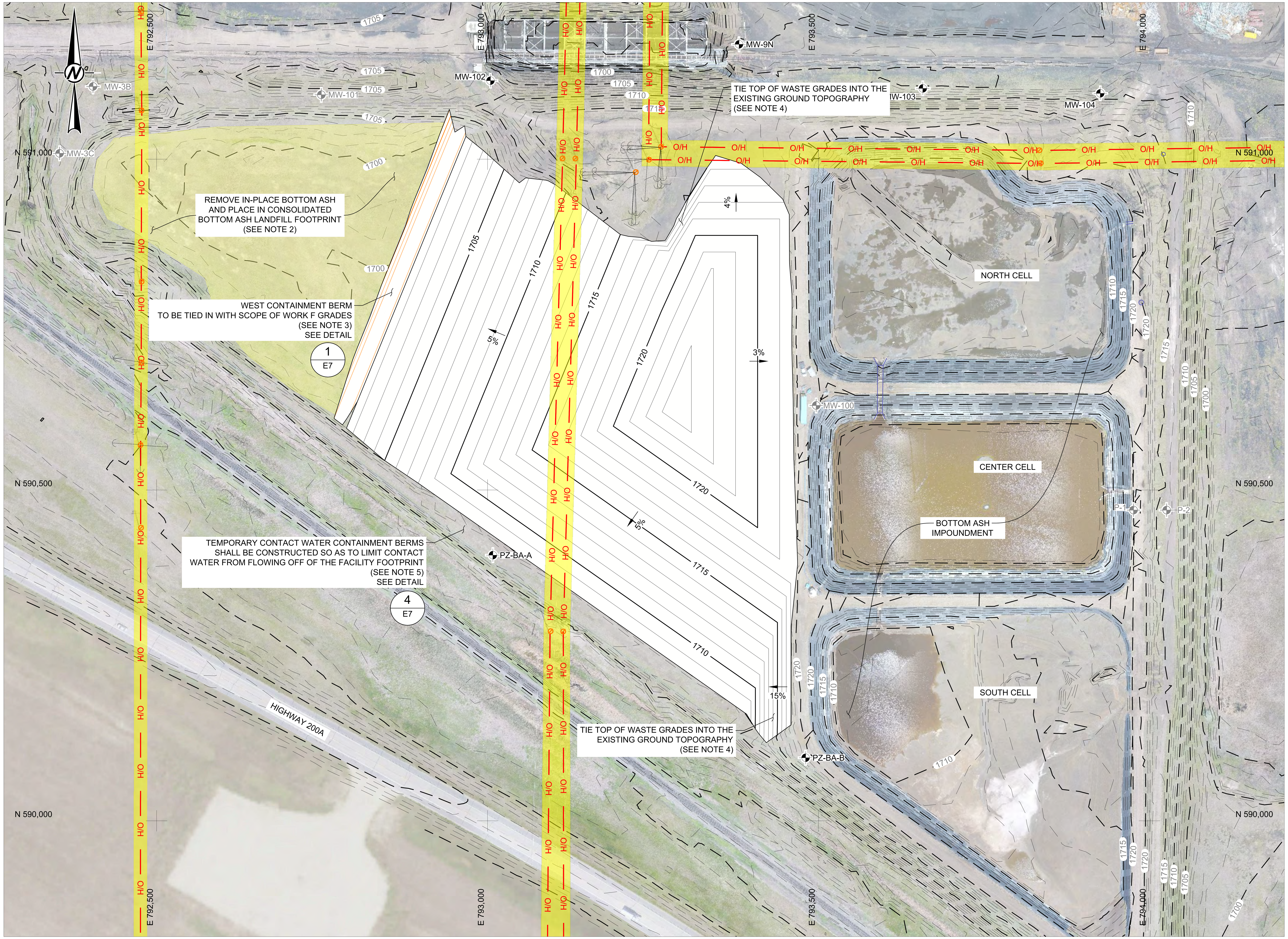
CLIENT
GREAT RIVER ENERGY
STANTON STATION
STANTON, NORTH DAKOTA

CONSULTANT
GOLDER
GOLDER ASSOCIATES INC.
7245 W ALASKA DR., SUITE 200
LAKEWOOD, COLORADO
USA
(303) 980-0540
www.golder.com

PROJECT
STANTON SITE RESTORATION
BOTTOM ASH LANDFILL CLOSURE

TITLE
EXISTING CONDITIONS

PROJECT NO.	REV.		DRAWING
1775717	0	E3 of E7	E3



LEGEND

- 3600 (dashed) — EXISTING GROUND TOPOGRAPHY (REFERENCES 3 AND 4)
- 3600 (solid) — TOP OF WASTE GRADES (NOTE 1, 2, AND 4) (REFERENCE 4)
- 3600 (orange) — WEST CONTAINMENT BERM GRADES (NOTE 3) (REFERENCE 4)
- REMOVE IN-PLACE BOTTOM ASH (NOTE 2)
- MW-10 — MONITORING WELLS/PIEZOMETERS (NOTE 6)
- MW-10 — MONITORING WELLS/PIEZOMETERS TO BE ABANDONED (BY OTHERS)
- EXISTING POWER POLES (NOTE 7)
- O/H — OVERHEAD ELECTRIC LINE (ACTIVE) (NOTE 7)

NOTE(S)

1. BOTTOM ASH AND OTHER SOIL-LIKE MATERIALS DEPOSITED IN THE BOTTOM ASH LANDFILL SHALL BE PLACED AND COMPACTED TO PRODUCE A FIRM AND UNYIELDING TOP OF WASTE SURFACE. THESE MATERIALS SHALL BE MOISTURE-CONDITIONED DURING PLACEMENT.
2. BOTTOM ASH ON THE FLOOR OF THE EXISTING WEST PORTION OF THE BOTTOM ASH LANDFILL SHALL BE REMOVED AND PLACED IN THE BOTTOM ASH LANDFILL FOOTPRINT AS SHOWN IN THESE DRAWINGS. CONTRACTOR SHALL LIMIT THE AMOUNT OF VEGETATION DISPOSED WITH REMOVED BOTTOM ASH TO THE EXTENT POSSIBLE. REMOVAL OF BOTTOM ASH IN THIS AREA SHALL BE VERIFIED BY THE OWNER'S REPRESENTATIVE IN WRITING PRIOR TO THE WORK BEING COMPLETED.
3. THE WEST CONTAINMENT BERM OF THE PROPOSED BOTTOM ASH LANDFILL FOOTPRINT INCLUDED IN THESE DRAWINGS SHALL NOT BE CONSTRUCTED ON SOFT OR SATURATED SOIL. SUBCUT MAY BE REQUIRED SO AS TO PROVIDE A FIRM AND UNYIELDING BASE FOR BERM CONSTRUCTION.
4. TOP OF WASTE GRADES ARE APPROXIMATE AND MAY VARY DEPENDING ON THE AMOUNT OF MATERIAL REQUIRED TO BE CONTAINED AS A PART OF THE STANTON STATION SITE RESTORATION CONSTRUCTION. TOP OF WASTE GRADES SHALL NOT BE LESS THAN 3% OR GREATER THAN 15% UNLESS OTHERWISE APPROVED BY THE OWNER'S REPRESENTATIVE.
5. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING CONTACT WATER WITHIN THE BOTTOM ASH LANDFILL FOOTPRINT. TEMPORARY CONTACT WATER MANAGEMENT BERMS MAY BE REQUIRED DURING CONSTRUCTION TO CONTAIN WATER WITHIN THE LANDFILL. CONTRACTOR TO FOLLOW PROJECT REQUIREMENTS FOR DISCHARGE OF THIS WATER (SEE NOTE 11 ON DRAWING E2)
6. CARE SHALL BE TAKEN WHEN WORKING NEAR EXISTING MONITORING WELLS/PIEZOMETERS. ANY DAMAGE TO MONITORING WELLS/PIEZOMETERS IS THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.
7. CONTRACTOR SHALL TAKE CARE WHEN WORKING NEAR ACTIVE OVERHEAD ELECTRIC LINES. APPROPRIATE VERTICAL AND HORIZONTAL OFFSETS FROM OVERHEAD POWER LINES, GUY WIRES, AND POLES/STRUCTURES SHALL BE MAINTAINED (A MINIMUM OF TWENTY (20) FEET VERTICAL AND TEN (10) FEET HORIZONTAL) AS DIRECTED BY THE OWNING UTILITY.

REFERENCE(S)

1. SITE LOCATION: T144N, R84W, MERCER COUNTY, NORTH DAKOTA.
2. AERIAL IMAGE IS A COMBINATION OF IMAGERY OBTAINED FROM THE UNITED STATES DEPARTMENT OF AGRICULTURE NATIONAL AERIAL IMAGE PROGRAM, ACQUIRED IN 2018, AND IMAGERY PROVIDED BY GRE, ACQUIRED IN JUNE 2018.
3. EXISTING GROUND TOPOGRAPHY IS FROM AN AERIAL SURVEY PERFORMED BY KBM, INC. ON APRIL 27, 2001 (SITE WIDE), A GROUND SURVEY PERFORMED BY INTERSTATE ENGINEERING IN 2014 (BOTTOM ASH IMPOUNDMENT AND LANDFILL AREA), A GROUND SURVEY PERFORMED BY INTERSTATE ENGINEERING IN 2017 (COAL PILE AREA), AND A GROUND SURVEY PERFORMED BY INTERSTATE ENGINEERING IN 2018.
4. EXISTING GROUND TOPOGRAPHY AND TOP OF WASTE CONTOUR INTERVAL IS ONE (1) FOOT.

0 80 160
1" = 80' FEET

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2019-07-19	ISSUED FOR CONSTRUCTION	CCS	CCS	RFS	TJS

SEAL

REGISTERED PROFESSIONAL ENGINEER TODD J. STONG PE-6144 DATE 7/19/19 NORTH DAKOTA

CLIENT
GREAT RIVER ENERGY
STANTON STATION
STANTON, NORTH DAKOTA

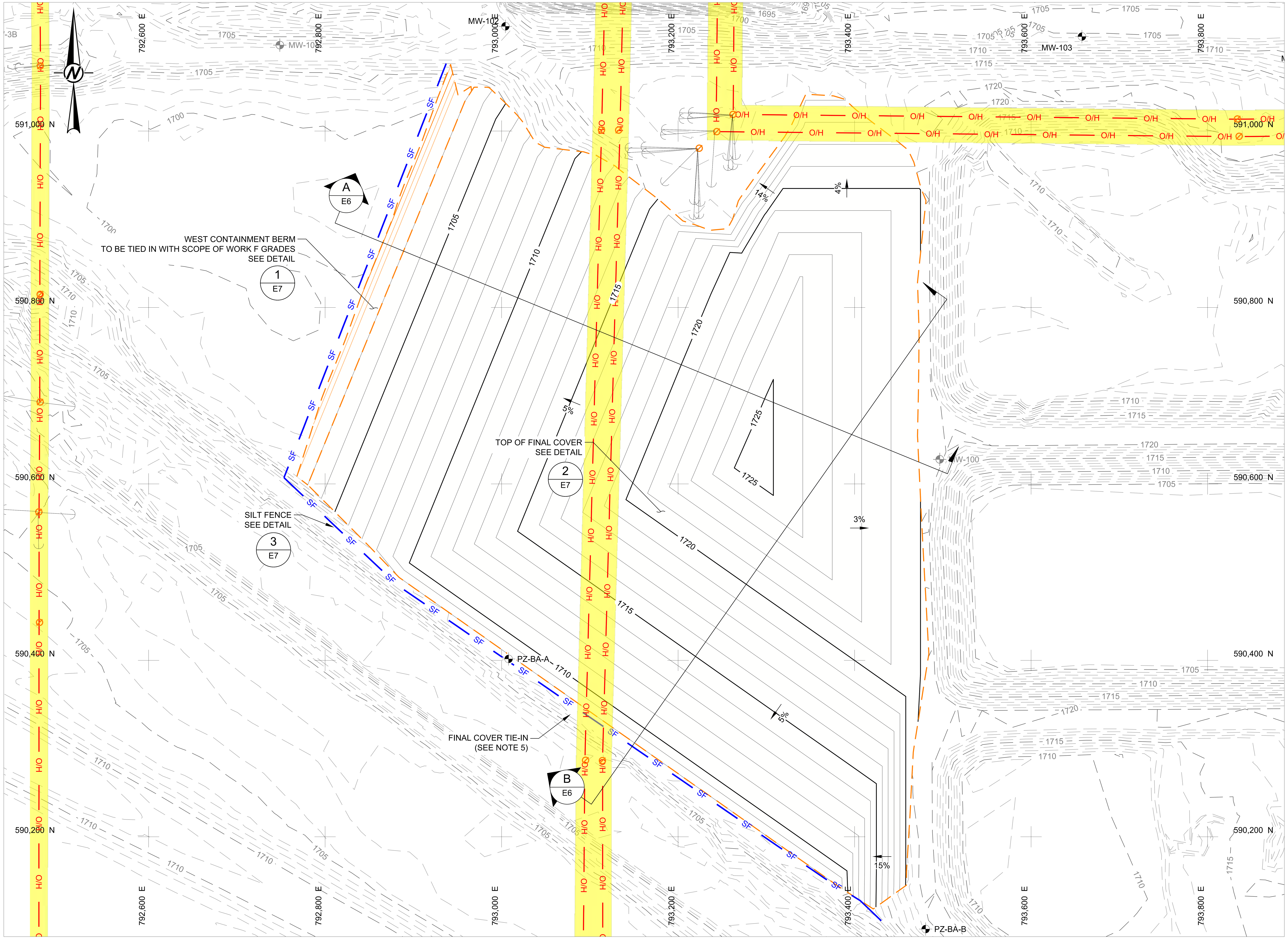
CONSULTANT

GOLDER
GOLDER ASSOCIATES INC.
7245 W ALASKA DR., SUITE 200
LAKEWOOD, COLORADO
USA
(303) 980-0540
www.golder.com

PROJECT
STANTON SITE RESTORATION
BOTTOM ASH LANDFILL CLOSURE

TITLE
TOP OF WASTE AND WEST CONTAINMENT BERM

PROJECT NO.	REV.		DRAWING
1775717	0	E4 of E7	E4



LEGEND

- 3600 — EXISTING GROUND TOPOGRAPHY (REFERENCES 2 AND 3)
- 3600 — TOP OF FINAL COVER GRADES (NOTES 1 AND 2) (REFERENCE 3)
- 3600 — WEST CONTAINMENT BERM GRADES
- APPROXIMATE TIE-IN LOCATION TO SCOPE OF WORK D NORTH AND CENTER CELLS CLOSURE AND SCOPE OF WORK F SITE RESTORATION GRADING AND SCOPE OF WORK G SOUTH CELL CLOSURE (NOTE 4)
- SF — SILT FENCE (AS REQUIRED) (NOTE 3)
- MW-10 — MONITORING WELLS/PIEZOMETERS (NOTE 6)
- MW-10 — MONITORING WELLS/PIEZOMETERS TO BE ABANDONED (BY OTHERS)
- EXISTING POWER POLES (NOTE 7)
- O/H — OVERHEAD ELECTRIC LINE (ACTIVE) (NOTE 7)

NOTE(S)

1. THE AREA RECEIVING FINAL COVER IS APPROXIMATE. ALL AREAS OF WASTE PLACEMENT SHALL RECEIVE FINAL COVER.
2. TOP OF FINAL COVER GRADES ARE APPROXIMATE AND THE FINAL SLOPES MAY VARY DEPENDING ON THE AMOUNT OF MATERIAL REQUIRED TO BE CONTAINED AS A PART OF THE STANTON STATION SITE RESTORATION CONSTRUCTION. ALL AREAS OF WASTE PLACEMENT WILL RECEIVE FINAL COVER. TOP OF FINAL COVER GRADES SHALL NOT BE LESS THAN 3% OR GREATER THAN 15% UNLESS OTHERWISE APPROVED BY THE OWNER'S REPRESENTATIVE.
3. CONTRACTOR SHALL FOLLOW BEST MANAGEMENT PRACTICES FOR INSTALLATION AND MAINTENANCE OF EROSION CONTROL MEASURES. ALL PERMANENT AND TEMPORARY EROSION CONTROL FEATURES ARE SUBJECT TO REVIEW FOR EFFECTIVENESS AND NECESSARY ADJUSTMENTS WILL BE MADE AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
4. BOTTOM ASH LANDFILL GRADING SHALL TIE INTO THE SCOPE OF WORK D, F AND G ALONG THE APPROXIMATE TIE-IN LINE INDICATED. SCOPE OF WORK D, F AND G GRADING IS NOT SHOWN FOR CLARITY. TEMPORARY SLOPES BETWEEN SUBGRADE GRADES SHOWN AND EXISTING GROUND (PRIOR TO SITE REGRADING) SHALL NOT BE STEEPER THAN 3H:1V.
5. THE FINAL COVER SHALL BE TIED INTO THE EXISTING SOUTH PERIMETER BERM AS REQUIRED TO MAINTAIN 2 FEET OF COVER OVER WASTE AREAS AND TO PROMOTE SURFACE WATER FLOW OFF OF THE BOTTOM ASH LANDFILL.
6. CARE SHALL BE TAKEN WHEN WORKING NEAR EXISTING MONITORING WELLS/PIEZOMETERS. ANY DAMAGE TO MONITORING WELLS/PIEZOMETERS IS THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.
7. CONTRACTOR SHALL TAKE CARE WHEN WORKING NEAR ACTIVE OVERHEAD ELECTRIC LINES. APPROPRIATE VERTICAL AND HORIZONTAL OFFSETS FROM OVERHEAD POWER LINES, GUY WIRES, AND POLES/STRUCTURES SHALL BE MAINTAINED (A MINIMUM OF TWENTY (20) FEET VERTICAL AND TEN (10) FEET HORIZONTAL) AS DIRECTED BY THE OWNING UTILITY.

REFERENCE(S)

1. SITE LOCATION: T144N, R84W, MERCER COUNTY, NORTH DAKOTA.
2. EXISTING GROUND TOPOGRAPHY IS FROM AN AERIAL SURVEY PERFORMED BY KBM, INC. ON APRIL 27, 2001 (SITE WIDE), A GROUND SURVEY PERFORMED BY INTERSTATE ENGINEERING IN 2014 (BOTTOM ASH IMPOUNDMENT AND LANDFILL AREA), A GROUND SURVEY PERFORMED BY INTERSTATE ENGINEERING IN 2017 (COAL PILE AREA), AND A GROUND SURVEY PERFORMED BY INTERSTATE ENGINEERING IN 2018.
3. EXISTING GROUND TOPOGRAPHY AND TOP OF FINAL COVER CONTOUR INTERVAL IS ONE (1) FOOT.

0 60 120
1" = 60' FEET

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2019-07-19	ISSUED FOR CONSTRUCTION	CCS	CCS	RFS	TJS

SEAL

REGISTERED PROFESSIONAL ENGINEER
TODD J. STONG
PE-6144
DATE 7/19/19
NORTH DAKOTA

CLIENT
GREAT RIVER ENERGY
STANTON STATION
STANTON, NORTH DAKOTA

CONSULTANT

GOLDER

GOLDER ASSOCIATES INC.
7245 W ALASKA DR., SUITE 200
LAKEWOOD, COLORADO
USA
(303) 980-0540
www.golder.com

PROJECT
STANTON SITE RESTORATION
BOTTOM ASH LANDFILL CLOSURE

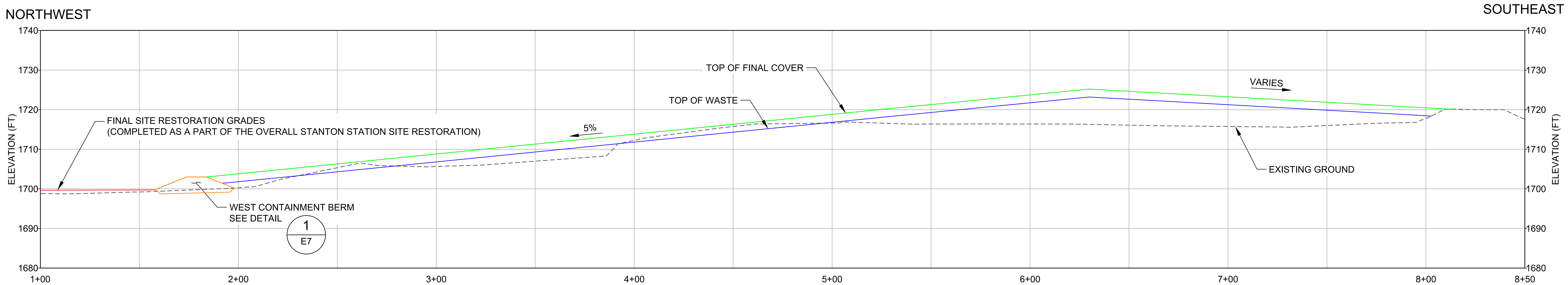
TITLE
TOP OF FINAL COVER

PROJECT NO. 1775717
REV. 0
E5 of E7
DRAWING E5

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

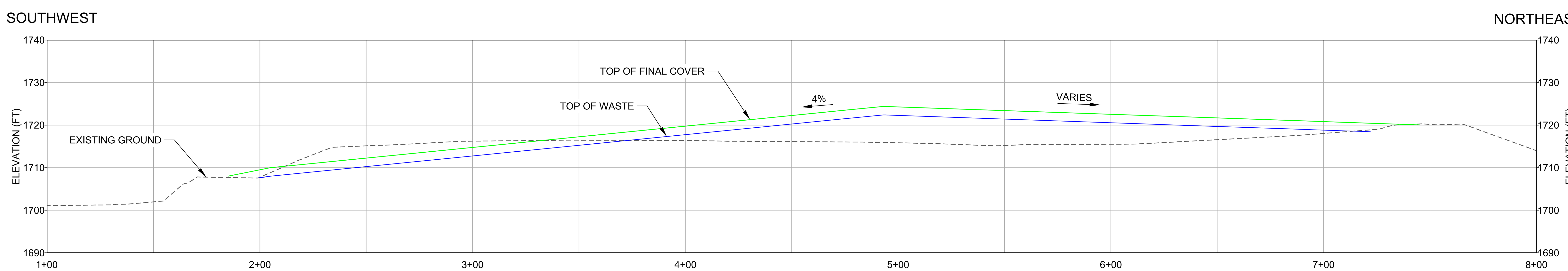
LEGEND

- EXISTING GROUND TOPOGRAPHY
- TOP OF WASTE GRADES
- TOP OF FINAL COVER GRADES
- WEST CONTAINMENT BERM GRADES
- FINAL SITE RESTORATION GRADES



SCALE 1" = 30'
2X VERTICAL EXAGGERATION

A / E5 BOTTOM ASH LANDFILL CLOSURE NORTHWEST-SOUTHEAST SECTION



SCALE 1" = 30'
2X VERTICAL EXAGGERATION

B / E5 BOTTOM ASH LANDFILL CLOSURE SOUTHWEST-NORTHEAST SECTION

0 30 60
1" = 30' FEET

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2019-07-19	ISSUED FOR CONSTRUCTION	MRS	MRS	RFS	TJS

SEAL

REGISTERED PROFESSIONAL ENGINEER
TODD J. STONG
PE-6144
NORTH DAKOTA

CLIENT
GREAT RIVER ENERGY
STANTON STATION
STANTON, NORTH DAKOTA

CONSULTANT

GOLDER

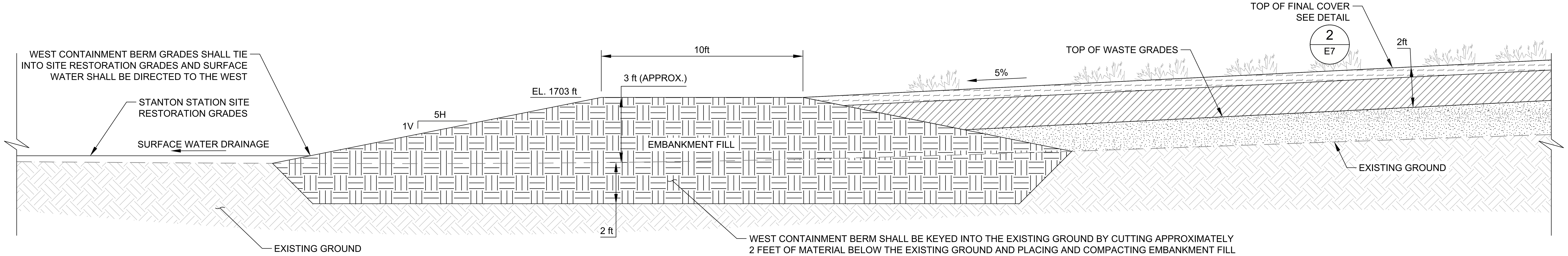
GOLDER ASSOCIATES INC.
7245 W ALASKA DR., SUITE 200
LAKEWOOD, COLORADO
USA
(303) 980-0540
www.golder.com

PROJECT
STANTON SITE RESTORATION
BOTTOM ASH LANDFILL CLOSURE

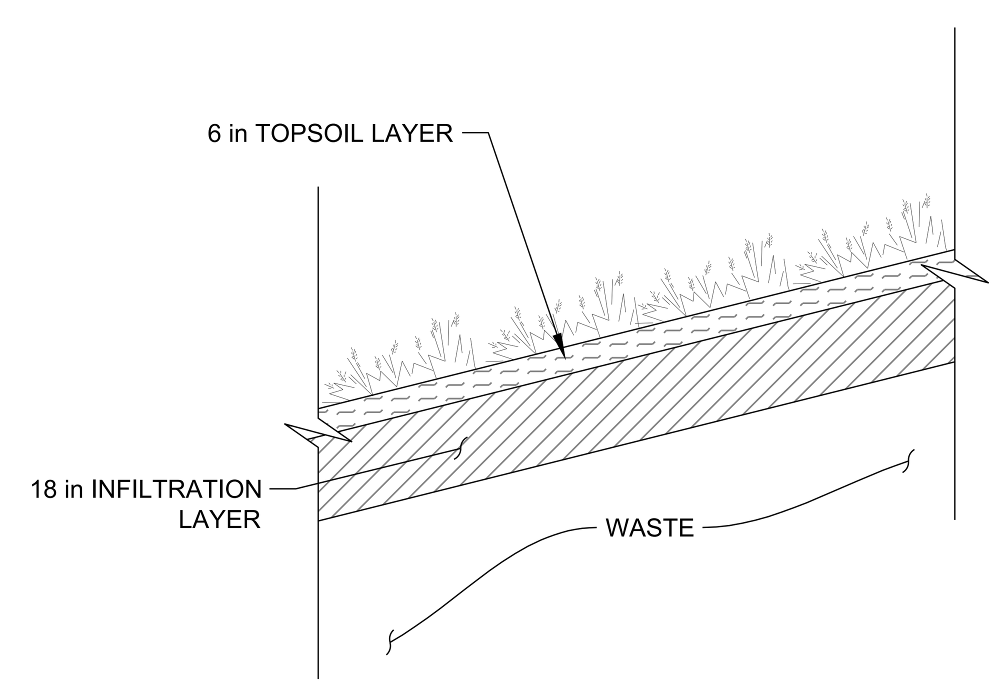
TITLE
SECTIONS

PROJECT NO. 1775717
REV. 0
E6 of E7
DRAWING E6

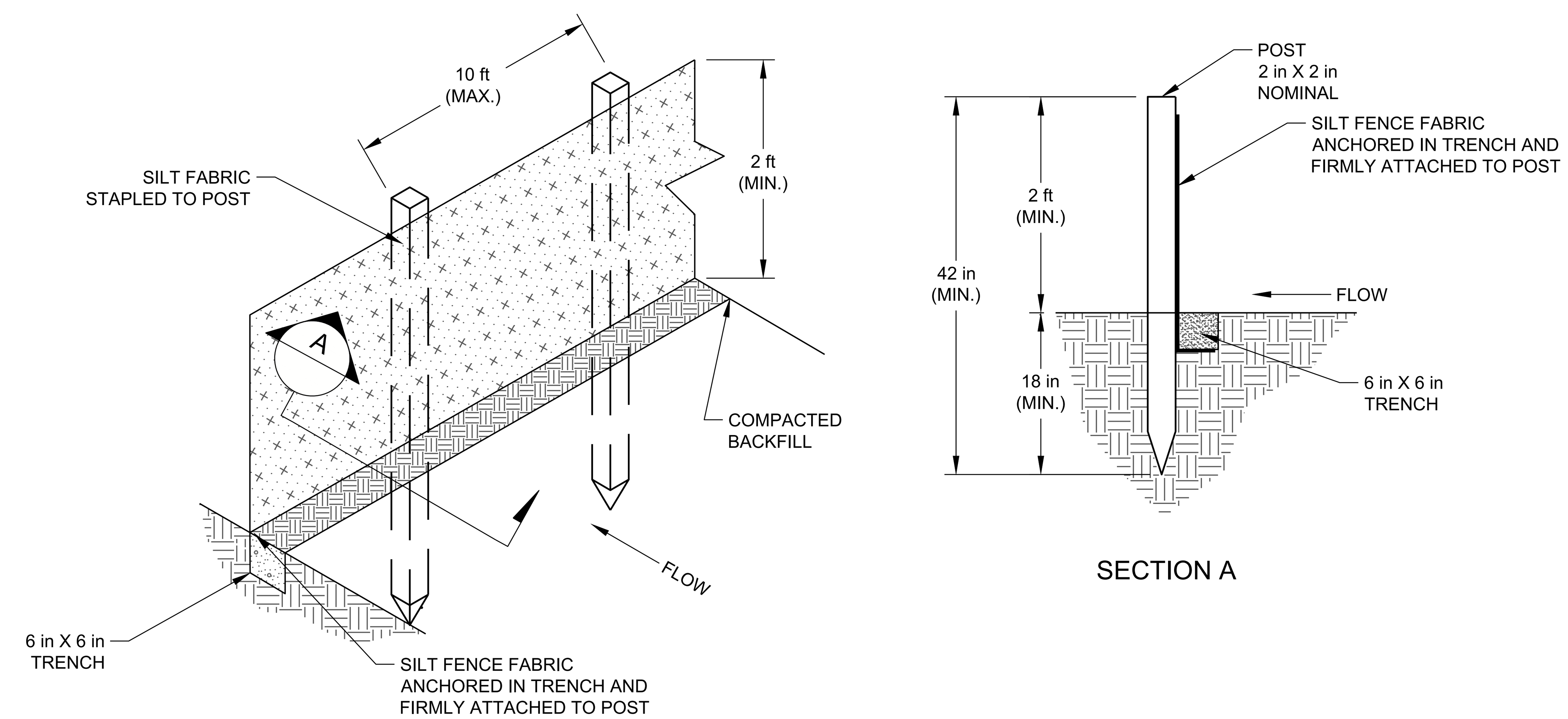
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D



NTS 1 E7 WEST CONTAINMENT BERM DETAIL

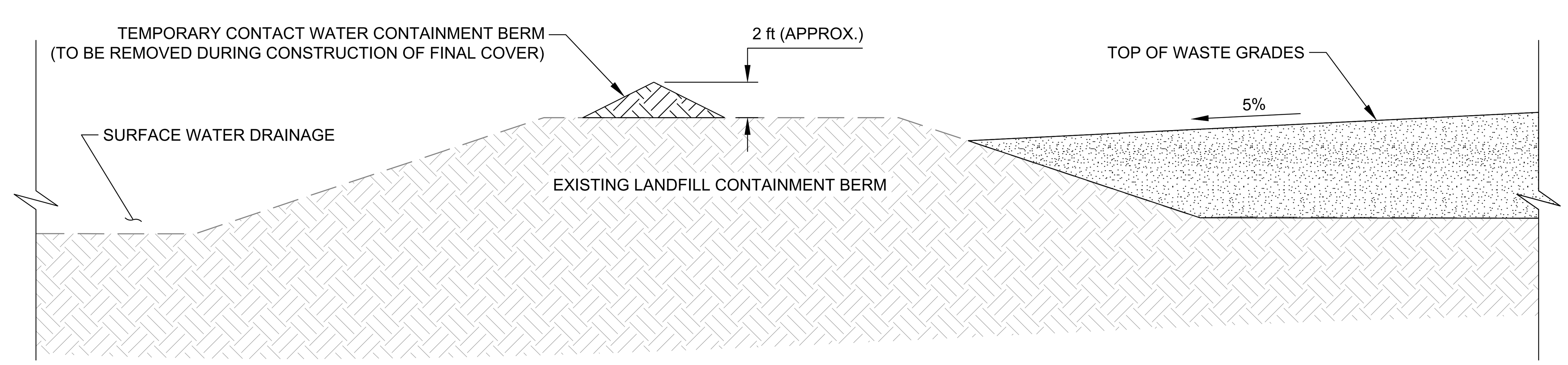


NTS 2 E7 FINAL COVER DETAIL



SECTION A

NTS 3 E7 SILT FENCE DETAIL



NTS 4 E7 TEMPORARY CONTACT WATER BERM

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2019-07-19	ISSUED FOR CONSTRUCTION	MRS	MRS	RFS	TJS

SEAL

REGISTERED PROFESSIONAL ENGINEER TODD J. STONG PE-6144 DATE NORTH DAKOTA

CLIENT
GREAT RIVER ENERGY
STANTON STATION
STANTON, NORTH DAKOTA

CONSULTANT
GOLDER

GOLDER ASSOCIATES INC.
7245 W ALASKA DR., SUITE 200
LAKEWOOD, COLORADO
USA
(303) 980-0540
www.golder.com

PROJECT
STANTON SITE RESTORATION
BOTTOM ASH LANDFILL CLOSURE

TITLE
DETAILS

PROJECT NO. 1775717

REV. 0

E7 of E7

DRAWING E7

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

Path: \\Denver\acad\GREAT RIVER ENERGY\STANTON\99_PROJECTS\1775717\SITE RESTORATION_E - Bottom Ash Landfill Closure\02_PRODUCTION\DWG\ | File Name: 1894194H006.dwg | Last Edited By: kcernik Date: 2019-07-22 Time:3:58:32 PM | Printed By: BPurcell Date: 2019-07-23 Time:12:23:23 PM

APPENDIX B

May 2022 Boring Logs and Well Completion Information

WELL LOG NO. MW210

PROJECT: Monitoring Well Installation

CLIENT: Golder Associates Inc
Lakewood, CO

SITE: Hwy 200
Stanton, ND

LOCATION See Exploration Plan

Latitude: 47.2851° Longitude: -101.3310°

Surface Elev.: 1700 (Ft.)

INSTALLATION DETAILS: PVC Cap; Protective Casing; Soil cuttings; PVC riser; Bentonite; Prepack PVC screen

DEPTH	Description	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS
0.5	**TOPSOIL**, dark brown	1699.5					
2.0	**FILL - LEAN CLAY WITH SAND**, dark brown	1698					
9.0	**FILL - SILTY SAND**, trace gravel, fine to medium grained, brown, seams of clay	1691	5		X	13	8-17-25 N=42
15.5	**POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)**, fine to coarse grained, brown, medium dense, waterbearing	1684.5	10	▽	X	16	4-9-10 N=19
			15		X	18	1-2-8-9 N=10
20.0	**POORLY GRADED SAND WITH SILT (SP-SM)**, trace gravel, fine to medium grained, brown, loose to medium dense	1680			X	18	1-2-4-8 N=6
					X	15	2-6-7-14 N=13
24.0	**POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)**, fine to medium grained, brown, medium dense	1676	20		X	18	2-4-11-15 N=15
					X	18	9-10-8-11 N=18

Boring Terminated at 24 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4¼" HSA, 0-22'

Abandonment Method:

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While sampling*

Terracon
1805 Hancock Dr PO Box 2084
Bismarck, ND

Well Started: 05-09-2022	Well Completed: 05-09-2022
Drill Rig: Mobile B-57	Driller: Mike R.
Project No.: M2225030	

WELL LOG NO. MW211

PROJECT: Monitoring Well Installation

**CLIENT: Golder Associates Inc
Lakewood, CO**

**SITE: Hwy 200
Stanton, ND**

LOCATION See Exploration Plan

Latitude: 47.2845° Longitude: -101.3323°

Surface Elev.: 1703 (Ft.)

INSTALLATION DETAILS: PVC Cap; Protective Casing; PVC riser; Soil cuttings; Bentonite; Silica sand; PVC screen

DEPTH	Description	ELEVATION (Ft.)	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS
0.5	**TOPSOIL**, dark brown	1702.5			
5.5	**LEAN CLAY WITH SAND**, dark brown	1697.5	X	15	5-13-11 N=24
14.0	**SILTY SAND (SM)**, fine to medium grained, grayish brown, medium dense to loose; waterbearing at 9.5'	1689	X	16	3-2-3 N=5
16.0	**LEAN CLAY WITH SAND (CL)**, grayish brown, stiff	1687	X	18	2-3-6-7 N=9
18.0	**SILTY SAND (SM)**, fine to medium grained, gray, medium dense, waterbearing	1685	X	19	3-5-9-11 N=14
24.0	**POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)**, fine to coarse grained, grayish brown to gray, medium dense, waterbearing	1679	X	24	8-11-8-14 N=19
			X	14	4-7-17-14 N=24
			X	16	3-7-12-12 N=19

Boring Terminated at 24 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4¼" HSA, 0-22'

Abandonment Method:

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While sampling*

Terracon
1805 Hancock Dr PO Box 2084
Bismarck, ND

Well Started: 05-10-2022	Well Completed: 05-10-2022
Drill Rig: Mobile B-57	Driller: Mike R.
Project No.: M2225030	

WELL LOG NO. MW212

PROJECT: Monitoring Well Installation

CLIENT: Golder Associates Inc
Lakewood, CO

SITE: Hwy 200
Stanton, ND

LOCATION See Exploration Plan

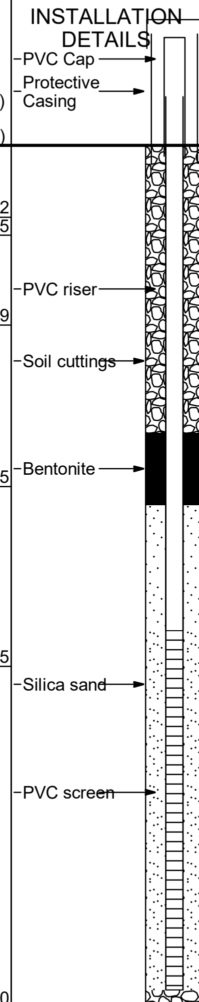
Latitude: 47.2845° Longitude: -101.3313°

Surface Elev.: 1704 (Ft.)

DEPTH		ELEVATION (Ft.)
2.0	**TOPSOIL AND ROOTZONE**, dark brown	1702
2.5	**COAL/LIGNITE**, black	1701.5
5.0	**SANDY LEAN CLAY (CL)**, dark brown, stiff	1699
9.5	**SILTY SAND (SM)**, brown, medium dense	1694.5
14.5	**FAT CLAY (CH)**, brown to dark brown, stiff, seam of coal at 14.5'	1689.5
24.0	**POORLY GRADED SAND WITH SILT (SP-SM)**, fine to coarse grained, brown, medium dense to loose, seams of gravel waterbearing at 16'	1680

Boring Terminated at 24 Feet

INSTALLATION DETAILS



DEPTH (Ft.): 5, 10, 15, 20

SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS
	18	3-7-7 N=14
	9	2-4-5 N=9
	17	7-9-9-11 N=18
	16	4-5-4-5 N=9
	11	2-3-4-5 N=7
	12	1-2-4-5 N=6
	11	2-1-3-5 N=4

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4¼" HSA, 0-22'

Abandonment Method:

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While sampling*

Terracon

1805 Hancock Dr PO Box 2084
Bismarck, ND

Well Started: 05-10-2022	Well Completed: 05-10-2022
Drill Rig: Mobile B-57	Driller: Mike R.
Project No.: M2225030	

WELL LOG NO. MW213

PROJECT: Monitoring Well Installation

CLIENT: Golder Associates Inc
Lakewood, CO

SITE: Hwy 200
Stanton, ND

LOCATION See Exploration Plan

Latitude: 47.2856° Longitude: -101.3303°

Surface Elev.: 1702 (Ft.)

GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS
	0.5 **TOPSOIL**, dark brown	1701.5	PVC Cap; Protective Casing					
	LEAN CLAY WITH SAND, dark brown 2.0	1700						
	LEAN CLAY WITH SAND (CL), dark brown 5.5	1696.5		5		X	16	14-21-22 N=43
	SILTY SAND (SM), trace gravel, fine to medium grained, brown, dense 9.5	1692.5	Soil cuttings; PVC riser					
	POORLY GRADED SAND WITH SILT (SP-SM), trace gravel, brown, medium dense 14.5	1687.5	Bentonite	10		X	12	6-9-9 N=18
	SILTY SAND (SM), trace gravel, fine to medium grained, grayish brown to brown, medium dense, waterbearing 25.5	1676.5	Prepack PVC screen	15	▽	X	17	4-8-10 N=18
				20		X	19	8-11-18-21 N=29
	FAT CLAY (CH), gray, hard 27.0	1675		25		X	18	6-11-35-41 N=46
	SANDY FAT CLAY (CH), gray, very stiff to hard 31.0	1671				X	23	8-10-15-21 N=25
				30		X	24	9-12-21-26 N=33

Boring Terminated at 31 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3¼" HSA, 0-29'

Abandonment Method:

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While sampling*

Terracon
1805 Hancock Dr PO Box 2084
Bismarck, ND

Well Started: 05-12-2022	Well Completed: 05-12-2022
Drill Rig: Mobile B-57	Driller: Mike R.
Project No.: M2225030	

WELL LOG NO. MW214

PROJECT: Monitoring Well Installation

CLIENT: Golder Associates Inc
Lakewood, CO

SITE: Hwy 200
Stanton, ND

LOCATION See Exploration Plan

Latitude: 47.2822° Longitude: -101.3357°

Surface Elev.: 1703 (Ft.)

DEPTH	Description	ELEVATION (Ft.)	Installation Details	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results
0.5	**TOPSOIL AND ROOTZONE**, dark brown	1702.5	PVC Cap; Protective Casing; Soil cuttings					
2.5	**CLAYEY SAND (SC)**, brown	1700.5	PVC riser; Bentonite					
	SILTY SAND (SM), fine to medium grained, brown, loose, waterbearing at 4.5'				▽			
				5			18	1-2-2-4 N=4
10.0		1693		10			18	2-3-5-8 N=8
	FAT CLAY (CH), brown, stiff		Silica sand; PVC screen					
16.5		1686.5		15			18	3-4-4-8 N=8

Boring Terminated at 16.5 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4¼" HSA, 0-14½'

Abandonment Method:

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While sampling*

Terracon
1805 Hancock Dr PO Box 2084
Bismarck, ND

Well Started: 05-12-2022	Well Completed: 05-12-2022
Drill Rig: Mobile B-57	Driller: Mike R.
Project No.: M2225030	

BORING LOG NO. BH1

PROJECT: Monitoring Well Installation

CLIENT: Golder Associates Inc
Lakewood, CO

SITE: Hwy 200
Stanton, ND

LOCATION See Exploration Plan

Latitude: 47.2831° Longitude: -101.3343°

Surface Elev.: 1715 (Ft.)

GRAPHIC LOG	DEPTH		ELEVATION (Ft.)	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS
	1.5	**TOPSOIL**, dark brown	1713.5						
	4.0	**FILL - BOTTOM ASH**	1711					13	6-6-5-2 N=11
		Boring Terminated at 4 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3¼" HSA, 0-2'

Abandonment Method:

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:

WATER LEVEL OBSERVATIONS

None observed

Terracon
1805 Hancock Dr PO Box 2084
Bismarck, ND

Boring Started: 05-10-2022	Boring Completed: 05-10-2022
Drill Rig: Mobile B-57	Driller: Mike R.
Project No.: M2225030	

APPENDIX C

Analytical Results from May 2022 Nature and Extent Wells

Table C1: Sample Results Summary Table - MW-210

		MW-210		
	Units	**26-May-22**	**19-Jul-22**	**6-Sep-22**
Water Elevation	ft AMSL	1690.7	1690.4	1689.8
Appendix III Parameters				
Boron	mg/L	0.66	0.67	0.69
Calcium	mg/L	78.6	75.2	77.1
Chloride	mg/L	14.7	14.2	14.8
Fluoride	mg/L	0.54	0.55	0.55
pH, Field	s.u.	7.75	7.6	7.61
pH, Lab	s.u.	7.9	7.8	8.0
Sulfate	mg/L	422	400	534
Total Dissolved Solids	mg/L	1240	1200	1160
Appendix IV Parameters				
Antimony	mg/L	< 0.001	< 0.001	< 0.001
Arsenic	mg/L	0.0024	0.0020	0.0021
Barium	mg/L	0.0589	0.0566	0.0658
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005
Chromium	mg/L	< 0.002	0.0028	0.0024
Cobalt	mg/L	< 0.002	< 0.002	< 0.002
Fluoride	mg/L	0.54	0.55	0.55
Lead	mg/L	0.0010	0.0011	0.0014
Lithium	mg/L	0.0392	0.0405	0.0440
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	0.0105	0.0107	0.0106
Radium 226	pCi/L	0.958 ± 0.326	0.299 U ± 0.344	0.233 U ± 0.302
Radium 228	pCi/L	1.10 U ± 0.816	1.12 U ± 1.09	1.54 U ± 1.59
Radium 226 and 228 combined	pCi/L	2.06 ± 0.879	1.41 ± 1.14	1.77 ± 1.62
Selenium	mg/L	< 0.005	< 0.005	< 0.005
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e., samples have not been filtered).

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample).

Table C2: Sample Results Summary Table - MW-211

		MW-211		
	Units	**26-May-22**	**19-Jul-22**	**6-Sep-22**
Water Elevation	ft AMSL	1691.0	1690.7	1690.1
Appendix III Parameters				
Boron	mg/L	1.26	1.60	2.18
Calcium	mg/L	53.4	56.9	97.9
Chloride	mg/L	19.3	17.9	18.0
Fluoride	mg/L	0.55	0.56	0.55
pH, Field	s.u.	8.04	7.73	7.23
pH, Lab	s.u.	8.3	7.9	7.8
Sulfate	mg/L	787	791	1020
Total Dissolved Solids	mg/L	1830	1950	2380
Appendix IV Parameters				
Antimony	mg/L	< 0.001	< 0.001	< 0.001
Arsenic	mg/L	0.0110	0.0152	0.0251
Barium	mg/L	0.1802	0.2714	0.3744
Beryllium	mg/L	< 0.0005	< 0.0005	0.0007
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005
Chromium	mg/L	0.0038	0.0110	0.0191
Cobalt	mg/L	0.0020	0.0058	0.0101
Fluoride	mg/L	0.55	0.56	0.55
Lead	mg/L	0.0016	0.0055	0.0089
Lithium	mg/L	0.0233	0.0300	0.0455
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	0.0214	0.0242	0.0244
Radium 226	pCi/L	1.28 ± 0.398	0.698 ± 0.362	0.851 ± 0.381
Radium 228	pCi/L	0.993 U ± 1.08	0.113 U ± 0.841	1.86 U ± 1.28
Radium 226 and 228 combined	pCi/L	2.28 ±1.15	0.810 ± 0.916	2.71 ± 1.33
Selenium	mg/L	< 0.005	< 0.005	0.0244
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e., samples have not been filtered).

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample).

Table C3: Sample Results Summary Table - MW-212

		MW-212		
	Units	**26-May-22**	**19-Jul-22**	**6-Sep-22**
Water Elevation	ft AMSL	1691.0	1690.7	1690.1
Appendix III Parameters				
Boron	mg/L	0.66	0.65	0.74
Calcium	mg/L	50.9	52.6	43.0
Chloride	mg/L	16.6	15.7	17.3
Fluoride	mg/L	0.44	0.48	0.49
pH, Field	s.u.	8.06	7.9	8.09
pH, Lab	s.u.	8.3	8.2	8.2
Sulfate	mg/L	522	486	477
Total Dissolved Solids	mg/L	1430	1370	1360
Appendix IV Parameters				
Antimony	mg/L	< 0.001	< 0.001	< 0.001
Arsenic	mg/L	0.0041	0.0034	0.0041
Barium	mg/L	0.1065	0.0888	0.0860
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005
Chromium	mg/L	0.0024	< 0.002	0.0020
Cobalt	mg/L	0.0023	0.0022	0.0036
Fluoride	mg/L	0.44	0.48	0.49
Lead	mg/L	0.0014	0.0017	0.0028
Lithium	mg/L	0.0255	0.0304	0.0252
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	0.0322	0.0365	0.0501
Radium 226	pCi/L	0.701 ± 0.292	0.281 U ± 0.237	0.317 ± 0.245
Radium 228	pCi/L	0.575 U ± 0.821	1.18 U ± 0.929	0.635 U ± 1.36
Radium 226 and 228 combined	pCi/L	1.28 ± 0.878	1.46 ± 0.959	0.952 ± 1.38
Selenium	mg/L	< 0.005	< 0.005	< 0.005
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e., samples have not been filtered).

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample).

Table C4: Sample Results Summary Table - MW-213

		MW-213		
	Units	**26-May-22**	**19-Jul-22**	**6-Sep-22**
Water Elevation	ft AMSL	1690.5	1689.8	1689.5
Appendix III Parameters				
Boron	mg/L	1.09	1.10	1.22
Calcium	mg/L	91.4	90.6	100
Chloride	mg/L	14.7	13.8	14.4
Fluoride	mg/L	0.74	0.78	0.75
pH, Field	s.u.	7.73	7.59	7.53
pH, Lab	s.u.	8.0	7.5	7.9
Sulfate	mg/L	368	354	389
Total Dissolved Solids	mg/L	1110	1110	1090
Appendix IV Parameters				
Antimony	mg/L	< 0.001	< 0.001	< 0.001
Arsenic	mg/L	< 0.002	0.0028	0.0057
Barium	mg/L	0.0463	0.0769	0.1282
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005
Chromium	mg/L	< 0.002	0.0056	0.0124
Cobalt	mg/L	< 0.002	0.0021	0.0049
Fluoride	mg/L	0.74	0.78	0.75
Lead	mg/L	< 0.0005	0.0026	0.0048
Lithium	mg/L	0.0342	0.0384	0.0463
Mercury	mg/L	0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	0.0126	0.0138	0.0152
Radium 226	pCi/L	0.552 ± 0.318	0.210 U ± 0.194	0.643 ± 0.441
Radium 228	pCi/L	-0.724 U ± 1.08	0.431 U ± 1.07	2.91 ± 1.51
Radium 226 and 228 combined	pCi/L	0.552 ± 1.12	0.641 ± 1.09	3.55 ± 1.57
Selenium	mg/L	< 0.005	< 0.005	< 0.005
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e., samples have not been filtered).

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample).

Table C5: Sample Results Summary Table - MW-214

		MW-214		
	Units	26-May-22	19-Jul-22	6-Sep-22
Water Elevation	ft AMSL	1702.7	1702.2	1701.2
Appendix III Parameters				
Boron	mg/L	0.29	0.35	0.40
Calcium	mg/L	45.5	45.4	43.2
Chloride	mg/L	23.1	70.2	16.6
Fluoride	mg/L	0.60	0.61	0.54
pH, Field	s.u.	7.7	7.49	7.7
pH, Lab	s.u.	8.1	8.0	8.0
Sulfate	mg/L	452	338	536
Total Dissolved Solids	mg/L	1320	1260	1220
Appendix IV Parameters				
Antimony	mg/L	< 0.001	< 0.001	< 0.001
Arsenic	mg/L	0.0023	< 0.002	0.0023
Barium	mg/L	0.0609	0.0559	0.0528
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005
Chromium	mg/L	0.0054	0.0044	0.0048
Cobalt	mg/L	0.0021	< 0.002	< 0.002
Fluoride	mg/L	0.60	0.61	0.54
Lead	mg/L	0.0015	0.0047	0.0016
Lithium	mg/L	0.0453	0.0496	0.0504
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	0.0136	0.0165	0.0161
Radium 226	pCi/L	0.644 ±0.346	0.686 ± 0.304	0.827 ± 0.386
Radium 228	pCi/L	1.09 U ± 0.858	0.0913 U ± 0.974	2.40 U ± 1.59
Radium 226 and 228 combined	pCi/L	1.73 ± 0.925	0.777 ± 1.02	3.22 ± 1.64
Selenium	mg/L	0.0074	< 0.005	< 0.005
Thallium	mg/L	< 0.0005	< 0.0005	< 0.0005

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e., samples have not been filtered).

Laboratory Provided Qualifiers:
U (Radiochem) = Not detected above the minimum detectable concentration (varies by sample).

APPENDIX D

Soil Testing Analytical Results

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921
Tel: (865)291-3000

Laboratory Job ID: 140-27497-1
Client Project/Site: GL21509219, GRE Stanton 2022

For:
Golder Associates Inc.
7245 W Alaska Drive
Suite 200
Lakewood, Colorado 80226

Attn: Ms. Erin Hunter

Ryan Henry

Authorized for release by:
6/17/2022 11:28:52 AM

Ryan Henry, Project Manager I
(865)291-3000
WilliamR.Henry@et.eurofinsus.com

Note from Golder:
Results for other sites have been redacted from the analytical report.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Qualifiers

Metals

Qualifier	Qualifier Description
*1	LCS/LCSD RPD exceeds control limits.
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
L	A negative instrument reading had an absolute value greater than the reporting limit

Glossary

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

Job ID: 140-27497-1

Laboratory: Eurofins Knoxville

Narrative

Job Narrative
140-27497-1

Receipt
The samples were received on 5/18/2022 at 11:20am and arrived in good condition.

Receipt Exceptions
The Field Sampler was not listed on the Chain of Custody.

The Chain-of-Custody (COC) was incomplete as received and/or improperly completed. Not relinquished by client.

Metals
7 Step Sequential Extraction Procedure

These soil samples were prepared and analyzed using Eurofins TestAmerica Knoxville standard operating procedure KNOX-MT-0008, “7 Step Sequential Extraction Procedure”. SW-846 Method 6010B as incorporated in Eurofins TestAmerica Knoxville standard operating procedure KNOX-MT-0007 was used to perform the final instrument analyses.

An aliquot of each sample was sequentially extracted using the steps listed below:

· Step 1 - Exchangeable Fraction: A 5 gram aliquot of sample was extracted with 25 mL of 1M magnesium sulfate ($MgSO_4$), centrifuged and filtered. 5 mL of the resulting leachate was digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
· Step 2 - Carbonate Fraction: The sample residue from step 1 was extracted with 25 mL of 1M sodium acetate/acetic acid (NaOAc/HOAc) at pH 5, centrifuged and filtered. 5 mL of the resulting leachate was digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
· Step 3 - Non-crystalline Materials Fraction: The sample residue from step 2 was extracted with 25 mL of 0.2M ammonium oxalate (pH 3), centrifuged and filtered. 5 mL of the resulting leachate was digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
· Step 4 - Metal Hydroxide Fraction: The sample residue from step 3 was extracted with 25 mL of 1M hydroxylamine hydrochloride solution in 25% v/v acetic acid, centrifuged and filtered. 5 mL of the resulting leachate was digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
· Step 5 - Organic-bound Fraction: The sample residue from step 4 was extracted three times with 25 mL of 5% sodium hypochlorite (NaClO) at pH 9.5, centrifuged and filtered. The resulting leachates were combined and 5 mL were digested using method 3010A and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
· Step 6 - Acid/Sulfide Fraction: The sample residue from step 5 was extracted with 25 mL of a 3:1:2 v/v solution of HCl-HNO_3-H_2O, centrifuged and filtered. 5 mL of the resulting leachate was diluted to 50 mL with reagent water and analyzed by method 6010B. Results are reported in mg/kg on a dry weight basis.
· Step 7 - Residual Fraction: A 1.0 g aliquot of the sample residue from step 6 was digested using HF, HNO_3, HCl and H_3BO_3. The digestate was analyzed by ICP using method 6010B. Results are reported in mg/kg on a dry weight basis.

In addition, a 1.0 g aliquot of the original sample was digested using HF, HNO_3, HCl and H_3BO_3. The digestate was analyzed by ICP using method 6010B. Total metal results are reported in mg/kg on a dry weight basis.

Results were calculated using the following equation:

Result, µg/g or mg/Kg, dry weight = $(C \times V \times V1 \times D) / (W \times S \times V2)$

Where:
C = Concentration from instrument readout, µg/mL
V = Final volume of digestate, mL
D = Instrument dilution factor
V1 = Total volume of leachate, mL
V2 = Volume of leachate digested, mL

Job ID: 140-27497-1 (Continued)

Laboratory: Eurofins Knoxville (Continued)

W = Wet weight of sample, g
S = Percent solids/100

A method blank, laboratory control sample and laboratory control sample duplicate were prepared and analyzed with each SEP step in order to provide information about both the presence of elements of interest in the extraction solutions, and the recovery of elements of interest from the extraction solutions. Results outside of laboratory QC limits do not reflect out of control performance, but rather the effect of the extraction solution upon the analyte.

A laboratory sample duplicate was prepared and analyzed with each batch of samples in order to provide information regarding the reproducibility of the procedure.

SEP Report Notes:

The final report lists the results for each step, the result for the total digestion of the sample, and a sum of the results of steps 1 through 7 by element.

Magnesium was not reported for step 1 because the extraction solution for this step (magnesium sulfate) contains high levels of magnesium. Sodium was not reported for steps 2 and 5 since the extraction solutions for these steps contain high levels of sodium. The sum of steps 1 through 7 is much higher than the total result for sodium and magnesium due to the magnesium and sodium introduced by the extraction solutions.

The digestates for steps 1, 2 and 5 were analyzed at a dilution due to instrument problems caused by the high solids content of the digestates. The reporting limits were adjusted accordingly.

Method 6010B: The following sample was diluted to bring the concentration of target analyte, Iron, within the calibration range: TW-TR2-C2 (140-27497-9). Elevated reporting limits (RLs) are provided.

Method 6010B: The following sample was diluted due to the presence of Iron which interferes with Arsenic and Lead: TW-TR2-C2 (140-27497-9). Elevated reporting limits (RLs) are provided.

Method 6010B: The following samples were diluted due to the presence of Silicon which interferes with Arsenic, Cobalt, and Lead: MW-212-C (140-27497-1), MW-212 (140-27497-2), MW-210 (140-27497-4), MW-211-0-5FT (140-27497-7) and TW-TR2-C2 (140-27497-9). Elevated reporting limits (RLs) are provided.

Method 6010B: Due to sample matrix effect on the internal standard (ISTD), a dilution was required for the following sample: BH-1 (140-27497-5).

Methods 6010B, 6010B SEP: The following samples were diluted due to the nature of the sample matrix: MW-212-C (140-27497-1), MW-212 (140-27497-2), TW-TR2 (140-27497-3), MW-210 (140-27497-4), BH-1 (140-27497-5), MW-214 (140-27497-6), MW-211-0-5FT (140-27497-7), MW-211-14-25FT (140-27497-8), TW-TR2-C2 (140-27497-9), TW-TR2-C1 (140-27497-10) and MW-213 (140-27497-11). Elevated reporting limits (RLs) are provided for Aluminum.

Method 6010B: The following samples were diluted due to the presence of Aluminum which interferes with Lead: TW-TR2 (140-27497-3) and MW-213 (140-27497-11). Elevated reporting limits (RLs) are provided.

Method 6010B: The following samples were diluted due to the presence of Titanium which interferes with Cobalt: TW-TR2 (140-27497-3), MW-214 (140-27497-6), TW-TR2-C1 (140-27497-10) and MW-213 (140-27497-11). Elevated reporting limits (RLs) are provided.

Titanium is not an interfering element for the Lead line used for reporting these samples.

Method 6010B SEP: LCS/LCSD %RPD was out due to the very low recoveries known for Manganese for this step.

Job ID: 140-27497-1 (Continued)

Laboratory: Eurofins Knoxville (Continued)

MW-212-C (140-27497-1)

Method 6010B SEP: The following sample was diluted due to the presence of titanium which interferes with Cobalt and Lead: BH-1 (140-27497-5). Elevated reporting limits (RLs) are provided.

Method 6010B SEP: The following samples were diluted due to the presence of Silicon which interferes with Arsenic, Cobalt, and Lead: MW-212-C (140-27497-1), MW-210 (140-27497-4), MW-211-0-5FT (140-27497-7), MW-211-14-25FT (140-27497-8), TW-TR2-C2 (140-27497-9), TW-TR2-C1 (140-27497-10) and MW-213 (140-27497-11). Elevated reporting limits (RLs) are provided.

Method 6010B SEP: The following samples were diluted due to the presence of Titanium which interferes with Cobalt: TW-TR2 (140-27497-3), BH-1 (140-27497-5) and MW-213 (140-27497-11). Elevated reporting limits (RLs) are provided.

Titanium is not an interfering element for the Lead line used for reporting these samples.

Method 6010B SEP: The following sample was diluted due to the nature of the sample matrix: MW-212-C (140-27497-1). Elevated reporting limits (RLs) are provided for Aluminum.

Method Organic-Bound: The following samples are not amenable for this step as each addition of the extraction reagent caused significant foaming which resulted in sample loss.

MW-212-C (140-27497-1), MW-211-0-5FT (140-27497-7), TW-TR2-C2 (140-27497-9) and TW-TR2-C1 (140-27497-10)

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

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

Sample Summary

Client: Golder Associates Inc. Job ID: 140-27497-1
Project/Site: GL21509219, GRE Stanton 2022

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
140-27497-1	MW-212-C	Solid	05/10/22 10:48	05/18/22 11:20
140-27497-2	MW-212	Solid	05/10/22 11:20	05/18/22 11:20
140-27497-3	TW-TR2	Solid	05/11/22 15:00	05/18/22 11:20
140-27497-4	MW-210	Solid	05/09/22 10:37	05/18/22 11:20
140-27497-5	BH-1	Solid	05/10/22 13:15	05/18/22 11:20
140-27497-6	MW-214	Solid	05/12/22 15:15	05/18/22 11:20
140-27497-7	MW-211-0-5FT	Solid	05/10/22 08:24	05/18/22 11:20
140-27497-8	MW-211-14-25FT	Solid	05/10/22 09:30	05/18/22 11:20
140-27497-9	TW-TR2-C2	Solid	05/11/22 14:00	05/18/22 11:20
140-27497-10	TW-TR2-C1	Solid	05/11/22 13:00	05/18/22 11:20
140-27497-11	MW-213	Solid	05/12/22 12:40	05/18/22 11:20

Client Sample Results

Client: Golder Associates Inc. Job ID: 140-27497-1
Project/Site: GL21509219, GRE Stanton 2022

Client Sample ID: MW-212-C Lab Sample ID: 140-27497-1

Date Collected: 05/10/22 10:48 **Matrix: Solid**
Date Received: 05/18/22 11:20 **Percent Solids: 72.2**

Method: 6010B SEP - SEP Metals (ICP) - Step 1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		55	8.9	mg/Kg	☼	06/01/22 08:00	06/08/22 11:27	4
Arsenic	ND		2.8	0.72	mg/Kg	☼	06/01/22 08:00	06/08/22 11:27	4
Cobalt	ND		14	0.25	mg/Kg	☼	06/01/22 08:00	06/08/22 11:27	4
Iron	ND		28	16	mg/Kg	☼	06/01/22 08:00	06/08/22 11:27	4
Lead	ND		2.8	0.61	mg/Kg	☼	06/01/22 08:00	06/08/22 11:27	4
Lithium	ND		14	0.83	mg/Kg	☼	06/01/22 08:00	06/08/22 11:27	4
Manganese	**7.3**		4.2	0.17	mg/Kg	☼	06/01/22 08:00	06/08/22 11:27	4
Molybdenum	ND		11	0.45	mg/Kg	☼	06/01/22 08:00	06/08/22 11:27	4

Method: 6010B SEP - SEP Metals (ICP) - Step 2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		42	6.6	mg/Kg	☼	06/02/22 08:00	06/08/22 13:26	3
Arsenic	ND		2.1	0.54	mg/Kg	☼	06/02/22 08:00	06/08/22 13:26	3
Cobalt	ND		10	0.26	mg/Kg	☼	06/02/22 08:00	06/08/22 13:26	3
Iron	ND		21	12	mg/Kg	☼	06/02/22 08:00	06/08/22 13:26	3
Lead	**0.47**	**J**	2.1	0.46	mg/Kg	☼	06/02/22 08:00	06/08/22 13:26	3
Lithium	**0.71**	**J**	10	0.62	mg/Kg	☼	06/02/22 08:00	06/08/22 13:26	3
Manganese	**16**		3.1	1.2	mg/Kg	☼	06/02/22 08:00	06/08/22 13:26	3
Molybdenum	ND		8.3	0.34	mg/Kg	☼	06/02/22 08:00	06/08/22 13:26	3

Method: 6010B SEP - SEP Metals (ICP) - Step 3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**730**		14	2.9	mg/Kg	☼	06/03/22 08:00	06/09/22 11:02	1
Arsenic	**1.3**		0.69	0.18	mg/Kg	☼	06/03/22 08:00	06/09/22 11:02	1
Cobalt	**1.2**	**J**	3.5	0.062	mg/Kg	☼	06/03/22 08:00	06/09/22 11:02	1
Iron	**1900**		6.9	4.0	mg/Kg	☼	06/03/22 08:00	06/09/22 11:02	1
Lead	ND		0.69	0.15	mg/Kg	☼	06/03/22 08:00	06/09/22 11:02	1
Lithium	**0.27**	**J**	3.5	0.21	mg/Kg	☼	06/03/22 08:00	06/09/22 11:02	1
Manganese	**71**	**B**	1.0	0.037	mg/Kg	☼	06/03/22 08:00	06/09/22 11:02	1
Molybdenum	ND		2.8	0.11	mg/Kg	☼	06/03/22 08:00	06/09/22 11:02	1

Method: 6010B SEP - SEP Metals (ICP) - Step 4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**2500**		14	2.2	mg/Kg	☼	06/06/22 08:00	06/09/22 12:59	1
Arsenic	**2.7**		0.69	0.30	mg/Kg	☼	06/06/22 08:00	06/09/22 12:59	1
Cobalt	**1.5**	**J**	3.5	0.073	mg/Kg	☼	06/06/22 08:00	06/09/22 12:59	1
Iron	**6300**		6.9	4.0	mg/Kg	☼	06/06/22 08:00	06/09/22 12:59	1
Lead	**3.9**		0.69	0.15	mg/Kg	☼	06/06/22 08:00	06/09/22 12:59	1
Lithium	**3.5**	**B**	3.5	0.21	mg/Kg	☼	06/06/22 08:00	06/09/22 12:59	1
Manganese	**78**		1.0	0.18	mg/Kg	☼	06/06/22 08:00	06/09/22 12:59	1
Molybdenum	**0.14**	**J**	2.8	0.11	mg/Kg	☼	06/06/22 08:00	06/09/22 12:59	1

Method: 6010B SEP - SEP Metals (ICP) - Step 5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**480**		210	33	mg/Kg	☼	06/08/22 08:00	06/10/22 11:22	5
Arsenic	ND		10	2.6	mg/Kg	☼	06/08/22 08:00	06/10/22 11:22	5
Cobalt	ND		52	0.83	mg/Kg	☼	06/08/22 08:00	06/10/22 11:22	5
Iron	**1300**		100	61	mg/Kg	☼	06/08/22 08:00	06/10/22 11:22	5
Lead	**2.4**	**J**	10	2.3	mg/Kg	☼	06/08/22 08:00	06/10/22 11:22	5
Lithium	**10**	**J B**	52	3.0	mg/Kg	☼	06/08/22 08:00	06/10/22 11:22	5

Client Sample ID: MW-212-C **Lab Sample ID: 140-27497-1**
Date Collected: 05/10/22 10:48 **Matrix: Solid**
Date Received: 05/18/22 11:20 **Percent Solids: 72.2**

Method: 6010B SEP - SEP Metals (ICP) - Step 5 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	14	J *1	16	2.6	mg/Kg	☼	06/08/22 08:00	06/10/22 11:22	5
Molybdenum	ND		42	1.7	mg/Kg	☼	06/08/22 08:00	06/10/22 11:22	5

Method: 6010B SEP - SEP Metals (ICP) - Step 6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	1300		14	2.2	mg/Kg	☼	06/08/22 08:00	06/10/22 13:22	1
Arsenic	0.94		0.69	0.21	mg/Kg	☼	06/08/22 08:00	06/10/22 13:22	1
Cobalt	0.41	J	3.5	0.064	mg/Kg	☼	06/08/22 08:00	06/10/22 13:22	1
Iron	2000		6.9	4.0	mg/Kg	☼	06/08/22 08:00	06/10/22 13:22	1
Lead	0.51	J	0.69	0.15	mg/Kg	☼	06/08/22 08:00	06/10/22 13:22	1
Lithium	1.0	J	3.5	0.21	mg/Kg	☼	06/08/22 08:00	06/10/22 13:22	1
Manganese	11		1.0	0.35	mg/Kg	☼	06/08/22 08:00	06/10/22 13:22	1
Molybdenum	ND		2.8	0.14	mg/Kg	☼	06/08/22 08:00	06/10/22 13:22	1

Method: 6010B SEP - SEP Metals (ICP) - Step 7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	22000		140	22	mg/Kg	☼	06/09/22 08:00	06/13/22 11:43	10
Arsenic	0.94	J	1.4	0.36	mg/Kg	☼	06/09/22 08:00	06/13/22 15:31	2
Cobalt	2.0	J	6.9	0.072	mg/Kg	☼	06/09/22 08:00	06/13/22 15:31	2
Iron	3100		6.9	5.7	mg/Kg	☼	06/09/22 08:00	06/14/22 12:42	1
Lead	2.3		1.4	0.30	mg/Kg	☼	06/09/22 08:00	06/13/22 15:31	2
Lithium	6.9		3.5	0.21	mg/Kg	☼	06/09/22 08:00	06/14/22 12:42	1
Manganese	28		1.0	0.15	mg/Kg	☼	06/09/22 08:00	06/13/22 13:40	1
Molybdenum	0.14	J	2.8	0.11	mg/Kg	☼	06/09/22 08:00	06/13/22 13:40	1

Method: 6010B SEP - SEP Metals (ICP) - Sum of Steps 1-7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	27000		10	1.6	mg/Kg			06/16/22 15:26	1
Arsenic	5.9		0.50	0.13	mg/Kg			06/16/22 15:26	1
Cobalt	5.2		2.5	0.023	mg/Kg			06/16/22 15:26	1
Iron	15000		5.0	4.1	mg/Kg			06/16/22 15:26	1
Lead	9.5		0.50	0.11	mg/Kg			06/16/22 15:26	1
Lithium	22		2.5	0.15	mg/Kg			06/16/22 15:26	1
Manganese	230		0.75	0.052	mg/Kg			06/16/22 15:26	1
Molybdenum	0.28	J	2.0	0.082	mg/Kg			06/16/22 15:26	1

Method: 6010B - SEP Metals (ICP) - Total

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	26000		140	22	mg/Kg	☼	05/26/22 08:00	06/14/22 13:41	10
Arsenic	7.9		2.1	0.54	mg/Kg	☼	05/26/22 08:00	06/14/22 17:27	3
Cobalt	5.8	J	10	0.11	mg/Kg	☼	05/26/22 08:00	06/14/22 17:27	3
Iron	13000		6.9	5.7	mg/Kg	☼	05/26/22 08:00	06/14/22 15:40	1
Lead	7.7		2.1	0.46	mg/Kg	☼	05/26/22 08:00	06/14/22 17:27	3
Lithium	10		3.5	0.21	mg/Kg	☼	05/26/22 08:00	06/14/22 15:40	1
Manganese	200		1.0	0.15	mg/Kg	☼	05/26/22 08:00	06/14/22 15:40	1
Molybdenum	1.1	J	2.8	0.11	mg/Kg	☼	05/26/22 08:00	06/14/22 15:40	1

Client: Golder Associates Inc. Job ID: 140-27497-1
Project/Site: GL21509219, GRE Stanton 2022

Client Sample ID: MW-212 **Lab Sample ID: 140-27497-2**
Date Collected: 05/10/22 11:20 **Matrix: Solid**
Date Received: 05/18/22 11:20 **Percent Solids: 85.2**

Method: 6010B SEP - SEP Metals (ICP) - Step 1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		47	7.5	mg/Kg	☼	06/01/22 08:00	06/08/22 11:42	4
Arsenic	ND		2.3	0.61	mg/Kg	☼	06/01/22 08:00	06/08/22 11:42	4
Cobalt	ND		12	0.21	mg/Kg	☼	06/01/22 08:00	06/08/22 11:42	4
Iron	ND		23	14	mg/Kg	☼	06/01/22 08:00	06/08/22 11:42	4
Lead	ND		2.3	0.52	mg/Kg	☼	06/01/22 08:00	06/08/22 11:42	4
Lithium	ND		12	0.70	mg/Kg	☼	06/01/22 08:00	06/08/22 11:42	4
Manganese	**10**		3.5	0.15	mg/Kg	☼	06/01/22 08:00	06/08/22 11:42	4
Molybdenum	ND		9.4	0.38	mg/Kg	☼	06/01/22 08:00	06/08/22 11:42	4

Method: 6010B SEP - SEP Metals (ICP) - Step 2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**5.9**	**J**	35	5.6	mg/Kg	☼	06/02/22 08:00	06/08/22 13:41	3
Arsenic	ND		1.8	0.46	mg/Kg	☼	06/02/22 08:00	06/08/22 13:41	3
Cobalt	ND		8.8	0.22	mg/Kg	☼	06/02/22 08:00	06/08/22 13:41	3
Iron	ND		18	10	mg/Kg	☼	06/02/22 08:00	06/08/22 13:41	3
Lead	ND		1.8	0.39	mg/Kg	☼	06/02/22 08:00	06/08/22 13:41	3
Lithium	ND		8.8	0.53	mg/Kg	☼	06/02/22 08:00	06/08/22 13:41	3
Manganese	**30**		2.6	0.99	mg/Kg	☼	06/02/22 08:00	06/08/22 13:41	3
Molybdenum	ND		7.0	0.29	mg/Kg	☼	06/02/22 08:00	06/08/22 13:41	3

Method: 6010B SEP - SEP Metals (ICP) - Step 3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**60**		12	2.5	mg/Kg	☼	06/03/22 08:00	06/09/22 11:17	1
Arsenic	**0.28**	**J**	0.59	0.15	mg/Kg	☼	06/03/22 08:00	06/09/22 11:17	1
Cobalt	**0.34**	**J**	2.9	0.053	mg/Kg	☼	06/03/22 08:00	06/09/22 11:17	1
Iron	**380**		5.9	3.4	mg/Kg	☼	06/03/22 08:00	06/09/22 11:17	1
Lead	ND		0.59	0.13	mg/Kg	☼	06/03/22 08:00	06/09/22 11:17	1
Lithium	ND		2.9	0.18	mg/Kg	☼	06/03/22 08:00	06/09/22 11:17	1
Manganese	**24**	**B**	0.88	0.032	mg/Kg	☼	06/03/22 08:00	06/09/22 11:17	1
Molybdenum	ND		2.3	0.096	mg/Kg	☼	06/03/22 08:00	06/09/22 11:17	1

Method: 6010B SEP - SEP Metals (ICP) - Step 4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**450**		12	1.9	mg/Kg	☼	06/06/22 08:00	06/09/22 13:14	1
Arsenic	**0.46**	**J**	0.59	0.26	mg/Kg	☼	06/06/22 08:00	06/09/22 13:14	1
Cobalt	**1.3**	**J**	2.9	0.062	mg/Kg	☼	06/06/22 08:00	06/09/22 13:14	1
Iron	**3400**		5.9	3.4	mg/Kg	☼	06/06/22 08:00	06/09/22 13:14	1
Lead	**1.3**		0.59	0.13	mg/Kg	☼	06/06/22 08:00	06/09/22 13:14	1
Lithium	**1.1**	**J B**	2.9	0.18	mg/Kg	☼	06/06/22 08:00	06/09/22 13:14	1
Manganese	**62**		0.88	0.15	mg/Kg	☼	06/06/22 08:00	06/09/22 13:14	1
Molybdenum	**0.58**	**J**	2.3	0.096	mg/Kg	☼	06/06/22 08:00	06/09/22 13:14	1

Method: 6010B SEP - SEP Metals (ICP) - Step 5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**87**	**J**	180	28	mg/Kg	☼	06/08/22 08:00	06/10/22 11:37	5
Arsenic	ND		8.8	2.2	mg/Kg	☼	06/08/22 08:00	06/10/22 11:37	5
Cobalt	ND		44	0.70	mg/Kg	☼	06/08/22 08:00	06/10/22 11:37	5
Iron	ND		88	52	mg/Kg	☼	06/08/22 08:00	06/10/22 11:37	5
Lead	ND		8.8	1.9	mg/Kg	☼	06/08/22 08:00	06/10/22 11:37	5
Lithium	**7.5**	**J B**	44	2.6	mg/Kg	☼	06/08/22 08:00	06/10/22 11:37	5

Client Sample ID: MW-212
Lab Sample ID: 140-27497-2

Date Collected: 05/10/22 11:20
Matrix: Solid

Date Received: 05/18/22 11:20
Percent Solids: 85.2

Method: 6010B SEP - SEP Metals (ICP) - Step 5 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	2.5	J *1	13	2.2	mg/Kg	☼	06/08/22 08:00	06/10/22 11:37	5
Molybdenum	ND		35	1.5	mg/Kg	☼	06/08/22 08:00	06/10/22 11:37	5

Method: 6010B SEP - SEP Metals (ICP) - Step 6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	1200		12	1.9	mg/Kg	☼	06/08/22 08:00	06/10/22 13:37	1
Arsenic	3.4		0.59	0.18	mg/Kg	☼	06/08/22 08:00	06/10/22 13:37	1
Cobalt	1.3	J	2.9	0.054	mg/Kg	☼	06/08/22 08:00	06/10/22 13:37	1
Iron	7600		5.9	3.4	mg/Kg	☼	06/08/22 08:00	06/10/22 13:37	1
Lead	0.90		0.59	0.13	mg/Kg	☼	06/08/22 08:00	06/10/22 13:37	1
Lithium	1.9	J	2.9	0.18	mg/Kg	☼	06/08/22 08:00	06/10/22 13:37	1
Manganese	84		0.88	0.29	mg/Kg	☼	06/08/22 08:00	06/10/22 13:37	1
Molybdenum	1.4	J	2.3	0.12	mg/Kg	☼	06/08/22 08:00	06/10/22 13:37	1

Method: 6010B SEP - SEP Metals (ICP) - Step 7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	29000		120	19	mg/Kg	☼	06/09/22 08:00	06/14/22 11:00	10
Arsenic	2.3		0.59	0.15	mg/Kg	☼	06/09/22 08:00	06/13/22 13:55	1
Cobalt	2.0	J	2.9	0.031	mg/Kg	☼	06/09/22 08:00	06/13/22 13:55	1
Iron	3600		5.9	4.8	mg/Kg	☼	06/09/22 08:00	06/13/22 13:55	1
Lead	7.1		0.59	0.13	mg/Kg	☼	06/09/22 08:00	06/13/22 13:55	1
Lithium	4.7		2.9	0.18	mg/Kg	☼	06/09/22 08:00	06/13/22 13:55	1
Manganese	55		0.88	0.13	mg/Kg	☼	06/09/22 08:00	06/13/22 13:55	1
Molybdenum	0.88	J	2.3	0.096	mg/Kg	☼	06/09/22 08:00	06/13/22 13:55	1

Method: 6010B SEP - SEP Metals (ICP) - Sum of Steps 1-7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	31000		10	1.6	mg/Kg			06/16/22 15:26	1
Arsenic	6.4		0.50	0.13	mg/Kg			06/16/22 15:26	1
Cobalt	4.9		2.5	0.023	mg/Kg			06/16/22 15:26	1
Iron	15000		5.0	4.1	mg/Kg			06/16/22 15:26	1
Lead	9.3		0.50	0.11	mg/Kg			06/16/22 15:26	1
Lithium	15		2.5	0.15	mg/Kg			06/16/22 15:26	1
Manganese	270		0.75	0.052	mg/Kg			06/16/22 15:26	1
Molybdenum	2.9		2.0	0.082	mg/Kg			06/16/22 15:26	1

Method: 6010B - SEP Metals (ICP) - Total

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	33000		120	19	mg/Kg	☼	05/26/22 08:00	06/14/22 13:55	10
Arsenic	7.9		1.2	0.31	mg/Kg	☼	05/26/22 08:00	06/14/22 17:32	2
Cobalt	5.4	J	5.9	0.061	mg/Kg	☼	05/26/22 08:00	06/14/22 17:32	2
Iron	13000		5.9	4.8	mg/Kg	☼	05/26/22 08:00	06/14/22 15:55	1
Lead	7.3		1.2	0.26	mg/Kg	☼	05/26/22 08:00	06/14/22 17:32	2
Lithium	8.5		2.9	0.18	mg/Kg	☼	05/26/22 08:00	06/14/22 15:55	1
Manganese	200		0.88	0.13	mg/Kg	☼	05/26/22 08:00	06/14/22 15:55	1
Molybdenum	0.62	J	2.3	0.096	mg/Kg	☼	05/26/22 08:00	06/14/22 15:55	1

Client Sample ID: TW-TR2 **Lab Sample ID: 140-27497-3**

Date Collected: 05/11/22 15:00 **Matrix: Solid**

Date Received: 05/18/22 11:20 **Percent Solids: 84.1**

Client Sample Results

Client: Golder Associates Inc. Job ID: 140-27497-1
Project/Site: GL21509219, GRE Stanton 2022

Client Sample ID: TW-TR2 **Lab Sample ID: 140-27497-3**
Date Collected: 05/11/22 15:00 **Matrix: Solid**
Date Received: 05/18/22 11:20 **Percent Solids: 84.1**

Client Sample ID: MW-210

Lab Sample ID: 140-27497-4

Date Collected: 05/09/22 10:37
Matrix: Solid
Date Received: 05/18/22 11:20
Percent Solids: 83.8

Method: 6010B SEP - SEP Metals (ICP) - Step 1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		48	7.6	mg/Kg	☼	06/01/22 08:00	06/08/22 11:52	4
Arsenic	ND		2.4	0.62	mg/Kg	☼	06/01/22 08:00	06/08/22 11:52	4
Cobalt	ND		12	0.21	mg/Kg	☼	06/01/22 08:00	06/08/22 11:52	4
Iron	ND		24	14	mg/Kg	☼	06/01/22 08:00	06/08/22 11:52	4
Lead	**0.54**	**J B**	2.4	0.53	mg/Kg	☼	06/01/22 08:00	06/08/22 11:52	4
Lithium	ND		12	0.72	mg/Kg	☼	06/01/22 08:00	06/08/22 11:52	4
Manganese	**1.4**	**J**	3.6	0.15	mg/Kg	☼	06/01/22 08:00	06/08/22 11:52	4
Molybdenum	ND		9.5	0.39	mg/Kg	☼	06/01/22 08:00	06/08/22 11:52	4

Method: 6010B SEP - SEP Metals (ICP) - Step 2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		36	5.7	mg/Kg	☼	06/02/22 08:00	06/08/22 13:51	3
Arsenic	ND		1.8	0.47	mg/Kg	☼	06/02/22 08:00	06/08/22 13:51	3
Cobalt	ND		9.0	0.23	mg/Kg	☼	06/02/22 08:00	06/08/22 13:51	3
Iron	**40**		18	10	mg/Kg	☼	06/02/22 08:00	06/08/22 13:51	3
Lead	**0.56**	**J**	1.8	0.39	mg/Kg	☼	06/02/22 08:00	06/08/22 13:51	3
Lithium	ND		9.0	0.54	mg/Kg	☼	06/02/22 08:00	06/08/22 13:51	3
Manganese	**13**		2.7	1.0	mg/Kg	☼	06/02/22 08:00	06/08/22 13:51	3
Molybdenum	ND		7.2	0.29	mg/Kg	☼	06/02/22 08:00	06/08/22 13:51	3

Method: 6010B SEP - SEP Metals (ICP) - Step 3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**45**		12	2.5	mg/Kg	☼	06/03/22 08:00	06/09/22 11:26	1
Arsenic	ND		0.60	0.16	mg/Kg	☼	06/03/22 08:00	06/09/22 11:26	1
Cobalt	**0.32**	**J**	3.0	0.054	mg/Kg	☼	06/03/22 08:00	06/09/22 11:26	1
Iron	**620**		6.0	3.5	mg/Kg	☼	06/03/22 08:00	06/09/22 11:26	1
Lead	ND		0.60	0.13	mg/Kg	☼	06/03/22 08:00	06/09/22 11:26	1
Lithium	ND		3.0	0.18	mg/Kg	☼	06/03/22 08:00	06/09/22 11:26	1
Manganese	**7.2**	**B**	0.90	0.032	mg/Kg	☼	06/03/22 08:00	06/09/22 11:26	1
Molybdenum	**0.11**	**J**	2.4	0.098	mg/Kg	☼	06/03/22 08:00	06/09/22 11:26	1

Method: 6010B SEP - SEP Metals (ICP) - Step 4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**570**		12	1.9	mg/Kg	☼	06/06/22 08:00	06/09/22 13:23	1
Arsenic	**0.30**	**J**	0.60	0.26	mg/Kg	☼	06/06/22 08:00	06/09/22 13:23	1
Cobalt	**1.5**	**J**	3.0	0.063	mg/Kg	☼	06/06/22 08:00	06/09/22 13:23	1
Iron	**3600**		6.0	3.5	mg/Kg	☼	06/06/22 08:00	06/09/22 13:23	1
Lead	**1.6**		0.60	0.13	mg/Kg	☼	06/06/22 08:00	06/09/22 13:23	1
Lithium	**1.4**	**J B**	3.0	0.18	mg/Kg	☼	06/06/22 08:00	06/09/22 13:23	1
Manganese	**37**		0.90	0.16	mg/Kg	☼	06/06/22 08:00	06/09/22 13:23	1
Molybdenum	**0.25**	**J**	2.4	0.098	mg/Kg	☼	06/06/22 08:00	06/09/22 13:23	1

Method: 6010B SEP - SEP Metals (ICP) - Step 5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**60**	**J**	180	28	mg/Kg	☼	06/08/22 08:00	06/10/22 11:47	5
Arsenic	ND		9.0	2.3	mg/Kg	☼	06/08/22 08:00	06/10/22 11:47	5
Cobalt	ND		45	0.72	mg/Kg	☼	06/08/22 08:00	06/10/22 11:47	5
Iron	ND		90	53	mg/Kg	☼	06/08/22 08:00	06/10/22 11:47	5
Lead	ND		9.0	2.0	mg/Kg	☼	06/08/22 08:00	06/10/22 11:47	5
Lithium	**7.8**	**J B**	45	2.6	mg/Kg	☼	06/08/22 08:00	06/10/22 11:47	5

Client Sample ID: MW-210

Lab Sample ID: 140-27497-4

Date Collected: 05/09/22 10:37
Matrix: Solid
Date Received: 05/18/22 11:20
Percent Solids: 83.8

Method: 6010B SEP - SEP Metals (ICP) - Step 5 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	ND	*1	13	2.2	mg/Kg	☼	06/08/22 08:00	06/10/22 11:47	5
Molybdenum	ND		36	1.5	mg/Kg	☼	06/08/22 08:00	06/10/22 11:47	5

Method: 6010B SEP - SEP Metals (ICP) - Step 6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**1300**		12	1.9	mg/Kg	☼	06/08/22 08:00	06/10/22 13:52	1
Arsenic	**2.6**		0.60	0.18	mg/Kg	☼	06/08/22 08:00	06/10/22 13:52	1
Cobalt	**1.3**	**J**	3.0	0.055	mg/Kg	☼	06/08/22 08:00	06/10/22 13:52	1
Iron	**6500**		6.0	3.5	mg/Kg	☼	06/08/22 08:00	06/10/22 13:52	1
Lead	**0.99**		0.60	0.13	mg/Kg	☼	06/08/22 08:00	06/10/22 13:52	1
Lithium	**1.9**	**J**	3.0	0.18	mg/Kg	☼	06/08/22 08:00	06/10/22 13:52	1
Manganese	**66**		0.90	0.30	mg/Kg	☼	06/08/22 08:00	06/10/22 13:52	1
Molybdenum	**0.33**	**J**	2.4	0.12	mg/Kg	☼	06/08/22 08:00	06/10/22 13:52	1

Method: 6010B SEP - SEP Metals (ICP) - Step 7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**31000**		120	19	mg/Kg	☼	06/09/22 08:00	06/14/22 11:09	10
Arsenic	**1.7**		1.2	0.31	mg/Kg	☼	06/09/22 08:00	06/13/22 15:41	2
Cobalt	**1.9**	**J**	6.0	0.062	mg/Kg	☼	06/09/22 08:00	06/13/22 15:41	2
Iron	**3300**		6.0	4.9	mg/Kg	☼	06/09/22 08:00	06/13/22 14:05	1
Lead	**4.7**		1.2	0.26	mg/Kg	☼	06/09/22 08:00	06/13/22 15:41	2
Lithium	**3.8**		3.0	0.18	mg/Kg	☼	06/09/22 08:00	06/13/22 14:05	1
Manganese	**61**		0.90	0.13	mg/Kg	☼	06/09/22 08:00	06/13/22 14:05	1
Molybdenum	**0.13**	**J**	2.4	0.098	mg/Kg	☼	06/09/22 08:00	06/13/22 14:05	1

Method: 6010B SEP - SEP Metals (ICP) - Sum of Steps 1-7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**33000**		10	1.6	mg/Kg			06/16/22 15:26	1
Arsenic	**4.6**		0.50	0.13	mg/Kg			06/16/22 15:26	1
Cobalt	**5.1**		2.5	0.023	mg/Kg			06/16/22 15:26	1
Iron	**14000**		5.0	4.1	mg/Kg			06/16/22 15:26	1
Lead	**8.4**		0.50	0.11	mg/Kg			06/16/22 15:26	1
Lithium	**15**		2.5	0.15	mg/Kg			06/16/22 15:26	1
Manganese	**180**		0.75	0.052	mg/Kg			06/16/22 15:26	1
Molybdenum	**0.81**	**J**	2.0	0.082	mg/Kg			06/16/22 15:26	1

Method: 6010B - SEP Metals (ICP) - Total

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**30000**		120	19	mg/Kg	☼	05/26/22 08:00	06/14/22 14:05	10
Arsenic	**6.0**		1.2	0.31	mg/Kg	☼	05/26/22 08:00	06/14/22 17:42	2
Cobalt	**4.7**	**J**	6.0	0.062	mg/Kg	☼	05/26/22 08:00	06/14/22 17:42	2
Iron	**13000**		6.0	4.9	mg/Kg	☼	05/26/22 08:00	06/14/22 16:06	1
Lead	**7.1**		1.2	0.26	mg/Kg	☼	05/26/22 08:00	06/14/22 17:42	2
Lithium	**6.5**		3.0	0.18	mg/Kg	☼	05/26/22 08:00	06/14/22 16:06	1
Manganese	**170**		0.90	0.13	mg/Kg	☼	05/26/22 08:00	06/14/22 16:06	1
Molybdenum	**0.85**	**J**	2.4	0.098	mg/Kg	☼	05/26/22 08:00	06/14/22 16:06	1

Client Sample Results

Client: Golder Associates Inc. Job ID: 140-27497-1
Project/Site: GL21509219, GRE Stanton 2022

Client Sample ID: BH-1 Lab Sample ID: 140-27497-5

Date Collected: 05/10/22 13:15 **Matrix: Solid**
Date Received: 05/18/22 11:20 **Percent Solids: 89.0**

Method: 6010B SEP - SEP Metals (ICP) - Step 1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		45	7.2	mg/Kg	☼	06/01/22 08:00	06/08/22 11:57	4
Arsenic	ND		2.2	0.58	mg/Kg	☼	06/01/22 08:00	06/08/22 11:57	4
Cobalt	ND		11	0.20	mg/Kg	☼	06/01/22 08:00	06/08/22 11:57	4
Iron	ND		22	13	mg/Kg	☼	06/01/22 08:00	06/08/22 11:57	4
Lead	ND		2.2	0.49	mg/Kg	☼	06/01/22 08:00	06/08/22 11:57	4
Lithium	ND		11	0.67	mg/Kg	☼	06/01/22 08:00	06/08/22 11:57	4
Manganese	**0.34**	**J**	3.4	0.14	mg/Kg	☼	06/01/22 08:00	06/08/22 11:57	4
Molybdenum	ND		9.0	0.37	mg/Kg	☼	06/01/22 08:00	06/08/22 11:57	4

Method: 6010B SEP - SEP Metals (ICP) - Step 2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**1600**		34	5.4	mg/Kg	☼	06/02/22 08:00	06/08/22 13:56	3
Arsenic	ND		1.7	0.44	mg/Kg	☼	06/02/22 08:00	06/08/22 13:56	3
Cobalt	**0.21**	**J**	8.4	0.21	mg/Kg	☼	06/02/22 08:00	06/08/22 13:56	3
Iron	**190**		17	9.8	mg/Kg	☼	06/02/22 08:00	06/08/22 13:56	3
Lead	**0.80**	**J**	1.7	0.37	mg/Kg	☼	06/02/22 08:00	06/08/22 13:56	3
Lithium	**1.9**	**J**	8.4	0.51	mg/Kg	☼	06/02/22 08:00	06/08/22 13:56	3
Manganese	**23**		2.5	0.94	mg/Kg	☼	06/02/22 08:00	06/08/22 13:56	3
Molybdenum	ND		6.7	0.28	mg/Kg	☼	06/02/22 08:00	06/08/22 13:56	3

Method: 6010B SEP - SEP Metals (ICP) - Step 3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**3400**		11	2.4	mg/Kg	☼	06/03/22 08:00	06/09/22 11:31	1
Arsenic	**1.6**		0.56	0.15	mg/Kg	☼	06/03/22 08:00	06/09/22 11:31	1
Cobalt	**0.60**	**J**	2.8	0.051	mg/Kg	☼	06/03/22 08:00	06/09/22 11:31	1
Iron	**1100**		5.6	3.3	mg/Kg	☼	06/03/22 08:00	06/09/22 11:31	1
Lead	ND		0.56	0.12	mg/Kg	☼	06/03/22 08:00	06/09/22 11:31	1
Lithium	**1.4**	**J**	2.8	0.17	mg/Kg	☼	06/03/22 08:00	06/09/22 11:31	1
Manganese	**12**	**B**	0.84	0.030	mg/Kg	☼	06/03/22 08:00	06/09/22 11:31	1
Molybdenum	**0.39**	**J**	2.2	0.092	mg/Kg	☼	06/03/22 08:00	06/09/22 11:31	1

Method: 6010B SEP - SEP Metals (ICP) - Step 4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**12000**		11	1.8	mg/Kg	☼	06/06/22 08:00	06/09/22 13:28	1
Arsenic	**1.0**		0.56	0.25	mg/Kg	☼	06/06/22 08:00	06/09/22 13:28	1
Cobalt	**2.0**	**J**	2.8	0.060	mg/Kg	☼	06/06/22 08:00	06/09/22 13:28	1
Iron	**3500**		5.6	3.3	mg/Kg	☼	06/06/22 08:00	06/09/22 13:28	1
Lead	**6.3**		0.56	0.12	mg/Kg	☼	06/06/22 08:00	06/09/22 13:28	1
Lithium	**12**	**B**	2.8	0.17	mg/Kg	☼	06/06/22 08:00	06/09/22 13:28	1
Manganese	**65**		0.84	0.15	mg/Kg	☼	06/06/22 08:00	06/09/22 13:28	1
Molybdenum	**0.80**	**J**	2.2	0.092	mg/Kg	☼	06/06/22 08:00	06/09/22 13:28	1

Method: 6010B SEP - SEP Metals (ICP) - Step 5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**710**		170	26	mg/Kg	☼	06/08/22 08:00	06/10/22 11:52	5
Arsenic	ND		8.4	2.1	mg/Kg	☼	06/08/22 08:00	06/10/22 11:52	5
Cobalt	ND		42	0.67	mg/Kg	☼	06/08/22 08:00	06/10/22 11:52	5
Iron	ND		84	49	mg/Kg	☼	06/08/22 08:00	06/10/22 11:52	5
Lead	ND		8.4	1.9	mg/Kg	☼	06/08/22 08:00	06/10/22 11:52	5
Lithium	**7.9**	**J B**	42	2.5	mg/Kg	☼	06/08/22 08:00	06/10/22 11:52	5

Client Sample Results

Client Sample ID: BH-1

Lab Sample ID: 140-27497-5

Date Collected: 05/10/22 13:15
Matrix: Solid
Date Received: 05/18/22 11:20
Percent Solids: 89.0

Method: 6010B SEP - SEP Metals (ICP) - Step 5 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	**11**	**J *1**	13	2.1	mg/Kg	☼	06/08/22 08:00	06/10/22 11:52	5
Molybdenum	ND		34	1.4	mg/Kg	☼	06/08/22 08:00	06/10/22 11:52	5

Method: 6010B SEP - SEP Metals (ICP) - Step 6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**23000**		11	1.8	mg/Kg	☼	06/08/22 08:00	06/10/22 13:56	1
Arsenic	**4.1**		0.56	0.17	mg/Kg	☼	06/08/22 08:00	06/10/22 13:56	1
Cobalt	**4.2**	**J**	5.6	0.10	mg/Kg	☼	06/08/22 08:00	06/13/22 16:26	2
Iron	**13000**		5.6	3.3	mg/Kg	☼	06/08/22 08:00	06/10/22 13:56	1
Lead	**4.5**		1.1	0.25	mg/Kg	☼	06/08/22 08:00	06/13/22 16:26	2
Lithium	**19**		2.8	0.17	mg/Kg	☼	06/08/22 08:00	06/10/22 13:56	1
Manganese	**86**		0.84	0.28	mg/Kg	☼	06/08/22 08:00	06/10/22 13:56	1
Molybdenum	**0.96**	**J**	2.2	0.11	mg/Kg	☼	06/08/22 08:00	06/10/22 13:56	1

Method: 6010B SEP - SEP Metals (ICP) - Step 7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**21000**		110	18	mg/Kg	☼	06/09/22 08:00	06/14/22 11:14	10
Arsenic	**1.6**		0.56	0.15	mg/Kg	☼	06/09/22 08:00	06/13/22 14:10	1
Cobalt	**5.6**	**J**	14	0.15	mg/Kg	☼	06/09/22 08:00	06/13/22 15:46	5
Iron	**14000**		5.6	4.6	mg/Kg	☼	06/09/22 08:00	06/13/22 14:10	1
Lead	**4.6**		0.56	0.12	mg/Kg	☼	06/09/22 08:00	06/13/22 14:10	1
Lithium	**24**		2.8	0.17	mg/Kg	☼	06/09/22 08:00	06/13/22 14:10	1
Manganese	**97**		0.84	0.12	mg/Kg	☼	06/09/22 08:00	06/13/22 14:10	1
Molybdenum	**0.98**	**J**	2.2	0.092	mg/Kg	☼	06/09/22 08:00	06/13/22 14:10	1

Method: 6010B SEP - SEP Metals (ICP) - Sum of Steps 1-7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**62000**		10	1.6	mg/Kg			06/16/22 15:26	1
Arsenic	**8.3**		0.50	0.13	mg/Kg			06/16/22 15:26	1
Cobalt	**13**		2.5	0.023	mg/Kg			06/16/22 15:26	1
Iron	**31000**		5.0	4.1	mg/Kg			06/16/22 15:26	1
Lead	**16**		0.50	0.11	mg/Kg			06/16/22 15:26	1
Lithium	**67**		2.5	0.15	mg/Kg			06/16/22 15:26	1
Manganese	**300**		0.75	0.052	mg/Kg			06/16/22 15:26	1
Molybdenum	**3.1**		2.0	0.082	mg/Kg			06/16/22 15:26	1

Method: 6010B - SEP Metals (ICP) - Total

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**79000**		110	18	mg/Kg	☼	05/26/22 08:00	06/14/22 14:09	10
Arsenic	**11**		1.1	0.29	mg/Kg	☼	05/26/22 08:00	06/14/22 17:48	2
Cobalt	**14**	**J**	28	0.29	mg/Kg	☼	05/26/22 08:00	06/14/22 14:09	10
Iron	**35000**		56	46	mg/Kg	☼	05/26/22 08:00	06/14/22 14:09	10
Lead	**11**		1.1	0.25	mg/Kg	☼	05/26/22 08:00	06/14/22 17:48	2
Lithium	**69**		28	1.7	mg/Kg	☼	05/26/22 08:00	06/14/22 14:09	10
Manganese	**250**		1.7	0.25	mg/Kg	☼	05/26/22 08:00	06/14/22 17:48	2
Molybdenum	**3.4**	**J**	4.5	0.18	mg/Kg	☼	05/26/22 08:00	06/14/22 17:48	2

Client Sample Results

Client: Golder Associates Inc.
Job ID: 140-27497-1
Project/Site: GL21509219, GRE Stanton 2022

Client Sample ID: MW-214
Lab Sample ID: 140-27497-6
Date Collected: 05/12/22 15:15
Matrix: Solid
Date Received: 05/18/22 11:20
Percent Solids: 83.4

Method: 6010B SEP - SEP Metals (ICP) - Step 1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		48	7.7	mg/Kg	☼	06/01/22 08:00	06/08/22 12:02	4
Arsenic	ND		2.4	0.62	mg/Kg	☼	06/01/22 08:00	06/08/22 12:02	4
Cobalt	ND		12	0.22	mg/Kg	☼	06/01/22 08:00	06/08/22 12:02	4
Iron	ND		24	14	mg/Kg	☼	06/01/22 08:00	06/08/22 12:02	4
Lead	**0.59**	**J B**	2.4	0.53	mg/Kg	☼	06/01/22 08:00	06/08/22 12:02	4
Lithium	ND		12	0.72	mg/Kg	☼	06/01/22 08:00	06/08/22 12:02	4
Manganese	**0.36**	**J**	3.6	0.15	mg/Kg	☼	06/01/22 08:00	06/08/22 12:02	4
Molybdenum	ND		9.6	0.39	mg/Kg	☼	06/01/22 08:00	06/08/22 12:02	4

Method: 6010B SEP - SEP Metals (ICP) - Step 2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		36	5.8	mg/Kg	☼	06/02/22 08:00	06/08/22 14:01	3
Arsenic	ND		1.8	0.47	mg/Kg	☼	06/02/22 08:00	06/08/22 14:01	3
Cobalt	ND		9.0	0.23	mg/Kg	☼	06/02/22 08:00	06/08/22 14:01	3
Iron	ND		18	10	mg/Kg	☼	06/02/22 08:00	06/08/22 14:01	3
Lead	ND		1.8	0.40	mg/Kg	☼	06/02/22 08:00	06/08/22 14:01	3
Lithium	ND		9.0	0.54	mg/Kg	☼	06/02/22 08:00	06/08/22 14:01	3
Manganese	**15**		2.7	1.0	mg/Kg	☼	06/02/22 08:00	06/08/22 14:01	3
Molybdenum	ND		7.2	0.29	mg/Kg	☼	06/02/22 08:00	06/08/22 14:01	3

Method: 6010B SEP - SEP Metals (ICP) - Step 3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**110**		12	2.5	mg/Kg	☼	06/03/22 08:00	06/09/22 11:36	1
Arsenic	**0.49**	**J**	0.60	0.16	mg/Kg	☼	06/03/22 08:00	06/09/22 11:36	1
Cobalt	**1.4**	**J**	3.0	0.054	mg/Kg	☼	06/03/22 08:00	06/09/22 11:36	1
Iron	**390**		6.0	3.5	mg/Kg	☼	06/03/22 08:00	06/09/22 11:36	1
Lead	**0.32**	**J**	0.60	0.13	mg/Kg	☼	06/03/22 08:00	06/09/22 11:36	1
Lithium	**0.21**	**J**	3.0	0.18	mg/Kg	☼	06/03/22 08:00	06/09/22 11:36	1
Manganese	**83**	**B**	0.90	0.032	mg/Kg	☼	06/03/22 08:00	06/09/22 11:36	1
Molybdenum	ND		2.4	0.098	mg/Kg	☼	06/03/22 08:00	06/09/22 11:36	1

Method: 6010B SEP - SEP Metals (ICP) - Step 4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**2100**		12	1.9	mg/Kg	☼	06/06/22 08:00	06/09/22 13:33	1
Arsenic	**2.2**		0.60	0.26	mg/Kg	☼	06/06/22 08:00	06/09/22 13:33	1
Cobalt	**3.2**		3.0	0.064	mg/Kg	☼	06/06/22 08:00	06/09/22 13:33	1
Iron	**8400**		6.0	3.5	mg/Kg	☼	06/06/22 08:00	06/09/22 13:33	1
Lead	**4.7**		0.60	0.13	mg/Kg	☼	06/06/22 08:00	06/09/22 13:33	1
Lithium	**3.9**	**B**	3.0	0.18	mg/Kg	☼	06/06/22 08:00	06/09/22 13:33	1
Manganese	**110**		0.90	0.16	mg/Kg	☼	06/06/22 08:00	06/09/22 13:33	1
Molybdenum	**0.35**	**J**	2.4	0.098	mg/Kg	☼	06/06/22 08:00	06/09/22 13:33	1

Method: 6010B SEP - SEP Metals (ICP) - Step 5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**53**	**J**	180	28	mg/Kg	☼	06/08/22 08:00	06/10/22 11:57	5
Arsenic	ND		9.0	2.3	mg/Kg	☼	06/08/22 08:00	06/10/22 11:57	5
Cobalt	ND		45	0.72	mg/Kg	☼	06/08/22 08:00	06/10/22 11:57	5
Iron	ND		90	53	mg/Kg	☼	06/08/22 08:00	06/10/22 11:57	5
Lead	ND		9.0	2.0	mg/Kg	☼	06/08/22 08:00	06/10/22 11:57	5
Lithium	**7.0**	**J B**	45	2.6	mg/Kg	☼	06/08/22 08:00	06/10/22 11:57	5

Client: Golder Associates Inc. Job ID: 140-27497-1
Project/Site: GL21509219, GRE Stanton 2022

Client Sample ID: MW-214 **Lab Sample ID: 140-27497-6**
Date Collected: 05/12/22 15:15 **Matrix: Solid**
Date Received: 05/18/22 11:20 **Percent Solids: 83.4**

Method: 6010B SEP - SEP Metals (ICP) - Step 5 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	5.0	J *1	13	2.2	mg/Kg	☼	06/08/22 08:00	06/10/22 11:57	5
Molybdenum	ND		36	1.5	mg/Kg	☼	06/08/22 08:00	06/10/22 11:57	5

Method: 6010B SEP - SEP Metals (ICP) - Step 6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	4500		12	1.9	mg/Kg	☼	06/08/22 08:00	06/10/22 14:02	1
Arsenic	1.6		0.60	0.18	mg/Kg	☼	06/08/22 08:00	06/10/22 14:02	1
Cobalt	1.5	J	3.0	0.055	mg/Kg	☼	06/08/22 08:00	06/10/22 14:02	1
Iron	7300		6.0	3.5	mg/Kg	☼	06/08/22 08:00	06/10/22 14:02	1
Lead	1.2		0.60	0.13	mg/Kg	☼	06/08/22 08:00	06/10/22 14:02	1
Lithium	3.7		3.0	0.18	mg/Kg	☼	06/08/22 08:00	06/10/22 14:02	1
Manganese	62		0.90	0.30	mg/Kg	☼	06/08/22 08:00	06/10/22 14:02	1
Molybdenum	0.12	J	2.4	0.12	mg/Kg	☼	06/08/22 08:00	06/10/22 14:02	1

Method: 6010B SEP - SEP Metals (ICP) - Step 7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	27000		120	19	mg/Kg	☼	06/09/22 08:00	06/14/22 11:19	10
Arsenic	1.2		0.60	0.16	mg/Kg	☼	06/09/22 08:00	06/13/22 14:16	1
Cobalt	1.1	J	3.0	0.031	mg/Kg	☼	06/09/22 08:00	06/13/22 14:16	1
Iron	4200		6.0	4.9	mg/Kg	☼	06/09/22 08:00	06/13/22 14:16	1
Lead	2.6		0.60	0.13	mg/Kg	☼	06/09/22 08:00	06/13/22 14:16	1
Lithium	5.3		3.0	0.18	mg/Kg	☼	06/09/22 08:00	06/13/22 14:16	1
Manganese	39		0.90	0.13	mg/Kg	☼	06/09/22 08:00	06/13/22 14:16	1
Molybdenum	0.15	J	2.4	0.098	mg/Kg	☼	06/09/22 08:00	06/13/22 14:16	1

Method: 6010B SEP - SEP Metals (ICP) - Sum of Steps 1-7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	34000		10	1.6	mg/Kg			06/16/22 15:26	1
Arsenic	5.4		0.50	0.13	mg/Kg			06/16/22 15:26	1
Cobalt	7.2		2.5	0.023	mg/Kg			06/16/22 15:26	1
Iron	20000		5.0	4.1	mg/Kg			06/16/22 15:26	1
Lead	9.4		0.50	0.11	mg/Kg			06/16/22 15:26	1
Lithium	20		2.5	0.15	mg/Kg			06/16/22 15:26	1
Manganese	310		0.75	0.052	mg/Kg			06/16/22 15:26	1
Molybdenum	0.62	J	2.0	0.082	mg/Kg			06/16/22 15:26	1

Method: 6010B - SEP Metals (ICP) - Total

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	44000		120	19	mg/Kg	☼	05/26/22 08:00	06/14/22 14:14	10
Arsenic	7.2		0.60	0.16	mg/Kg	☼	05/26/22 08:00	06/14/22 16:18	1
Cobalt	6.1		6.0	0.062	mg/Kg	☼	05/26/22 08:00	06/14/22 17:53	2
Iron	17000		6.0	4.9	mg/Kg	☼	05/26/22 08:00	06/14/22 16:18	1
Lead	7.8		0.60	0.13	mg/Kg	☼	05/26/22 08:00	06/14/22 16:18	1
Lithium	13		3.0	0.18	mg/Kg	☼	05/26/22 08:00	06/14/22 16:18	1
Manganese	210		0.90	0.13	mg/Kg	☼	05/26/22 08:00	06/14/22 16:18	1
Molybdenum	0.66	J	2.4	0.098	mg/Kg	☼	05/26/22 08:00	06/14/22 16:18	1

Client Sample ID: MW-211-0-5FT Lab Sample ID: 140-27497-7

Date Collected: 05/10/22 08:24 **Matrix: Solid**
Date Received: 05/18/22 11:20 **Percent Solids: 83.9**

Method: 6010B SEP - SEP Metals (ICP) - Step 1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		48	7.6	mg/Kg	☼	06/01/22 08:00	06/08/22 12:07	4
Arsenic	ND		2.4	0.62	mg/Kg	☼	06/01/22 08:00	06/08/22 12:07	4
Cobalt	ND		12	0.21	mg/Kg	☼	06/01/22 08:00	06/08/22 12:07	4
Iron	ND		24	14	mg/Kg	☼	06/01/22 08:00	06/08/22 12:07	4
Lead	ND		2.4	0.52	mg/Kg	☼	06/01/22 08:00	06/08/22 12:07	4
Lithium	ND		12	0.72	mg/Kg	☼	06/01/22 08:00	06/08/22 12:07	4
Manganese	ND		3.6	0.15	mg/Kg	☼	06/01/22 08:00	06/08/22 12:07	4
Molybdenum	ND		9.5	0.39	mg/Kg	☼	06/01/22 08:00	06/08/22 12:07	4

Method: 6010B SEP - SEP Metals (ICP) - Step 2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		36	5.7	mg/Kg	☼	06/02/22 08:00	06/08/22 14:06	3
Arsenic	ND		1.8	0.47	mg/Kg	☼	06/02/22 08:00	06/08/22 14:06	3
Cobalt	ND		8.9	0.23	mg/Kg	☼	06/02/22 08:00	06/08/22 14:06	3
Iron	ND		18	10	mg/Kg	☼	06/02/22 08:00	06/08/22 14:06	3
Lead	ND		1.8	0.39	mg/Kg	☼	06/02/22 08:00	06/08/22 14:06	3
Lithium	ND		8.9	0.54	mg/Kg	☼	06/02/22 08:00	06/08/22 14:06	3
Manganese	**17**		2.7	1.0	mg/Kg	☼	06/02/22 08:00	06/08/22 14:06	3
Molybdenum	ND		7.2	0.29	mg/Kg	☼	06/02/22 08:00	06/08/22 14:06	3

Method: 6010B SEP - SEP Metals (ICP) - Step 3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**320**		12	2.5	mg/Kg	☼	06/03/22 08:00	06/09/22 11:41	1
Arsenic	**1.0**		0.60	0.16	mg/Kg	☼	06/03/22 08:00	06/09/22 11:41	1
Cobalt	**1.4**	**J**	3.0	0.054	mg/Kg	☼	06/03/22 08:00	06/09/22 11:41	1
Iron	**1100**		6.0	3.5	mg/Kg	☼	06/03/22 08:00	06/09/22 11:41	1
Lead	ND		0.60	0.13	mg/Kg	☼	06/03/22 08:00	06/09/22 11:41	1
Lithium	**0.24**	**J**	3.0	0.18	mg/Kg	☼	06/03/22 08:00	06/09/22 11:41	1
Manganese	**94**	**B**	0.89	0.032	mg/Kg	☼	06/03/22 08:00	06/09/22 11:41	1
Molybdenum	**0.21**	**J**	2.4	0.098	mg/Kg	☼	06/03/22 08:00	06/09/22 11:41	1

Method: 6010B SEP - SEP Metals (ICP) - Step 4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**1600**		12	1.9	mg/Kg	☼	06/06/22 08:00	06/09/22 13:38	1
Arsenic	**1.7**		0.60	0.26	mg/Kg	☼	06/06/22 08:00	06/09/22 13:38	1
Cobalt	**1.5**	**J**	3.0	0.063	mg/Kg	☼	06/06/22 08:00	06/09/22 13:38	1
Iron	**5000**		6.0	3.5	mg/Kg	☼	06/06/22 08:00	06/09/22 13:38	1
Lead	**3.6**		0.60	0.13	mg/Kg	☼	06/06/22 08:00	06/09/22 13:38	1
Lithium	**3.2**	**B**	3.0	0.18	mg/Kg	☼	06/06/22 08:00	06/09/22 13:38	1
Manganese	**67**		0.89	0.16	mg/Kg	☼	06/06/22 08:00	06/09/22 13:38	1
Molybdenum	**0.18**	**J**	2.4	0.098	mg/Kg	☼	06/06/22 08:00	06/09/22 13:38	1

Method: 6010B SEP - SEP Metals (ICP) - Step 5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**190**		180	28	mg/Kg	☼	06/08/22 08:00	06/10/22 12:02	5
Arsenic	ND		8.9	2.3	mg/Kg	☼	06/08/22 08:00	06/10/22 12:02	5
Cobalt	ND		45	0.72	mg/Kg	☼	06/08/22 08:00	06/10/22 12:02	5
Iron	**410**		89	52	mg/Kg	☼	06/08/22 08:00	06/10/22 12:02	5
Lead	ND		8.9	2.0	mg/Kg	☼	06/08/22 08:00	06/10/22 12:02	5
Lithium	**6.3**	**J B**	45	2.6	mg/Kg	☼	06/08/22 08:00	06/10/22 12:02	5

Client Sample ID: MW-211-0-5FT

Lab Sample ID: 140-27497-7

Date Collected: 05/10/22 08:24
Matrix: Solid
Date Received: 05/18/22 11:20
Percent Solids: 83.9

Method: 6010B SEP - SEP Metals (ICP) - Step 5 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	**12**	**J *1**	13	2.2	mg/Kg	☼	06/08/22 08:00	06/10/22 12:02	5
Molybdenum	ND		36	1.5	mg/Kg	☼	06/08/22 08:00	06/10/22 12:02	5

Method: 6010B SEP - SEP Metals (ICP) - Step 6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**2500**		12	1.9	mg/Kg	☼	06/08/22 08:00	06/10/22 14:07	1
Arsenic	**2.0**		0.60	0.18	mg/Kg	☼	06/08/22 08:00	06/10/22 14:07	1
Cobalt	**0.98**	**J**	3.0	0.055	mg/Kg	☼	06/08/22 08:00	06/10/22 14:07	1
Iron	**5000**		6.0	3.5	mg/Kg	☼	06/08/22 08:00	06/10/22 14:07	1
Lead	**1.0**		0.60	0.13	mg/Kg	☼	06/08/22 08:00	06/10/22 14:07	1
Lithium	**2.4**	**J**	3.0	0.18	mg/Kg	☼	06/08/22 08:00	06/10/22 14:07	1
Manganese	**39**		0.89	0.30	mg/Kg	☼	06/08/22 08:00	06/10/22 14:07	1
Molybdenum	**0.13**	**J**	2.4	0.12	mg/Kg	☼	06/08/22 08:00	06/10/22 14:07	1

Method: 6010B SEP - SEP Metals (ICP) - Step 7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**32000**		120	19	mg/Kg	☼	06/09/22 08:00	06/14/22 11:24	10
Arsenic	**1.1**	**J**	1.8	0.47	mg/Kg	☼	06/09/22 08:00	06/13/22 15:51	3
Cobalt	**2.1**	**J**	8.9	0.093	mg/Kg	☼	06/09/22 08:00	06/13/22 15:51	3
Iron	**3300**		6.0	4.9	mg/Kg	☼	06/09/22 08:00	06/13/22 14:21	1
Lead	**3.2**		1.8	0.39	mg/Kg	☼	06/09/22 08:00	06/13/22 15:51	3
Lithium	**5.6**		3.0	0.18	mg/Kg	☼	06/09/22 08:00	06/13/22 14:21	1
Manganese	**42**		0.89	0.13	mg/Kg	☼	06/09/22 08:00	06/13/22 14:21	1
Molybdenum	**0.14**	**J**	2.4	0.098	mg/Kg	☼	06/09/22 08:00	06/13/22 14:21	1

Method: 6010B SEP - SEP Metals (ICP) - Sum of Steps 1-7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**37000**		10	1.6	mg/Kg			06/16/22 15:26	1
Arsenic	**5.9**		0.50	0.13	mg/Kg			06/16/22 15:26	1
Cobalt	**6.0**		2.5	0.023	mg/Kg			06/16/22 15:26	1
Iron	**15000**		5.0	4.1	mg/Kg			06/16/22 15:26	1
Lead	**7.8**		0.50	0.11	mg/Kg			06/16/22 15:26	1
Lithium	**18**		2.5	0.15	mg/Kg			06/16/22 15:26	1
Manganese	**270**		0.75	0.052	mg/Kg			06/16/22 15:26	1
Molybdenum	**0.66**	**J**	2.0	0.082	mg/Kg			06/16/22 15:26	1

Method: 6010B - SEP Metals (ICP) - Total

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**32000**		120	19	mg/Kg	☼	05/26/22 08:00	06/14/22 14:19	10
Arsenic	**7.8**		1.2	0.31	mg/Kg	☼	05/26/22 08:00	06/14/22 17:58	2
Cobalt	**5.5**	**J**	6.0	0.062	mg/Kg	☼	05/26/22 08:00	06/14/22 17:58	2
Iron	**13000**		6.0	4.9	mg/Kg	☼	05/26/22 08:00	06/14/22 16:23	1
Lead	**8.4**		1.2	0.26	mg/Kg	☼	05/26/22 08:00	06/14/22 17:58	2
Lithium	**10**		3.0	0.18	mg/Kg	☼	05/26/22 08:00	06/14/22 16:23	1
Manganese	**260**		0.89	0.13	mg/Kg	☼	05/26/22 08:00	06/14/22 16:23	1
Molybdenum	**0.98**	**J**	2.4	0.098	mg/Kg	☼	05/26/22 08:00	06/14/22 16:23	1

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

Client Sample ID: MW-211-14-25FT

Date Collected: 05/10/22 09:30
Date Received: 05/18/22 11:20

Lab Sample ID: 140-27497-8

Matrix: Solid
Percent Solids: 83.2

Method: 6010B SEP - SEP Metals (ICP) - Step 1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		48	7.7	mg/Kg	☼	06/01/22 08:00	06/08/22 12:12	4
Arsenic	ND		2.4	0.63	mg/Kg	☼	06/01/22 08:00	06/08/22 12:12	4
Cobalt	ND		12	0.22	mg/Kg	☼	06/01/22 08:00	06/08/22 12:12	4
Iron	ND		24	14	mg/Kg	☼	06/01/22 08:00	06/08/22 12:12	4
Lead	ND		2.4	0.53	mg/Kg	☼	06/01/22 08:00	06/08/22 12:12	4
Lithium	ND		12	0.72	mg/Kg	☼	06/01/22 08:00	06/08/22 12:12	4
Manganese	**13**		3.6	0.15	mg/Kg	☼	06/01/22 08:00	06/08/22 12:12	4
Molybdenum	ND		9.6	0.39	mg/Kg	☼	06/01/22 08:00	06/08/22 12:12	4

Method: 6010B SEP - SEP Metals (ICP) - Step 2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**11**	**J**	36	5.8	mg/Kg	☼	06/02/22 08:00	06/08/22 14:11	3
Arsenic	ND		1.8	0.47	mg/Kg	☼	06/02/22 08:00	06/08/22 14:11	3
Cobalt	ND		9.0	0.23	mg/Kg	☼	06/02/22 08:00	06/08/22 14:11	3
Iron	**38**		18	10	mg/Kg	☼	06/02/22 08:00	06/08/22 14:11	3
Lead	**0.43**	**J**	1.8	0.40	mg/Kg	☼	06/02/22 08:00	06/08/22 14:11	3
Lithium	ND		9.0	0.54	mg/Kg	☼	06/02/22 08:00	06/08/22 14:11	3
Manganese	**29**		2.7	1.0	mg/Kg	☼	06/02/22 08:00	06/08/22 14:11	3
Molybdenum	ND		7.2	0.30	mg/Kg	☼	06/02/22 08:00	06/08/22 14:11	3

Method: 6010B SEP - SEP Metals (ICP) - Step 3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**130**		12	2.5	mg/Kg	☼	06/03/22 08:00	06/09/22 11:46	1
Arsenic	**0.85**		0.60	0.16	mg/Kg	☼	06/03/22 08:00	06/09/22 11:46	1
Cobalt	**0.54**	**J**	3.0	0.054	mg/Kg	☼	06/03/22 08:00	06/09/22 11:46	1
Iron	**820**		6.0	3.5	mg/Kg	☼	06/03/22 08:00	06/09/22 11:46	1
Lead	**0.28**	**J**	0.60	0.13	mg/Kg	☼	06/03/22 08:00	06/09/22 11:46	1
Lithium	**0.19**	**J**	3.0	0.18	mg/Kg	☼	06/03/22 08:00	06/09/22 11:46	1
Manganese	**26**	**B**	0.90	0.032	mg/Kg	☼	06/03/22 08:00	06/09/22 11:46	1
Molybdenum	**0.29**	**J**	2.4	0.099	mg/Kg	☼	06/03/22 08:00	06/09/22 11:46	1

Method: 6010B SEP - SEP Metals (ICP) - Step 4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**1400**		12	1.9	mg/Kg	☼	06/06/22 08:00	06/09/22 13:42	1
Arsenic	**1.6**		0.60	0.26	mg/Kg	☼	06/06/22 08:00	06/09/22 13:42	1
Cobalt	**1.8**	**J**	3.0	0.064	mg/Kg	☼	06/06/22 08:00	06/09/22 13:42	1
Iron	**5500**		6.0	3.5	mg/Kg	☼	06/06/22 08:00	06/09/22 13:42	1
Lead	**1.9**		0.60	0.13	mg/Kg	☼	06/06/22 08:00	06/09/22 13:42	1
Lithium	**2.5**	**J B**	3.0	0.18	mg/Kg	☼	06/06/22 08:00	06/09/22 13:42	1
Manganese	**69**		0.90	0.16	mg/Kg	☼	06/06/22 08:00	06/09/22 13:42	1
Molybdenum	**0.64**	**J**	2.4	0.099	mg/Kg	☼	06/06/22 08:00	06/09/22 13:42	1

Method: 6010B SEP - SEP Metals (ICP) - Step 5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**69**	**J**	180	28	mg/Kg	☼	06/08/22 08:00	06/10/22 12:07	5
Arsenic	ND		9.0	2.3	mg/Kg	☼	06/08/22 08:00	06/10/22 12:07	5
Cobalt	ND		45	0.72	mg/Kg	☼	06/08/22 08:00	06/10/22 12:07	5
Iron	ND		90	53	mg/Kg	☼	06/08/22 08:00	06/10/22 12:07	5
Lead	ND		9.0	2.0	mg/Kg	☼	06/08/22 08:00	06/10/22 12:07	5
Lithium	**6.6**	**J B**	45	2.6	mg/Kg	☼	06/08/22 08:00	06/10/22 12:07	5

Client Sample ID: MW-211-14-25FT Lab Sample ID: 140-27497-8

Date Collected: 05/10/22 09:30 **Matrix: Solid**
Date Received: 05/18/22 11:20 **Percent Solids: 83.2**

Method: 6010B SEP - SEP Metals (ICP) - Step 5 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	ND	*1	14	2.2	mg/Kg	☼	06/08/22 08:00	06/10/22 12:07	5
Molybdenum	ND		36	1.5	mg/Kg	☼	06/08/22 08:00	06/10/22 12:07	5

Method: 6010B SEP - SEP Metals (ICP) - Step 6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**2200**		12	1.9	mg/Kg	☼	06/08/22 08:00	06/10/22 14:11	1
Arsenic	**2.0**		0.60	0.18	mg/Kg	☼	06/08/22 08:00	06/10/22 14:11	1
Cobalt	**0.95**	**J**	3.0	0.055	mg/Kg	☼	06/08/22 08:00	06/10/22 14:11	1
Iron	**5400**		6.0	3.5	mg/Kg	☼	06/08/22 08:00	06/10/22 14:11	1
Lead	**0.62**		0.60	0.13	mg/Kg	☼	06/08/22 08:00	06/10/22 14:11	1
Lithium	**2.2**	**J**	3.0	0.18	mg/Kg	☼	06/08/22 08:00	06/10/22 14:11	1
Manganese	**50**		0.90	0.30	mg/Kg	☼	06/08/22 08:00	06/10/22 14:11	1
Molybdenum	**0.85**	**J**	2.4	0.12	mg/Kg	☼	06/08/22 08:00	06/10/22 14:11	1

Method: 6010B SEP - SEP Metals (ICP) - Step 7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**28000**		120	19	mg/Kg	☼	06/09/22 08:00	06/14/22 11:29	10
Arsenic	**1.3**	**J**	1.8	0.47	mg/Kg	☼	06/09/22 08:00	06/13/22 16:06	3
Cobalt	**1.4**	**J**	9.0	0.094	mg/Kg	☼	06/09/22 08:00	06/13/22 16:06	3
Iron	**2400**		6.0	4.9	mg/Kg	☼	06/09/22 08:00	06/13/22 14:26	1
Lead	**3.4**		1.8	0.40	mg/Kg	☼	06/09/22 08:00	06/13/22 16:06	3
Lithium	**4.0**		3.0	0.18	mg/Kg	☼	06/09/22 08:00	06/13/22 14:26	1
Manganese	**36**		0.90	0.13	mg/Kg	☼	06/09/22 08:00	06/13/22 14:26	1
Molybdenum	**0.16**	**J**	2.4	0.099	mg/Kg	☼	06/09/22 08:00	06/13/22 14:26	1

Method: 6010B SEP - SEP Metals (ICP) - Sum of Steps 1-7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**32000**		10	1.6	mg/Kg			06/16/22 15:26	1
Arsenic	**5.8**		0.50	0.13	mg/Kg			06/16/22 15:26	1
Cobalt	**4.7**		2.5	0.023	mg/Kg			06/16/22 15:26	1
Iron	**14000**		5.0	4.1	mg/Kg			06/16/22 15:26	1
Lead	**6.6**		0.50	0.11	mg/Kg			06/16/22 15:26	1
Lithium	**16**		2.5	0.15	mg/Kg			06/16/22 15:26	1
Manganese	**220**		0.75	0.052	mg/Kg			06/16/22 15:26	1
Molybdenum	**2.0**		2.0	0.082	mg/Kg			06/16/22 15:26	1

Method: 6010B - SEP Metals (ICP) - Total

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**43000**		120	19	mg/Kg	☼	05/26/22 08:00	06/14/22 14:24	10
Arsenic	**8.7**		0.60	0.16	mg/Kg	☼	05/26/22 08:00	06/14/22 16:29	1
Cobalt	**4.7**		3.0	0.031	mg/Kg	☼	05/26/22 08:00	06/14/22 16:29	1
Iron	**13000**		6.0	4.9	mg/Kg	☼	05/26/22 08:00	06/14/22 16:29	1
Lead	**7.5**		0.60	0.13	mg/Kg	☼	05/26/22 08:00	06/14/22 16:29	1
Lithium	**9.2**		3.0	0.18	mg/Kg	☼	05/26/22 08:00	06/14/22 16:29	1
Manganese	**240**		0.90	0.13	mg/Kg	☼	05/26/22 08:00	06/14/22 16:29	1
Molybdenum	**0.79**	**J**	2.4	0.099	mg/Kg	☼	05/26/22 08:00	06/14/22 16:29	1

Client Sample Results

Client: Golder Associates Inc. | Job ID: 140-27497-1

Project/Site: GL21509219, GRE Stanton 2022

Client Sample ID: TW-TR2-C2 | **Lab Sample ID: 140-27497-9**

Date Collected: 05/11/22 14:00 | **Matrix: Solid**

Date Received: 05/18/22 11:20 | **Percent Solids: 54.6**

Client Sample Results

Client: Golder Associates Inc. Job ID: 140-27497-1
Project/Site: GL21509219, GRE Stanton 2022

Client Sample ID: TW-TR2-C2 **Lab Sample ID: 140-27497-9**
Date Collected: 05/11/22 14:00 **Matrix: Solid**
Date Received: 05/18/22 11:20 **Percent Solids: 54.6**

Client Sample Results

Client: Golder Associates Inc. Job ID: 140-27497-1
Project/Site: GL21509219, GRE Stanton 2022

Client Sample ID: TW-TR2-C1 **Lab Sample ID: 140-27497-10**
Date Collected: 05/11/22 13:00 **Matrix: Solid**
Date Received: 05/18/22 11:20 **Percent Solids: 64.6**

Client Sample ID: TW-TR2-C1 **Lab Sample ID: 140-27497-10**

Date Collected: 05/11/22 13:00 **Matrix: Solid**

Date Received: 05/18/22 11:20 **Percent Solids: 64.6**

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

Client Sample ID: MW-213
Lab Sample ID: 140-27497-11

Date Collected: 05/12/22 12:40
Matrix: Solid
Date Received: 05/18/22 11:20
Percent Solids: 85.3

Method: 6010B SEP - SEP Metals (ICP) - Step 1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		47	7.5	mg/Kg	☼	06/01/22 08:00	06/08/22 12:27	4
Arsenic	ND		2.3	0.61	mg/Kg	☼	06/01/22 08:00	06/08/22 12:27	4
Cobalt	**0.46**	**J**	12	0.21	mg/Kg	☼	06/01/22 08:00	06/08/22 12:27	4
Iron	ND		23	14	mg/Kg	☼	06/01/22 08:00	06/08/22 12:27	4
Lead	ND		2.3	0.52	mg/Kg	☼	06/01/22 08:00	06/08/22 12:27	4
Lithium	ND		12	0.70	mg/Kg	☼	06/01/22 08:00	06/08/22 12:27	4
Manganese	**10**		3.5	0.15	mg/Kg	☼	06/01/22 08:00	06/08/22 12:27	4
Molybdenum	ND		9.4	0.38	mg/Kg	☼	06/01/22 08:00	06/08/22 12:27	4

Method: 6010B SEP - SEP Metals (ICP) - Step 2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**15**	**J**	35	5.6	mg/Kg	☼	06/02/22 08:00	06/08/22 14:27	3
Arsenic	ND		1.8	0.46	mg/Kg	☼	06/02/22 08:00	06/08/22 14:27	3
Cobalt	**1.1**	**J**	8.8	0.22	mg/Kg	☼	06/02/22 08:00	06/08/22 14:27	3
Iron	**580**		18	10	mg/Kg	☼	06/02/22 08:00	06/08/22 14:27	3
Lead	**1.6**	**J**	1.8	0.39	mg/Kg	☼	06/02/22 08:00	06/08/22 14:27	3
Lithium	**0.91**	**J**	8.8	0.53	mg/Kg	☼	06/02/22 08:00	06/08/22 14:27	3
Manganese	**69**		2.6	0.98	mg/Kg	☼	06/02/22 08:00	06/08/22 14:27	3
Molybdenum	ND		7.0	0.29	mg/Kg	☼	06/02/22 08:00	06/08/22 14:27	3

Method: 6010B SEP - SEP Metals (ICP) - Step 3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**87**		12	2.5	mg/Kg	☼	06/03/22 08:00	06/09/22 12:01	1
Arsenic	**0.29**	**J**	0.59	0.15	mg/Kg	☼	06/03/22 08:00	06/09/22 12:01	1
Cobalt	**0.96**	**J**	2.9	0.053	mg/Kg	☼	06/03/22 08:00	06/09/22 12:01	1
Iron	**4900**		5.9	3.4	mg/Kg	☼	06/03/22 08:00	06/09/22 12:01	1
Lead	ND		0.59	0.13	mg/Kg	☼	06/03/22 08:00	06/09/22 12:01	1
Lithium	**0.34**	**J**	2.9	0.18	mg/Kg	☼	06/03/22 08:00	06/09/22 12:01	1
Manganese	**130**	**B**	0.88	0.032	mg/Kg	☼	06/03/22 08:00	06/09/22 12:01	1
Molybdenum	**0.11**	**J**	2.3	0.096	mg/Kg	☼	06/03/22 08:00	06/09/22 12:01	1

Method: 6010B SEP - SEP Metals (ICP) - Step 4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**1100**		12	1.9	mg/Kg	☼	06/06/22 08:00	06/09/22 13:57	1
Arsenic	ND	L	0.59	0.26	mg/Kg	☼	06/06/22 08:00	06/09/22 13:57	1
Cobalt	**2.4**	**J**	2.9	0.062	mg/Kg	☼	06/06/22 08:00	06/09/22 13:57	1
Iron	**14000**		5.9	3.4	mg/Kg	☼	06/06/22 08:00	06/09/22 13:57	1
Lead	**3.1**		0.59	0.13	mg/Kg	☼	06/06/22 08:00	06/09/22 13:57	1
Lithium	**3.7**	**B**	2.9	0.18	mg/Kg	☼	06/06/22 08:00	06/09/22 13:57	1
Manganese	**350**		0.88	0.15	mg/Kg	☼	06/06/22 08:00	06/09/22 13:57	1
Molybdenum	ND		2.3	0.096	mg/Kg	☼	06/06/22 08:00	06/09/22 13:57	1

Method: 6010B SEP - SEP Metals (ICP) - Step 5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**59**	**J**	180	28	mg/Kg	☼	06/08/22 08:00	06/10/22 12:22	5
Arsenic	ND		8.8	2.2	mg/Kg	☼	06/08/22 08:00	06/10/22 12:22	5
Cobalt	ND		44	0.70	mg/Kg	☼	06/08/22 08:00	06/10/22 12:22	5
Iron	ND		88	52	mg/Kg	☼	06/08/22 08:00	06/10/22 12:22	5
Lead	ND		8.8	1.9	mg/Kg	☼	06/08/22 08:00	06/10/22 12:22	5
Lithium	**5.4**	**J B**	44	2.6	mg/Kg	☼	06/08/22 08:00	06/10/22 12:22	5

Client Sample ID: MW-213 **Lab Sample ID: 140-27497-11**
Date Collected: 05/12/22 12:40 **Matrix: Solid**
Date Received: 05/18/22 11:20 **Percent Solids: 85.3**

Method: 6010B SEP - SEP Metals (ICP) - Step 5 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	7.3	J *1	13	2.2	mg/Kg	☼	06/08/22 08:00	06/10/22 12:22	5
Molybdenum	ND		35	1.5	mg/Kg	☼	06/08/22 08:00	06/10/22 12:22	5

Method: 6010B SEP - SEP Metals (ICP) - Step 6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	4200		12	1.9	mg/Kg	☼	06/08/22 08:00	06/10/22 14:27	1
Arsenic	4.5		0.59	0.18	mg/Kg	☼	06/08/22 08:00	06/10/22 14:27	1
Cobalt	2.5	J	2.9	0.054	mg/Kg	☼	06/08/22 08:00	06/10/22 14:27	1
Iron	7700		5.9	3.4	mg/Kg	☼	06/08/22 08:00	06/10/22 14:27	1
Lead	1.6		0.59	0.13	mg/Kg	☼	06/08/22 08:00	06/10/22 14:27	1
Lithium	5.1		2.9	0.18	mg/Kg	☼	06/08/22 08:00	06/10/22 14:27	1
Manganese	84		0.88	0.29	mg/Kg	☼	06/08/22 08:00	06/10/22 14:27	1
Molybdenum	ND		2.3	0.12	mg/Kg	☼	06/08/22 08:00	06/10/22 14:27	1

Method: 6010B SEP - SEP Metals (ICP) - Step 7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	40000		120	19	mg/Kg	☼	06/09/22 08:00	06/14/22 11:43	10
Arsenic	1.9		1.2	0.30	mg/Kg	☼	06/09/22 08:00	06/13/22 16:21	2
Cobalt	1.6	J	5.9	0.061	mg/Kg	☼	06/09/22 08:00	06/13/22 16:21	2
Iron	3700		5.9	4.8	mg/Kg	☼	06/09/22 08:00	06/13/22 14:41	1
Lead	2.1		1.2	0.26	mg/Kg	☼	06/09/22 08:00	06/13/22 16:21	2
Lithium	11		2.9	0.18	mg/Kg	☼	06/09/22 08:00	06/13/22 14:41	1
Manganese	34		0.88	0.13	mg/Kg	☼	06/09/22 08:00	06/13/22 14:41	1
Molybdenum	0.12	J	2.3	0.096	mg/Kg	☼	06/09/22 08:00	06/13/22 14:41	1

Method: 6010B SEP - SEP Metals (ICP) - Sum of Steps 1-7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	46000		10	1.6	mg/Kg			06/16/22 15:26	1
Arsenic	6.7		0.50	0.13	mg/Kg			06/16/22 15:26	1
Cobalt	9.1		2.5	0.023	mg/Kg			06/16/22 15:26	1
Iron	31000		5.0	4.1	mg/Kg			06/16/22 15:26	1
Lead	8.4		0.50	0.11	mg/Kg			06/16/22 15:26	1
Lithium	26		2.5	0.15	mg/Kg			06/16/22 15:26	1
Manganese	690		0.75	0.052	mg/Kg			06/16/22 15:26	1
Molybdenum	0.23	J	2.0	0.082	mg/Kg			06/16/22 15:26	1

Method: 6010B - SEP Metals (ICP) - Total

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	62000		120	19	mg/Kg	☼	05/26/22 08:00	06/14/22 14:38	10
Arsenic	6.2		0.59	0.15	mg/Kg	☼	05/26/22 08:00	06/14/22 16:45	1
Cobalt	9.3		5.9	0.061	mg/Kg	☼	05/26/22 08:00	06/14/22 18:24	2
Iron	19000		5.9	4.8	mg/Kg	☼	05/26/22 08:00	06/14/22 16:45	1
Lead	8.9		1.2	0.26	mg/Kg	☼	05/26/22 08:00	06/14/22 18:24	2
Lithium	21		2.9	0.18	mg/Kg	☼	05/26/22 08:00	06/14/22 16:45	1
Manganese	300		0.88	0.13	mg/Kg	☼	05/26/22 08:00	06/14/22 16:45	1
Molybdenum	0.40	J	2.3	0.096	mg/Kg	☼	05/26/22 08:00	06/14/22 16:45	1

Default Detection Limits

Client: Golder Associates Inc. Job ID: 140-27497-1
Project/Site: GL21509219, GRE Stanton 2022

Method: 6010B SEP - SEP Metals (ICP) - Step 1

Prep: 3010A

SEP: Exchangeable

Analyte	RL	MDL	Units
Aluminum	10	1.6	mg/Kg
Arsenic	0.50	0.13	mg/Kg
Cobalt	2.5	0.045	mg/Kg
Iron	5.0	2.9	mg/Kg
Lead	0.50	0.11	mg/Kg
Lithium	2.5	0.15	mg/Kg
Manganese	0.75	0.031	mg/Kg
Molybdenum	2.0	0.082	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 2

Prep: 3010A

SEP: Carbonate

Analyte	RL	MDL	Units
Aluminum	10	1.6	mg/Kg
Arsenic	0.50	0.13	mg/Kg
Cobalt	2.5	0.063	mg/Kg
Iron	5.0	2.9	mg/Kg
Lead	0.50	0.11	mg/Kg
Lithium	2.5	0.15	mg/Kg
Manganese	0.75	0.28	mg/Kg
Molybdenum	2.0	0.082	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 3

Prep: 3010A

SEP: Non-Crystalline

Analyte	RL	MDL	Units
Aluminum	10	2.1	mg/Kg
Arsenic	0.50	0.13	mg/Kg
Cobalt	2.5	0.045	mg/Kg
Iron	5.0	2.9	mg/Kg
Lead	0.50	0.11	mg/Kg
Lithium	2.5	0.15	mg/Kg
Manganese	0.75	0.027	mg/Kg
Molybdenum	2.0	0.082	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 4

Prep: 3010A

SEP: Metal Hydroxide

Analyte	RL	MDL	Units
Aluminum	10	1.6	mg/Kg
Arsenic	0.50	0.22	mg/Kg
Cobalt	2.5	0.053	mg/Kg
Iron	5.0	2.9	mg/Kg
Lead	0.50	0.11	mg/Kg
Lithium	2.5	0.15	mg/Kg
Manganese	0.75	0.13	mg/Kg
Molybdenum	2.0	0.082	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 5

Prep: 3010A

Default Detection Limits

Client: Golder Associates Inc. Job ID: 140-27497-1
Project/Site: GL21509219, GRE Stanton 2022

Method: 6010B SEP - SEP Metals (ICP) - Step 5
Prep: 3010A
SEP: Organic-Bound

Analyte	RL	MDL	Units
Aluminum	30	4.7	mg/Kg
Arsenic	1.5	0.38	mg/Kg
Cobalt	7.5	0.12	mg/Kg
Iron	15	8.8	mg/Kg
Lead	1.5	0.33	mg/Kg
Lithium	7.5	0.44	mg/Kg
Manganese	2.3	0.37	mg/Kg
Molybdenum	6.0	0.25	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 6
SEP: Acid/Sulfide

Analyte	RL	MDL	Units
Aluminum	10	1.6	mg/Kg
Arsenic	0.50	0.15	mg/Kg
Cobalt	2.5	0.046	mg/Kg
Iron	5.0	2.9	mg/Kg
Lead	0.50	0.11	mg/Kg
Lithium	2.5	0.15	mg/Kg
Manganese	0.75	0.25	mg/Kg
Molybdenum	2.0	0.099	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Step 7
Prep: Residual

Analyte	RL	MDL	Units
Aluminum	10	1.6	mg/Kg
Arsenic	0.50	0.13	mg/Kg
Cobalt	2.5	0.026	mg/Kg
Iron	5.0	4.1	mg/Kg
Lead	0.50	0.11	mg/Kg
Lithium	2.5	0.15	mg/Kg
Manganese	0.75	0.11	mg/Kg
Molybdenum	2.0	0.082	mg/Kg

Method: 6010B SEP - SEP Metals (ICP) - Sum of Steps 1-7

Analyte	RL	MDL	Units
Aluminum	10	1.6	mg/Kg
Arsenic	0.50	0.13	mg/Kg
Cobalt	2.5	0.023	mg/Kg
Iron	5.0	4.1	mg/Kg
Lead	0.50	0.11	mg/Kg
Lithium	2.5	0.15	mg/Kg
Manganese	0.75	0.052	mg/Kg
Molybdenum	2.0	0.082	mg/Kg

Method: 6010B - SEP Metals (ICP) - Total
Prep: Total

Analyte	RL	MDL	Units
Aluminum	10	1.6	mg/Kg
Arsenic	0.50	0.13	mg/Kg
Cobalt	2.5	0.026	mg/Kg

Method: 6010B - SEP Metals (ICP) - Total (Continued)

Prep: Total

Analyte	RL	MDL	Units
Iron	5.0	4.1	mg/Kg
Lead	0.50	0.11	mg/Kg
Lithium	2.5	0.15	mg/Kg
Manganese	0.75	0.11	mg/Kg
Molybdenum	2.0	0.082	mg/Kg

Method: 6010B - SEP Metals (ICP) - Total

Lab Sample ID: MB 140-61991/17-A
Matrix: Solid
Analysis Batch: 62595

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 61991

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		10	1.6	mg/Kg		05/26/22 08:00	06/14/22 14:53	1
Arsenic	ND		0.50	0.13	mg/Kg		05/26/22 08:00	06/14/22 14:53	1
Cobalt	ND		2.5	0.026	mg/Kg		05/26/22 08:00	06/14/22 14:53	1
Iron	ND		5.0	4.1	mg/Kg		05/26/22 08:00	06/14/22 14:53	1
Lead	ND		0.50	0.11	mg/Kg		05/26/22 08:00	06/14/22 14:53	1
Lithium	ND		2.5	0.15	mg/Kg		05/26/22 08:00	06/14/22 14:53	1
Manganese	ND		0.75	0.11	mg/Kg		05/26/22 08:00	06/14/22 14:53	1
Molybdenum	ND		2.0	0.082	mg/Kg		05/26/22 08:00	06/14/22 14:53	1

Lab Sample ID: LCS 140-61991/18-A
Matrix: Solid
Analysis Batch: 62595

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 61991

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	100	98.2		mg/Kg		98	80 - 120
Arsenic	5.00	5.31		mg/Kg		106	80 - 120
Cobalt	5.00	5.19		mg/Kg		104	80 - 125
Iron	50.0	51.9		mg/Kg		104	80 - 120
Lead	5.00	5.08		mg/Kg		102	80 - 120
Lithium	5.00	4.98		mg/Kg		100	80 - 120
Manganese	5.00	5.06		mg/Kg		101	80 - 120
Molybdenum	25.0	25.7		mg/Kg		103	80 - 125

Lab Sample ID: LCSD 140-61991/19-A
Matrix: Solid
Analysis Batch: 62595

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 61991

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Aluminum	100	97.3		mg/Kg		97	80 - 120	1	30
Arsenic	5.00	5.29		mg/Kg		106	80 - 120	0	30
Cobalt	5.00	5.17		mg/Kg		103	80 - 125	0	30
Iron	50.0	52.4		mg/Kg		105	80 - 120	1	30
Lead	5.00	5.07		mg/Kg		101	80 - 120	0	30
Lithium	5.00	4.98		mg/Kg		100	80 - 120	0	30
Manganese	5.00	5.06		mg/Kg		101	80 - 120	0	30
Molybdenum	25.0	25.7		mg/Kg		103	80 - 125	0	30

Method: 6010B SEP - SEP Metals (ICP)

Lab Sample ID: MB 140-61992/17-B ^4
Matrix: Solid
Analysis Batch: 62391

Client Sample ID: Method Blank
Prep Type: Step 1
Prep Batch: 62134

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		40	6.4	mg/Kg		06/01/22 08:00	06/08/22 10:43	4
Arsenic	ND		2.0	0.52	mg/Kg		06/01/22 08:00	06/08/22 10:43	4
Cobalt	ND		10	0.18	mg/Kg		06/01/22 08:00	06/08/22 10:43	4
Iron	ND		20	12	mg/Kg		06/01/22 08:00	06/08/22 10:43	4
Lead	0.592	J	2.0	0.44	mg/Kg		06/01/22 08:00	06/08/22 10:43	4

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: MB 140-61992/17-B ^4 **Client Sample ID: Method Blank**
Matrix: Solid **Prep Type: Step 1**
Analysis Batch: 62391 **Prep Batch: 62134**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		10	0.60	mg/Kg		06/01/22 08:00	06/08/22 10:43	4
Manganese	ND		3.0	0.12	mg/Kg		06/01/22 08:00	06/08/22 10:43	4
Molybdenum	ND		8.0	0.33	mg/Kg		06/01/22 08:00	06/08/22 10:43	4

Lab Sample ID: LCS 140-61992/18-B ^5 **Client Sample ID: Lab Control Sample**
Matrix: Solid **Prep Type: Step 1**
Analysis Batch: 62391 **Prep Batch: 62134**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	100	102		mg/Kg		102	80 - 120
Arsenic	5.00	5.07		mg/Kg		101	80 - 120
Cobalt	5.00	5.04	J	mg/Kg		101	80 - 120
Iron	50.0	50.8		mg/Kg		102	80 - 120
Lead	5.00	5.40		mg/Kg		108	80 - 120
Lithium	5.00	5.47	J	mg/Kg		109	80 - 120
Manganese	5.00	5.09		mg/Kg		102	80 - 120
Molybdenum	25.0	24.7		mg/Kg		99	80 - 120

Lab Sample ID: LCSD 140-61992/19-B ^5 **Client Sample ID: Lab Control Sample Dup**
Matrix: Solid **Prep Type: Step 1**
Analysis Batch: 62391 **Prep Batch: 62134**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Aluminum	100	99.3		mg/Kg		99	80 - 120	3	30
Arsenic	5.00	5.06		mg/Kg		101	80 - 120	0	30
Cobalt	5.00	5.19	J	mg/Kg		104	80 - 120	3	30
Iron	50.0	51.5		mg/Kg		103	80 - 120	1	30
Lead	5.00	5.46		mg/Kg		109	80 - 120	1	30
Lithium	5.00	5.39	J	mg/Kg		108	80 - 120	1	30
Manganese	5.00	5.21		mg/Kg		104	80 - 120	2	30
Molybdenum	25.0	25.2		mg/Kg		101	80 - 120	2	30

Lab Sample ID: MB 140-62135/17-B ^3 **Client Sample ID: Method Blank**
Matrix: Solid **Prep Type: Step 2**
Analysis Batch: 62391 **Prep Batch: 62164**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		30	4.8	mg/Kg		06/02/22 08:00	06/08/22 12:41	3
Arsenic	ND		1.5	0.39	mg/Kg		06/02/22 08:00	06/08/22 12:41	3
Cobalt	ND		7.5	0.19	mg/Kg		06/02/22 08:00	06/08/22 12:41	3
Iron	ND		15	8.7	mg/Kg		06/02/22 08:00	06/08/22 12:41	3
Lead	ND		1.5	0.33	mg/Kg		06/02/22 08:00	06/08/22 12:41	3
Lithium	ND		7.5	0.45	mg/Kg		06/02/22 08:00	06/08/22 12:41	3
Manganese	ND		2.3	0.84	mg/Kg		06/02/22 08:00	06/08/22 12:41	3
Molybdenum	ND		6.0	0.25	mg/Kg		06/02/22 08:00	06/08/22 12:41	3

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: LCS 140-62135/18-B ^5 **Client Sample ID: Lab Control Sample**
Matrix: Solid **Prep Type: Step 2**
Analysis Batch: 62391 **Prep Batch: 62164**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	100	ND		mg/Kg		4	
Arsenic	5.00	3.61		mg/Kg		72	60 - 120
Cobalt	5.00	4.80	J	mg/Kg		96	80 - 120
Iron	50.0	ND		mg/Kg		3	
Lead	5.00	4.50		mg/Kg		90	70 - 120
Lithium	5.00	5.26	J	mg/Kg		105	80 - 120
Manganese	5.00	4.78		mg/Kg		96	80 - 120
Molybdenum	25.0	21.2		mg/Kg		85	70 - 120

Lab Sample ID: LCSD 140-62135/19-B ^5 **Client Sample ID: Lab Control Sample Dup**
Matrix: Solid **Prep Type: Step 2**
Analysis Batch: 62391 **Prep Batch: 62164**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Aluminum	100	ND		mg/Kg		3		4	
Arsenic	5.00	3.74		mg/Kg		75	60 - 120	4	30
Cobalt	5.00	4.72	J	mg/Kg		94	80 - 120	2	30
Iron	50.0	ND		mg/Kg		3		9	
Lead	5.00	4.74		mg/Kg		95	70 - 120	5	30
Lithium	5.00	4.90	J	mg/Kg		98	80 - 120	7	30
Manganese	5.00	4.76		mg/Kg		95	80 - 120	1	30
Molybdenum	25.0	21.2		mg/Kg		85	70 - 120	0	30

Lab Sample ID: MB 140-62165/17-B **Client Sample ID: Method Blank**
Matrix: Solid **Prep Type: Step 3**
Analysis Batch: 62441 **Prep Batch: 62194**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		10	2.1	mg/Kg		06/03/22 08:00	06/09/22 10:19	1
Arsenic	ND		0.50	0.13	mg/Kg		06/03/22 08:00	06/09/22 10:19	1
Cobalt	ND		2.5	0.045	mg/Kg		06/03/22 08:00	06/09/22 10:19	1
Iron	ND		5.0	2.9	mg/Kg		06/03/22 08:00	06/09/22 10:19	1
Lead	ND		0.50	0.11	mg/Kg		06/03/22 08:00	06/09/22 10:19	1
Lithium	ND		2.5	0.15	mg/Kg		06/03/22 08:00	06/09/22 10:19	1
Manganese	0.0870	J	0.75	0.027	mg/Kg		06/03/22 08:00	06/09/22 10:19	1
Molybdenum	ND		2.0	0.082	mg/Kg		06/03/22 08:00	06/09/22 10:19	1

Lab Sample ID: LCS 140-62165/18-B **Client Sample ID: Lab Control Sample**
Matrix: Solid **Prep Type: Step 3**
Analysis Batch: 62441 **Prep Batch: 62194**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	100	102		mg/Kg		102	80 - 120
Arsenic	5.00	5.05		mg/Kg		101	80 - 120
Cobalt	5.00	5.14		mg/Kg		103	80 - 120
Iron	50.0	51.7		mg/Kg		103	80 - 120
Lead	5.00	0.143	J	mg/Kg		3	
Lithium	5.00	5.07		mg/Kg		101	80 - 120
Manganese	5.00	5.08		mg/Kg		102	80 - 120

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

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: LCS 140-62165/18-B
Matrix: Solid
Analysis Batch: 62441

Client Sample ID: Lab Control Sample
Prep Type: Step 3
Prep Batch: 62194

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Molybdenum	25.0	25.2		mg/Kg		101	80 - 120

Lab Sample ID: LCSD 140-62165/19-B
Matrix: Solid
Analysis Batch: 62441

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 3
Prep Batch: 62194

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Aluminum	100	103		mg/Kg		103	80 - 120	1	30
Arsenic	5.00	5.11		mg/Kg		102	80 - 120	1	30
Cobalt	5.00	5.16		mg/Kg		103	80 - 120	0	30
Iron	50.0	52.2		mg/Kg		104	80 - 120	1	30
Lead	5.00	0.149	J	mg/Kg		3		4	
Lithium	5.00	5.08		mg/Kg		102	80 - 120	0	30
Manganese	5.00	5.05		mg/Kg		101	80 - 120	1	30
Molybdenum	25.0	25.5		mg/Kg		102	80 - 120	1	30

Lab Sample ID: MB 140-62195/17-B
Matrix: Solid
Analysis Batch: 62441

Client Sample ID: Method Blank
Prep Type: Step 4
Prep Batch: 62239

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		10	1.6	mg/Kg		06/06/22 08:00	06/09/22 12:15	1
Arsenic	ND		0.50	0.22	mg/Kg		06/06/22 08:00	06/09/22 12:15	1
Cobalt	ND		2.5	0.053	mg/Kg		06/06/22 08:00	06/09/22 12:15	1
Iron	ND		5.0	2.9	mg/Kg		06/06/22 08:00	06/09/22 12:15	1
Lead	ND		0.50	0.11	mg/Kg		06/06/22 08:00	06/09/22 12:15	1
Lithium	0.166	J	2.5	0.15	mg/Kg		06/06/22 08:00	06/09/22 12:15	1
Manganese	ND		0.75	0.13	mg/Kg		06/06/22 08:00	06/09/22 12:15	1
Molybdenum	ND		2.0	0.082	mg/Kg		06/06/22 08:00	06/09/22 12:15	1

Lab Sample ID: LCS 140-62195/18-B
Matrix: Solid
Analysis Batch: 62441

Client Sample ID: Lab Control Sample
Prep Type: Step 4
Prep Batch: 62239

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	100	107		mg/Kg		107	80 - 120
Arsenic	5.00	5.45		mg/Kg		109	80 - 130
Cobalt	5.00	5.35		mg/Kg		107	80 - 120
Iron	50.0	54.3		mg/Kg		109	80 - 120
Lead	5.00	5.17		mg/Kg		103	80 - 120
Lithium	5.00	5.37		mg/Kg		107	80 - 120
Manganese	5.00	5.19		mg/Kg		104	80 - 120
Molybdenum	25.0	27.2		mg/Kg		109	80 - 120

Lab Sample ID: LCSD 140-62195/19-B
Matrix: Solid
Analysis Batch: 62441

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 4
Prep Batch: 62239

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Aluminum	100	103		mg/Kg		103	80 - 120	4	30

Client: Golder Associates Inc. Job ID: 140-27497-1
Project/Site: GL21509219, GRE Stanton 2022

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: LCSD 140-62195/19-B — **Client Sample ID: Lab Control Sample Dup**
Matrix: Solid — **Prep Type: Step 4**
Analysis Batch: 62441 — **Prep Batch: 62239**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	5.00	5.21		mg/Kg		104	80 - 130	5	30
Cobalt	5.00	5.13		mg/Kg		103	80 - 120	4	30
Iron	50.0	52.0		mg/Kg		104	80 - 120	4	30
Lead	5.00	4.89		mg/Kg		98	80 - 120	5	30
Lithium	5.00	5.10		mg/Kg		102	80 - 120	5	30
Manganese	5.00	4.96		mg/Kg		99	80 - 120	4	30
Molybdenum	25.0	26.1		mg/Kg		105	80 - 120	4	30

Lab Sample ID: MB 140-62240/17-B ^5 — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Step 5**
Analysis Batch: 62493 — **Prep Batch: 62350**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		150	24	mg/Kg		06/08/22 08:00	06/10/22 10:11	5
Arsenic	ND		7.5	1.9	mg/Kg		06/08/22 08:00	06/10/22 10:11	5
Cobalt	ND		38	0.60	mg/Kg		06/08/22 08:00	06/10/22 10:11	5
Iron	ND		75	44	mg/Kg		06/08/22 08:00	06/10/22 10:11	5
Lead	ND		7.5	1.7	mg/Kg		06/08/22 08:00	06/10/22 10:11	5
Lithium	5.22	J	38	2.2	mg/Kg		06/08/22 08:00	06/10/22 10:11	5
Manganese	ND		11	1.9	mg/Kg		06/08/22 08:00	06/10/22 10:11	5
Molybdenum	ND		30	1.3	mg/Kg		06/08/22 08:00	06/10/22 10:11	5

Lab Sample ID: LCS 140-62240/18-B ^5 — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Step 5**
Analysis Batch: 62493 — **Prep Batch: 62350**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	300	ND		mg/Kg		5	
Arsenic	15.0	10.9		mg/Kg		73	60 - 100
Cobalt	15.0	ND		mg/Kg		3	1 - 60
Iron	150	ND		mg/Kg		2	
Lead	15.0	8.02		mg/Kg		53	40 - 80
Lithium	15.0	20.3	J	mg/Kg		135	80 - 150
Manganese	15.0	2.48	J	mg/Kg		17	1 - 60
Molybdenum	75.0	54.8		mg/Kg		73	60 - 100

Lab Sample ID: LCSD 140-62240/19-B ^5 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Solid — **Prep Type: Step 5**
Analysis Batch: 62493 — **Prep Batch: 62350**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Aluminum	300	28.6	J	mg/Kg		10		67	
Arsenic	15.0	10.4		mg/Kg		69	60 - 100	5	30
Cobalt	15.0	ND		mg/Kg		3	1 - 60	8	30
Iron	150	ND		mg/Kg		-0.2		244	
Lead	15.0	8.11		mg/Kg		54	40 - 80	1	30
Lithium	15.0	21.4	J	mg/Kg		142	80 - 150	5	30
Manganese	15.0	3.62	J *1	mg/Kg		24	1 - 60	37	30
Molybdenum	75.0	55.9		mg/Kg		75	60 - 100	2	30

Client: Golder Associates Inc.
Project/Site: GL21509219, GRE Stanton 2022

Job ID: 140-27497-1

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: MB 140-62351/17-A
Matrix: Solid
Analysis Batch: 62493

Client Sample ID: Method Blank
Prep Type: Step 6
Prep Batch: 62351

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		10	1.6	mg/Kg		06/08/22 08:00	06/10/22 12:37	1
Arsenic	ND		0.50	0.15	mg/Kg		06/08/22 08:00	06/10/22 12:37	1
Cobalt	ND		2.5	0.046	mg/Kg		06/08/22 08:00	06/10/22 12:37	1
Iron	ND		5.0	2.9	mg/Kg		06/08/22 08:00	06/10/22 12:37	1
Lead	ND		0.50	0.11	mg/Kg		06/08/22 08:00	06/10/22 12:37	1
Lithium	ND		2.5	0.15	mg/Kg		06/08/22 08:00	06/10/22 12:37	1
Manganese	ND		0.75	0.25	mg/Kg		06/08/22 08:00	06/10/22 12:37	1
Molybdenum	ND		2.0	0.099	mg/Kg		06/08/22 08:00	06/10/22 12:37	1

Lab Sample ID: LCS 140-62351/18-A
Matrix: Solid
Analysis Batch: 62493

Client Sample ID: Lab Control Sample
Prep Type: Step 6
Prep Batch: 62351

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	100	97.2		mg/Kg		97	80 - 120
Arsenic	5.00	5.03		mg/Kg		101	80 - 120
Cobalt	5.00	4.90		mg/Kg		98	80 - 120
Iron	50.0	49.0		mg/Kg		98	80 - 120
Lead	5.00	4.81		mg/Kg		96	80 - 120
Lithium	5.00	4.79		mg/Kg		96	80 - 120
Manganese	5.00	4.94		mg/Kg		99	80 - 120
Molybdenum	25.0	24.1		mg/Kg		96	80 - 120

Lab Sample ID: LCSD 140-62351/19-A
Matrix: Solid
Analysis Batch: 62493

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 6
Prep Batch: 62351

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Aluminum	100	102		mg/Kg		102	80 - 120	4	30
Arsenic	5.00	5.09		mg/Kg		102	80 - 120	1	30
Cobalt	5.00	4.98		mg/Kg		100	80 - 120	2	30
Iron	50.0	50.7		mg/Kg		101	80 - 120	3	30
Lead	5.00	4.97		mg/Kg		99	80 - 120	3	30
Lithium	5.00	4.99		mg/Kg		100	80 - 120	4	30
Manganese	5.00	5.00		mg/Kg		100	80 - 120	1	30
Molybdenum	25.0	24.8		mg/Kg		99	80 - 120	3	30

Lab Sample ID: MB 140-62386/17-A
Matrix: Solid
Analysis Batch: 62545

Client Sample ID: Method Blank
Prep Type: Step 7
Prep Batch: 62386

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.13	mg/Kg		06/09/22 08:00	06/13/22 12:55	1
Cobalt	ND		2.5	0.026	mg/Kg		06/09/22 08:00	06/13/22 12:55	1
Lead	ND		0.50	0.11	mg/Kg		06/09/22 08:00	06/13/22 12:55	1
Manganese	ND		0.75	0.11	mg/Kg		06/09/22 08:00	06/13/22 12:55	1
Molybdenum	ND		2.0	0.082	mg/Kg		06/09/22 08:00	06/13/22 12:55	1

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: MB 140-62386/17-A **Client Sample ID: Method Blank**
Matrix: Solid **Prep Type: Step 7**
Analysis Batch: 62595 **Prep Batch: 62386**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		10	1.6	mg/Kg		06/09/22 08:00	06/14/22 11:57	1
Arsenic	ND		0.50	0.13	mg/Kg		06/09/22 08:00	06/14/22 11:57	1
Cobalt	ND		2.5	0.026	mg/Kg		06/09/22 08:00	06/14/22 11:57	1
Iron	ND		5.0	4.1	mg/Kg		06/09/22 08:00	06/14/22 11:57	1
Lead	ND		0.50	0.11	mg/Kg		06/09/22 08:00	06/14/22 11:57	1
Lithium	ND		2.5	0.15	mg/Kg		06/09/22 08:00	06/14/22 11:57	1
Manganese	ND		0.75	0.11	mg/Kg		06/09/22 08:00	06/14/22 11:57	1
Molybdenum	ND		2.0	0.082	mg/Kg		06/09/22 08:00	06/14/22 11:57	1

Lab Sample ID: LCS 140-62386/18-A **Client Sample ID: Lab Control Sample**
Matrix: Solid **Prep Type: Step 7**
Analysis Batch: 62545 **Prep Batch: 62386**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	5.00	5.28		mg/Kg		106	80 - 120
Cobalt	5.00	5.30		mg/Kg		106	80 - 125
Lead	5.00	5.15		mg/Kg		103	80 - 120
Manganese	5.00	5.24		mg/Kg		105	80 - 120
Molybdenum	25.0	26.5		mg/Kg		106	80 - 125

Lab Sample ID: LCS 140-62386/18-A **Client Sample ID: Lab Control Sample**
Matrix: Solid **Prep Type: Step 7**
Analysis Batch: 62595 **Prep Batch: 62386**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	100	98.1		mg/Kg		98	80 - 120
Arsenic	5.00	5.23		mg/Kg		105	80 - 120
Cobalt	5.00	5.18		mg/Kg		104	80 - 125
Iron	50.0	51.4		mg/Kg		103	80 - 120
Lead	5.00	5.18		mg/Kg		104	80 - 120
Lithium	5.00	5.08		mg/Kg		102	80 - 120
Manganese	5.00	5.11		mg/Kg		102	80 - 120
Molybdenum	25.0	25.4		mg/Kg		101	80 - 125

Lab Sample ID: LCSD 140-62386/19-A **Client Sample ID: Lab Control Sample Dup**
Matrix: Solid **Prep Type: Step 7**
Analysis Batch: 62545 **Prep Batch: 62386**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	5.00	5.34		mg/Kg		107	80 - 120	1	30
Cobalt	5.00	5.32		mg/Kg		106	80 - 125	0	30
Lead	5.00	5.19		mg/Kg		104	80 - 120	1	30
Manganese	5.00	5.16		mg/Kg		103	80 - 120	1	30
Molybdenum	25.0	26.6		mg/Kg		107	80 - 125	0	30

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

Method: 6010B SEP - SEP Metals (ICP) (Continued)

Lab Sample ID: LCSD 140-62386/19-A
Matrix: Solid
Analysis Batch: 62595

Client Sample ID: Lab Control Sample Dup
Prep Type: Step 7
Prep Batch: 62386

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Aluminum	100	98.0		mg/Kg		98	80 - 120	0	30
Arsenic	5.00	5.27		mg/Kg		105	80 - 120	1	30
Cobalt	5.00	5.17		mg/Kg		103	80 - 125	0	30
Iron	50.0	50.9		mg/Kg		102	80 - 120	1	30
Lead	5.00	5.12		mg/Kg		102	80 - 120	1	30
Lithium	5.00	5.03		mg/Kg		101	80 - 120	1	30
Manganese	5.00	5.05		mg/Kg		101	80 - 120	1	30
Molybdenum	25.0	25.3		mg/Kg		101	80 - 125	0	30

Metals

Prep Batch: 61991

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-1	MW-212-C	Total/NA	Solid	Total	
140-27497-2	MW-212	Total/NA	Solid	Total	
140-27497-3	TW-TR2	Total/NA	Solid	Total	
140-27497-4	MW-210	Total/NA	Solid	Total	
140-27497-5	BH-1	Total/NA	Solid	Total	
140-27497-6	MW-214	Total/NA	Solid	Total	
140-27497-7	MW-211-0-5FT	Total/NA	Solid	Total	
140-27497-8	MW-211-14-25FT	Total/NA	Solid	Total	
140-27497-9	TW-TR2-C2	Total/NA	Solid	Total	
140-27497-10	TW-TR2-C1	Total/NA	Solid	Total	
140-27497-11	MW-213	Total/NA	Solid	Total	
MB 140-61991/17-A	Method Blank	Total/NA	Solid	Total	
LCS 140-61991/18-A	Lab Control Sample	Total/NA	Solid	Total	
LCSD 140-61991/19-A	Lab Control Sample Dup	Total/NA	Solid	Total	

SEP Batch: 61992

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-1	MW-212-C	Step 1	Solid	Exchangeable	
140-27497-2	MW-212	Step 1	Solid	Exchangeable	
140-27497-3	TW-TR2	Step 1	Solid	Exchangeable	
140-27497-4	MW-210	Step 1	Solid	Exchangeable	
140-27497-5	BH-1	Step 1	Solid	Exchangeable	
140-27497-6	MW-214	Step 1	Solid	Exchangeable	
140-27497-7	MW-211-0-5FT	Step 1	Solid	Exchangeable	
140-27497-8	MW-211-14-25FT	Step 1	Solid	Exchangeable	
140-27497-9	TW-TR2-C2	Step 1	Solid	Exchangeable	
140-27497-10	TW-TR2-C1	Step 1	Solid	Exchangeable	
140-27497-11	MW-213	Step 1	Solid	Exchangeable	
MB 140-61992/17-B ^4	Method Blank	Step 1	Solid	Exchangeable	
LCS 140-61992/18-B ^5	Lab Control Sample	Step 1	Solid	Exchangeable	
LCSD 140-61992/19-B ^5	Lab Control Sample Dup	Step 1	Solid	Exchangeable	

Prep Batch: 62134

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-1	MW-212-C	Step 1	Solid	3010A	61992
140-27497-2	MW-212	Step 1	Solid	3010A	61992
140-27497-3	TW-TR2	Step 1	Solid	3010A	61992
140-27497-4	MW-210	Step 1	Solid	3010A	61992
140-27497-5	BH-1	Step 1	Solid	3010A	61992
140-27497-6	MW-214	Step 1	Solid	3010A	61992
140-27497-7	MW-211-0-5FT	Step 1	Solid	3010A	61992
140-27497-8	MW-211-14-25FT	Step 1	Solid	3010A	61992
140-27497-9	TW-TR2-C2	Step 1	Solid	3010A	61992
140-27497-10	TW-TR2-C1	Step 1	Solid	3010A	61992
140-27497-11	MW-213	Step 1	Solid	3010A	61992
MB 140-61992/17-B ^4	Method Blank	Step 1	Solid	3010A	61992
LCS 140-61992/18-B ^5	Lab Control Sample	Step 1	Solid	3010A	61992
LCSD 140-61992/19-B ^5	Lab Control Sample Dup	Step 1	Solid	3010A	61992

Metals

SEP Batch: 62135

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-1	MW-212-C	Step 2	Solid	Carbonate	
140-27497-2	MW-212	Step 2	Solid	Carbonate	
140-27497-3	TW-TR2	Step 2	Solid	Carbonate	
140-27497-4	MW-210	Step 2	Solid	Carbonate	
140-27497-5	BH-1	Step 2	Solid	Carbonate	
140-27497-6	MW-214	Step 2	Solid	Carbonate	
140-27497-7	MW-211-0-5FT	Step 2	Solid	Carbonate	
140-27497-8	MW-211-14-25FT	Step 2	Solid	Carbonate	
140-27497-9	TW-TR2-C2	Step 2	Solid	Carbonate	
140-27497-10	TW-TR2-C1	Step 2	Solid	Carbonate	
140-27497-11	MW-213	Step 2	Solid	Carbonate	
MB 140-62135/17-B ^3	Method Blank	Step 2	Solid	Carbonate	
LCS 140-62135/18-B ^5	Lab Control Sample	Step 2	Solid	Carbonate	
LCSD 140-62135/19-B ^5	Lab Control Sample Dup	Step 2	Solid	Carbonate	

Prep Batch: 62164

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-1	MW-212-C	Step 2	Solid	3010A	62135
140-27497-2	MW-212	Step 2	Solid	3010A	62135
140-27497-3	TW-TR2	Step 2	Solid	3010A	62135
140-27497-4	MW-210	Step 2	Solid	3010A	62135
140-27497-5	BH-1	Step 2	Solid	3010A	62135
140-27497-6	MW-214	Step 2	Solid	3010A	62135
140-27497-7	MW-211-0-5FT	Step 2	Solid	3010A	62135
140-27497-8	MW-211-14-25FT	Step 2	Solid	3010A	62135
140-27497-9	TW-TR2-C2	Step 2	Solid	3010A	62135
140-27497-10	TW-TR2-C1	Step 2	Solid	3010A	62135
140-27497-11	MW-213	Step 2	Solid	3010A	62135
MB 140-62135/17-B ^3	Method Blank	Step 2	Solid	3010A	62135
LCS 140-62135/18-B ^5	Lab Control Sample	Step 2	Solid	3010A	62135
LCSD 140-62135/19-B ^5	Lab Control Sample Dup	Step 2	Solid	3010A	62135

SEP Batch: 62165

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-1	MW-212-C	Step 3	Solid	Non-Crystalline	
140-27497-2	MW-212	Step 3	Solid	Non-Crystalline	
140-27497-3	TW-TR2	Step 3	Solid	Non-Crystalline	
140-27497-4	MW-210	Step 3	Solid	Non-Crystalline	
140-27497-5	BH-1	Step 3	Solid	Non-Crystalline	
140-27497-6	MW-214	Step 3	Solid	Non-Crystalline	
140-27497-7	MW-211-0-5FT	Step 3	Solid	Non-Crystalline	
140-27497-8	MW-211-14-25FT	Step 3	Solid	Non-Crystalline	
140-27497-9	TW-TR2-C2	Step 3	Solid	Non-Crystalline	
140-27497-10	TW-TR2-C1	Step 3	Solid	Non-Crystalline	
140-27497-11	MW-213	Step 3	Solid	Non-Crystalline	
MB 140-62165/17-B	Method Blank	Step 3	Solid	Non-Crystalline	
LCS 140-62165/18-B	Lab Control Sample	Step 3	Solid	Non-Crystalline	
LCSD 140-62165/19-B	Lab Control Sample Dup	Step 3	Solid	Non-Crystalline	

Metals

Prep Batch: 62194

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-1	MW-212-C	Step 3	Solid	3010A	62165
140-27497-2	MW-212	Step 3	Solid	3010A	62165
140-27497-3	TW-TR2	Step 3	Solid	3010A	62165
140-27497-4	MW-210	Step 3	Solid	3010A	62165
140-27497-5	BH-1	Step 3	Solid	3010A	62165
140-27497-6	MW-214	Step 3	Solid	3010A	62165
140-27497-7	MW-211-0-5FT	Step 3	Solid	3010A	62165
140-27497-8	MW-211-14-25FT	Step 3	Solid	3010A	62165
140-27497-9	TW-TR2-C2	Step 3	Solid	3010A	62165
140-27497-10	TW-TR2-C1	Step 3	Solid	3010A	62165
140-27497-11	MW-213	Step 3	Solid	3010A	62165
MB 140-62165/17-B	Method Blank	Step 3	Solid	3010A	62165
LCS 140-62165/18-B	Lab Control Sample	Step 3	Solid	3010A	62165
LCSD 140-62165/19-B	Lab Control Sample Dup	Step 3	Solid	3010A	62165

SEP Batch: 62195

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-1	MW-212-C	Step 4	Solid	Metal Hydroxide	
140-27497-2	MW-212	Step 4	Solid	Metal Hydroxide	
140-27497-3	TW-TR2	Step 4	Solid	Metal Hydroxide	
140-27497-4	MW-210	Step 4	Solid	Metal Hydroxide	
140-27497-5	BH-1	Step 4	Solid	Metal Hydroxide	
140-27497-6	MW-214	Step 4	Solid	Metal Hydroxide	
140-27497-7	MW-211-0-5FT	Step 4	Solid	Metal Hydroxide	
140-27497-8	MW-211-14-25FT	Step 4	Solid	Metal Hydroxide	
140-27497-9	TW-TR2-C2	Step 4	Solid	Metal Hydroxide	
140-27497-10	TW-TR2-C1	Step 4	Solid	Metal Hydroxide	
140-27497-11	MW-213	Step 4	Solid	Metal Hydroxide	
MB 140-62195/17-B	Method Blank	Step 4	Solid	Metal Hydroxide	
LCS 140-62195/18-B	Lab Control Sample	Step 4	Solid	Metal Hydroxide	
LCSD 140-62195/19-B	Lab Control Sample Dup	Step 4	Solid	Metal Hydroxide	

Prep Batch: 62239

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-1	MW-212-C	Step 4	Solid	3010A	62195
140-27497-2	MW-212	Step 4	Solid	3010A	62195
140-27497-3	TW-TR2	Step 4	Solid	3010A	62195
140-27497-4	MW-210	Step 4	Solid	3010A	62195
140-27497-5	BH-1	Step 4	Solid	3010A	62195
140-27497-6	MW-214	Step 4	Solid	3010A	62195
140-27497-7	MW-211-0-5FT	Step 4	Solid	3010A	62195
140-27497-8	MW-211-14-25FT	Step 4	Solid	3010A	62195
140-27497-9	TW-TR2-C2	Step 4	Solid	3010A	62195
140-27497-10	TW-TR2-C1	Step 4	Solid	3010A	62195
140-27497-11	MW-213	Step 4	Solid	3010A	62195
MB 140-62195/17-B	Method Blank	Step 4	Solid	3010A	62195
LCS 140-62195/18-B	Lab Control Sample	Step 4	Solid	3010A	62195
LCSD 140-62195/19-B	Lab Control Sample Dup	Step 4	Solid	3010A	62195

Metals

SEP Batch: 62240

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-1	MW-212-C	Step 5	Solid	Organic-Bound	
140-27497-2	MW-212	Step 5	Solid	Organic-Bound	
140-27497-3	TW-TR2	Step 5	Solid	Organic-Bound	
140-27497-4	MW-210	Step 5	Solid	Organic-Bound	
140-27497-5	BH-1	Step 5	Solid	Organic-Bound	
140-27497-6	MW-214	Step 5	Solid	Organic-Bound	
140-27497-7	MW-211-0-5FT	Step 5	Solid	Organic-Bound	
140-27497-8	MW-211-14-25FT	Step 5	Solid	Organic-Bound	
140-27497-9	TW-TR2-C2	Step 5	Solid	Organic-Bound	
140-27497-10	TW-TR2-C1	Step 5	Solid	Organic-Bound	
140-27497-11	MW-213	Step 5	Solid	Organic-Bound	
MB 140-62240/17-B ^5	Method Blank	Step 5	Solid	Organic-Bound	
LCS 140-62240/18-B ^5	Lab Control Sample	Step 5	Solid	Organic-Bound	
LCSD 140-62240/19-B ^5	Lab Control Sample Dup	Step 5	Solid	Organic-Bound	

Prep Batch: 62350

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-1	MW-212-C	Step 5	Solid	3010A	62240
140-27497-2	MW-212	Step 5	Solid	3010A	62240
140-27497-3	TW-TR2	Step 5	Solid	3010A	62240
140-27497-4	MW-210	Step 5	Solid	3010A	62240
140-27497-5	BH-1	Step 5	Solid	3010A	62240
140-27497-6	MW-214	Step 5	Solid	3010A	62240
140-27497-7	MW-211-0-5FT	Step 5	Solid	3010A	62240
140-27497-8	MW-211-14-25FT	Step 5	Solid	3010A	62240
140-27497-9	TW-TR2-C2	Step 5	Solid	3010A	62240
140-27497-10	TW-TR2-C1	Step 5	Solid	3010A	62240
140-27497-11	MW-213	Step 5	Solid	3010A	62240
MB 140-62240/17-B ^5	Method Blank	Step 5	Solid	3010A	62240
LCS 140-62240/18-B ^5	Lab Control Sample	Step 5	Solid	3010A	62240
LCSD 140-62240/19-B ^5	Lab Control Sample Dup	Step 5	Solid	3010A	62240

SEP Batch: 62351

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-1	MW-212-C	Step 6	Solid	Acid/Sulfide	
140-27497-2	MW-212	Step 6	Solid	Acid/Sulfide	
140-27497-3	TW-TR2	Step 6	Solid	Acid/Sulfide	
140-27497-4	MW-210	Step 6	Solid	Acid/Sulfide	
140-27497-5	BH-1	Step 6	Solid	Acid/Sulfide	
140-27497-6	MW-214	Step 6	Solid	Acid/Sulfide	
140-27497-7	MW-211-0-5FT	Step 6	Solid	Acid/Sulfide	
140-27497-8	MW-211-14-25FT	Step 6	Solid	Acid/Sulfide	
140-27497-9	TW-TR2-C2	Step 6	Solid	Acid/Sulfide	
140-27497-10	TW-TR2-C1	Step 6	Solid	Acid/Sulfide	
140-27497-11	MW-213	Step 6	Solid	Acid/Sulfide	
MB 140-62351/17-A	Method Blank	Step 6	Solid	Acid/Sulfide	
LCS 140-62351/18-A	Lab Control Sample	Step 6	Solid	Acid/Sulfide	
LCSD 140-62351/19-A	Lab Control Sample Dup	Step 6	Solid	Acid/Sulfide	

Metals

Prep Batch: 62386

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-1	MW-212-C	Step 7	Solid	Residual	
140-27497-2	MW-212	Step 7	Solid	Residual	
140-27497-3	TW-TR2	Step 7	Solid	Residual	
140-27497-4	MW-210	Step 7	Solid	Residual	
140-27497-5	BH-1	Step 7	Solid	Residual	
140-27497-6	MW-214	Step 7	Solid	Residual	
140-27497-7	MW-211-0-5FT	Step 7	Solid	Residual	
140-27497-8	MW-211-14-25FT	Step 7	Solid	Residual	
140-27497-9	TW-TR2-C2	Step 7	Solid	Residual	
140-27497-10	TW-TR2-C1	Step 7	Solid	Residual	
140-27497-11	MW-213	Step 7	Solid	Residual	
MB 140-62386/17-A	Method Blank	Step 7	Solid	Residual	
LCS 140-62386/18-A	Lab Control Sample	Step 7	Solid	Residual	
LCSD 140-62386/19-A	Lab Control Sample Dup	Step 7	Solid	Residual	

Analysis Batch: 62391

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-1	MW-212-C	Step 1	Solid	6010B SEP	62134
140-27497-1	MW-212-C	Step 2	Solid	6010B SEP	62164
140-27497-2	MW-212	Step 1	Solid	6010B SEP	62134
140-27497-2	MW-212	Step 2	Solid	6010B SEP	62164
140-27497-3	TW-TR2	Step 1	Solid	6010B SEP	62134
140-27497-3	TW-TR2	Step 2	Solid	6010B SEP	62164
140-27497-4	MW-210	Step 1	Solid	6010B SEP	62134
140-27497-4	MW-210	Step 2	Solid	6010B SEP	62164
140-27497-5	BH-1	Step 1	Solid	6010B SEP	62134
140-27497-5	BH-1	Step 2	Solid	6010B SEP	62164
140-27497-6	MW-214	Step 1	Solid	6010B SEP	62134
140-27497-6	MW-214	Step 2	Solid	6010B SEP	62164
140-27497-7	MW-211-0-5FT	Step 1	Solid	6010B SEP	62134
140-27497-7	MW-211-0-5FT	Step 2	Solid	6010B SEP	62164
140-27497-8	MW-211-14-25FT	Step 1	Solid	6010B SEP	62134
140-27497-8	MW-211-14-25FT	Step 2	Solid	6010B SEP	62164
140-27497-9	TW-TR2-C2	Step 1	Solid	6010B SEP	62134
140-27497-9	TW-TR2-C2	Step 2	Solid	6010B SEP	62164
140-27497-10	TW-TR2-C1	Step 1	Solid	6010B SEP	62134
140-27497-10	TW-TR2-C1	Step 2	Solid	6010B SEP	62164
140-27497-11	MW-213	Step 1	Solid	6010B SEP	62134
140-27497-11	MW-213	Step 2	Solid	6010B SEP	62164
MB 140-61992/17-B ^4	Method Blank	Step 1	Solid	6010B SEP	62134
MB 140-62135/17-B ^3	Method Blank	Step 2	Solid	6010B SEP	62164
LCS 140-61992/18-B ^5	Lab Control Sample	Step 1	Solid	6010B SEP	62134
LCS 140-62135/18-B ^5	Lab Control Sample	Step 2	Solid	6010B SEP	62164
LCSD 140-61992/19-B ^5	Lab Control Sample Dup	Step 1	Solid	6010B SEP	62134
LCSD 140-62135/19-B ^5	Lab Control Sample Dup	Step 2	Solid	6010B SEP	62164

Analysis Batch: 62441

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-1	MW-212-C	Step 3	Solid	6010B SEP	62194
140-27497-1	MW-212-C	Step 4	Solid	6010B SEP	62239
140-27497-2	MW-212	Step 3	Solid	6010B SEP	62194

Client: Golder Associates Inc.	Job ID: 140-27497-1
Project/Site: GL21509219, GRE Stanton 2022

Metals (Continued)

Analysis Batch: 62441 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-2	MW-212	Step 4	Solid	6010B SEP	62239
140-27497-3	TW-TR2	Step 3	Solid	6010B SEP	62194
140-27497-3	TW-TR2	Step 4	Solid	6010B SEP	62239
140-27497-4	MW-210	Step 3	Solid	6010B SEP	62194
140-27497-4	MW-210	Step 4	Solid	6010B SEP	62239
140-27497-5	BH-1	Step 3	Solid	6010B SEP	62194
140-27497-5	BH-1	Step 4	Solid	6010B SEP	62239
140-27497-6	MW-214	Step 3	Solid	6010B SEP	62194
140-27497-6	MW-214	Step 4	Solid	6010B SEP	62239
140-27497-7	MW-211-0-5FT	Step 3	Solid	6010B SEP	62194
140-27497-7	MW-211-0-5FT	Step 4	Solid	6010B SEP	62239
140-27497-8	MW-211-14-25FT	Step 3	Solid	6010B SEP	62194
140-27497-8	MW-211-14-25FT	Step 4	Solid	6010B SEP	62239
140-27497-9	TW-TR2-C2	Step 3	Solid	6010B SEP	62194
140-27497-9	TW-TR2-C2	Step 4	Solid	6010B SEP	62239
140-27497-10	TW-TR2-C1	Step 3	Solid	6010B SEP	62194
140-27497-10	TW-TR2-C1	Step 4	Solid	6010B SEP	62239
140-27497-11	MW-213	Step 3	Solid	6010B SEP	62194
140-27497-11	MW-213	Step 4	Solid	6010B SEP	62239
MB 140-62165/17-B	Method Blank	Step 3	Solid	6010B SEP	62194
MB 140-62195/17-B	Method Blank	Step 4	Solid	6010B SEP	62239
LCS 140-62165/18-B	Lab Control Sample	Step 3	Solid	6010B SEP	62194
LCS 140-62195/18-B	Lab Control Sample	Step 4	Solid	6010B SEP	62239
LCSD 140-62165/19-B	Lab Control Sample Dup	Step 3	Solid	6010B SEP	62194
LCSD 140-62195/19-B	Lab Control Sample Dup	Step 4	Solid	6010B SEP	62239

Analysis Batch: 62493

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-1	MW-212-C	Step 5	Solid	6010B SEP	62350
140-27497-1	MW-212-C	Step 6	Solid	6010B SEP	62351
140-27497-2	MW-212	Step 5	Solid	6010B SEP	62350
140-27497-2	MW-212	Step 6	Solid	6010B SEP	62351
140-27497-3	TW-TR2	Step 5	Solid	6010B SEP	62350
140-27497-3	TW-TR2	Step 6	Solid	6010B SEP	62351
140-27497-4	MW-210	Step 5	Solid	6010B SEP	62350
140-27497-4	MW-210	Step 6	Solid	6010B SEP	62351
140-27497-5	BH-1	Step 5	Solid	6010B SEP	62350
140-27497-5	BH-1	Step 6	Solid	6010B SEP	62351
140-27497-6	MW-214	Step 5	Solid	6010B SEP	62350
140-27497-6	MW-214	Step 6	Solid	6010B SEP	62351
140-27497-7	MW-211-0-5FT	Step 5	Solid	6010B SEP	62350
140-27497-7	MW-211-0-5FT	Step 6	Solid	6010B SEP	62351
140-27497-8	MW-211-14-25FT	Step 5	Solid	6010B SEP	62350
140-27497-8	MW-211-14-25FT	Step 6	Solid	6010B SEP	62351
140-27497-9	TW-TR2-C2	Step 5	Solid	6010B SEP	62350
140-27497-9	TW-TR2-C2	Step 6	Solid	6010B SEP	62351
140-27497-10	TW-TR2-C1	Step 5	Solid	6010B SEP	62350
140-27497-10	TW-TR2-C1	Step 6	Solid	6010B SEP	62351
140-27497-11	MW-213	Step 5	Solid	6010B SEP	62350
140-27497-11	MW-213	Step 6	Solid	6010B SEP	62351
MB 140-62240/17-B ^5	Method Blank	Step 5	Solid	6010B SEP	62350

Metals (Continued)

Analysis Batch: 62493 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 140-62351/17-A	Method Blank	Step 6	Solid	6010B SEP	62351
LCS 140-62240/18-B ^5	Lab Control Sample	Step 5	Solid	6010B SEP	62350
LCS 140-62351/18-A	Lab Control Sample	Step 6	Solid	6010B SEP	62351
LCSD 140-62240/19-B ^5	Lab Control Sample Dup	Step 5	Solid	6010B SEP	62350
LCSD 140-62351/19-A	Lab Control Sample Dup	Step 6	Solid	6010B SEP	62351

Analysis Batch: 62545

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-1	MW-212-C	Step 7	Solid	6010B SEP	62386
140-27497-1	MW-212-C	Step 7	Solid	6010B SEP	62386
140-27497-1	MW-212-C	Step 7	Solid	6010B SEP	62386
140-27497-2	MW-212	Step 7	Solid	6010B SEP	62386
140-27497-3	TW-TR2	Step 7	Solid	6010B SEP	62386
140-27497-3	TW-TR2	Step 7	Solid	6010B SEP	62386
140-27497-4	MW-210	Step 7	Solid	6010B SEP	62386
140-27497-4	MW-210	Step 7	Solid	6010B SEP	62386
140-27497-5	BH-1	Step 6	Solid	6010B SEP	62351
140-27497-5	BH-1	Step 7	Solid	6010B SEP	62386
140-27497-5	BH-1	Step 7	Solid	6010B SEP	62386
140-27497-6	MW-214	Step 7	Solid	6010B SEP	62386
140-27497-7	MW-211-0-5FT	Step 7	Solid	6010B SEP	62386
140-27497-7	MW-211-0-5FT	Step 7	Solid	6010B SEP	62386
140-27497-8	MW-211-14-25FT	Step 7	Solid	6010B SEP	62386
140-27497-8	MW-211-14-25FT	Step 7	Solid	6010B SEP	62386
140-27497-9	TW-TR2-C2	Step 7	Solid	6010B SEP	62386
140-27497-9	TW-TR2-C2	Step 7	Solid	6010B SEP	62386
140-27497-10	TW-TR2-C1	Step 7	Solid	6010B SEP	62386
140-27497-10	TW-TR2-C1	Step 7	Solid	6010B SEP	62386
140-27497-11	MW-213	Step 7	Solid	6010B SEP	62386
140-27497-11	MW-213	Step 7	Solid	6010B SEP	62386
MB 140-62386/17-A	Method Blank	Step 7	Solid	6010B SEP	62386
LCS 140-62386/18-A	Lab Control Sample	Step 7	Solid	6010B SEP	62386
LCSD 140-62386/19-A	Lab Control Sample Dup	Step 7	Solid	6010B SEP	62386

Analysis Batch: 62595

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-1	MW-212-C	Step 7	Solid	6010B SEP	62386
140-27497-1	MW-212-C	Total/NA	Solid	6010B	61991
140-27497-1	MW-212-C	Total/NA	Solid	6010B	61991
140-27497-1	MW-212-C	Total/NA	Solid	6010B	61991
140-27497-2	MW-212	Step 7	Solid	6010B SEP	62386
140-27497-2	MW-212	Total/NA	Solid	6010B	61991
140-27497-2	MW-212	Total/NA	Solid	6010B	61991
140-27497-2	MW-212	Total/NA	Solid	6010B	61991
140-27497-3	TW-TR2	Step 7	Solid	6010B SEP	62386
140-27497-3	TW-TR2	Total/NA	Solid	6010B	61991
140-27497-3	TW-TR2	Total/NA	Solid	6010B	61991
140-27497-3	TW-TR2	Total/NA	Solid	6010B	61991
140-27497-4	MW-210	Step 7	Solid	6010B SEP	62386
140-27497-4	MW-210	Total/NA	Solid	6010B	61991
140-27497-4	MW-210	Total/NA	Solid	6010B	61991

Metals (Continued)

Analysis Batch: 62595 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-4	MW-210	Total/NA	Solid	6010B	61991
140-27497-5	BH-1	Step 7	Solid	6010B SEP	62386
140-27497-5	BH-1	Total/NA	Solid	6010B	61991
140-27497-5	BH-1	Total/NA	Solid	6010B	61991
140-27497-6	MW-214	Step 7	Solid	6010B SEP	62386
140-27497-6	MW-214	Total/NA	Solid	6010B	61991
140-27497-6	MW-214	Total/NA	Solid	6010B	61991
140-27497-6	MW-214	Total/NA	Solid	6010B	61991
140-27497-7	MW-211-0-5FT	Step 7	Solid	6010B SEP	62386
140-27497-7	MW-211-0-5FT	Total/NA	Solid	6010B	61991
140-27497-7	MW-211-0-5FT	Total/NA	Solid	6010B	61991
140-27497-7	MW-211-0-5FT	Total/NA	Solid	6010B	61991
140-27497-8	MW-211-14-25FT	Step 7	Solid	6010B SEP	62386
140-27497-8	MW-211-14-25FT	Total/NA	Solid	6010B	61991
140-27497-8	MW-211-14-25FT	Total/NA	Solid	6010B	61991
140-27497-9	TW-TR2-C2	Step 7	Solid	6010B SEP	62386
140-27497-9	TW-TR2-C2	Total/NA	Solid	6010B	61991
140-27497-9	TW-TR2-C2	Total/NA	Solid	6010B	61991
140-27497-9	TW-TR2-C2	Total/NA	Solid	6010B	61991
140-27497-10	TW-TR2-C1	Step 7	Solid	6010B SEP	62386
140-27497-10	TW-TR2-C1	Total/NA	Solid	6010B	61991
140-27497-10	TW-TR2-C1	Total/NA	Solid	6010B	61991
140-27497-10	TW-TR2-C1	Total/NA	Solid	6010B	61991
140-27497-11	MW-213	Step 7	Solid	6010B SEP	62386
140-27497-11	MW-213	Total/NA	Solid	6010B	61991
140-27497-11	MW-213	Total/NA	Solid	6010B	61991
140-27497-11	MW-213	Total/NA	Solid	6010B	61991
MB 140-61991/17-A	Method Blank	Total/NA	Solid	6010B	61991
MB 140-62386/17-A	Method Blank	Step 7	Solid	6010B SEP	62386
LCS 140-61991/18-A	Lab Control Sample	Total/NA	Solid	6010B	61991
LCS 140-62386/18-A	Lab Control Sample	Step 7	Solid	6010B SEP	62386
LCSD 140-61991/19-A	Lab Control Sample Dup	Total/NA	Solid	6010B	61991
LCSD 140-62386/19-A	Lab Control Sample Dup	Step 7	Solid	6010B SEP	62386

Analysis Batch: 62654

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-1	MW-212-C	Sum of Steps 1-7	Solid	6010B SEP	
140-27497-2	MW-212	Sum of Steps 1-7	Solid	6010B SEP	
140-27497-3	TW-TR2	Sum of Steps 1-7	Solid	6010B SEP	
140-27497-4	MW-210	Sum of Steps 1-7	Solid	6010B SEP	
140-27497-5	BH-1	Sum of Steps 1-7	Solid	6010B SEP	
140-27497-6	MW-214	Sum of Steps 1-7	Solid	6010B SEP	
140-27497-7	MW-211-0-5FT	Sum of Steps 1-7	Solid	6010B SEP	
140-27497-8	MW-211-14-25FT	Sum of Steps 1-7	Solid	6010B SEP	
140-27497-9	TW-TR2-C2	Sum of Steps 1-7	Solid	6010B SEP	
140-27497-10	TW-TR2-C1	Sum of Steps 1-7	Solid	6010B SEP	
140-27497-11	MW-213	Sum of Steps 1-7	Solid	6010B SEP	

General Chemistry

Analysis Batch: 62024

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-27497-1	MW-212-C	Total/NA	Solid	Moisture	
140-27497-2	MW-212	Total/NA	Solid	Moisture	
140-27497-3	TW-TR2	Total/NA	Solid	Moisture	
140-27497-4	MW-210	Total/NA	Solid	Moisture	
140-27497-5	BH-1	Total/NA	Solid	Moisture	
140-27497-6	MW-214	Total/NA	Solid	Moisture	
140-27497-7	MW-211-0-5FT	Total/NA	Solid	Moisture	
140-27497-8	MW-211-14-25FT	Total/NA	Solid	Moisture	
140-27497-9	TW-TR2-C2	Total/NA	Solid	Moisture	
140-27497-10	TW-TR2-C1	Total/NA	Solid	Moisture	
140-27497-11	MW-213	Total/NA	Solid	Moisture	
140-27497-1 DU	MW-212-C	Total/NA	Solid	Moisture	

Lab Chronicle

Client: Golder Associates Inc.
Job ID: 140-27497-1
Project/Site: GL21509219, GRE Stanton 2022

Client Sample ID: MW-212-C
Lab Sample ID: 140-27497-1
Date Collected: 05/10/22 10:48
Matrix: Solid
Date Received: 05/18/22 11:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Sum of Steps 1-7	Analysis	6010B SEP		1			62654	06/16/22 15:26	KNC	TAL KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			62024	05/25/22 14:02	ACW	TAL KNX
	Instrument ID: NOEQUIP									

Client Sample ID: MW-212-C
Lab Sample ID: 140-27497-1
Date Collected: 05/10/22 10:48
Matrix: Solid
Date Received: 05/18/22 11:20
Percent Solids: 72.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		10			62595	06/14/22 13:41	JGT	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			62595	06/14/22 15:40	JGT	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		3			62595	06/14/22 17:27	JGT	TAL KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.000 g	25 mL	61992	05/31/22 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	62134	06/01/22 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			62391	06/08/22 11:27	JGT	TAL KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.000 g	25 mL	62135	06/01/22 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	62164	06/02/22 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			62391	06/08/22 13:26	JGT	TAL KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	62165	06/02/22 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	62194	06/03/22 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			62441	06/09/22 11:02	JGT	TAL KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	62195	06/03/22 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	62239	06/06/22 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			62441	06/09/22 12:59	JGT	TAL KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	62240	06/06/22 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	62350	06/08/22 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			62493	06/10/22 11:22	JGT	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	62351	06/08/22 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			62493	06/10/22 13:22	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		10			62545	06/13/22 11:43	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: MW-212-C

Lab Sample ID: 140-27497-1

Date Collected: 05/10/22 10:48

Matrix: Solid

Date Received: 05/18/22 11:20

Percent Solids: 72.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			62545	06/13/22 13:40	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		2			62545	06/13/22 15:31	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			62595	06/14/22 12:42	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: MW-212

Lab Sample ID: 140-27497-2

Date Collected: 05/10/22 11:20

Matrix: Solid

Date Received: 05/18/22 11:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Sum of Steps 1-7	Analysis	6010B SEP		1			62654	06/16/22 15:26	KNC	TAL KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			62024	05/25/22 14:02	ACW	TAL KNX
	Instrument ID: NOEQUIP									

Client Sample ID: MW-212

Lab Sample ID: 140-27497-2

Date Collected: 05/10/22 11:20

Matrix: Solid

Date Received: 05/18/22 11:20

Percent Solids: 85.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		10			62595	06/14/22 13:55	JGT	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			62595	06/14/22 15:55	JGT	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		2			62595	06/14/22 17:32	JGT	TAL KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.000 g	25 mL	61992	05/31/22 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	62134	06/01/22 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			62391	06/08/22 11:42	JGT	TAL KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.000 g	25 mL	62135	06/01/22 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	62164	06/02/22 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			62391	06/08/22 13:41	JGT	TAL KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	62165	06/02/22 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	62194	06/03/22 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			62441	06/09/22 11:17	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: MW-212
Lab Sample ID: 140-27497-2
Date Collected: 05/10/22 11:20
Matrix: Solid
Date Received: 05/18/22 11:20
Percent Solids: 85.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	62195	06/03/22 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	62239	06/06/22 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			62441	06/09/22 13:14	JGT	TAL KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	62240	06/06/22 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	62350	06/08/22 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			62493	06/10/22 11:37	JGT	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	62351	06/08/22 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			62493	06/10/22 13:37	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			62545	06/13/22 13:55	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		10			62595	06/14/22 11:00	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: TW-TR2
Lab Sample ID: 140-27497-3
Date Collected: 05/11/22 15:00
Matrix: Solid
Date Received: 05/18/22 11:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Sum of Steps 1-7	Analysis	6010B SEP		1			62654	06/16/22 15:26	KNC	TAL KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			62024	05/25/22 14:02	ACW	TAL KNX
	Instrument ID: NOEQUIP									

Client Sample ID: TW-TR2
Lab Sample ID: 140-27497-3
Date Collected: 05/11/22 15:00
Matrix: Solid
Date Received: 05/18/22 11:20
Percent Solids: 84.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		10			62595	06/14/22 14:00	JGT	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			62595	06/14/22 16:01	JGT	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		3			62595	06/14/22 17:37	JGT	TAL KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.000 g	25 mL	61992	05/31/22 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	62134	06/01/22 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			62391	06/08/22 11:47	JGT	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Golder Associates Inc. | Job ID: 140-27497-1
Project/Site: GL21509219, GRE Stanton 2022

Client Sample ID: TW-TR2 | Lab Sample ID: 140-27497-3

Date Collected: 05/11/22 15:00 | **Matrix: Solid**
Date Received: 05/18/22 11:20 | **Percent Solids: 84.1**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 2	SEP	Carbonate			5.000 g	25 mL	62135	06/01/22 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	62164	06/02/22 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			62391	06/08/22 13:46	JGT	TAL KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	62165	06/02/22 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	62194	06/03/22 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			62441	06/09/22 11:21	JGT	TAL KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	62195	06/03/22 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	62239	06/06/22 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			62441	06/09/22 13:18	JGT	TAL KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	62240	06/06/22 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	62350	06/08/22 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			62493	06/10/22 11:42	JGT	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	62351	06/08/22 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			62493	06/10/22 13:47	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			62545	06/13/22 14:00	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		2			62545	06/13/22 15:36	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		10			62595	06/14/22 11:05	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: MW-210 | Lab Sample ID: 140-27497-4

Date Collected: 05/09/22 10:37 | **Matrix: Solid**
Date Received: 05/18/22 11:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Sum of Steps 1-7	Analysis	6010B SEP		1			62654	06/16/22 15:26	KNC	TAL KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			62024	05/25/22 14:02	ACW	TAL KNX
	Instrument ID: NOEQUIP									

Client Sample ID: MW-210 **Lab Sample ID: 140-27497-4**
Date Collected: 05/09/22 10:37 **Matrix: Solid**
Date Received: 05/18/22 11:20 **Percent Solids: 83.8**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		10			62595	06/14/22 14:05	JGT	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			62595	06/14/22 16:06	JGT	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		2			62595	06/14/22 17:42	JGT	TAL KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.000 g	25 mL	61992	05/31/22 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	62134	06/01/22 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			62391	06/08/22 11:52	JGT	TAL KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.000 g	25 mL	62135	06/01/22 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	62164	06/02/22 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			62391	06/08/22 13:51	JGT	TAL KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	62165	06/02/22 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	62194	06/03/22 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			62441	06/09/22 11:26	JGT	TAL KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	62195	06/03/22 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	62239	06/06/22 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			62441	06/09/22 13:23	JGT	TAL KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	62240	06/06/22 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	62350	06/08/22 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			62493	06/10/22 11:47	JGT	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	62351	06/08/22 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			62493	06/10/22 13:52	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			62545	06/13/22 14:05	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		2			62545	06/13/22 15:41	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		10			62595	06/14/22 11:09	JGT	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Golder Associates Inc.
Project/Site: GL21509219, GRE Stanton 2022

Job ID: 140-27497-1

Client Sample ID: BH-1
Date Collected: 05/10/22 13:15
Date Received: 05/18/22 11:20

Lab Sample ID: 140-27497-5
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Sum of Steps 1-7	Analysis	6010B SEP		1			62654	06/16/22 15:26	KNC	TAL KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			62024	05/25/22 14:02	ACW	TAL KNX
	Instrument ID: NOEQUIP									

Client Sample ID: BH-1
Date Collected: 05/10/22 13:15
Date Received: 05/18/22 11:20

Lab Sample ID: 140-27497-5
Matrix: Solid
Percent Solids: 89.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		10			62595	06/14/22 14:09	JGT	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		2			62595	06/14/22 17:48	JGT	TAL KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.000 g	25 mL	61992	05/31/22 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	62134	06/01/22 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			62391	06/08/22 11:57	JGT	TAL KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.000 g	25 mL	62135	06/01/22 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	62164	06/02/22 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			62391	06/08/22 13:56	JGT	TAL KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	62165	06/02/22 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	62194	06/03/22 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			62441	06/09/22 11:31	JGT	TAL KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	62195	06/03/22 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	62239	06/06/22 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			62441	06/09/22 13:28	JGT	TAL KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	62240	06/06/22 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	62350	06/08/22 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			62493	06/10/22 11:52	JGT	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	62351	06/08/22 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			62493	06/10/22 13:56	JGT	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	62351	06/08/22 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		2			62545	06/13/22 16:26	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			62545	06/13/22 14:10	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: BH-1 — Lab Sample ID: 140-27497-5

Date Collected: 05/10/22 13:15 — **Matrix: Solid**

Date Received: 05/18/22 11:20 — **Percent Solids: 89.0**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		5			62545	06/13/22 15:46	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		10			62595	06/14/22 11:14	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: MW-214 — Lab Sample ID: 140-27497-6

Date Collected: 05/12/22 15:15 — **Matrix: Solid**

Date Received: 05/18/22 11:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Sum of Steps 1-7	Analysis	6010B SEP		1			62654	06/16/22 15:26	KNC	TAL KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			62024	05/25/22 14:02	ACW	TAL KNX
	Instrument ID: NOEQUIP									

Client Sample ID: MW-214 — Lab Sample ID: 140-27497-6

Date Collected: 05/12/22 15:15 — **Matrix: Solid**

Date Received: 05/18/22 11:20 — **Percent Solids: 83.4**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		10			62595	06/14/22 14:14	JGT	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			62595	06/14/22 16:18	JGT	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		2			62595	06/14/22 17:53	JGT	TAL KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.000 g	25 mL	61992	05/31/22 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	62134	06/01/22 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			62391	06/08/22 12:02	JGT	TAL KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.000 g	25 mL	62135	06/01/22 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	62164	06/02/22 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			62391	06/08/22 14:01	JGT	TAL KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	62165	06/02/22 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	62194	06/03/22 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			62441	06/09/22 11:36	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: MW-214

Lab Sample ID: 140-27497-6
Date Collected: 05/12/22 15:15
Matrix: Solid
Date Received: 05/18/22 11:20
Percent Solids: 83.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	62195	06/03/22 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	62239	06/06/22 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			62441	06/09/22 13:33	JGT	TAL KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	62240	06/06/22 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	62350	06/08/22 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			62493	06/10/22 11:57	JGT	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	62351	06/08/22 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			62493	06/10/22 14:02	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			62545	06/13/22 14:16	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		10			62595	06/14/22 11:19	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: MW-211-0-5FT

Lab Sample ID: 140-27497-7
Date Collected: 05/10/22 08:24
Matrix: Solid
Date Received: 05/18/22 11:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Sum of Steps 1-7	Analysis	6010B SEP		1			62654	06/16/22 15:26	KNC	TAL KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			62024	05/25/22 14:02	ACW	TAL KNX
	Instrument ID: NOEQUIP									

Client Sample ID: MW-211-0-5FT

Lab Sample ID: 140-27497-7
Date Collected: 05/10/22 08:24
Matrix: Solid
Date Received: 05/18/22 11:20
Percent Solids: 83.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		10			62595	06/14/22 14:19	JGT	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			62595	06/14/22 16:23	JGT	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		2			62595	06/14/22 17:58	JGT	TAL KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.000 g	25 mL	61992	05/31/22 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	62134	06/01/22 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			62391	06/08/22 12:07	JGT	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Golder Associates Inc.
Project/Site: GL21509219, GRE Stanton 2022

Job ID: 140-27497-1

Client Sample ID: MW-211-0-5FT

Date Collected: 05/10/22 08:24
Date Received: 05/18/22 11:20

Lab Sample ID: 140-27497-7
Matrix: Solid
Percent Solids: 83.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 2	SEP	Carbonate			5.000 g	25 mL	62135	06/01/22 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	62164	06/02/22 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			62391	06/08/22 14:06	JGT	TAL KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	62165	06/02/22 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	62194	06/03/22 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			62441	06/09/22 11:41	JGT	TAL KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	62195	06/03/22 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	62239	06/06/22 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			62441	06/09/22 13:38	JGT	TAL KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	62240	06/06/22 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	62350	06/08/22 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			62493	06/10/22 12:02	JGT	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	62351	06/08/22 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			62493	06/10/22 14:07	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			62545	06/13/22 14:21	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		3			62545	06/13/22 15:51	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		10			62595	06/14/22 11:24	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: MW-211-14-25FT

Date Collected: 05/10/22 09:30
Date Received: 05/18/22 11:20

Lab Sample ID: 140-27497-8
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Sum of Steps 1-7	Analysis	6010B SEP		1			62654	06/16/22 15:26	KNC	TAL KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			62024	05/25/22 14:02	ACW	TAL KNX
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Golder Associates Inc. Job ID: 140-27497-1

Project/Site: GL21509219, GRE Stanton 2022

Client Sample ID: MW-211-14-25FT — Lab Sample ID: 140-27497-8

Date Collected: 05/10/22 09:30 — **Matrix: Solid**

Date Received: 05/18/22 11:20 — **Percent Solids: 83.2**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		10			62595	06/14/22 14:24	JGT	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			62595	06/14/22 16:29	JGT	TAL KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.000 g	25 mL	61992	05/31/22 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	62134	06/01/22 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			62391	06/08/22 12:12	JGT	TAL KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.000 g	25 mL	62135	06/01/22 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	62164	06/02/22 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			62391	06/08/22 14:11	JGT	TAL KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	62165	06/02/22 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	62194	06/03/22 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			62441	06/09/22 11:46	JGT	TAL KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	62195	06/03/22 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	62239	06/06/22 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			62441	06/09/22 13:42	JGT	TAL KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	62240	06/06/22 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	62350	06/08/22 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			62493	06/10/22 12:07	JGT	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	62351	06/08/22 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			62493	06/10/22 14:11	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			62545	06/13/22 14:26	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		3			62545	06/13/22 16:06	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		10			62595	06/14/22 11:29	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: TW-TR2-C2 — Lab Sample ID: 140-27497-9

Date Collected: 05/11/22 14:00 — **Matrix: Solid**

Date Received: 05/18/22 11:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Sum of Steps 1-7	Analysis	6010B SEP		1			62654	06/16/22 15:26	KNC	TAL KNX
	Instrument ID: NOEQUIP									

Eurofins Knoxville

Client Sample ID: TW-TR2-C2 Lab Sample ID: 140-27497-9

Date Collected: 05/11/22 14:00 **Matrix: Solid**
Date Received: 05/18/22 11:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			62024	05/25/22 14:02	ACW	TAL KNX

Client Sample ID: TW-TR2-C2 Lab Sample ID: 140-27497-9

Date Collected: 05/11/22 14:00 **Matrix: Solid**
Date Received: 05/18/22 11:20 **Percent Solids: 54.6**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		10			62595	06/14/22 14:29	JGT	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			62595	06/14/22 16:34	JGT	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		2			62595	06/14/22 18:13	JGT	TAL KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.000 g	25 mL	61992	05/31/22 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	62134	06/01/22 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			62391	06/08/22 12:17	JGT	TAL KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.000 g	25 mL	62135	06/01/22 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	62164	06/02/22 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			62391	06/08/22 14:16	JGT	TAL KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	62165	06/02/22 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	62194	06/03/22 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			62441	06/09/22 11:51	JGT	TAL KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	62195	06/03/22 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	62239	06/06/22 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			62441	06/09/22 13:47	JGT	TAL KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	62240	06/06/22 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	62350	06/08/22 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			62493	06/10/22 12:12	JGT	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	62351	06/08/22 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			62493	06/10/22 14:16	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			62545	06/13/22 14:31	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		2			62545	06/13/22 16:10	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: TW-TR2-C2

Date Collected: 05/11/22 14:00
Date Received: 05/18/22 11:20

Lab Sample ID: 140-27497-9
Matrix: Solid
Percent Solids: 54.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		10			62595	06/14/22 11:33	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: TW-TR2-C1

Date Collected: 05/11/22 13:00
Date Received: 05/18/22 11:20

Lab Sample ID: 140-27497-10
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Sum of Steps 1-7	Analysis	6010B SEP		1			62654	06/16/22 15:26	KNC	TAL KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			62024	05/25/22 14:02	ACW	TAL KNX
	Instrument ID: NOEQUIP									

Client Sample ID: TW-TR2-C1

Date Collected: 05/11/22 13:00
Date Received: 05/18/22 11:20

Lab Sample ID: 140-27497-10
Matrix: Solid
Percent Solids: 64.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		10			62595	06/14/22 14:33	JGT	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			62595	06/14/22 16:40	JGT	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		2			62595	06/14/22 18:19	JGT	TAL KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.000 g	25 mL	61992	05/31/22 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	62134	06/01/22 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			62391	06/08/22 12:22	JGT	TAL KNX
	Instrument ID: DUO									
Step 2	SEP	Carbonate			5.000 g	25 mL	62135	06/01/22 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	62164	06/02/22 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			62391	06/08/22 14:22	JGT	TAL KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	62165	06/02/22 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	62194	06/03/22 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			62441	06/09/22 11:56	JGT	TAL KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	62195	06/03/22 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	62239	06/06/22 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			62441	06/09/22 13:52	JGT	TAL KNX
	Instrument ID: DUO									

Client: Golder Associates Inc. Job ID: 140-27497-1
Project/Site: GL21509219, GRE Stanton 2022

Client Sample ID: TW-TR2-C1 **Lab Sample ID: 140-27497-10**
Date Collected: 05/11/22 13:00 **Matrix: Solid**
Date Received: 05/18/22 11:20 **Percent Solids: 64.6**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 5	SEP	Organic-Bound			5.000 g	75 mL	62240	06/06/22 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	62350	06/08/22 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			62493	06/10/22 12:17	JGT	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	62351	06/08/22 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			62493	06/10/22 14:21	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			62545	06/13/22 14:36	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		2			62545	06/13/22 16:16	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		10			62595	06/14/22 11:38	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: MW-213 **Lab Sample ID: 140-27497-11**
Date Collected: 05/12/22 12:40 **Matrix: Solid**
Date Received: 05/18/22 11:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Sum of Steps 1-7	Analysis	6010B SEP		1			62654	06/16/22 15:26	KNC	TAL KNX
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Moisture		1			62024	05/25/22 14:02	ACW	TAL KNX
	Instrument ID: NOEQUIP									

Client Sample ID: MW-213 **Lab Sample ID: 140-27497-11**
Date Collected: 05/12/22 12:40 **Matrix: Solid**
Date Received: 05/18/22 11:20 **Percent Solids: 85.3**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		10			62595	06/14/22 14:38	JGT	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			62595	06/14/22 16:45	JGT	TAL KNX
	Instrument ID: DUO									
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		2			62595	06/14/22 18:24	JGT	TAL KNX
	Instrument ID: DUO									
Step 1	SEP	Exchangeable			5.000 g	25 mL	61992	05/31/22 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	62134	06/01/22 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			62391	06/08/22 12:27	JGT	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Golder Associates Inc. Job ID: 140-27497-1
Project/Site: GL21509219, GRE Stanton 2022

Client Sample ID: MW-213 Lab Sample ID: 140-27497-11

Date Collected: 05/12/22 12:40 **Matrix: Solid**
Date Received: 05/18/22 11:20 **Percent Solids: 85.3**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 2	SEP	Carbonate			5.000 g	25 mL	62135	06/01/22 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	62164	06/02/22 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			62391	06/08/22 14:27	JGT	TAL KNX
	Instrument ID: DUO									
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	62165	06/02/22 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	62194	06/03/22 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			62441	06/09/22 12:01	JGT	TAL KNX
	Instrument ID: DUO									
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	62195	06/03/22 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	62239	06/06/22 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			62441	06/09/22 13:57	JGT	TAL KNX
	Instrument ID: DUO									
Step 5	SEP	Organic-Bound			5.000 g	75 mL	62240	06/06/22 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	62350	06/08/22 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			62493	06/10/22 12:22	JGT	TAL KNX
	Instrument ID: DUO									
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	62351	06/08/22 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			62493	06/10/22 14:27	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			62545	06/13/22 14:41	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		2			62545	06/13/22 16:21	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		10			62595	06/14/22 11:43	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank Lab Sample ID: MB 140-61991/17-A

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			62595	06/14/22 14:53	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-61992/17-B ^4
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 1	SEP	Exchangeable			5.000 g	25 mL	61992	05/31/22 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	62134	06/01/22 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		4			62391	06/08/22 10:43	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-62135/17-B ^3
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 2	SEP	Carbonate			5.000 g	25 mL	62135	06/01/22 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	62164	06/02/22 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		3			62391	06/08/22 12:41	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-62165/17-B
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	62165	06/02/22 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	62194	06/03/22 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			62441	06/09/22 10:19	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-62195/17-B
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	62195	06/03/22 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	62239	06/06/22 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			62441	06/09/22 12:15	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-62240/17-B ^5
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 5	SEP	Organic-Bound			5.000 g	75 mL	62240	06/06/22 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	62350	06/08/22 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			62493	06/10/22 10:11	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank **Lab Sample ID: MB 140-62351/17-A**
Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	62351	06/08/22 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			62493	06/10/22 12:37	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Method Blank **Lab Sample ID: MB 140-62386/17-A**
Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			62545	06/13/22 12:55	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			62595	06/14/22 11:57	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample **Lab Sample ID: LCS 140-61991/18-A**
Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			62595	06/14/22 14:58	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample **Lab Sample ID: LCS 140-61992/18-B ^5**
Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 1	SEP	Exchangeable			5.000 g	25 mL	61992	05/31/22 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	62134	06/01/22 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		5			62391	06/08/22 10:48	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample **Lab Sample ID: LCS 140-62135/18-B ^5**
Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 2	SEP	Carbonate			5.000 g	25 mL	62135	06/01/22 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	62164	06/02/22 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		5			62391	06/08/22 12:46	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-62165/18-B
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	62165	06/02/22 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	62194	06/03/22 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			62441	06/09/22 10:24	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-62195/18-B
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	62195	06/03/22 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	62239	06/06/22 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			62441	06/09/22 12:20	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-62240/18-B ^5
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 5	SEP	Organic-Bound			5.000 g	75 mL	62240	06/06/22 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	62350	06/08/22 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			62493	06/10/22 10:16	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-62351/18-A
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	62351	06/08/22 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			62493	06/10/22 12:42	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-62386/18-A
Date Collected: N/A
Matrix: Solid
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			62545	06/13/22 13:00	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			62595	06/14/22 12:02	JGT	TAL KNX
	Instrument ID: DUO									

Lab Chronicle

Client: Golder Associates Inc. Job ID: 140-27497-1
Project/Site: GL21509219, GRE Stanton 2022

Client Sample ID: Lab Control Sample Dup — Lab Sample ID: LCSD 140-61991/19-A

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Total			1.000 g	50 mL	61991	05/26/22 08:00	KNC	TAL KNX
Total/NA	Analysis	6010B		1			62595	06/14/22 15:03	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup — Lab Sample ID: LCSD 140-61992/19-B ^5

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 1	SEP	Exchangeable			5.000 g	25 mL	61992	05/31/22 08:00	KNC	TAL KNX
Step 1	Prep	3010A			5 mL	50 mL	62134	06/01/22 08:00	KNC	TAL KNX
Step 1	Analysis	6010B SEP		5			62391	06/08/22 10:53	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup — Lab Sample ID: LCSD 140-62135/19-B ^5

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 2	SEP	Carbonate			5.000 g	25 mL	62135	06/01/22 08:00	KNC	TAL KNX
Step 2	Prep	3010A			5 mL	50 mL	62164	06/02/22 08:00	KNC	TAL KNX
Step 2	Analysis	6010B SEP		5			62391	06/08/22 12:51	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup — Lab Sample ID: LCSD 140-62165/19-B

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 3	SEP	Non-Crystalline			5.000 g	25 mL	62165	06/02/22 08:00	KNC	TAL KNX
Step 3	Prep	3010A			5 mL	50 mL	62194	06/03/22 08:00	KNC	TAL KNX
Step 3	Analysis	6010B SEP		1			62441	06/09/22 10:28	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup — Lab Sample ID: LCSD 140-62195/19-B

Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 4	SEP	Metal Hydroxide			5.000 g	25 mL	62195	06/03/22 08:00	KNC	TAL KNX
Step 4	Prep	3010A			5 mL	50 mL	62239	06/06/22 08:00	KNC	TAL KNX
Step 4	Analysis	6010B SEP		1			62441	06/09/22 12:25	JGT	TAL KNX
	Instrument ID: DUO									

Client: Golder Associates Inc. Job ID: 140-27497-1
Project/Site: GL21509219, GRE Stanton 2022

Client Sample ID: Lab Control Sample Dup **Lab Sample ID: LCSD 140-62240/19-B ^5**
Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 5	SEP	Organic-Bound			5.000 g	75 mL	62240	06/06/22 08:00	KNC	TAL KNX
Step 5	Prep	3010A			5 mL	50 mL	62350	06/08/22 08:00	KNC	TAL KNX
Step 5	Analysis	6010B SEP		5			62493	06/10/22 10:21	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup **Lab Sample ID: LCSD 140-62351/19-A**
Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 6	SEP	Acid/Sulfide			5.000 g	250 mL	62351	06/08/22 08:00	KNC	TAL KNX
Step 6	Analysis	6010B SEP		1			62493	06/10/22 12:47	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: Lab Control Sample Dup **Lab Sample ID: LCSD 140-62386/19-A**
Date Collected: N/A **Matrix: Solid**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			62545	06/13/22 13:05	JGT	TAL KNX
	Instrument ID: DUO									
Step 7	Prep	Residual			1.000 g	50 mL	62386	06/09/22 08:00	KNC	TAL KNX
Step 7	Analysis	6010B SEP		1			62595	06/14/22 12:07	JGT	TAL KNX
	Instrument ID: DUO									

Client Sample ID: MW-212-C **Lab Sample ID: 140-27497-1 DU**
Date Collected: 05/10/22 10:48 **Matrix: Solid**
Date Received: 05/18/22 11:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			62024	05/25/22 14:02	ACW	TAL KNX
	Instrument ID: NOEQUIP									

Laboratory References:
TAL KNX = Eurofins Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Accreditation/Certification Summary

Client: Golder Associates Inc. Job ID: 140-27497-1
Project/Site: GL21509219, GRE Stanton 2022

Laboratory: Eurofins Knoxville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
	AFCEE	N/A	
ANAB	Dept. of Defense ELAP	L2311	02-13-25
ANAB	Dept. of Energy	L2311.01	02-13-25
ANAB	ISO/IEC 17025	L2311	02-13-25
Arkansas DEQ	State	88-0688	06-17-22
California	State	2423	06-30-22
Colorado	State	TN00009	02-28-23
Connecticut	State	PH-0223	09-30-23
Florida	NELAP	E87177	06-30-22
Georgia (DW)	State	906	12-11-22
Hawaii	State	NA	12-11-22
Kansas	NELAP	E-10349	10-31-22
Kentucky (DW)	State	90101	12-31-22
Louisiana	NELAP	83979	06-30-22
Louisiana (DW)	State	LA019	12-31-22
Maryland	State	277	03-31-23
Michigan	State	9933	12-11-22
Nevada	State	TN00009	07-31-22
New Hampshire	NELAP	299919	01-17-23
New Jersey	NELAP	TN001	06-30-22
New York	NELAP	10781	03-31-23
North Carolina (DW)	State	21705	07-31-22
North Carolina (WW/SW)	State	64	12-31-22
Ohio VAP	State	CL0059	06-02-23
Oklahoma	State	9415	08-31-22
Oregon	NELAP	TNI0189	12-31-22
Pennsylvania	NELAP	68-00576	12-31-22
Tennessee	State	02014	12-11-22
Texas	NELAP	T104704380-18-12	08-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-19-00236	08-20-22
Utah	NELAP	TN00009	07-31-22
Virginia	NELAP	460176	09-14-22
Washington	State	C593	01-19-23
West Virginia (DW)	State	9955C	12-31-22
West Virginia DEP	State	345	04-30-23
Wisconsin	State	998044300	08-31-22

Method	Method Description	Protocol	Laboratory
6010B	SEP Metals (ICP) - Total	SW846	TAL KNX
6010B SEP	SEP Metals (ICP)	SW846	TAL KNX
Moisture	Percent Moisture	EPA	TAL KNX
3010A	Preparation, Total Metals	SW846	TAL KNX
Acid/Sulfide	Sequential Extraction Procedure, Acid/Sulfide Fraction	TAL-KNOX	TAL KNX
Carbonate	Sequential Extraction Procedure, Carbonate Fraction	TAL-KNOX	TAL KNX
Exchangeable	Sequential Extraction Procedure, Exchangeable Fraction	TAL-KNOX	TAL KNX
Metal Hydroxide	Sequential Extraction Procedure, Metal Hydroxide Fraction	TAL-KNOX	TAL KNX
Non-Crystalline	Sequential Extraction Procedure, Non-crystalline Materials	TAL-KNOX	TAL KNX
Organic-Bound	Sequential Extraction Procedure, Organic Bound Fraction	TAL-KNOX	TAL KNX
Residual	Sequential Extraction Procedure, Residual Fraction	TAL-KNOX	TAL KNX
Total	Preparation, Total Material	TAL-KNOX	TAL KNX

Protocol References:

EPA = US Environmental Protection Agency

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

TAL-KNOX = TestAmerica Laboratories, Knoxville, Facility Standard Operating Procedure.

Laboratory References:

TAL KNX = Eurofins Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Eurofins TestAmerica, Knoxville
5815 Middlebrook Pike

Knoxville, TN 37921-5947
phone 865.291.3000 fax 865.584.4315

Chain of Custody Record

eurofins Environment Testing America

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☑ Other: CCR

TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica

Client Contact	Project Manager: Erin Hunter	Site Contact: Brittany Bradley	Date:	COC No: 1
Golder Associates USA Inc., Member of WSP	Email: erin.hunter@wsp.com	Lab Contact: Ryan Henry	Carrier:	1 of 1 COCs
7245 W Alaska Drive, Suite 200	Tel/Fax: 720-962-3424			TALS Project #:
Lakewood, CO 80226	Analysis Turnaround Time			Sampler:
(303) 980-0540 Phone	☐ CALENDAR DAYS ☑ WORKING DAYS			For Lab Use Only:
(xxx) xxx-xxxx FAX	TAT if different from Below ____			Walk-in Client:
Project Name: GL21509219, GRE Stanton 2022	☐ 2 weeks			
Site: Stanton Station	☐ 1 week			
P O #	☐ 2 days			
	☐ 1 day			

140-27497 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	6010B SEP - Al, As, Fe, Li, Mn	Sample Specific Notes:
MW-212-C	5/10/22	10:48	Soil	C	1	N	N	X	0-5 ft
MW-212	5/10/22	11:20	C	Soil	1	N	N	X	14-25 ft
TW-TR2	5/11/22	15:00	C	Soil	1	N	N	X	75-95 ft
MW-210	5/9/22	10:37	C	Soil	1	N	N	X	15-25 ft
BH-1	5/10/22	13:15	C	Soil	1	N	N	X	2-5 ft
MW-214	5/12/22	15:15	C	Soil	1	N	N	X	2-15 ft
MW-211 - 0-5 ft	5/10/22	8:24	C	Soil	1	N	N	X	0-5 ft
MW-211 - 14-25 ft	5/10/22	9:30	C	Soil	1	N	N	X	14-25 ft
TW-TR2-C2	5/11/22	14:00	C	Soil	1	N	N	X	50-55 ft
TW-TR2-C1	5/11/22	13:00	C	Soil	1	N	N	X	20-25 ft
MW-213	5/12/22	12:40	C	Soil	1	N	N	X	20-30 ft

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for ____ Months

Special Instructions/QC Requirements & Comments: NO CUSTODY SEALS, RECEIVED AMBIENT RT 20.3/CT 20.6°C
5/18/22, 1 BOX FEDX#2731 1134 0091 G

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:		Cooler Temp. (°C): Obs'd: ____ Corr'd: ____		Therm ID No.: ____
Relinquished by:	Company:	Date/Time:	Received by: [signature]	Company: ETA Knx	Date/Time: 5-18-22 11:20
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Loc: 140
27497

EUROFINS/TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Log In Number:

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Are the shipping containers intact?	✓			☐ Containers, Broken	10
2. Were ambient air containers received intact?			✓	☐ Checked in lab	
3. The coolers/containers custody seal if present, is it intact?			✓	☐ Yes ☐ NA	14
4. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C) Thermometer ID : SC71 Correction factor: +0.3°C			✓	☐ Cooler Out of Temp, Client Contacted, Proceed/Cancel ☐ Cooler Out of Temp, Same Day Receipt	
5. Were all of the sample containers received intact?	✓			☐ Containers, Broken	
6. Were samples received in appropriate containers?	✓			☐ Containers, Improper; Client Contacted; Proceed/Cancel	
7. Do sample container labels match COC? (IDs, Dates, Times)	✓			☐ COC & Samples Do Not Match ☐ COC Incorrect/Incomplete ☐ COC Not Received	
8. Were all of the samples listed on the COC received?	✓			☐ Sample Received, Not on COC ☐ Sample on COC, Not Received	
9. Is the date/time of sample collection noted?	✓			☐ COC; No Date/Time; Client Contacted	**Labeling Verified by:** **Date:**
10. Was the sampler identified on the COC?		✓		☑ Sampler Not Listed on COC	
11. Is the client and project name/# identified?	✓			☐ COC Incorrect/Incomplete	**pH test strip lot number:**
12. Are tests/parameters listed for each sample?	✓			☐ COC No tests on COC	
13. Is the matrix of the samples noted?	✓			☐ COC Incorrect/Incomplete	
14. Was COC relinquished? (Signed/Dated/Timed)		✓		☑ COC Incorrect/Incomplete	
15. Were samples received within holding time?	✓			☐ Holding Time - Receipt	
16. Were samples received with correct chemical preservative (excluding Encore)?			✓	☐ pH Adjusted, pH Included (See box 16A) ☐ Incorrect Preservative	
17. Were VOA samples received without headspace?			✓	☐ Headspace (VOA only)	
18. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) Chlorine test strip lot number:			✓	☐ Residual Chlorine	
19. For 1613B water samples is pH<9?			✓	☐ If no, notify lab to adjust	
20. For rad samples was sample activity info. Provided?			✓	☐ Project missing info	

	Box 16A: pH Preservation	Box 18A: Residual Chlorine
Preservative:		
Lot Number:		
Exp Date:		
Analyst:		
Date:		
Time:		

Project #: 14006675 PM Instructions:

Sample Receiving Associate: [signature] Date: 5-18-22

QA026R32.doc, 062719

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

Laboratory Job ID: 180-138265-1

Client Project/Site: GL21509219, GRE Stanton 2022, Stanton Station

For:
Golder Associates Inc.
7245 W Alaska Drive
Suite 200
Lakewood, Colorado 80226

Attn: Ms. Erin Hunter

Authorized for release by:
6/27/2022 12:58:18 PM

Carrie Gamber, Senior Project Manager
(412)963-2428
Carrie.Gamber@et.eurofinsus.com

LINKS

Review your project results through myEOL

Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

PA Lab ID: 02-00416

Table of Contents

Job ID: 180-138265-1

Laboratory: Eurofins Pittsburgh

Narrative

CASE NARRATIVE

Client: Golder Associates Inc.

Project: GL21509219, GRE Stanton 2022, Stanton Station

Report Number: 180-138265-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 05/18/2022; the samples arrived in good condition. The temperature of the coolers at receipt was 12.4 C.

The following samples were received at the laboratory outside the required temperature criteria: MW-214 (180-138265-1), MW-210 (180-138265-2), MW-212-C (180-138265-3), BH-1 (180-138265-4), MW-214 (180-138265-5), MW-210 (180-138265-6), MW-212-C (180-138265-7), BH-1 (180-138265-8) and LEACH BLANK (180-138265-9). There was no cooling media present in the cooler. The analyses proceeded.

The Chain-of-Custody (COC) was incomplete as received and/or improperly completed. The COC was not relinquished.

IC 300.0
Sulfate was detected in method blank LB 180-400047/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

METALS
Lead was detected in method blank MB 180-400702/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

Boron was detected in method blank LB 180-400041/1-C at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

Sodium failed the recovery criteria low for the MS of sample BH-1MS (180-138265-4) in batch 180-401849. The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount.

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

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

Qualifiers

HPLC/IC

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

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

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

Accreditation/Certification Summary

Client: Golder Associates Inc. Job ID: 180-138265-1
Project/Site: GL21509219, GRE Stanton 2022, Stanton Statior

Laboratory: Eurofins Pittsburgh

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	19-033-0	06-27-22
California	State	2891	04-30-22 *
Connecticut	State	PH-0688	09-30-22
Florida	NELAP	E871008	06-30-22
Georgia	State	PA 02-00416	04-30-23
Illinois	NELAP	004375	06-30-22
Kansas	NELAP	E-10350	03-31-23
Kentucky (UST)	State	162013	04-30-22 *
Kentucky (WW)	State	KY98043	12-31-22
Louisiana	NELAP	04041	06-30-22
Maine	State	PA00164	03-06-24
Minnesota	NELAP	042-999-482	12-31-22
Nevada	State	PA00164	08-31-22
New Hampshire	NELAP	2030	04-04-23
New Jersey	NELAP	PA005	06-30-23
New York	NELAP	11182	04-01-23
North Carolina (WW/SW)	State	434	12-31-22
North Dakota	State	R-227	04-30-22 *
Oregon	NELAP	PA-2151	02-07-23
Pennsylvania	NELAP	02-00416	04-30-23
Rhode Island	State	LAO00362	12-31-21 *
South Carolina	State	89014	06-30-22
Texas	NELAP	T104704528	03-31-23
USDA	Federal	P-Soil-01	06-26-22
USDA	US Federal Programs	P330-16-00211	06-26-22
Utah	NELAP	PA001462019-8	05-31-22 *
Virginia	NELAP	10043	09-14-22
West Virginia DEP	State	142	01-31-23
Wisconsin	State	998027800	08-31-22

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Sample Summary

Client: Golder Associates Inc.
Project/Site: GL21509219, GRE Stanton 2022, Stanton Station

Job ID: 180-138265-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-138265-1	MW-214	Solid	05/12/22 15:15	05/18/22 09:00
180-138265-2	MW-210	Solid	05/09/22 10:30	05/18/22 09:00
180-138265-3	MW-212-C	Solid	05/10/22 10:58	05/18/22 09:00
180-138265-4	BH-1	Solid	05/10/22 13:15	05/18/22 09:00
180-138265-5	MW-214	Water	05/27/22 04:30	05/18/22 09:00
180-138265-6	MW-210	Water	05/27/22 04:30	05/18/22 09:00
180-138265-7	MW-212-C	Water	05/27/22 04:30	05/18/22 09:00
180-138265-8	BH-1	Water	05/27/22 04:30	05/18/22 09:00
180-138265-9	LEACH BLANK	Water	05/27/22 04:30	05/18/22 09:00

Method Summary

Method	Method Description	Protocol	Laboratory
EPA 300.0 R2.1	Anions, Ion Chromatography	EPA	TAL PIT
EPA 6020B	Metals (ICP/MS)	SW846	TAL PIT
EPA 7470A	Mercury (CVAA)	SW846	TAL PIT
EPA 9040C	pH	SW846	TAL PIT
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PIT
SM 2580B	Reduction-Oxidation (REDOX) Potential	SM	TAL PIT
SM2320 B	Alkalinity, Total	SM18	TAL PIT
1312	SPLP Extraction	SW846	TAL PIT
3010A	Preparation, Total Metals	SW846	TAL PIT
7470A	Preparation, Mercury	SW846	TAL PIT
EPA 1312	SPLP Extraction	SW846	TAL PIT

Protocol References:

EPA = US Environmental Protection Agency

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

SM18 = "Standard Methods For The Examination Of Water And Wastewater", 18th Edition, 1992.

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

Laboratory References:

TAL PIT = Eurofins Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Client Sample ID: MW-214

Lab Sample ID: 180-138265-1

Date Collected: 05/12/22 15:15

Matrix: Solid

Date Received: 05/18/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP	Leach	1312			801.6 g	4000 mL	400047	05/26/22 12:30	MJC	TAL PIT
SPLP	Analysis	EPA 300.0 R2.1		1			402663	06/22/22 06:09	M1D	TAL PIT
	Instrument ID: INTEGRION									
SPLP West	Leach	EPA 1312			801.6 g	4000 mL	400041	05/26/22 12:30	MJC	TAL PIT
SPLP West	Prep	3010A			25 mL	25 mL	400702	06/02/22 15:06	NAF	TAL PIT
SPLP West	Analysis	EPA 6020B		1			401849	06/11/22 10:15	RSK	TAL PIT
	Instrument ID: A									
SPLP West	Leach	EPA 1312			801.6 g	4000 mL	400041	05/26/22 12:30	MJC	TAL PIT
SPLP West	Prep	7470A			50 mL	50 mL	400433	06/01/22 05:00	RJR	TAL PIT
SPLP West	Analysis	EPA 7470A		1			400599	06/01/22 16:49	RJR	TAL PIT
	Instrument ID: HGY									
SPLP West	Leach	EPA 1312			801.6 g	4000 mL	400041	05/26/22 12:30	MJC	TAL PIT
SPLP West	Analysis	SM 2540C		1	100 mL	100 mL	400551	06/01/22 12:55	JCR	TAL PIT
	Instrument ID: NOEQUIP									
SPLP West	Leach	EPA 1312			801.6 g	4000 mL	400041	05/26/22 12:30	MJC	TAL PIT
SPLP West	Analysis	SM2320 B		1			400522	05/28/22 20:24	CMT	TAL PIT
	Instrument ID: PCTITRATOR									

Client Sample ID: MW-210

Lab Sample ID: 180-138265-2

Date Collected: 05/09/22 10:30

Matrix: Solid

Date Received: 05/18/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP	Leach	1312			800.8 g	4000 mL	400047	05/26/22 12:30	MJC	TAL PIT
SPLP	Analysis	EPA 300.0 R2.1		1			402663	06/22/22 06:49	M1D	TAL PIT
	Instrument ID: INTEGRION									
SPLP West	Leach	EPA 1312			800.8 g	4000 mL	400041	05/26/22 12:30	MJC	TAL PIT
SPLP West	Prep	3010A			25 mL	25 mL	400702	06/02/22 15:06	NAF	TAL PIT
SPLP West	Analysis	EPA 6020B		1			401849	06/11/22 10:19	RSK	TAL PIT
	Instrument ID: A									
SPLP West	Leach	EPA 1312			800.8 g	4000 mL	400041	05/26/22 12:30	MJC	TAL PIT
SPLP West	Prep	7470A			50 mL	50 mL	400433	06/01/22 05:00	RJR	TAL PIT
SPLP West	Analysis	EPA 7470A		1			400599	06/01/22 16:50	RJR	TAL PIT
	Instrument ID: HGY									
SPLP West	Leach	EPA 1312			800.8 g	4000 mL	400041	05/26/22 12:30	MJC	TAL PIT
SPLP West	Analysis	SM 2540C		1	100 mL	100 mL	400551	06/01/22 12:55	JCR	TAL PIT
	Instrument ID: NOEQUIP									
SPLP West	Leach	EPA 1312			800.8 g	4000 mL	400041	05/26/22 12:30	MJC	TAL PIT
SPLP West	Analysis	SM2320 B		1			400522	05/29/22 12:36	CMT	TAL PIT
	Instrument ID: PCTITRATOR									

Lab Chronicle

Client: Golder Associates Inc. Job ID: 180-138265-1

Project/Site: GL21509219, GRE Stanton 2022, Stanton Statior

Client Sample ID: MW-212-C

Lab Sample ID: 180-138265-3

Date Collected: 05/10/22 10:58

Matrix: Solid

Date Received: 05/18/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP	Leach	1312			800.8 g	4000 mL	400047	05/26/22 12:30	MJC	TAL PIT
SPLP	Analysis	EPA 300.0 R2.1		1			402663	06/22/22 06:22	M1D	TAL PIT
	Instrument ID: INTEGRION									
SPLP West	Leach	EPA 1312			800.8 g	4000 mL	400041	05/26/22 12:30	MJC	TAL PIT
SPLP West	Prep	3010A			25 mL	25 mL	400702	06/02/22 15:06	NAF	TAL PIT
SPLP West	Analysis	EPA 6020B		1			401849	06/11/22 10:22	RSK	TAL PIT
	Instrument ID: A									
SPLP West	Leach	EPA 1312			800.8 g	4000 mL	400041	05/26/22 12:30	MJC	TAL PIT
SPLP West	Prep	7470A			50 mL	50 mL	400433	06/01/22 05:00	RJR	TAL PIT
SPLP West	Analysis	EPA 7470A		1			400599	06/01/22 16:51	RJR	TAL PIT
	Instrument ID: HGY									
SPLP West	Leach	EPA 1312			800.8 g	4000 mL	400041	05/26/22 12:30	MJC	TAL PIT
SPLP West	Analysis	SM 2540C		1	100 mL	100 mL	400551	06/01/22 12:55	JCR	TAL PIT
	Instrument ID: NOEQUIP									
SPLP West	Leach	EPA 1312			800.8 g	4000 mL	400041	05/26/22 12:30	MJC	TAL PIT
SPLP West	Analysis	SM2320 B		1			400522	05/28/22 20:35	CMT	TAL PIT
	Instrument ID: PCTITRATOR									

Client Sample ID: BH-1

Lab Sample ID: 180-138265-4

Date Collected: 05/10/22 13:15

Matrix: Solid

Date Received: 05/18/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP	Leach	1312			801.6 g	4000 mL	400047	05/26/22 12:30	MJC	TAL PIT
SPLP	Analysis	EPA 300.0 R2.1		1			402663	06/22/22 06:36	M1D	TAL PIT
	Instrument ID: INTEGRION									
SPLP West	Leach	EPA 1312			801.6 g	4000 mL	400041	05/26/22 12:30	MJC	TAL PIT
SPLP West	Prep	3010A			25 mL	25 mL	400702	06/02/22 15:06	NAF	TAL PIT
SPLP West	Analysis	EPA 6020B		1			401849	06/11/22 10:26	RSK	TAL PIT
	Instrument ID: A									
SPLP West	Leach	EPA 1312			801.6 g	4000 mL	400041	05/26/22 12:30	MJC	TAL PIT
SPLP West	Prep	7470A			50 mL	50 mL	400433	06/01/22 05:00	RJR	TAL PIT
SPLP West	Analysis	EPA 7470A		1			400599	06/01/22 16:52	RJR	TAL PIT
	Instrument ID: HGY									
SPLP West	Leach	EPA 1312			801.6 g	4000 mL	400041	05/26/22 12:30	MJC	TAL PIT
SPLP West	Analysis	SM 2540C		1	100 mL	100 mL	400551	06/01/22 12:55	JCR	TAL PIT
	Instrument ID: NOEQUIP									
SPLP West	Leach	EPA 1312			801.6 g	4000 mL	400041	05/26/22 12:30	MJC	TAL PIT
SPLP West	Analysis	SM2320 B		1			400522	05/28/22 20:49	CMT	TAL PIT
	Instrument ID: PCTITRATOR									

Client: Golder Associates Inc.
Job ID: 180-138265-1
Project/Site: GL21509219, GRE Stanton 2022, Stanton Station

Client Sample ID: MW-214
Lab Sample ID: 180-138265-5
Date Collected: 05/27/22 04:30
Matrix: Water
Date Received: 05/18/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9040C		1			400577	06/01/22 16:06	HEK	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2580B		1			400192	05/27/22 15:54	ELS	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: MW-210
Lab Sample ID: 180-138265-6
Date Collected: 05/27/22 04:30
Matrix: Water
Date Received: 05/18/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9040C		1			400577	06/01/22 16:08	HEK	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2580B		1			400192	05/27/22 16:04	ELS	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: MW-212-C
Lab Sample ID: 180-138265-7
Date Collected: 05/27/22 04:30
Matrix: Water
Date Received: 05/18/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9040C		1			400577	06/01/22 16:10	HEK	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2580B		1			400192	05/27/22 16:11	ELS	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: BH-1
Lab Sample ID: 180-138265-8
Date Collected: 05/27/22 04:30
Matrix: Water
Date Received: 05/18/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9040C		1			400577	06/01/22 16:12	HEK	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2580B		1			400192	05/27/22 16:14	ELS	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: LEACH BLANK
Lab Sample ID: 180-138265-9
Date Collected: 05/27/22 04:30
Matrix: Water
Date Received: 05/18/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9040C		1			400577	06/01/22 16:14	HEK	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2580B		1			400192	05/27/22 16:18	ELS	TAL PIT
	Instrument ID: NOEQUIP									

Laboratory References:

TAL PIT = Eurofins Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL PIT

- Batch Type: Leach
  - MJC = Mathew Catanzariti
- Batch Type: Prep
  - NAF = Nicholas Frankos
  - RJR = Ron Rosenbaum
- Batch Type: Analysis
  - CMT = Cassandra Tlumac
  - ELS = Edwin Shireman
  - HEK = Hope Kiesling
  - JCR = Jessica Rodgers
  - M1D = Maureen Donlin
  - RJR = Ron Rosenbaum
  - RSK = Robert Kurtz

Client Sample ID: MW-214

Lab Sample ID: 180-138265-1
Date Collected: 05/12/22 15:15
Matrix: Solid
Date Received: 05/18/22 09:00

Method: EPA 300.0 R2.1 - Anions, Ion Chromatography - SPLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.10	0.053	mg/L			06/22/22 06:09	1
Chloride	2.7		1.0	0.71	mg/L			06/22/22 06:09	1
Fluoride	0.49		0.10	0.026	mg/L			06/22/22 06:09	1
Sulfate	20	B	1.0	0.76	mg/L			06/22/22 06:09	1

Method: EPA 6020B - Metals (ICP/MS) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.94	J	2.0	0.51	ug/L		06/02/22 15:06	06/11/22 10:15	1
Arsenic	3.2		1.0	0.28	ug/L		06/02/22 15:06	06/11/22 10:15	1
Barium	5.3	J	10	3.1	ug/L		06/02/22 15:06	06/11/22 10:15	1
Beryllium	ND		1.0	0.27	ug/L		06/02/22 15:06	06/11/22 10:15	1
Boron	170	B	80	60	ug/L		06/02/22 15:06	06/11/22 10:15	1
Cadmium	ND		1.0	0.22	ug/L		06/02/22 15:06	06/11/22 10:15	1
Calcium	2900		500	130	ug/L		06/02/22 15:06	06/11/22 10:15	1
Chromium	2.1		2.0	1.5	ug/L		06/02/22 15:06	06/11/22 10:15	1
Cobalt	0.50		0.50	0.26	ug/L		06/02/22 15:06	06/11/22 10:15	1
Lead	0.43	J B	1.0	0.17	ug/L		06/02/22 15:06	06/11/22 10:15	1
Lithium	5.5		5.0	0.83	ug/L		06/02/22 15:06	06/11/22 10:15	1
Magnesium	1900		500	50	ug/L		06/02/22 15:06	06/11/22 10:15	1
Molybdenum	15		5.0	0.61	ug/L		06/02/22 15:06	06/11/22 10:15	1
Potassium	1600		500	160	ug/L		06/02/22 15:06	06/11/22 10:15	1
Selenium	ND		5.0	0.74	ug/L		06/02/22 15:06	06/11/22 10:15	1
Sodium	39000		500	180	ug/L		06/02/22 15:06	06/11/22 10:15	1
Thallium	ND		1.0	0.47	ug/L		06/02/22 15:06	06/11/22 10:15	1
Iron	510		50	28	ug/L		06/02/22 15:06	06/11/22 10:15	1

Method: EPA 7470A - Mercury (CVAA) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		06/01/22 05:00	06/01/22 16:49	1

General Chemistry - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	130		10	10	mg/L			06/01/22 12:55	1
Total Alkalinity as CaCO3 to pH 4.5	170		5.0	5.0	mg/L			05/28/22 20:24	1
Bicarbonate Alkalinity as CaCO3	170		5.0	5.0	mg/L			05/28/22 20:24	1
Carbonate Alkalinity as CaCO3	ND		5.0	5.0	mg/L			05/28/22 20:24	1

Client Sample ID: MW-210

Lab Sample ID: 180-138265-2
Date Collected: 05/09/22 10:30
Matrix: Solid
Date Received: 05/18/22 09:00

Method: EPA 300.0 R2.1 - Anions, Ion Chromatography - SPLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.10	0.053	mg/L			06/22/22 06:49	1
Chloride	1.4		1.0	0.71	mg/L			06/22/22 06:49	1
Fluoride	0.23		0.10	0.026	mg/L			06/22/22 06:49	1
Sulfate	21	B	1.0	0.76	mg/L			06/22/22 06:49	1

Method: EPA 6020B - Metals (ICP/MS) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	1.6	J	2.0	0.51	ug/L		06/02/22 15:06	06/11/22 10:19	1

Client Sample ID: MW-210
Lab Sample ID: 180-138265-2
Date Collected: 05/09/22 10:30
Matrix: Solid
Date Received: 05/18/22 09:00

Method: EPA 6020B - Metals (ICP/MS) - SPLP West (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.49**	**J**	1.0	0.28	ug/L		06/02/22 15:06	06/11/22 10:19	1
Barium	**25**		10	3.1	ug/L		06/02/22 15:06	06/11/22 10:19	1
Beryllium	ND		1.0	0.27	ug/L		06/02/22 15:06	06/11/22 10:19	1
Boron	**220**	**B**	80	60	ug/L		06/02/22 15:06	06/11/22 10:19	1
Cadmium	ND		1.0	0.22	ug/L		06/02/22 15:06	06/11/22 10:19	1
Calcium	**9200**		500	130	ug/L		06/02/22 15:06	06/11/22 10:19	1
Chromium	ND		2.0	1.5	ug/L		06/02/22 15:06	06/11/22 10:19	1
Cobalt	ND		0.50	0.26	ug/L		06/02/22 15:06	06/11/22 10:19	1
Lead	ND		1.0	0.17	ug/L		06/02/22 15:06	06/11/22 10:19	1
Lithium	**5.3**		5.0	0.83	ug/L		06/02/22 15:06	06/11/22 10:19	1
Magnesium	**1800**		500	50	ug/L		06/02/22 15:06	06/11/22 10:19	1
Molybdenum	**20**		5.0	0.61	ug/L		06/02/22 15:06	06/11/22 10:19	1
Potassium	**2500**		500	160	ug/L		06/02/22 15:06	06/11/22 10:19	1
Selenium	**1.3**	**J**	5.0	0.74	ug/L		06/02/22 15:06	06/11/22 10:19	1
Sodium	**20000**		500	180	ug/L		06/02/22 15:06	06/11/22 10:19	1
Thallium	ND		1.0	0.47	ug/L		06/02/22 15:06	06/11/22 10:19	1
Iron	**40**	**J**	50	28	ug/L		06/02/22 15:06	06/11/22 10:19	1

Method: EPA 7470A - Mercury (CVAA) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		06/01/22 05:00	06/01/22 16:50	1

General Chemistry - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**89**		10	10	mg/L			06/01/22 12:55	1
Total Alkalinity as CaCO3 to pH 4.5	**65**		5.0	5.0	mg/L			05/29/22 12:36	1
Bicarbonate Alkalinity as CaCO3	**65**		5.0	5.0	mg/L			05/29/22 12:36	1
Carbonate Alkalinity as CaCO3	ND		5.0	5.0	mg/L			05/29/22 12:36	1

Client Sample ID: MW-212-C
Lab Sample ID: 180-138265-3
Date Collected: 05/10/22 10:58
Matrix: Solid
Date Received: 05/18/22 09:00

Method: EPA 300.0 R2.1 - Anions, Ion Chromatography - SPLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.10	0.053	mg/L			06/22/22 06:22	1
Chloride	ND		1.0	0.71	mg/L			06/22/22 06:22	1
Fluoride	**0.40**		0.10	0.026	mg/L			06/22/22 06:22	1
Sulfate	**200**	**B**	1.0	0.76	mg/L			06/22/22 06:22	1

Method: EPA 6020B - Metals (ICP/MS) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**1.5**	**J**	2.0	0.51	ug/L		06/02/22 15:06	06/11/22 10:22	1
Arsenic	**1.9**		1.0	0.28	ug/L		06/02/22 15:06	06/11/22 10:22	1
Barium	**96**		10	3.1	ug/L		06/02/22 15:06	06/11/22 10:22	1
Beryllium	ND		1.0	0.27	ug/L		06/02/22 15:06	06/11/22 10:22	1
Boron	**750**	**B**	80	60	ug/L		06/02/22 15:06	06/11/22 10:22	1
Cadmium	ND		1.0	0.22	ug/L		06/02/22 15:06	06/11/22 10:22	1
Calcium	**41000**		500	130	ug/L		06/02/22 15:06	06/11/22 10:22	1
Chromium	ND		2.0	1.5	ug/L		06/02/22 15:06	06/11/22 10:22	1
Cobalt	**0.64**		0.50	0.26	ug/L		06/02/22 15:06	06/11/22 10:22	1

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

Client: Golder Associates Inc. | Job ID: 180-138265-1
Project/Site: GL21509219, GRE Stanton 2022, Stanton Statior

Client Sample ID: MW-212-C | Lab Sample ID: 180-138265-3

Date Collected: 05/10/22 10:58 | **Matrix: Solid**
Date Received: 05/18/22 09:00

Method: EPA 6020B - Metals (ICP/MS) - SPLP West (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		1.0	0.17	ug/L		06/02/22 15:06	06/11/22 10:22	1
Lithium	14		5.0	0.83	ug/L		06/02/22 15:06	06/11/22 10:22	1
Magnesium	20000		500	50	ug/L		06/02/22 15:06	06/11/22 10:22	1
Molybdenum	48		5.0	0.61	ug/L		06/02/22 15:06	06/11/22 10:22	1
Potassium	11000		500	160	ug/L		06/02/22 15:06	06/11/22 10:22	1
Selenium	ND		5.0	0.74	ug/L		06/02/22 15:06	06/11/22 10:22	1
Sodium	79000		500	180	ug/L		06/02/22 15:06	06/11/22 10:22	1
Thallium	ND		1.0	0.47	ug/L		06/02/22 15:06	06/11/22 10:22	1
Iron	ND		50	28	ug/L		06/02/22 15:06	06/11/22 10:22	1

Method: EPA 7470A - Mercury (CVAA) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		06/01/22 05:00	06/01/22 16:51	1

General Chemistry - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	480		10	10	mg/L			06/01/22 12:55	1
Total Alkalinity as CaCO3 to pH 4.5	170		5.0	5.0	mg/L			05/28/22 20:35	1
Bicarbonate Alkalinity as CaCO3	170		5.0	5.0	mg/L			05/28/22 20:35	1
Carbonate Alkalinity as CaCO3	ND		5.0	5.0	mg/L			05/28/22 20:35	1

Client Sample ID: BH-1 | Lab Sample ID: 180-138265-4

Date Collected: 05/10/22 13:15 | **Matrix: Solid**
Date Received: 05/18/22 09:00

Method: EPA 300.0 R2.1 - Anions, Ion Chromatography - SPLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.10	0.053	mg/L			06/22/22 06:36	1
Chloride	1.7		1.0	0.71	mg/L			06/22/22 06:36	1
Fluoride	1.6		0.10	0.026	mg/L			06/22/22 06:36	1
Sulfate	ND		1.0	0.76	mg/L			06/22/22 06:36	1

Method: EPA 6020B - Metals (ICP/MS) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	2.4		2.0	0.51	ug/L		06/02/22 15:06	06/11/22 10:26	1
Arsenic	3.4		1.0	0.28	ug/L		06/02/22 15:06	06/11/22 10:26	1
Barium	140		10	3.1	ug/L		06/02/22 15:06	06/11/22 10:26	1
Beryllium	ND		1.0	0.27	ug/L		06/02/22 15:06	06/11/22 10:26	1
Boron	3400	B	80	60	ug/L		06/02/22 15:06	06/11/22 10:26	1
Cadmium	ND		1.0	0.22	ug/L		06/02/22 15:06	06/11/22 10:26	1
Calcium	120000		500	130	ug/L		06/02/22 15:06	06/11/22 10:26	1
Chromium	3.3		2.0	1.5	ug/L		06/02/22 15:06	06/11/22 10:26	1
Cobalt	ND		0.50	0.26	ug/L		06/02/22 15:06	06/11/22 10:26	1
Lead	ND		1.0	0.17	ug/L		06/02/22 15:06	06/11/22 10:26	1
Lithium	11		5.0	0.83	ug/L		06/02/22 15:06	06/11/22 10:26	1
Magnesium	3400		500	50	ug/L		06/02/22 15:06	06/11/22 10:26	1
Molybdenum	27		5.0	0.61	ug/L		06/02/22 15:06	06/11/22 10:26	1
Potassium	13000		500	160	ug/L		06/02/22 15:06	06/11/22 10:26	1
Selenium	1.3	J	5.0	0.74	ug/L		06/02/22 15:06	06/11/22 10:26	1
Sodium	190000		500	180	ug/L		06/02/22 15:06	06/11/22 10:26	1
Thallium	ND		1.0	0.47	ug/L		06/02/22 15:06	06/11/22 10:26	1

Client Sample ID: BH-1

Lab Sample ID: 180-138265-4

Date Collected: 05/10/22 13:15

Matrix: Solid

Date Received: 05/18/22 09:00

Method: EPA 6020B - Metals (ICP/MS) - SPLP West (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		50	28	ug/L		06/02/22 15:06	06/11/22 10:26	1

Method: EPA 7470A - Mercury (CVAA) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		06/01/22 05:00	06/01/22 16:52	1

General Chemistry - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	990		10	10	mg/L			06/01/22 12:55	1
Total Alkalinity as CaCO3 to pH 4.5	56		5.0	5.0	mg/L			05/28/22 20:49	1
Bicarbonate Alkalinity as CaCO3	30		5.0	5.0	mg/L			05/28/22 20:49	1
Carbonate Alkalinity as CaCO3	26		5.0	5.0	mg/L			05/28/22 20:49	1

Client Sample ID: MW-214

Lab Sample ID: 180-138265-5

Date Collected: 05/27/22 04:30

Matrix: Water

Date Received: 05/18/22 09:00

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	8.2	HF	0.1	0.1	SU			06/01/22 16:06	1
Oxidation Reduction Potential	290		10	10	millivolts			05/27/22 15:54	1

Client Sample ID: MW-210

Lab Sample ID: 180-138265-6

Date Collected: 05/27/22 04:30

Matrix: Water

Date Received: 05/18/22 09:00

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	8.3	HF	0.1	0.1	SU			06/01/22 16:08	1
Oxidation Reduction Potential	290		10	10	millivolts			05/27/22 16:04	1

Client Sample ID: MW-212-C

Lab Sample ID: 180-138265-7

Date Collected: 05/27/22 04:30

Matrix: Water

Date Received: 05/18/22 09:00

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	8.3	HF	0.1	0.1	SU			06/01/22 16:10	1
Oxidation Reduction Potential	280		10	10	millivolts			05/27/22 16:11	1

Client Sample ID: BH-1

Lab Sample ID: 180-138265-8

Date Collected: 05/27/22 04:30

Matrix: Water

Date Received: 05/18/22 09:00

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	9.3	HF	0.1	0.1	SU			06/01/22 16:12	1
Oxidation Reduction Potential	210		10	10	millivolts			05/27/22 16:14	1

Client Sample ID: LEACH BLANK

Lab Sample ID: 180-138265-9

Date Collected: 05/27/22 04:30
Matrix: Water
Date Received: 05/18/22 09:00

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.1	HF	0.1	0.1	SU			06/01/22 16:14	1
Oxidation Reduction Potential	300		10	10	millivolts			05/27/22 16:18	1

Method: EPA 300.0 R2.1 - Anions, Ion Chromatography

Lab Sample ID: MB 180-402663/110
Matrix: Solid
Analysis Batch: 402663

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.10	0.053	mg/L			06/22/22 09:01	1
Chloride	ND		1.0	0.71	mg/L			06/22/22 09:01	1
Fluoride	ND		0.10	0.026	mg/L			06/22/22 09:01	1
Sulfate	ND		1.0	0.76	mg/L			06/22/22 09:01	1

Lab Sample ID: LCS 180-402663/109
Matrix: Solid
Analysis Batch: 402663

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	10.0	10.2		mg/L		102	90 - 110
Chloride	50.0	49.3		mg/L		99	90 - 110
Fluoride	2.50	2.35		mg/L		94	90 - 110
Sulfate	50.0	49.1		mg/L		98	90 - 110

Lab Sample ID: LB 180-400047/1-A
Matrix: Solid
Analysis Batch: 402663

Client Sample ID: Method Blank
Prep Type: SPLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	ND		0.10	0.053	mg/L			06/22/22 05:28	1
Chloride	ND		1.0	0.71	mg/L			06/22/22 05:28	1
Fluoride	ND		0.10	0.026	mg/L			06/22/22 05:28	1
Sulfate	0.828	J	1.0	0.76	mg/L			06/22/22 05:28	1

Method: EPA 6020B - Metals (ICP/MS)

Lab Sample ID: MB 180-400702/1-A
Matrix: Solid
Analysis Batch: 401849

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 400702

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		2.0	0.51	ug/L		06/02/22 15:06	06/11/22 09:49	1
Arsenic	ND		1.0	0.28	ug/L		06/02/22 15:06	06/11/22 09:49	1
Barium	ND		10	3.1	ug/L		06/02/22 15:06	06/11/22 09:49	1
Beryllium	ND		1.0	0.27	ug/L		06/02/22 15:06	06/11/22 09:49	1
Boron	ND		80	60	ug/L		06/02/22 15:06	06/11/22 09:49	1
Cadmium	ND		1.0	0.22	ug/L		06/02/22 15:06	06/11/22 09:49	1
Calcium	ND		500	130	ug/L		06/02/22 15:06	06/11/22 09:49	1
Chromium	ND		2.0	1.5	ug/L		06/02/22 15:06	06/11/22 09:49	1
Cobalt	ND		0.50	0.26	ug/L		06/02/22 15:06	06/11/22 09:49	1
Lead	0.175	J	1.0	0.17	ug/L		06/02/22 15:06	06/11/22 09:49	1
Lithium	ND		5.0	0.83	ug/L		06/02/22 15:06	06/11/22 09:49	1
Magnesium	ND		500	50	ug/L		06/02/22 15:06	06/11/22 09:49	1
Molybdenum	ND		5.0	0.61	ug/L		06/02/22 15:06	06/11/22 09:49	1
Potassium	ND		500	160	ug/L		06/02/22 15:06	06/11/22 09:49	1
Selenium	ND		5.0	0.74	ug/L		06/02/22 15:06	06/11/22 09:49	1
Sodium	ND		500	180	ug/L		06/02/22 15:06	06/11/22 09:49	1
Thallium	ND		1.0	0.47	ug/L		06/02/22 15:06	06/11/22 09:49	1

Method: EPA 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 180-400702/1-A
Matrix: Solid
Analysis Batch: 401849

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 400702

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		50	28	ug/L		06/02/22 15:06	06/11/22 09:49	1

Lab Sample ID: LCS 180-400702/2-A
Matrix: Solid
Analysis Batch: 401849

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 400702

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	250	272		ug/L		109	80 - 120
Arsenic	1000	1050		ug/L		105	80 - 120
Barium	1000	1080		ug/L		108	80 - 120
Beryllium	500	534		ug/L		107	80 - 120
Boron	1250	1240		ug/L		99	80 - 120
Cadmium	500	534		ug/L		107	80 - 120
Calcium	25000	27400		ug/L		110	80 - 120
Chromium	500	526		ug/L		105	80 - 120
Cobalt	500	531		ug/L		106	80 - 120
Lead	500	534		ug/L		107	80 - 120
Lithium	500	512		ug/L		102	80 - 120
Magnesium	25000	24800		ug/L		99	80 - 120
Molybdenum	500	538		ug/L		108	80 - 120
Potassium	25000	25500		ug/L		102	80 - 120
Selenium	1000	1040		ug/L		104	80 - 120
Sodium	25000	25500		ug/L		102	80 - 120
Thallium	1000	1120		ug/L		112	80 - 120
Iron	5000	5810		ug/L		116	80 - 120

Lab Sample ID: LB 180-400041/1-C
Matrix: Solid
Analysis Batch: 401849

Client Sample ID: Method Blank
Prep Type: SPLP West
Prep Batch: 400702

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		2.0	0.51	ug/L		06/02/22 15:06	06/11/22 10:00	1
Arsenic	ND		1.0	0.28	ug/L		06/02/22 15:06	06/11/22 10:00	1
Barium	ND		10	3.1	ug/L		06/02/22 15:06	06/11/22 10:00	1
Beryllium	ND		1.0	0.27	ug/L		06/02/22 15:06	06/11/22 10:00	1
Boron	78.2	J	80	60	ug/L		06/02/22 15:06	06/11/22 10:00	1
Cadmium	ND		1.0	0.22	ug/L		06/02/22 15:06	06/11/22 10:00	1
Calcium	ND		500	130	ug/L		06/02/22 15:06	06/11/22 10:00	1
Chromium	ND		2.0	1.5	ug/L		06/02/22 15:06	06/11/22 10:00	1
Cobalt	ND		0.50	0.26	ug/L		06/02/22 15:06	06/11/22 10:00	1
Lead	ND		1.0	0.17	ug/L		06/02/22 15:06	06/11/22 10:00	1
Lithium	ND		5.0	0.83	ug/L		06/02/22 15:06	06/11/22 10:00	1
Magnesium	ND		500	50	ug/L		06/02/22 15:06	06/11/22 10:00	1
Molybdenum	ND		5.0	0.61	ug/L		06/02/22 15:06	06/11/22 10:00	1
Potassium	ND		500	160	ug/L		06/02/22 15:06	06/11/22 10:00	1
Selenium	ND		5.0	0.74	ug/L		06/02/22 15:06	06/11/22 10:00	1
Sodium	ND		500	180	ug/L		06/02/22 15:06	06/11/22 10:00	1
Thallium	ND		1.0	0.47	ug/L		06/02/22 15:06	06/11/22 10:00	1
Iron	ND		50	28	ug/L		06/02/22 15:06	06/11/22 10:00	1

Client: Golder Associates Inc. Job ID: 180-138265-1
Project/Site: GL21509219, GRE Stanton 2022, Stanton Statior

Method: EPA 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 180-138265-4 MS
Matrix: Solid
Analysis Batch: 401849

Client Sample ID: BH-1
Prep Type: SPLP West
Prep Batch: 400702

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	2.4		250	266		ug/L		106	75 - 125
Arsenic	3.4		1000	1000		ug/L		100	75 - 125
Barium	140		1000	1130		ug/L		99	75 - 125
Beryllium	ND		500	483		ug/L		97	75 - 125
Boron	3400	B	1250	4390		ug/L		80	75 - 125
Cadmium	ND		500	488		ug/L		98	75 - 125
Calcium	120000		25000	138000	4	ug/L		88	75 - 125
Chromium	3.3		500	489		ug/L		97	75 - 125
Cobalt	ND		500	501		ug/L		100	75 - 125
Lead	ND		500	500		ug/L		100	75 - 125
Lithium	11		500	473		ug/L		92	75 - 125
Magnesium	3400		25000	27500		ug/L		96	75 - 125
Molybdenum	27		500	535		ug/L		102	75 - 125
Potassium	13000		25000	37800		ug/L		98	75 - 125
Selenium	1.3	J	1000	966		ug/L		96	75 - 125
Sodium	190000		25000	199000	4	ug/L		51	75 - 125
Thallium	ND		1000	1030		ug/L		103	75 - 125
Iron	ND		5000	5090		ug/L		102	75 - 125

Lab Sample ID: 180-138265-4 MSD
Matrix: Solid
Analysis Batch: 401849

Client Sample ID: BH-1
Prep Type: SPLP West
Prep Batch: 400702

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Antimony	2.4		250	274		ug/L		109	75 - 125	3	20
Arsenic	3.4		1000	1020		ug/L		101	75 - 125	1	20
Barium	140		1000	1180		ug/L		103	75 - 125	4	20
Beryllium	ND		500	489		ug/L		98	75 - 125	1	20
Boron	3400	B	1250	4410		ug/L		82	75 - 125	0	20
Cadmium	ND		500	505		ug/L		101	75 - 125	3	20
Calcium	120000		25000	139000	4	ug/L		95	75 - 125	1	20
Chromium	3.3		500	504		ug/L		100	75 - 125	3	20
Cobalt	ND		500	512		ug/L		102	75 - 125	2	20
Lead	ND		500	511		ug/L		102	75 - 125	2	20
Lithium	11		500	480		ug/L		94	75 - 125	2	20
Magnesium	3400		25000	28800		ug/L		101	75 - 125	4	20
Molybdenum	27		500	548		ug/L		104	75 - 125	2	20
Potassium	13000		25000	39100		ug/L		103	75 - 125	3	20
Selenium	1.3	J	1000	974		ug/L		97	75 - 125	1	20
Sodium	190000		25000	206000	4	ug/L		78	75 - 125	3	20
Thallium	ND		1000	1060		ug/L		106	75 - 125	2	20
Iron	ND		5000	5240		ug/L		105	75 - 125	3	20

Method: EPA 7470A - Mercury (CVAA)

Lab Sample ID: MB 180-400433/1-A **Client Sample ID: Method Blank**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 400599 **Prep Batch: 400433**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		06/01/22 05:00	06/01/22 16:31	1

Lab Sample ID: LCS 180-400433/2-A **Client Sample ID: Lab Control Sample**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 400599 **Prep Batch: 400433**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.50	2.56		ug/L		102	80 - 120

Lab Sample ID: LB 180-400041/1-B **Client Sample ID: Method Blank**
Matrix: Solid **Prep Type: SPLP West**
Analysis Batch: 400599 **Prep Batch: 400433**

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		06/01/22 05:00	06/01/22 16:48	1

Method: EPA 9040C - pH

Lab Sample ID: LCS 180-400577/1 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 400577

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	99 - 101

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

Lab Sample ID: MB 180-400551/2 **Client Sample ID: Method Blank**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 400551

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			06/01/22 12:55	1

Lab Sample ID: LCS 180-400551/1 **Client Sample ID: Lab Control Sample**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 400551

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	251	258		mg/L		103	85 - 115

Lab Sample ID: LB 180-400041/1-A **Client Sample ID: Method Blank**
Matrix: Solid **Prep Type: SPLP West**
Analysis Batch: 400551

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			06/01/22 12:55	1

Method: SM 2580B - Reduction-Oxidation (REDOX) Potential

Lab Sample ID: LCS 180-400192/1
Matrix: Water
Analysis Batch: 400192

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Oxidation Reduction Potential	475	468		millivolts		99	90 - 110

Lab Sample ID: LCS 180-400192/26
Matrix: Water
Analysis Batch: 400192

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Oxidation Reduction Potential	475	445		millivolts		94	90 - 110

Lab Sample ID: 180-138265-6 DU
Matrix: Water
Analysis Batch: 400192

Client Sample ID: MW-210
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Oxidation Reduction Potential	290		300		millivolts		2	20

Method: SM2320 B - Alkalinity, Total

Lab Sample ID: MB 180-400522/102
Matrix: Solid
Analysis Batch: 400522

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5	ND		5.0	5.0	mg/L			05/29/22 07:43	1
Bicarbonate Alkalinity as CaCO3	ND		5.0	5.0	mg/L			05/29/22 07:43	1
Carbonate Alkalinity as CaCO3	ND		5.0	5.0	mg/L			05/29/22 07:43	1

Lab Sample ID: MB 180-400522/30
Matrix: Solid
Analysis Batch: 400522

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5	ND		5.0	5.0	mg/L			05/28/22 18:22	1
Bicarbonate Alkalinity as CaCO3	ND		5.0	5.0	mg/L			05/28/22 18:22	1
Carbonate Alkalinity as CaCO3	ND		5.0	5.0	mg/L			05/28/22 18:22	1

Lab Sample ID: MB 180-400522/6
Matrix: Solid
Analysis Batch: 400522

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5	ND		5.0	5.0	mg/L			05/28/22 13:50	1
Bicarbonate Alkalinity as CaCO3	ND		5.0	5.0	mg/L			05/28/22 13:50	1
Carbonate Alkalinity as CaCO3	ND		5.0	5.0	mg/L			05/28/22 13:50	1

Client: Golder Associates Inc. | Job ID: 180-138265-1
Project/Site: GL21509219, GRE Stanton 2022, Stanton Statior

Method: SM2320 B - Alkalinity, Total (Continued)

Lab Sample ID: MB 180-400522/78 | **Client Sample ID: Method Blank**
Matrix: Solid | **Prep Type: Total/NA**
Analysis Batch: 400522

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5	ND		5.0	5.0	mg/L			05/29/22 03:17	1
Bicarbonate Alkalinity as CaCO3	ND		5.0	5.0	mg/L			05/29/22 03:17	1
Carbonate Alkalinity as CaCO3	ND		5.0	5.0	mg/L			05/29/22 03:17	1

Lab Sample ID: LCS 180-400522/101 | **Client Sample ID: Lab Control Sample**
Matrix: Solid | **Prep Type: Total/NA**
Analysis Batch: 400522

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Alkalinity as CaCO3 to pH 4.5	265	256		mg/L		97	90 - 110

Lab Sample ID: LCS 180-400522/29 | **Client Sample ID: Lab Control Sample**
Matrix: Solid | **Prep Type: Total/NA**
Analysis Batch: 400522

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Alkalinity as CaCO3 to pH 4.5	265	256		mg/L		97	90 - 110

Lab Sample ID: LLCS 180-400522/100 | **Client Sample ID: Lab Control Sample**
Matrix: Solid | **Prep Type: Total/NA**
Analysis Batch: 400522

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Alkalinity as CaCO3 to pH 4.5	15.9	17.3		mg/L		109	75 - 125

Lab Sample ID: LLCS 180-400522/28 | **Client Sample ID: Lab Control Sample**
Matrix: Solid | **Prep Type: Total/NA**
Analysis Batch: 400522

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Alkalinity as CaCO3 to pH 4.5	15.9	17.1		mg/L		108	75 - 125

Lab Sample ID: LB 180-400041/1-A | **Client Sample ID: Method Blank**
Matrix: Solid | **Prep Type: SPLP West**
Analysis Batch: 400522

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5	ND		5.0	5.0	mg/L			05/28/22 20:13	1
Bicarbonate Alkalinity as CaCO3	ND		5.0	5.0	mg/L			05/28/22 20:13	1
Carbonate Alkalinity as CaCO3	ND		5.0	5.0	mg/L			05/28/22 20:13	1

HPLC/IC

Leach Batch: 400047

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138265-1	MW-214	SPLP	Solid	1312	
180-138265-2	MW-210	SPLP	Solid	1312	
180-138265-3	MW-212-C	SPLP	Solid	1312	
180-138265-4	BH-1	SPLP	Solid	1312	
LB 180-400047/1-A	Method Blank	SPLP	Solid	1312	

Analysis Batch: 402663

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138265-1	MW-214	SPLP	Solid	EPA 300.0 R2.1	400047
180-138265-2	MW-210	SPLP	Solid	EPA 300.0 R2.1	400047
180-138265-3	MW-212-C	SPLP	Solid	EPA 300.0 R2.1	400047
180-138265-4	BH-1	SPLP	Solid	EPA 300.0 R2.1	400047
LB 180-400047/1-A	Method Blank	SPLP	Solid	EPA 300.0 R2.1	400047
MB 180-402663/110	Method Blank	Total/NA	Solid	EPA 300.0 R2.1	
LCS 180-402663/109	Lab Control Sample	Total/NA	Solid	EPA 300.0 R2.1	

Metals

Leach Batch: 400041

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138265-1	MW-214	SPLP West	Solid	EPA 1312	
180-138265-2	MW-210	SPLP West	Solid	EPA 1312	
180-138265-3	MW-212-C	SPLP West	Solid	EPA 1312	
180-138265-4	BH-1	SPLP West	Solid	EPA 1312	
LB 180-400041/1-B	Method Blank	SPLP West	Solid	EPA 1312	
LB 180-400041/1-C	Method Blank	SPLP West	Solid	EPA 1312	
180-138265-4 MS	BH-1	SPLP West	Solid	EPA 1312	
180-138265-4 MSD	BH-1	SPLP West	Solid	EPA 1312	

Prep Batch: 400433

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138265-1	MW-214	SPLP West	Solid	7470A	400041
180-138265-2	MW-210	SPLP West	Solid	7470A	400041
180-138265-3	MW-212-C	SPLP West	Solid	7470A	400041
180-138265-4	BH-1	SPLP West	Solid	7470A	400041
LB 180-400041/1-B	Method Blank	SPLP West	Solid	7470A	400041
MB 180-400433/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 180-400433/2-A	Lab Control Sample	Total/NA	Solid	7470A	

Analysis Batch: 400599

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138265-1	MW-214	SPLP West	Solid	EPA 7470A	400433
180-138265-2	MW-210	SPLP West	Solid	EPA 7470A	400433
180-138265-3	MW-212-C	SPLP West	Solid	EPA 7470A	400433
180-138265-4	BH-1	SPLP West	Solid	EPA 7470A	400433
LB 180-400041/1-B	Method Blank	SPLP West	Solid	EPA 7470A	400433
MB 180-400433/1-A	Method Blank	Total/NA	Solid	EPA 7470A	400433
LCS 180-400433/2-A	Lab Control Sample	Total/NA	Solid	EPA 7470A	400433

QC Association Summary

Client: Golder Associates Inc. Job ID: 180-138265-1
Project/Site: GL21509219, GRE Stanton 2022, Stanton Statior

Metals

Prep Batch: 400702

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138265-1	MW-214	SPLP West	Solid	3010A	400041
180-138265-2	MW-210	SPLP West	Solid	3010A	400041
180-138265-3	MW-212-C	SPLP West	Solid	3010A	400041
180-138265-4	BH-1	SPLP West	Solid	3010A	400041
LB 180-400041/1-C	Method Blank	SPLP West	Solid	3010A	400041
MB 180-400702/1-A	Method Blank	Total/NA	Solid	3010A	
LCS 180-400702/2-A	Lab Control Sample	Total/NA	Solid	3010A	
180-138265-4 MS	BH-1	SPLP West	Solid	3010A	400041
180-138265-4 MSD	BH-1	SPLP West	Solid	3010A	400041

Analysis Batch: 401849

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138265-1	MW-214	SPLP West	Solid	EPA 6020B	400702
180-138265-2	MW-210	SPLP West	Solid	EPA 6020B	400702
180-138265-3	MW-212-C	SPLP West	Solid	EPA 6020B	400702
180-138265-4	BH-1	SPLP West	Solid	EPA 6020B	400702
LB 180-400041/1-C	Method Blank	SPLP West	Solid	EPA 6020B	400702
MB 180-400702/1-A	Method Blank	Total/NA	Solid	EPA 6020B	400702
LCS 180-400702/2-A	Lab Control Sample	Total/NA	Solid	EPA 6020B	400702
180-138265-4 MS	BH-1	SPLP West	Solid	EPA 6020B	400702
180-138265-4 MSD	BH-1	SPLP West	Solid	EPA 6020B	400702

General Chemistry

Leach Batch: 400041

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138265-1	MW-214	SPLP West	Solid	EPA 1312	
180-138265-2	MW-210	SPLP West	Solid	EPA 1312	
180-138265-3	MW-212-C	SPLP West	Solid	EPA 1312	
180-138265-4	BH-1	SPLP West	Solid	EPA 1312	
LB 180-400041/1-A	Method Blank	SPLP West	Solid	EPA 1312	

Analysis Batch: 400192

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138265-5	MW-214	Total/NA	Water	SM 2580B	
180-138265-6	MW-210	Total/NA	Water	SM 2580B	
180-138265-7	MW-212-C	Total/NA	Water	SM 2580B	
180-138265-8	BH-1	Total/NA	Water	SM 2580B	
180-138265-9	LEACH BLANK	Total/NA	Water	SM 2580B	
LCS 180-400192/1	Lab Control Sample	Total/NA	Water	SM 2580B	
LCS 180-400192/26	Lab Control Sample	Total/NA	Water	SM 2580B	
180-138265-6 DU	MW-210	Total/NA	Water	SM 2580B	

Analysis Batch: 400522

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138265-1	MW-214	SPLP West	Solid	SM2320 B	400041
180-138265-2	MW-210	SPLP West	Solid	SM2320 B	400041
180-138265-3	MW-212-C	SPLP West	Solid	SM2320 B	400041
180-138265-4	BH-1	SPLP West	Solid	SM2320 B	400041
LB 180-400041/1-A	Method Blank	SPLP West	Solid	SM2320 B	400041
MB 180-400522/102	Method Blank	Total/NA	Solid	SM2320 B	

General Chemistry (Continued)

Analysis Batch: 400522 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 180-400522/30	Method Blank	Total/NA	Solid	SM2320 B	
MB 180-400522/6	Method Blank	Total/NA	Solid	SM2320 B	
MB 180-400522/78	Method Blank	Total/NA	Solid	SM2320 B	
LCS 180-400522/101	Lab Control Sample	Total/NA	Solid	SM2320 B	
LCS 180-400522/29	Lab Control Sample	Total/NA	Solid	SM2320 B	
LLCS 180-400522/100	Lab Control Sample	Total/NA	Solid	SM2320 B	
LLCS 180-400522/28	Lab Control Sample	Total/NA	Solid	SM2320 B	

Analysis Batch: 400551

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138265-1	MW-214	SPLP West	Solid	SM 2540C	400041
180-138265-2	MW-210	SPLP West	Solid	SM 2540C	400041
180-138265-3	MW-212-C	SPLP West	Solid	SM 2540C	400041
180-138265-4	BH-1	SPLP West	Solid	SM 2540C	400041
LB 180-400041/1-A	Method Blank	SPLP West	Solid	SM 2540C	400041
MB 180-400551/2	Method Blank	Total/NA	Solid	SM 2540C	
LCS 180-400551/1	Lab Control Sample	Total/NA	Solid	SM 2540C	

Analysis Batch: 400577

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138265-5	MW-214	Total/NA	Water	EPA 9040C	
180-138265-6	MW-210	Total/NA	Water	EPA 9040C	
180-138265-7	MW-212-C	Total/NA	Water	EPA 9040C	
180-138265-8	BH-1	Total/NA	Water	EPA 9040C	
180-138265-9	LEACH BLANK	Total/NA	Water	EPA 9040C	
LCS 180-400577/1	Lab Control Sample	Total/NA	Water	EPA 9040C	

Eurofins TestAmerica, Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238-2907
phone 412.963.7058 fax 412.963.2468

Chain of Custody Record

eurofins | Environment Testing America

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☑ Other: CCR

TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica

Client Contact	Project Manager: Erin Hunter	Site Contact: Brittany Bradley	Date:	COC No: 1
Golder Associates USA Inc., Member of WSP	Email: erin.hunter@wsp.com			1 of 1 COCs
7245 W Alaska Drive, Suite 200	Tel/Fax: 720-962-3424	Lab Contact: Carrie Gamber	Carrier:	TALS Project #:
Lakewood, CO 80226	Analysis Turnaround Time			Sampler: B. Bradley
(303) 980-0540 Phone	☐ CALENDAR DAYS ☑ WORKING DAYS			For Lab Use Only:
(xxx) xxx-xxxx FAX	TAT if different from Below ______			Walk-in Client:
Project Name: GL21509219, GRE Stanton 2022	☑ 2 weeks			Lab Sampling:
Site: Stanton Station	☐ 1 week			
P O #	☐ 2 days			Job / SDG No.:
	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	EPA 1312 - Special SPLP Extraction 4:1	EPA 6020B - CCR Metals + Mg, K, Na, Fe,	EPA 300.0 R2.1 - Cl, F, SO4 SPLP 4:1	EPA 9045D, pH, SPLP 4:1	EPA 7470A, Hg, SPLP 4:1	SM 2540C, TDS, SPLP 4:1	SM2320B, Alk HCO3, CO3, Total, SPLP 4:	SM2580B, Redox Potential, ASTM Leach	D3986-85 ASTM Leaching Procedure	9315, Ra-226, SPLP 4:1	9320, Ra-228, SPLP 4:1	Ra226_Ra228, Combined Ra-226 + Ra-22	Sample Specific Notes:
MW-214	5/12/22	8:15:15	C	Soil	1	N	N	x	x	x	x	x	x	x	x	x	x	x	x	2-15 ft
MW-210	5/9/22	10:30	C	Soil	1	N	N	X	X	X	X	X	X	X	X	X	X	X	X	15-25 ft
MW-212-C	5/10/22	10:58	C	Soil	1	N	N	X	X	X	X	X	X	X	X	X	X	X	X	5-10 ft
BH-1	5/10/22	13:15	C	Soil	1	N	N	X	X	X	X	X	X	X	X	X	X	X	X	2-5 ft

180-138265 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ______

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal by Lab ☐ Archive for ______ Months

Special Instructions/QC Requirements & Comments:
See Quote 18025563-0 for additional details.

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: ______ Corr'd: ______ Therm ID No.: ______

Relinquished by:	Company:	Date/Time:	Received by: D Watson	Company: TestAmerica	Date/Time: 5-18-22 900
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.35, dated 10/6/2020 6/27/2022

Eurofins TestAmerica, Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238-2907
phone 412.963.7058 fax 412.963.2468

Chain of Custody Record

eurofins Environment Testing America

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☑ Other: CCR

TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica

Client Contact	Project Manager: Erin Hunter
Golder Associates USA Inc., Member of WSP	Email: erin.hunter@wsp.com
7245 W Alaska Drive, Suite 200	Tel/Fax: 720-962-3424
Lakewood, CO 80226	Analysis Turnaround Time
(303) 980-0540 Phone	☐ CALENDAR DAYS ☑ WORKING DAYS
(xxx) xxx-xxxx FAX	TAT if different from Below ______
Project Name: GL21509219, GRE Stanton 2022	☑ 2 weeks ☐ 1 week
Site: Stanton Station	☐ 2 days
P O #	☐ 1 day

Site Contact: Brittany Bradley | Date:
Lab Contact: Carrie Gamber | Carrier:

COC No: 1 — 1 of 1 COCs
TALS Project #:
Sampler: B. Bradley
For Lab Use Only:
Walk-in Client:
Lab Sampling:
Job / SDG No.:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	EPA 1312 - Special SPLP Extraction 4:1	EPA 6020B - CCR Metals + Mg, K, Na, Fe,	EPA 300.0 R2.1 - Cl, F, SO4 SPLP 4:1	EPA 9045D, pH, SPLP 4:1	EPA 7470A, Hg, SPLP 4:1	SM 2540C, TDS, SPLP 4:1	SM2320B, Alk HCO3, CO3, Total, SPLP 4:	SM2580B, Redox Potential, ASTM Leach	D3987-85 ASTM Leaching Procedure	9315, Ra-226, SPLP 4:1	9320, Ra-228, SPLP 4:1	Ra226_Ra228, Combined Ra-226 + Ra-22	Sample Specific Notes:
MW-214	5/12/22	8:15:15	C	Soil	1	N	N	x	x	x	x	x	x	x	x	x	x	x	x	2-15 ft
MW-210	5/9/22	10:30	C	Soil	1	N	N	X	X	X	X	X	X	X	X	X	X	X	X	15-25 ft
MW-212-C	5/10/22	10:58	C	Soil	1	N	N	X	X	X	X	X	X	X	X	X	X	X	X	5-10 ft
BH-1	5/10/22	13:15	C	Soil	1	N	N	X	X	X	X	X	X	X	X	X	X	X	X	2-5 ft

180-138265 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ______

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal by Lab ☐ Archive for ______ Months

Special Instructions/QC Requirements & Comments:
See Quote 18025563-0 for additional details.

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd:______ Corr'd:______ Therm ID No.:______

Relinquished by:	Company:	Date/Time:	Received by: D Watson	Company: Eet Pitt	Date/Time: 5-18-22 900
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

6/27/2022
Form No. CA-C-WI-002, Rev. 4.35, dated 10/6/2020

FROM: (517) 348-2998

GOLDER ASSOCIATES INC
STE 200
7245 W ALASKA DR STE 200
DENVER CO 80226
US

SHIP DATE: 13MAY22
ACTWGT: 14.40 LB
CAD: 6893797/SSFE2300
DIMMED: 17 X 17 X 7 IN
BILL 3rd PARTY

Part # 156297-435 RRDB2 EXP 03/23

TO

EUROFINS TESTAMERICA PITTSBURGH
301 ALPHA DR

PITTSBURGH PA 15238 **(US)**
(412) 963-7058 REF:
INV:
PO: DEPT:

FedEx Ground

G

J22202204120144

TRK# 2731 1126 7371

15238

9622 0417 7371

Uncorrected temp 12.8 °C
Thermometer ID 14
CF -0.4 no ice Initials 8
PT-WI-SR-001 effective 11/8/18

180-138265 Waybill

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

FROM: (517) 348-2998

GOLDER ASSOCIATES INC
STE 200
7245 W ALASKA DR STE 200
DENVER CO 80226
US

SHIP DATE: 13MAY22
ACTWGT: 14.40 LB
CAD: 6993797/SSFE2300
DIMMED: 17 X 17 X 7 IN
BILL 3rd PARTY

Part # 156297-435 RRDB2 EXP 03/23

TO

EUROFINS TESTAMERICA PITTSBURGH
301 ALPHA DR

PITTSBURGH PA 15238 (US)
(412) 963-7058 REF:
INV:
PO: DEPT:

FedEx Ground

G

J222022041201uv

TRK# 2731 1126 7371

15238

9622 0417

7371

Uncorrected temp 12.8 °C
Thermometer ID 14
CF -0.4 no ice Initials 8
PT-WI-SR-001 effective 11/8/18

180-138265 Waybill

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

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-462511.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 180-138265-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 6/6/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: GL21509219, GRE Stanton 2022, Stanton Station	Project #: 18025573			
Site:	SSOW#:			

Analysis Requested

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

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Radium-226 SPLP leach 4:1	9320_Ra228/PrecSep_0 Radium-228 SPLP 4:1	Ra226_228GFP_PW	Total Number of containers	Special Instructions/Note:
				Preservation Code:							
MW-214 (180-138265-5)	5/27/22	04:30 Mountain		Water			X	X	X	2	leached by Pittsburgh
MW-210 (180-138265-6)	5/27/22	04:30 Mountain		Water			X	X	X	2	leached by Pittsburgh
MW-212-C (180-138265-7)	5/27/22	04:30 Mountain		Water			X	X	X	2	leached by Pittsburgh
BH-1 (180-138265-8)	5/27/22	04:30 Mountain		Water			X	X	X	2	leached by Pittsburgh
LB 180-400041				W			X	X	X	2	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Pittsburgh.

Possible Hazard Identification
Unconfirmed

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

Deliverable Requested: I, II, III, IV, Other (specify) | Primary Deliverable Rank: 2
Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by:	Date/Time:	Company	Received by: FED EX	Date/Time:	Company
Relinquished by: FED EX	Date/Time:	Company	Received by: Sierra Worthington	Date/Time: JUN 0 1 2022 0155	Company: ETASTL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks		

Ver: 06/08/2021

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Gamber, Carrie L	Carrier Tracking No(s):	COC No: 180-462511.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Carrie.Gamber@et.eurofinsus.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 180-138265-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 6/6/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: GL21509219, GRE Stanton 2022, Stanton Station	Project #: 18025573			
Site:	SSOW#:			

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

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Radium-226 SPLP leach 4:1	9320_Ra228/PrecSep_0 Radium-228 SPLP 4:1	Ra226_228GFP_PW	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-214 (180-138265-5)	5/27/22	04:30 Mountain		Water			X	X	X	2	leached by Pittsburgh
MW-210 (180-138265-6)	5/27/22	04:30 Mountain		Water			X	X	X	2	leached by Pittsburgh
MW-212-C (180-138265-7)	5/27/22	04:30 Mountain		Water			X	X	X	2	leached by Pittsburgh
BH-1 (180-138265-8)	5/27/22	04:30 Mountain		Water			X	X	X	2	leached by Pittsburgh
LB 180-400041				W			X	X	X	2	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Pittsburgh.

Possible Hazard Identification
Unconfirmed

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

Deliverable Requested: I, II, III, IV, Other (specify) | Primary Deliverable Rank: 2

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
			FED EX		
FED EX			Sierra Worthington	JUN 0 1 2022 0155	ETASTL

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

Ver: 06/08/2021

Login Sample Receipt Checklist

Client: Golder Associates Inc. | Job Number: 180-138265-1

Login Number: 138265 | **List Source: Eurofins Pittsburgh**
List Number: 1
Creator: Watson, Debbie

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

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

Laboratory Job ID: 180-138265-2
Client Project/Site: GL21509219, GRE Stanton 2022, Stanton Station

For:
Golder Associates Inc.
7245 W Alaska Drive
Suite 200
Lakewood, Colorado 80226

Attn: Ms. Erin Hunter

Authorized for release by:
6/27/2022 8:40:24 AM

Carrie Gamber, Senior Project Manager
(412)963-2428
Carrie.Gamber@et.eurofinsus.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

PA Lab ID: 02-00416

Table of Contents

Job ID: 180-138265-2

Laboratory: Eurofins Pittsburgh

Narrative

CASE NARRATIVE

Client: Golder Associates Inc.

Project: GL21509219, GRE Stanton 2022, Stanton Station

Report Number: 180-138265-2

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 05/18/2022; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 12.4 C.

The following samples were received at the laboratory outside the required temperature criteria: MW-214 (180-138265-1), MW-210 (180-138265-2), MW-212-C (180-138265-3), BH-1 (180-138265-4), MW-214 (180-138265-5), MW-210 (180-138265-6), MW-212-C (180-138265-7), BH-1 (180-138265-8) and LEACH BLANK (180-138265-9). There was no cooling media present in the cooler. The analyses proceeded.

The Chain-of-Custody (COC) was incomplete as received and/or improperly completed. The COC was not relinquished.

9315 RADIUM 226

The following samples were prepared at a reduced aliquot due to Matrix: MW-214 (180-138265-5), MW-212-C (180-138265-7) and BH-1 (180-138265-8). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date: MW-214 (180-138265-5), MW-210 (180-138265-6), MW-212-C (180-138265-7), BH-1 (180-138265-8), (LCS 160-567939/1-A), (LCSD 160-567939/2-A) and (MB 160-567939/23-A)

9320 RADIUM 228

The following samples were prepared at a reduced aliquot due to Matrix: MW-214 (180-138265-5), MW-212-C (180-138265-7) and BH-1 (180-138265-8). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date: MW-214 (180-138265-5), MW-210 (180-138265-6), MW-212-C (180-138265-7), BH-1 (180-138265-8), (LCS 160-567945/1-A), (LCSD 160-567945/2-A) and (MB 160-567945/23-A)

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date: (CCB 160-571242/53), (CCB 160-571243/17), (CCB 160-571243/18), (CCB 160-571243/21), (CCB

Job ID: 180-138265-2 (Continued)

Laboratory: Eurofins Pittsburgh (Continued)

160-571243/22), (CCB 160-571243/48), (CCB 160-571243/49), (CCVA 160-571242/5), (CCVA 160-571243/1), (CCVA 160-571243/2), (CCVA 160-571243/40), (CCVA 160-571243/41), (CCVA 160-571243/5), (CCVA 160-571243/6), (CCVB 160-571242/29), (CCVB 160-571243/10), (CCVB 160-571243/13), (CCVB 160-571243/14), (CCVB 160-571243/32), (CCVB 160-571243/33) and (CCVB 160-571243/9)

Definitions/Glossary

Client: Golder Associates Inc.
Job ID: 180-138265-2
Project/Site: GL21509219, GRE Stanton 2022, Stanton Statior

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

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

Accreditation/Certification Summary

Client: Golder Associates Inc. Job ID: 180-138265-2
Project/Site: GL21509219, GRE Stanton 2022, Stanton Statior

Laboratory: Eurofins St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22
California	State	2886	07-01-22
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-22
HI - RadChem Recognition	State	n/a	06-30-22
Illinois	NELAP	200023	11-30-22
Iowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana	NELAP	04080	06-30-22
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-22
MI - RadChem Recognition	State	9005	06-30-22
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-22
New Jersey	NELAP	MO002	06-30-22
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-22
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-22
Texas	NELAP	T104704193	07-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22
Virginia	NELAP	10310	06-14-23
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

Sample Summary

Client: Golder Associates Inc.
Project/Site: GL21509219, GRE Stanton 2022, Stanton Station

Job ID: 180-138265-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-138265-5	MW-214	Water	05/27/22 04:30	05/18/22 09:00
180-138265-6	MW-210	Water	05/27/22 04:30	05/18/22 09:00
180-138265-7	MW-212-C	Water	05/27/22 04:30	05/18/22 09:00
180-138265-8	BH-1	Water	05/27/22 04:30	05/18/22 09:00

Method Summary

Client: Golder Associates Inc. Job ID: 180-138265-2
Project/Site: GL21509219, GRE Stanton 2022, Stanton Statior

Method	Method Description	Protocol	Laboratory
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None

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

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Lab Chronicle

Client: Golder Associates Inc. Job ID: 180-138265-2
Project/Site: GL21509219, GRE Stanton 2022, Stanton Statior

Client Sample ID: MW-214 — Lab Sample ID: 180-138265-5

Date Collected: 05/27/22 04:30 — **Matrix: Water**
Date Received: 05/18/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			742.35 mL	1.0 g	567939	06/01/22 15:21	MS	TAL SL
Total/NA	Analysis	9315		1			571243	06/23/22 08:35	FLC	TAL SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			742.35 mL	1.0 g	567945	06/01/22 15:49	BMP	TAL SL
Total/NA	Analysis	9320		1			570287	06/16/22 11:29	FLC	TAL SL
	Instrument ID: GFPCRED									
Total/NA	Analysis	Ra226_Ra228		1			571471	06/24/22 14:22	FLC	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: MW-210 — Lab Sample ID: 180-138265-6

Date Collected: 05/27/22 04:30 — **Matrix: Water**
Date Received: 05/18/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			991.69 mL	1.0 g	567939	06/01/22 15:21	MS	TAL SL
Total/NA	Analysis	9315		1			571243	06/23/22 08:36	FLC	TAL SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			991.69 mL	1.0 g	567945	06/01/22 15:49	BMP	TAL SL
Total/NA	Analysis	9320		1			570287	06/16/22 11:29	FLC	TAL SL
	Instrument ID: GFPCRED									
Total/NA	Analysis	Ra226_Ra228		1			571471	06/24/22 14:22	FLC	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: MW-212-C — Lab Sample ID: 180-138265-7

Date Collected: 05/27/22 04:30 — **Matrix: Water**
Date Received: 05/18/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			746.21 mL	1.0 g	567939	06/01/22 15:21	MS	TAL SL
Total/NA	Analysis	9315		1			571243	06/23/22 08:36	FLC	TAL SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			746.21 mL	1.0 g	567945	06/01/22 15:49	BMP	TAL SL
Total/NA	Analysis	9320		1			570287	06/16/22 11:29	FLC	TAL SL
	Instrument ID: GFPCRED									
Total/NA	Analysis	Ra226_Ra228		1			571471	06/24/22 14:22	FLC	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: BH-1 — Lab Sample ID: 180-138265-8

Date Collected: 05/27/22 04:30 — **Matrix: Water**
Date Received: 05/18/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			746.92 mL	1.0 g	567939	06/01/22 15:21	MS	TAL SL
Total/NA	Analysis	9315		1			571243	06/23/22 08:37	FLC	TAL SL
	Instrument ID: GFPCRED									

Lab Chronicle

Client: Golder Associates Inc. Job ID: 180-138265-2
Project/Site: GL21509219, GRE Stanton 2022, Stanton Statior

Client Sample ID: BH-1 **Lab Sample ID: 180-138265-8**
Date Collected: 05/27/22 04:30 **Matrix: Water**
Date Received: 05/18/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep_0			746.92 mL	1.0 g	567945	06/01/22 15:49	BMP	TAL SL
Total/NA	Analysis	9320		1			570287	06/16/22 11:29	FLC	TAL SL
	Instrument ID: GFPCRED									
Total/NA	Analysis	Ra226_Ra228		1			571471	06/24/22 14:22	FLC	TAL SL
	Instrument ID: NOEQUIP									

Laboratory References:
TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Analyst References:
Lab: TAL SL
Batch Type: Prep
BMP = Bailey Pinette
MS = Matthew Swaringam
Batch Type: Analysis
FLC = Fernando Cruz

Client Sample Results

Client: Golder Associates Inc. Job ID: 180-138265-2
Project/Site: GL21509219, GRE Stanton 2022, Stanton Station

Client Sample ID: MW-214 Lab Sample ID: 180-138265-5
Date Collected: 05/27/22 04:30 **Matrix: Water**
Date Received: 05/18/22 09:00

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.175	U	0.142	0.143	1.00	0.216	pCi/L	06/01/22 15:21	06/23/22 08:35	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.5*		*40 - 110*	*06/01/22 15:21*	*06/23/22 08:35*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.776**		0.453	0.458	1.00	0.651	pCi/L	06/01/22 15:49	06/16/22 11:29	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.5*		*40 - 110*	*06/01/22 15:49*	*06/16/22 11:29*	*1*
Y Carrier	*84.5*		*40 - 110*	*06/01/22 15:49*	*06/16/22 11:29*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.952**		0.475	0.480	5.00	0.651	pCi/L		06/24/22 14:22	1

Client Sample ID: MW-210 Lab Sample ID: 180-138265-6
Date Collected: 05/27/22 04:30 **Matrix: Water**
Date Received: 05/18/22 09:00

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0101	U	0.0632	0.0632	1.00	0.131	pCi/L	06/01/22 15:21	06/23/22 08:36	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.5*		*40 - 110*	*06/01/22 15:21*	*06/23/22 08:36*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.246	U	0.261	0.262	1.00	0.421	pCi/L	06/01/22 15:49	06/16/22 11:29	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.5*		*40 - 110*	*06/01/22 15:49*	*06/16/22 11:29*	*1*
Y Carrier	*83.0*		*40 - 110*	*06/01/22 15:49*	*06/16/22 11:29*	*1*

Client Sample ID: MW-210 Lab Sample ID: 180-138265-6

Date Collected: 05/27/22 04:30 **Matrix: Water**
Date Received: 05/18/22 09:00

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.236	U	0.269	0.270	5.00	0.421	pCi/L		06/24/22 14:22	1

Client Sample ID: MW-212-C Lab Sample ID: 180-138265-7

Date Collected: 05/27/22 04:30 **Matrix: Water**
Date Received: 05/18/22 09:00

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.121	U	0.0949	0.0956	1.00	0.134	pCi/L	06/01/22 15:21	06/23/22 08:36	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.3*		*40 - 110*	*06/01/22 15:21*	*06/23/22 08:36*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.472	U	0.383	0.386	1.00	0.590	pCi/L	06/01/22 15:49	06/16/22 11:29	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.3*		*40 - 110*	*06/01/22 15:49*	*06/16/22 11:29*	*1*
Y Carrier	*86.0*		*40 - 110*	*06/01/22 15:49*	*06/16/22 11:29*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.592**		0.395	0.398	5.00	0.590	pCi/L		06/24/22 14:22	1

Client Sample ID: BH-1 Lab Sample ID: 180-138265-8

Date Collected: 05/27/22 04:30 **Matrix: Water**
Date Received: 05/18/22 09:00

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0109	U	0.0681	0.0681	1.00	0.139	pCi/L	06/01/22 15:21	06/23/22 08:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*87.5*		*40 - 110*	*06/01/22 15:21*	*06/23/22 08:37*	*1*

Client Sample ID: BH-1

Lab Sample ID: 180-138265-8

Date Collected: 05/27/22 04:30

Matrix: Water

Date Received: 05/18/22 09:00

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.267	U	0.434	0.435	1.00	0.739	pCi/L	06/01/22 15:49	06/16/22 11:29	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*87.5*		*40 - 110*	*06/01/22 15:49*	*06/16/22 11:29*	*1*
Y Carrier	*86.4*		*40 - 110*	*06/01/22 15:49*	*06/16/22 11:29*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.278	U	0.439	0.440	5.00	0.739	pCi/L		06/24/22 14:22	1

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-567939/23-A **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 571242 **Prep Batch: 567939**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.08531	U	0.0830	0.0834	1.00	0.131	pCi/L	06/01/22 15:21	06/23/22 08:34	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*106*		*40 - 110*	*06/01/22 15:21*	*06/23/22 08:34*	*1*

Lab Sample ID: LCS 160-567939/1-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 571243 **Prep Batch: 567939**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Radium-226	11.3	10.53		1.11	1.00	0.109	pCi/L	93	75 - 125

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*91.5*		*40 - 110*

Lab Sample ID: LCSD 160-567939/2-A **Client Sample ID: Lab Control Sample Dup**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 571243 **Prep Batch: 567939**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-226	11.3	10.53		1.11	1.00	0.102	pCi/L	93	75 - 125	0	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*91.3*		*40 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-567945/23-A **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 570287 **Prep Batch: 567945**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.2566	U	0.202	0.204	1.00	0.445	pCi/L	06/01/22 15:49	06/16/22 11:33	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*106*		*40 - 110*	*06/01/22 15:49*	*06/16/22 11:33*	*1*
Y Carrier	*92.7*		*40 - 110*	*06/01/22 15:49*	*06/16/22 11:33*	*1*

Method: 9320 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-567945/1-A
Matrix: Water
Analysis Batch: 570309

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 567945

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Radium-228	8.53	9.932		1.32	1.00	0.500	pCi/L	116	75 - 125

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*91.5*		*40 - 110*
Y Carrier	*82.6*		*40 - 110*

Lab Sample ID: LCSD 160-567945/2-A
Matrix: Water
Analysis Batch: 570309

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 567945

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-228	8.53	9.522		1.27	1.00	0.495	pCi/L	112	75 - 125	0.16	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*91.3*		*40 - 110*
Y Carrier	*82.6*		*40 - 110*

Rad

Prep Batch: 567939

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138265-5	MW-214	Total/NA	Water	PrecSep-21	
180-138265-6	MW-210	Total/NA	Water	PrecSep-21	
180-138265-7	MW-212-C	Total/NA	Water	PrecSep-21	
180-138265-8	BH-1	Total/NA	Water	PrecSep-21	
MB 160-567939/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-567939/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-567939/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 567945

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138265-5	MW-214	Total/NA	Water	PrecSep_0	
180-138265-6	MW-210	Total/NA	Water	PrecSep_0	
180-138265-7	MW-212-C	Total/NA	Water	PrecSep_0	
180-138265-8	BH-1	Total/NA	Water	PrecSep_0	
MB 160-567945/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-567945/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-567945/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

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

Eurofins TestAmerica, Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238-2907
phone 412.963.7058 fax 412.963.2468

Chain of Custody Record

eurofins Environment Testing America

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☑ Other: CCR

TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica

Client Contact	Project Manager: Erin Hunter	Site Contact: Brittany Bradley	Date:
Golder Associates USA Inc., Member of WSP	Email: erin.hunter@wsp.com	Lab Contact: Carrie Gamber	Carrier:
7245 W Alaska Drive, Suite 200	Tel/Fax: 720-962-3424		
Lakewood, CO 80226	Analysis Turnaround Time: ☐ CALENDAR DAYS ☑ WORKING DAYS		
(303) 980-0540 Phone	TAT if different from Below ______		
(xxx) xxx-xxxx FAX	☑ 2 weeks		
Project Name: GL21509219, GRE Stanton 2022	☐ 1 week		
Site: Stanton Station	☐ 2 days		
P O #	☐ 1 day		

COC No: 1 | 1 of 1 COCs
TALS Project #:
Sampler: B. Bradley
For Lab Use Only:
Walk-in Client:
Lab Sampling:
Job / SDG No.:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	EPA 1312 - Special SPLP Extraction 4:1	EPA 6020B - CCR Metals + Mg, K, Na, Fe,	EPA 300.0 R2.1 - Cl, F, SO4 SPLP 4:1	EPA 9045D, pH, SPLP 4:1	EPA 7470A, Hg, SPLP 4:1	SM 2540C, TDS, SPLP 4:1	SM2320B, Alk HCO3, CO3, Total, SPLP 4:	SM2580B, Redox Potential, ASTM Leach	D3986-85 ASTM Leaching Procedure	9315, Ra-226, SPLP 4:1	9320, Ra-228, SPLP 4:1	Ra226_Ra228, Combined Ra-226 + Ra-22	Sample Specific Notes:
MW-214	5/12/22	8:15:15	C	Soil	1	N	N	x	x	x	x	x	x	x	x	x	x	x	x	2-15 ft
MW-210	5/9/22	10:30	C	Soil	1	N	N	X	X	X	X	X	X	X	X	X	X	X	X	15-25 ft
MW-212-C	5/10/22	10:58	C	Soil	1	N	N	X	X	X	X	X	X	X	X	X	X	X	X	5-10 ft
BH-1	5/10/22	13:15	C	Soil	1	N	N	X	X	X	X	X	X	X	X	X	X	X	X	2-5 ft

180-138265 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ______

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal by Lab ☐ Archive for ______ Months

Special Instructions/QC Requirements & Comments:
See Quote 18025563-0 for additional details.

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd:______ Corr'd:______ Therm ID No.:______

Relinquished by:	Company:	Date/Time:	Received by: D Watson	Company: TestAmerica	Date/Time: 5-18-22 900
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.35, dated 10/6/2020 6/27/2022

FROM: (517) 348-2998

GOLDER ASSOCIATES INC
STE 200
7245 W ALASKA DR STE 200
DENVER CO 80226
US

SHIP DATE: 13MAY22
ACTWGT: 14.40 LB
CAD: 6893797/SSFE2300
DIMMED: 17 X 17 X 7 IN
BILL 3rd PARTY

Part # 156297-435 RRDB2 EXP 03/23

TO
EUROFINS TESTAMERICA PITTSBURGH
301 ALPHA DR

PITTSBURGH PA 15238 (US)
(412) 963-7058 REF:
INV:
PO: DEPT:

FedEx Ground
G

TRK# 2731 1126 7371

15238

7371

9622 0417

Uncorrected temp 12.8 °C
Thermometer ID 14
CF -0.4 no ice Initials &

PT-WI-SR-001 effective 11/8/18

180-138265 Waybill

Login Sample Receipt Checklist

Client: Golder Associates Inc. | Job Number: 180-138265-2

Login Number: 138265 | **List Source: Eurofins Pittsburgh**
List Number: 1
Creator: Watson, Debbie

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

Login Sample Receipt Checklist

Client: Golder Associates Inc. — Job Number: 180-138265-2

Login Number: 138265
List Number: 2
Creator: Worthington, Sierra M

List Source: Eurofins St. Louis
List Creation: 06/01/22 11:09 AM

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

WSP GOLDER

golder.com

wsp.com