



REPORT

**QUARTERLY MONITORING REPORT
FIRST QUARTER 2022
RESERVE SILICA RECLAMATION SITE**

*Ecology Facility Site No. 2041/Cleanup Site No 4728
28131 Ravensdale-Black Diamond Road
Ravensdale, Washington 98051*

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1.0 INTRODUCTION

This report, prepared by Golder Associates USA Inc. (Golder) for Holcim (US) Inc., presents the results of surface water and groundwater monitoring conducted at the Reserve Silica Reclamation Site (Site) during the first quarter of 2022. The Site is located at 28131 Ravensdale-Black Diamond Road in Ravensdale, Washington. Figure 1 shows the Site location.

A Model Toxics Control Act (MTCA) Remedial Investigation/Feasibility Study (RI/FS) is being conducted at the Site under Agreed Order (AO) No. DE 16052. An RI Work Plan (Work Plan), supporting Sampling and Analysis Plan (SAP), and Quality Assurance Project Plan (QAPP) (Golder 2021) describe the RI monitoring requirements and sampling procedures. Quarterly groundwater monitoring at the Site is currently being conducted in accordance with the Work Plan and supporting documents. Historical groundwater and surface water monitoring activities at the Site were conducted under the requirements of Post-Closure Care and Maintenance Permits issued by Public Health – Seattle and King County (Public Health). The first quarter monitoring event was conducted in March 2022.

2.0 BACKGROUND

2.1 Site Background

The following is a brief description of the historical mining and reclamation activities that occurred at the Site and includes a discussion of the quarterly monitoring program.

2.1.1 Lower Disposal Area Background

The Lower Disposal Area (LDA) is a former open pit sand mine that was reclaimed by placing cement kiln dust (CKD) and other material into the mine excavation from June 1979 to October 1982. The LDA was filled with approximately 175,000 tons of CKD. Records indicate that a cap consisting of clay and up to 7 feet of overburden material from sand mining operations was placed over the CKD.

Historically, high pH seepage surfaced along the slope west of the LDA. The outbreaks are primarily located along the northern half of the western boundary of the LDA and records as early as 1987 indicate a leachate collection system was implemented for the LDA seepage. The leachate drained through low-lying, marshy areas and commingled with stormwater before flowing to the three infiltration ponds (the Infiltration Ponds as shown in Figure 2) near the Ravensdale-Black Diamond Road (ARCADIS 2004). In 2013 a new seepage collection ditch was installed to intercept and collect the seepage (see Section 2.2.3 of this report), which then flowed inside a pipe to the infiltration ponds. In 2018, a water treatment system was constructed, and the high pH water captured by the collection ditch is currently piped to on-site treatment area for pH neutralization and dissolved metals removal. The treated water discharges from the treatment system to the infiltration ponds.

2.1.2 Dale Strip Pit Background

The Dale Strip Pit (DSP) was created to mine the Dale No. 4 coal seam from the surface starting in 1946. Prior to 1946, the coal seam was worked from an underground mine. The underground mining chutes were driven upward to the surface to provide ventilation and allow the transportation of timbers into the mine. Construction of the mine allowed groundwater to drain by gravity to the mine portal (Portal). The Portal has since collapsed, and now a pipe in the collapsed Portal allows water to continuously drain from the mine under an Ecology Sand and Gravel General Permit (Ecology 2005) with monitoring as described below. The Portal is located north of the LDA on the east side of the main haul road.

The DSP was approximately 1,800 feet long (north to south), averaged 140 feet wide (east to west), and averaged 40 feet deep. It was filled in the 1970s and 1980s with approximately 250,000 cubic yards of material including CKD, borrow, and other materials pursuant to a permit from Public Health. It is estimated that about one-third of the DSP was filled with CKD (ARCADIS 2004).

2.2 Mitigation Activities

2.2.1 LDA Cover Upgrade

During September and October 2007, the existing soil cover on the LDA was regraded to provide positive drainage at all locations, reduce overly-steep slope areas, and place a minimum 2-foot-thick clean soil cover over the entire area, including locations where CKD was exposed at the surface. The construction activities are described in the Construction Summary Report (Golder 2008a).

2.2.2 LDA Seep Collection System Test Trenches

During September and October 2008, test trenches for collecting high pH seepage were constructed (Golder 2008b). The purpose of this test system was to evaluate the feasibility of using a more extensive trench system to collect high pH seepage that would otherwise discharge at the ground surface adjacent to the LDA. Details of the test trench construction are presented in the Construction Summary Report (Golder 2009a).

Between October 2008 and September 2009, Golder monitored seepage flow rates from each of the two test trenches and the pipeline discharge once per month, on average. A summary of activities and results of this monitoring program is presented in the flow monitoring report (Golder 2009b).

2.2.3 LDA Seep Collection Ditch and Seepage Treatment System

In February 2013, a surface water collection ditch and concrete catch basin were constructed on the bench below the main access road on the west side of the LDA. This system was installed to capture leachate seeps emerging from the bank along the east side of the bench (west of the main access road) and direct them into the existing pipeline that carries flow from the test trenches to the infiltration ponds. In April 2015, the 4-inch-diameter pipeline from the catch basin to the infiltration ponds, approximately 1,000 feet in length, was replaced with a 12-inch-diameter pipeline to alleviate plugging issues.

In December 2017, the seepage collection trench was further extended approximately 100 feet to the north to collect additional seepage that was not previously captured. Seepage water was then redirected into a seepage treatment system, which completed construction and started initial operations on September 28, 2018. The treatment system uses carbon dioxide (CO₂) sparging to neutralize pH levels and arsenic and lead adsorption using an iron-based adsorption media.

During the initial year of operation, the system operated intermittently, with system shut-downs occurring as various upgrades and modifications were completed to increase the long-term operational efficiency of the treatment system. The system began continuous operating in June 2019, with only minor shutdowns occurring to complete routine maintenance.

2.2.4 LDA Interceptor Trench

In September 2013, a gravel-filled interceptor trench that included a perforated drainpipe and vertical downgradient liner was installed south of the LDA to intercept clean groundwater moving in a northerly direction prior to encountering the CDK in the LDA.

2.2.5 DSP Cover Upgrade

Cover upgrade activities began at the DSP in November 2010 and were completed in July 2011. Cover upgrade activities included stripping surficial vegetation and topsoil, regrading the existing surface to establish positive drainage, placing low permeability soil to provide a minimum 2-foot-thick layer at all locations, filling the existing ditch along the northeast side of the DSP, replacing topsoil, and revegetating the cover surface.

3.0 MONITORING PROGRAM

The purpose of the quarterly monitoring activities is to assess the groundwater and surface water conditions with respect to potential impact from the CKD placed in the LDA and the DSP. Prior to the start of the RI, quarterly monitoring and reporting activities were conducted under requirements of Post-Closure Care and Maintenance Permits issued by Public Health. The current RI groundwater and surface water requirements are detailed within the Work Plan (Golder 2021).

3.1 LDA Sampling Locations

The LDA groundwater and surface water sampling locations are shown in Figure 2. Monitoring well construction details are provided in Table 1. Shallow/alluvial monitoring wells were installed near the LDA in July 2005 and are monitored to assess the shallow/alluvial groundwater conditions with respect to potential impact from the CKD. Four of the wells (MW-1A, MW-2A, MW-5A, and MW-6A) are located around the infiltration ponds. MW-3A is located west of the high pH seepage area. MW-4A, a background well, is located south of, and upgradient with respect to groundwater flow and surface water drainage, the high pH seepage area. P-14 was installed in November 2020 in the center of the LDA and is screened within CKD and other fill material disposed in the LDA. Groundwater samples collected from P-14 provide data on chemical composition of water in an area where saturated CKD is present.

As part of the RI, during September 2021, the following groundwater monitoring wells were also installed to evaluate groundwater quality in and downgradient of the LDA:

- MW-7A and MW-8A were installed west and southwest of the infiltration ponds to evaluate groundwater gradients and groundwater quality.
- MW-9A and MW-10A are located west of the high pH seepage area and the South Pond, near the western property boundary to evaluate groundwater gradients and groundwater quality.
- P-15 was installed in the LDA and, similar to P-14, is also screened within CKD and other fill material disposed in the LDA. Groundwater samples collected from P-15 provide data on chemical composition of water just before the groundwater flows across the Lower Haul Road to daylight as seeps west of the LDA.
- P-16 was installed just west (downgradient) of the high pH seepage area and east (upgradient) of the South Pond.
- P-17 was installed per Ecology's request during their Site visit in September 2021 and is located southwest of the LDA.

The LDA surface water sampling locations evaluate the high pH seepage that occurs west of the LDA:

- The Still Well is a 2-inch-diameter flush-mount well located within the high pH seepage zone west of the LDA.
- The South Pond is a closed depression located west of the high pH seepage area.

- The Weir is located north of the access road to MW-3A immediately below the discharge point from the wetlands. If no flow is observed at the Weir, the constructed wetlands upstream are the alternative sampling location.
- The Infiltration Ponds are located at the north end of the Site near Ravensdale-Black Diamond Road and receive treated water from the on-Site seepage treatment system. The surface sample is collected from the southwest area of the infiltration ponds.

In 2006, bedrock monitoring wells were installed along the west side of the main access road, west of the LDA. The bedrock wells were installed to assess groundwater conditions in the bedrock immediately downgradient of the LDA. MWB-1LDA is located near the northern tip of the LDA, MWB-2LDA is located near the center of the LDA, and MWB-3 LDA is located near the southern end of the LDA. In accordance with the Work Plan, field parameters are monitored in the LDA bedrock monitoring wells semi-annually, and the wells are sampled annually. The fourth quarter monitoring event did not include sampling or measurement of field parameters in the LDA bedrock wells.

3.2 DSP Sampling Locations

The DSP groundwater monitoring locations are shown in Figure 2. The DSP bedrock groundwater monitoring program includes four wells in the DSP area (MWB-1SDSP, MWB-1DDSP, MWB-5DSP, and MWB-6DSP), which evaluate groundwater quality beneath, upgradient, and downgradient of the DSP. Field parameters of groundwater discharging from the Portal are monitored semi-annually, and the Portal is sampled annually. The Portal was originally constructed to drain water from the Dale Strip Coal mine. In accordance with the Work Plan, field parameters are monitored in the LDA bedrock monitoring wells semi-annually, and the wells are sampled annually. There are two additional monitoring wells (MWB-2DSP and MWB-4SDSP) near the DSP area that are monitored semi-annually for water levels and field parameters only.

3.3 LDA Interceptor Trench

The purpose of the Interceptor Trench is to intercept clean shallow groundwater and direct the water away from the LDA before the water enters the LDA. Monitoring is performed at the Interceptor Trench outfall for flow, pH, turbidity, and total dissolved solids. The purpose of the monitoring is to ensure that the trench is not collecting impacted groundwater.

4.0 SAMPLING ACTIVITIES

The following section summarizes the activities associated with the current monitoring event.

4.1 Procedures

4.1.1 Water Level and Field Parameter Measurements

Depth to water measurements were collected from all monitoring wells at the Site on March 16 and 24, 2022. Table 1 presents depth to water measurements and elevations. Groundwater elevation contour maps are provided in Figures 3A-C.

Field parameters for groundwater and surface water were measured as part of the sampling activities described in the following sections. These measurements were performed with the following equipment:

- YSI ProDSS multimeter with pH, ORP (oxidation-reduction potential), conductivity, dissolved oxygen, and temperature probes

■ Hach 2100P Turbidimeter

Some of the readings recorded from the pH meter during the March 2022 sampling round appear erroneous and field meter error is suspected. For example, the pH recorded in MW-1A and MW-2A were atypically low at 5.6 and 6.0, respectively; while the pH recorded in P-14 and P-15 were greater than 14, which is not realistic. Additionally, the interceptor trench pH was recorded at 11.75 but all other readings from this location indicate the water is not impacted, and subsequent measurements of the interceptor trench pH were near neutral as historical measurements.

4.1.2 Laboratory Analysis

Laboratory analyses were performed on samples collected from the various locations described in the following sections. Although the analytic parameters varied between the types of samples, the following elements are common to all the sampling and analysis activities:

- The collected samples were transported to the laboratory within appropriate sample hold times following chain-of-custody protocols.
- The testing was performed by Analytical Resources, Inc. (ARI) of Tukwila, Washington.
- All samples were tested for the following parameters using the methods indicated:

Antimony	EPA Method 200.8
Arsenic	EPA Method 200.8
Lead	EPA Method 200.8
Potassium	EPA Method 6010D
Vanadium	EPA Method 200.8
Total Dissolved Solids (TDS)	SM 2540 C

- Samples were collected for both total metals and dissolved metals analyses, with dissolved metals samples field filtered with a 0.45 µm in-line filter. Samples historically were analyzed for dissolved metals at the Site until December 2020. Ecology requested in their review of the draft Work Plan that metals analyses be conducted as total metals. Groundwater samples are collected in the field for both dissolved metals and for total metals analyses. The dissolved metals samples are held at the laboratory so that they can be analyzed if the total metals results indicated significant differences from historical dissolved metals results.
- Interceptor Trench samples were tested for the following parameters using the method indicated:

pH	Field Measurement
TDS	SM 2540 C
Turbidity	Field Measurement
- Summaries of historical analytic data for the various sampling locations are presented in Appendix A. The data validation report and the laboratory analytical data packages are provided in Appendix C. Sampling Integrity Data Sheets (SIDS) are provided in Appendix D.

4.1.3 LDA Groundwater Sampling

On March 16, 17, 18, and 21, 2022, Golder sampled groundwater from the LDA shallow/alluvial groundwater monitoring wells (MW-1A, MW-2A, MW-3A, MW-4A, MW-5A, MW-6A, MW-7A, MW-8A, MW-9A, MW-10, P-16, P-17), the LDA disposal area (P-14, P-15), and bedrock monitoring wells (MWB-1LDA, MWB-2LDA, and MWB-3LDA).

The following methods and procedures were used in collecting the groundwater samples:

- Depth to groundwater was measured in the wells prior to purging and sampling.
- Using a dedicated bladder pump or dedicated tubing connected to a peristaltic pump (if groundwater elevation allowed), water from wells MW-1A, MW-2A, MW-3A, MW-4A, MW-5A, MW-6A, MW-7A, MW-8A, MW-9A, MW-10, P-16, P-17, P-14, and P-15 was purged at a rate between approximately 200 and 500 milliliters (mL) per minute.
- Using the dedicated bladder pump installed in wells MWB-1LDA, MWB-2LDA, and MWB-3LDA, water was purged at a rate of approximately 375 mL per minute.
- Field parameters of pH, conductivity, temperature, DO, ORP, and turbidity were measured and recorded during purging at approximately five-minute intervals until parameters were stable.
- Once the field parameters stabilized, the purging phase of the process was concluded. Groundwater samples were then collected directly from the dedicated sample tubing.
- For quality control purposes, a duplicate sample was collected from MW-2A (labeled as MW-45A).
- Laboratory-provided containers were used to collect the samples. For each groundwater sample, two 500-mL bottles preserved with nitric acid and one 1-Liter (L) unpreserved bottle were collected. The samples were then labeled and placed in a cooler with ice.

All groundwater and quality control samples were analyzed for the parameters listed in Section 4.1.2. Field parameters and analytical data are presented in Table 2.

4.1.4 LDA Surface Water Sampling

On March 16 and 17, 2022, Golder monitored surface water from the Still Well, Weir, South Pond, and the Infiltration Ponds sampling locations. The following methods and procedures were used in collecting the surface water samples:

- Field parameters of pH, conductivity, temperature, DO, ORP, and turbidity were measured and recorded. These parameters were measured and recorded at each of the surface water locations at the time of sample collection.
- Grab surface water samples were collected using dedicated sample tubing connected to a peristaltic pump.
- For quality control purposes, a duplicate sample was collected from the Infiltration Ponds (labeled as MW-35A).
- Laboratory-provided containers were used to collect the surface water samples. For each surface water sample, two 500-mL bottles preserved with nitric acid and one unpreserved 1-L bottle were collected. The samples were labeled and placed in a cooler with ice.

- The pH of some LDA surface water sampling locations is occasionally greater than 10. Sampling protocol requires that the preserved samples for dissolved metals analysis have a pH of less than 2 upon receipt at the laboratory. To meet this requirement, the pH of the LDA surface water samples collected for metals analysis were checked at the time of sample collection using pH test paper strips. If the pH was higher than 2, additional nitric acid (provided by the laboratory) was added until the pH of the sample was less than 2.

All surface water and quality control samples were analyzed for the parameters listed in Section 4.1.2. Field parameters and analytical data are presented in Table 2.

4.1.5 DSP Groundwater Sampling

On March 16, 18, and 21, 2022, Golder sampled groundwater from the DSP groundwater monitoring wells (MWB-1SDSP, MWB-1DDSP, MWB-5DSP, and MWB-6DSP) and the Portal. The following methods and procedures were used in collecting the groundwater samples:

- Depth to groundwater was measured in the wells prior to purging and sampling.
- Using the dedicated discharge tubing connected to the dedicated bladder pump, water from wells MWB-1DDSP, MWB-1SDSP, MWB-5DSP, and MWB-6DSP was purged at a rate between approximately 350 and 500 mL per minute.
- Field parameters of pH, conductivity, temperature, DO, ORP, and turbidity were measured and recorded during purging at approximately five-minute intervals until parameters were stable.
- Once the field parameters stabilized, the purging phase of the process was concluded. Groundwater samples were then collected directly from the dedicated sample tubing.
- Grab water samples were collected from the Portal using dedicated sample tubing connected to a peristaltic pump. The water quality parameters were measured and recorded at the Portal at the time of sample collection.
- For quality control purposes, a duplicate sample was collected from MWB-6DSP (labeled as MW-55A).
- Laboratory-provided containers were used to collect the samples. For each groundwater sample, two 500-mL bottles preserved with nitric acid and one 1-L unpreserved bottle were collected. The samples were labeled and placed in a cooler with ice.

All groundwater and quality control samples were analyzed for the parameters listed in Section 4.1.2. Field parameters and analytical data are presented in Table 2.

In addition, water levels and field parameters were measured in DSP monitoring wells 2DSP and 4SDSP.

4.1.6 LDA Interceptor Trench Sampling

On March 17, 2022, Golder sampled groundwater from the Interceptor Trench. The following methods and procedures were used to collect the groundwater sample:

- Field pH, turbidity, and the flow rate at the Interceptor Trench outfall were measured and recorded.
- Grab water samples were collected from the Interceptor Trench by placing the sample bottles under the flow of water.

- Laboratory-provided containers were used to collect the sample for TDS lab analysis. One 1-L unpreserved bottle was collected. The sample was then labeled and placed in a cooler with ice.

The Interceptor Trench sample was analyzed for the parameters listed in Section 4.1.2. Field parameters and analytical data are presented in Table 2.

4.1.7 Sampling for Cation/Anion Analyses

In addition to the analyses of parameters listed in Section 4.1.2, general chemistry and cation/anion analyses were conducted on samples collected from:

- The LDA shallow/alluvial monitoring wells (MW-1A, MW-2A, MW-3A, MW-4A, MW-5A, MW-6A, MW-7A, MW-8A, MW-9A, MW-10, P-16, P-17)
- The LDA disposal area monitoring wells (P-14, P-15)
- The LDA bedrock monitoring wells (MWB-1LDA, MWB-2LDA, MWB-3LDA)
- The DSP bedrock monitoring wells (MWB-1SDSP, MWB-1DDSP, MWB-5DSP, MWB-6DSP)
- The DSP Portal

The additional analyses included: total hardness, calcium, magnesium, potassium, sodium, chloride, sulfate, and total alkalinity. These parameters are present in most waters, and the analytical data allow for comparison of the relative abundance of these ions within samples. Plotting of the data from multiple samples on trilinear diagrams and other geochemical evaluations allows for an evaluation of similarities between water types. A geochemical evaluation of the data will be completed and included in the RI Report.

5.0 RESULTS

Analytical results from the March 2022 monitoring round are presented in Table 2. Table 3 presents the current and a historical summary of the Interceptor Trench monitoring data. Historical summary tables of analytical results at each sampling location are provided in Appendix A and concentrations trend graphs for key parameters are provided in Appendix B. All analytical data were subject to a data validation review. Data validation was conducted in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (EPA 2020), the SAP, and the QAPP (Golder 2021). Data reporting qualifiers are included with the analytical results in Appendix A. The data validation review found that all the data were considered valid and usable. The data validation and raw analytical data packages provided by the laboratory are provided in Appendix C. Data collected during this sampling round will be combined with all RI data to complete the evaluations and requirements of the RI/FS.

6.0 OPERATIONS AND MAINTENANCE OF THE LEACHATE TREATMENT SYSTEM

The leachate treatment system first began operating in September 2018. The system operated intermittently from December 2018 to May 2019 as the system upgrades were completed during that time, which included various upgrades and modifications to improve the system's long-term operating efficiency. The system began continuous operations in June 2019, with minor shutdowns occurring to complete routine maintenance and continued minor modifications to improve long-term operating efficiency.

The treatment system includes a 4,200-gallon mixing tank (steel rectangular box shaped tank) that receives the influent water coming from the seepage collection ditch and piping. Water from the tank constantly flows through the carbon dioxide (CO₂) sparge unit, which continuously monitors the water pH and activates CO₂ sparging when the water pH exceeds 8.3. CO₂ sparging continues until the pH reduces to 7.5. The sparged water is pumped back into the mixing tank to maintain the neutralized water within the tank. The influent flow, pumping from the tank and through the CO₂ sparge unit, and discharge from the sparge unit back into the tank are all specifically located in different areas of the mixing tank to provide a constant circulation effectively providing pH neutralization throughout the tank. The mixing tank contains a float switch activated discharge pump that activates when the water reaches a set height within the tank and turns the pump off when the water is lowered to the desired height. Neutralized water pumped from the tank is discharged through filters and an iron-based adsorption media to remove arsenic, prior to discharge of the water to the Infiltration Ponds.

The continuous pH monitoring system is connected to telemetry that sends pH readings and alerts to Golder engineer's cell phones if readings outside of the set ranges occur allowing for response and troubleshooting. Routine inspections of the treatment system are conducted approximately once every two weeks. The inspections include routine maintenance activities such as cleaning scale off pump parts, hoses, and probes to sustain continued operations of the treatment system. The treatment system has been effective in reducing the pH of the seepage water to below 8 standard units and reducing metals concentrations before discharge to the infiltration ponds. Typical maintenance down time of less than 1 day occasionally occurs. Optimization of the metals adsorption system continues, as calcium carbonate clogging of the adsorption system frequently arises. Table 4 provides the 2022 first quarter laboratory analytical data before it enters the pH treatment tank, pre-iron-based adsorption media, and post-iron-based adsorption media showing the reduction in lead and arsenic concentrations. The laboratory analytical report is provided in Appendix C.

The treatment system has been effective in reducing the impacts to groundwater in the immediate vicinity of the infiltration ponds that were historically observed in groundwater monitoring wells MW-5A and MW-6A. Additional modifications and improvements are anticipated to occur to the treatment system during the MTCA cleanup process to improve system performance, efficiency, and achieve Site-specific cleanup standards that are protective of human health and the environment.

7.0 LIMITATIONS

Golder prepared this report for the exclusive use of Holcim (US) Inc. and their authorized agents. It may also be submitted to regulatory agencies.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood. This report was prepared, in part, based on previous investigations and data collected by others. Golder Associates USA Inc. is not responsible for any data that were inaccurately reported by others and reproduced here.

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Tables

Table 1: First Quarter 2022 Water Level Measurements

Sample Area	Sample Location ID	Date Measured	Well Data				Water Levels		
			Total Well Depth (feet bgs)	Screened Interval (feet bgs)	Bentonite Seal (feet bgs)	Casing Diameter (inches)	TOC Elevation (feet NAVD88)	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)
LDA - Shallow/Alluvial Groundwater	MW-1A	3/24/2022	44	28-43	2-26	2	613.44	23.67	589.77
	MW-2A	3/24/2022	40	25-40	2-23	2	607.21	17.54	589.67
	MW-3A	3/16/2022	20	4-20	2-4	2	689.11	4.97	684.14
	MW-4A	3/16/2022	20	5-20	2-4	2	705.45	3.52	701.93
	MW-5A	3/24/2022	40	25-40	2-23	2	611.23	21.48	589.75
	MW-6A	3/24/2022	39	24-39	2-22	2	608.95	19.23	589.72
	MW-7A	3/24/2022	20	10-20	2-7	2	592.69	3.21	589.48
	MW-8A	3/24/2022	26	16-26	2-13	2	601.49	12.11	589.38
	MW-9A	3/16/2022	13	8-13	2-5	2	697.29	2.38	694.91
	MW-10A	3/16/2022	29	9-29	2-6	2	698.02	5.39	692.63
Within LDA - Groundwater	P-16	3/16/2022	10	5-10	1-3	2	702.87	2.73	700.14
	P-17	3/16/2022	13	8-13	2-5	2	720.32	4.12	716.20
Within LDA - Groundwater	P-14	3/16/2022	52	40-50	3-38	2	773.32	27.50	745.82
	P-15	3/16/2022	34	24-34	2-20	2	756.55	14.44	742.11
LDA - Bedrock Groundwater	MWB-1LDA	3/16/2022	135	115-135	2-105	2	704.68	21.89	682.79
	MWB-2LDA	3/16/2022	125	110-125	2-103	2	741.66	34.52	707.14
	MWB-3LDA	3/16/2022	145	125-145	2-115	2	744.19	0.20	743.99
DSP - Bedrock Groundwater	MWB-1SDSP	3/16/2022	160	150-160	138-148	2	936.29	38.20	898.09
	MWB-1DDSP	3/16/2022	265	255-265	243-253	2	935.37	48.37	887.00
	MWB-2DSP	3/16/2022	258	238-258	-	2	934.82	193.68	741.14
	MWB-4SDSP	3/16/2022	43	32-42.8	-	2	932.41	16.70	915.71
	MWB-5DSP	3/16/2022	83	73-83	2-61	2	935.05	17.14	917.91
	MWB-6DSP	3/16/2022	195	120-195	2-108	2	920.65	20.70	899.95

- Not measured or not available
 feet bgs Feet below ground surface
 feet bmp Feet below measuring point
 feet NAVD88 Feet in NAVD88 datum
 TOC Top of casing

Table 2: First Quarter 2022 Field Parameters and Analytical Data

Sample Area	Sample Location ID	Date Sampled	Field Parameters									Gen. Chem.	Metals (ug/L)					
			TOC Elevation (feet NAVD88)	Depth to Water (feet btoc)*	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (Rel mV)	Turbidity (NTU)	pH^ (standard units)		Total Dissolved Solids (mg/L)	Antimony, Total	Arsenic, Total	Potassium, Total	Lead, Total	Vanadium, Total
Preliminary Screening Level ^a			-	-	-	-	-	-	-	-	-	6.5-8.5	-	6	5	-	15	80
LDA - Shallow/Alluvial Groundwater	MW-1A	3/16/2022	613.44	23.67	589.77	9.3	386.3	7.79	155	0.96	5.60	350	1.58	1.33	36800	0.1 U	0.887	
	MW-2A	3/16/2022	607.21	17.54	589.67	8.4	304.1	9.88	154.6	6.43	6.00	291	3.26	1.85	60900	0.218	1.15	
	MW-2A Duplicate (MW-45A)	3/16/2022	-	-	-	-	-	-	-	-	-	284	3.28	1.8	61000	0.156	1.22	
	MW-3A	3/17/2022	689.11	4.97	684.14	7.5	270	2.33	189.1	1.84	7.38	252	3.39	1.98	53200	0.169	0.879	
	MW-4A	3/18/2022	705.45	3.52	701.93	9.1	340.6	3.26	123.8	1.85	6.63	320	0.2 U	0.279	1140	0.1 U	1.53	
	MW-5A	3/16/2022	611.23	21.48	589.75	7.8	724	7	187	2.65	6.60	711	6.01	4.02	223000	0.11	1.52	
	MW-6A	3/16/2022	608.95	19.23	589.72	7.3	828	7.3	176.4	3.63	7.57	808	7.9	2.85	255000	0.155	0.935	
	MW-7A	3/21/2022	592.69	3.21	589.48	7.3	691	6.38	66.2	1.52	7.46	632	6.23	2.88	179000	0.071 J	1.34	
	MW-8A	3/21/2022	601.49	12.11	589.38	8	587	7.13	45	3.32	7.71	536	4.76	7.48	163000	0.1 U	3.84	
	MW-9A	3/18/2022	697.29	2.38	694.91	8.5	423.1	5.19	138.3	1.17	7.16	403	0.154 J	0.788	2470	0.1 U	0.776	
	MW-10A	3/17/2022	698.02	5.39	692.63	9.4	151	7.12	95.1	6.21	6.50	139	0.2 U	0.91	1880	0.061 J	0.807	
	P-16	3/17/2022	702.87	2.73	700.14	8.4	2,600	1.16	-421.2	23.5	13.71	2570	8.14	124	771000	10.5	255	
	P-17	3/18/2022	720.32	4.12	716.20	8.4	404.4	1.46	23.7	5.41	7.33	362	1.38	1.34	13300	0.1 U	1.08	
Within LDA - Groundwater	P-14	3/21/2022	773.32	27.5	745.82	12.5	11,725	1.27	-25.3	2.18	14.52	4110	46.1	74.8	1430000	41.3	6.68	
	P-15	3/17/2022	756.55	14.44	742.11	11.8	9,351	1.11	-70	1.88	14.6	3060	3.08	5.63	970000	109	0.406	
LDA - Bedrock Groundwater ³	MWB-1LDA	3/17/2022	704.68	21.89	682.79	10.7	259.6	1.24	-60.4	0.22	6.52	220	0.2 U	8.20	925	0.1 U	0.2 U	
	MWB-2LDA	3/17/2022	741.66	34.52	707.14	11.6	244.3	2.84	-60.6	3.21	6.56	201	0.2 U	5.53	1060	0.071 J	0.081 J	
	MWB-3LDA	3/17/2022	744.19	0.2	743.99	11.4	166.1	5.44	58.3	0.79	7.54	151	0.2 U	1.58	1200	0.1 U	0.2 U	

Table 2: First Quarter 2022 Field Parameters and Analytical Data

Sample Area	Sample Location ID	Date Sampled	Field Parameters									Gen. Chem.	Metals (ug/L)				
			TOC Elevation (feet NAVD88)	Depth to Water (feet btoc)*	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (Rel mV)	Turbidity (NTU)	pH^		Total Dissolved Solids (mg/L)	Antimony, Total	Arsenic, Total	Potassium, Total	Lead, Total
LDA- Surface Water	South Pond	3/17/2022	-	-	-	8.8	997	8.53	-66.4	4.54	11.32	912	4.85	22.6	358000	16.7	37.8
	Still Well	3/17/2022	-	-	-	9	4955	7.42	153.1	1.88	13.71	2070	8.23	51.7	517000	5.88	3.02
	Weir	3/17/2022	-	-	-	7	410	9.46	157.2	0.91	7.43	394	5.37	3.5	86000	0.055 J	0.92
	Infiltration Ponds	3/16/2022	-	-	-	11.10	786.00	10.41	172.10	12.80	7.45	733	7.59	10.6	236000	4.77	1.82
	Infiltration Ponds Duplicate (MW-35A)	3/16/2022	-	-	-	-	-	-	-	-	-	743	7.95	10.9	231000	4.81	1.91
DSP - Bedrock Groundwater ³	MWB-1SDSP	3/18/2022	936.29	38.2	898.09	11.5	1096	1.17	-40.8	0.31	7.18	1260	0.2 U	16.6	6400	0.1 U	0.2 U
	MWB-1DDSP	3/18/2022	935.37	48.37	887.00	11.3	741	1.2	-93.4	0.39	7.52	781	0.2 U	4.64	4240	0.1 U	0.2 U
	MWB-2DSP	3/21/2022	934.82	193.68	741.14	9.6	369	7.04	125.6	5.95	6.63	-	-	-	-	-	-
	MWB-4SDSP	3/21/2022	932.41	16.7	915.71	10.7	456.3	9.94	115.5	2.79	7.05	-	-	-	-	-	-
	MWB-5DSP	3/21/2022	935.05	17.14	917.91	11.3	601	1.28	-42.9	0.82	6.26	513	0.2 U	4.79	2560	0.1 U	0.2 U
	MWB-6DSP	3/21/2022	920.65	20.7	899.95	10.9	348.2	1.41	102.1	1.4	6.42	297	0.2 U	1.06	1090	0.1 U	0.2 U
	MWB-6DSP Duplicate (MW-55A)	3/21/2022	-	-	-	-	-	-	-	-	-	276	0.2 U	1.01	1060	0.1 U	0.4 U
Portal	3/16/2022	-	-	-	12	402.9	6.78	70.7	19.8	5.81	348	0.2 U	5.32	18800	0.1 U	0.164 J	

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL.

- Not measured or not collected.

* Depth to water (DTW) measurements for all shallow/alluvial wells collected on the same day; date noted is sampling date.

^ pH values may be anomalous due to a potentially faulty pH probe.

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

J Data validation code; estimated value.

J+ Data validation code; estimated value with high bias

J- Data validation code; estimated value with low bias.

U Data validation code; not detected at the Reporting Limit (RL).

DRY Location is dry. Unable to collect field parameters or samples.

Note 1 P-15 did not produce sufficient volume for sampling of dissolved metals.

TOC

°C

feet bmp

feet NAVD88

ug/L

mV

NTU

µmhos/cm

Top of casing inside PVC well

Degrees Celsius

Feet below measuring point

Feet in NAVD88 datum

Micrograms per liter

Millivolts

Nephelometric Turbidity Unit

Micromhos per centimeter

Table 3: Interceptor Trench Discharge Monitoring

Date Sampled	Time Sampled	Flow (gpm)	Field pH (standard units)	Turbidity (NTU)	Total Dissolved Solids (mg/L)
19-Oct-13	8:45	0.3	7.47	-	-
19-Nov-13	9:25	0.7	7.52	-	-
23-Dec-13	15:25	1.2	7.27	-	-
20-Jan-14	11:15	0.8	7.58	1	277
-	-	-	-	-	-
31-Mar-14	11:12	1	7.22	1.6	257
22-Apr-14	16:05	3.6	6.85	474	214
27-May-14	15:30	0.8	7.12	21.9	294
27-Jun-14	11:10	0.3	7.13	13.3	136
31-Jul-14	19:45	0.2	6.95	4.1	305
28-Aug-14	14:00	0.1	7.2	1.8	294
29-Sep-14	13:39	0.1	7.87	1.4	340
29-Oct-14	11:45	0.3	7.03	1.1	319
24-Nov-14	11:50	0.8	7.09	0.7	229
22-Dec-14	8:00	0.4	7.08	0.4	253
30-Jan-15 ¹	10:10	1.1	7.09	0.7	270
4-May-15	9:30	0.31	7.54	2.05	290
4-Aug-15	12:20	0.06	7.61	1.51	268
3-Nov-15	13:15	0.8	7.38	36.9	320
8-Feb-16	10:40	1.9	7.23	9.29	279
2-May-16	16:00	0.5	7.77	22.5	431
22-Aug-16	11:00	0.08	7.78	3.34	302
1-Nov-16	11:40	2.4	8.16	96.3	345
2-Feb-17	9:25	4.5	7.61	0.85	514
30-May-17	15:45	4.5	7.33	4.04	324
18-Aug-17	8:50	0.1	7.57	34	300
10-Nov-17	11:20	1.1	6.81	12.9	365

Table 3: Interceptor Trench Discharge Monitoring

Date Sampled	Time Sampled	Flow (gpm)	Field pH (standard units)	Turbidity (NTU)	Total Dissolved Solids (mg/L)
28-Feb-18	10:16	2.22	7.02	37.9	381
2-May-18	11:45	1.18	7.46	2.89	339
22-Aug-18	10:00	0.13	7.32	19.3	287
7-Nov-18	14:40	0.33	7.24	3.05	342
13-Mar-19	11:31	1.43	7.61	19.4	313
9-May-19	10:30	0.88	7.77	8.9	394
26-Aug-19	18:15	0.42	7.25	26.4	361
14-Nov-19	13:30	0.42	7.05	34.5	447
13-Feb-20	12:35	1.58	6.95	1.76	306
13-Aug-20	12:00	0.21	7.32	20.8	339
10-Dec-20	12:22	3.8	7.7	228	691
4-Mar-21	12:20	3.5	7.23	116	584
10-Jun-21	13:10	0.2	7.02	6.31	360
15-Oct-21	13:55	0.2	7.08	31	382
7-Jan-22	11:58	9.2	7.43	6.23	288
17-Mar-22	15:25	3.5	11.75 [^]	3.24	368

- Not measured or not available

[^] pH values may be anomalous due to potentially faulty pH probe. pH was measured again on June 13, 2022 to be around 7 pH units.

gpm Gallons per minute

NTU Nephelometric Turbidity Unit

mg/L Milligrams per liter

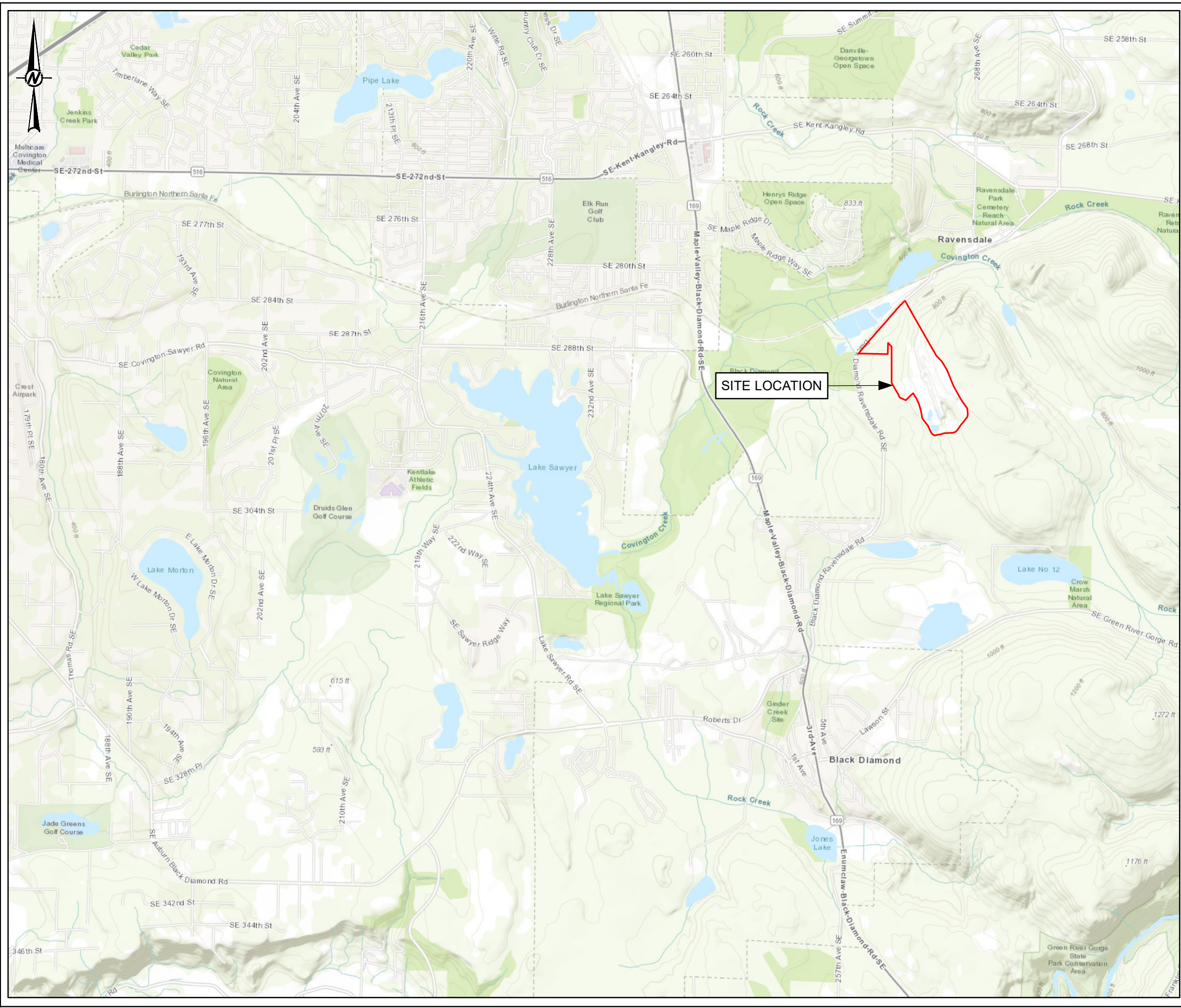
1 Reduction in monitoring frequency to quarterly approved by Public Health – Seattle and King County in an email to Holcim dated January 2, 2015. Sampling schedule follows the Golder 2021 RI Work Plan starting in Q3 2021.

Table 4: First Quarter 2022 Treatment System Metals Monitoring

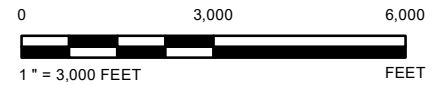
Sample Location	Sample ID	Date Sampled	Total Antimony (ug/L)	Dissolved Antimony (ug/L)	Total Arsenic (ug/L)	Dissolved Arsenic (ug/L)	Total Lead (ug/L)	Dissolved Lead (ug/L)	Total Vanadium (ug/L)	Dissolved Vanadium (ug/L)
pH Tank Influent	Tank-Influent	7-Apr-22	14.5	-	29.6	-	103	-	2.90	-
pH Tank Effluent/Filter Media Influent	Sand-Effluent	7-Apr-22	14.3	-	26.8	-	45.4	-	2.75	-
Filter Media Effluent	As-Effluent	7-Apr-22	7.49	7.65	4.19	4.46	73.9	<0.5	1.17	0.228

- Not measured or not available
mg/L Milligrams per liter

Figures



LEGEND
 Property Boundary



REFERENCE(S)
 1. ASPECT CONSULTING (PROPERTY BOUNDARY)
 2. ESRI (WASHINGTON STATE COUNTY BOUNDARY)
 3. COORDINATE SYSTEM: NAD 1983 STATEPLANE WASHINGTON NORTH FIPS 4601 FEET
 4. MAP SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, GARMIN, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), NGCC, (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
 SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY

CLIENT
HOLCIM

PROJECT
**RI WORK PLAN 2020
 RAVENSDALE, WA**

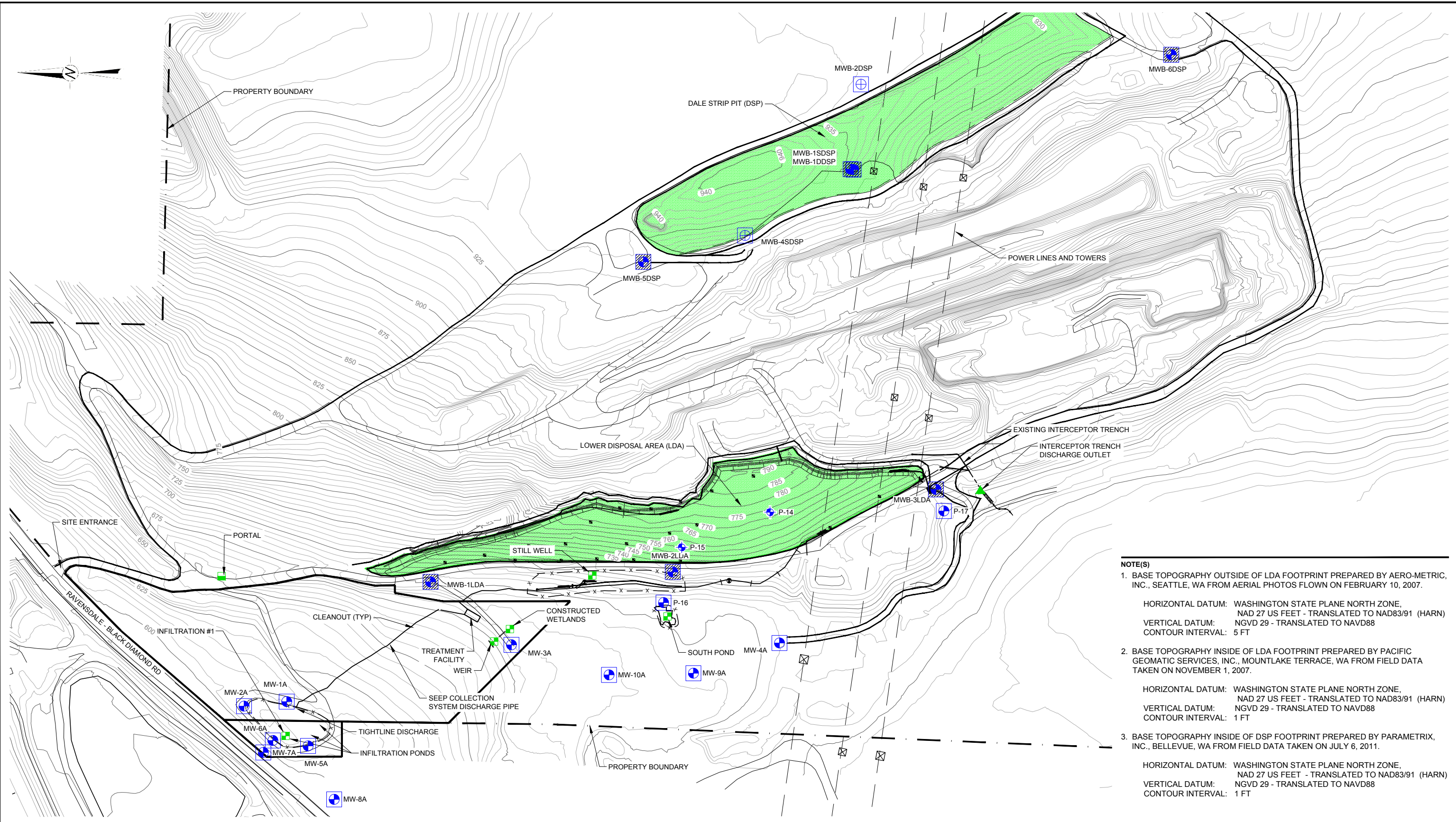
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SITE LOCATION MAP

CONSULTANT	YYYY-MM-DD	2021-02-10
	DESIGNED	TL
	PREPARED	TL
	REVIEWED	JX
	APPROVED	GZ

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANS I

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NOTE(S)

- BASE TOPOGRAPHY OUTSIDE OF LDA FOOTPRINT PREPARED BY AERO-METRIC, INC., SEATTLE, WA FROM AERIAL PHOTOS FLOWN ON FEBRUARY 10, 2007.
 HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD 27 US FEET - TRANSLATED TO NAD83/91 (HARN)
 VERTICAL DATUM: NGVD 29 - TRANSLATED TO NAVD88
 CONTOUR INTERVAL: 5 FT
- BASE TOPOGRAPHY INSIDE OF LDA FOOTPRINT PREPARED BY PACIFIC GEOMATIC SERVICES, INC., MOUNTLAKE TERRACE, WA FROM FIELD DATA TAKEN ON NOVEMBER 1, 2007.
 HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD 27 US FEET - TRANSLATED TO NAD83/91 (HARN)
 VERTICAL DATUM: NGVD 29 - TRANSLATED TO NAVD88
 CONTOUR INTERVAL: 1 FT
- BASE TOPOGRAPHY INSIDE OF DSP FOOTPRINT PREPARED BY PARAMETRIX, INC., BELLEVUE, WA FROM FIELD DATA TAKEN ON JULY 6, 2011.
 HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD 27 US FEET - TRANSLATED TO NAD83/91 (HARN)
 VERTICAL DATUM: NGVD 29 - TRANSLATED TO NAVD88
 CONTOUR INTERVAL: 1 FT

LEGEND			
	COVER AREA		LDA SURFACE WATER SAMPLING LOCATION
	MW-1A ALLUVIAL MONITORING WELL		DSP BEDROCK SAMPLING LOCATION (PORTAL)
	MWB-1DDSP BEDROCK MONITORING WELL		INTERCEPTOR TRENCH SAMPLING LOCATION
	MWB-2DSP BEDROCK MONITORING WELL (NOTE 4)	- x - x -	FENCE LINE
	DISPOSAL AREA MONITORING WELL		



CLIENT
HOLCIM

CONSULTANT



YYYY-MM-DD	2022-01-20
DESIGNED	JX
PREPARED	REDMOND
REVIEWED	JX
APPROVED	GZ

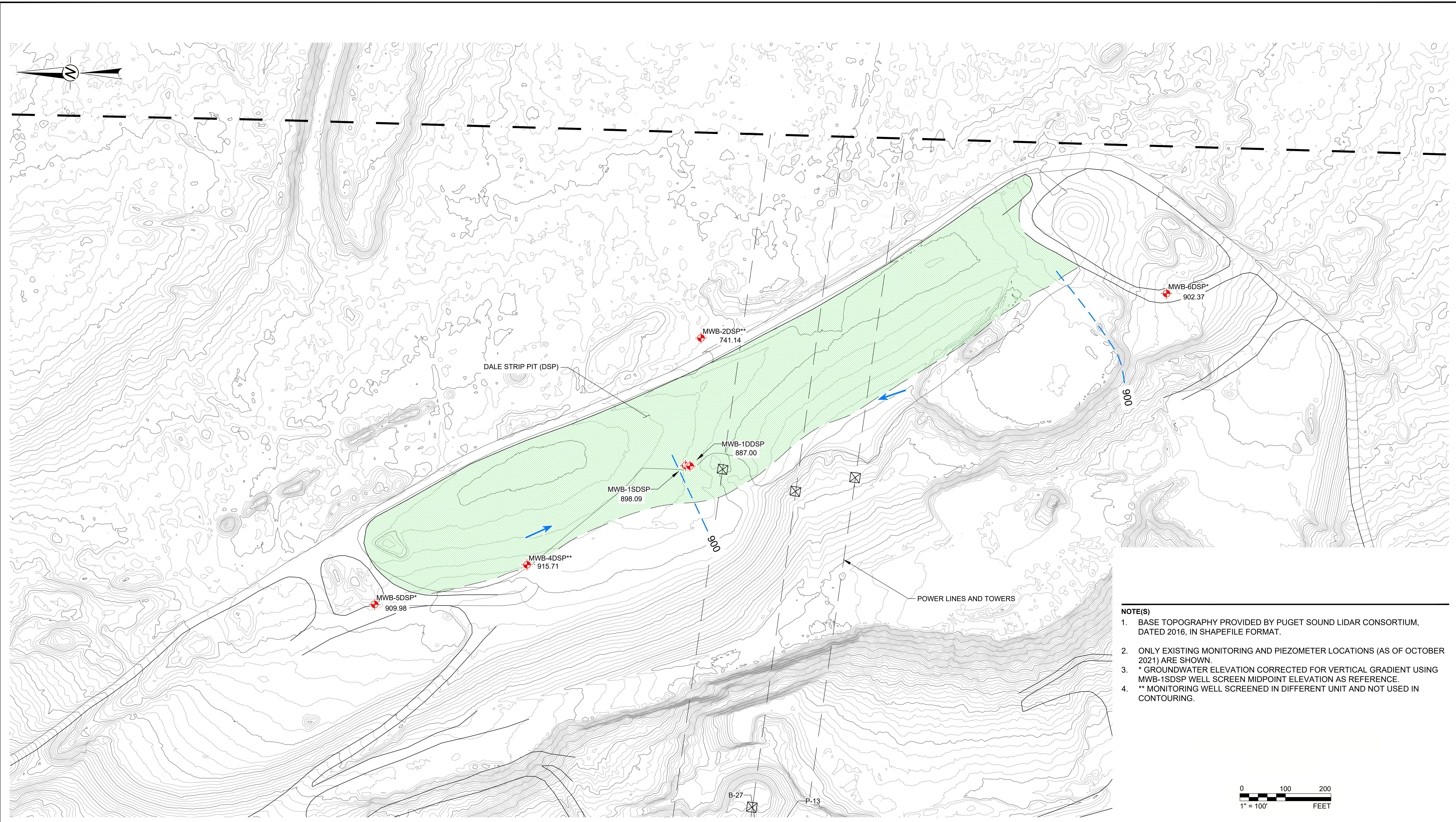
PROJECT
**RI WORK PLAN 2020
RAVENSDALE, WA**

TITLE
SITE PLAN

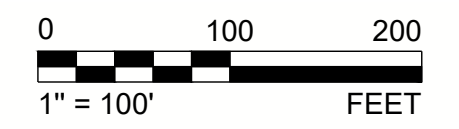
PROJECT NO. 152030420	PHASE 004	REV. A	FIGURE 2
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3S-D

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- NOTE(S)**
1. BASE TOPOGRAPHY PROVIDED BY PUGET SOUND LIDAR CONSORTIUM, DATED 2016, IN SHAPEFILE FORMAT.
 2. ONLY EXISTING MONITORING AND PIEZOMETER LOCATIONS (AS OF OCTOBER 2021) ARE SHOWN.
 3. * GROUNDWATER ELEVATION CORRECTED FOR VERTICAL GRADIENT USING MWB-1SDSP WELL SCREEN MIDPOINT ELEVATION AS REFERENCE.
 4. ** MONITORING WELL SCREENED IN DIFFERENT UNIT AND NOT USED IN CONTOURING.



LEGEND			
	COVER AREA		P-1
	MWB-1A		GOLDER PIEZOMETER
	ALLUVIAL MONITORING WELL		LDA SURFACE WATER SAMPLING LOCATION
	MWB-1DDSP		DSP BEDROCK SAMPLING LOCATION (PORTAL)
	BEDROCK MONITORING WELL		INTERCEPTOR TRENCH SAMPLING LOCATION
	P-14		FENCE LINE
	LDA MONITORING WELL		
	AMW-1		
	PLANT SITE MONITORING WELLS		

CLIENT
HOLCIM

CONSULTANT



YYYY-MM-DD	2022-04-12
DESIGNED	JX
PREPARED	REDMOND
REVIEWED	JX
APPROVED	GZ

PROJECT
**MARCH 16, 2022 GROUNDWATER ELEVATIONS
RAVENSDALE, WA**

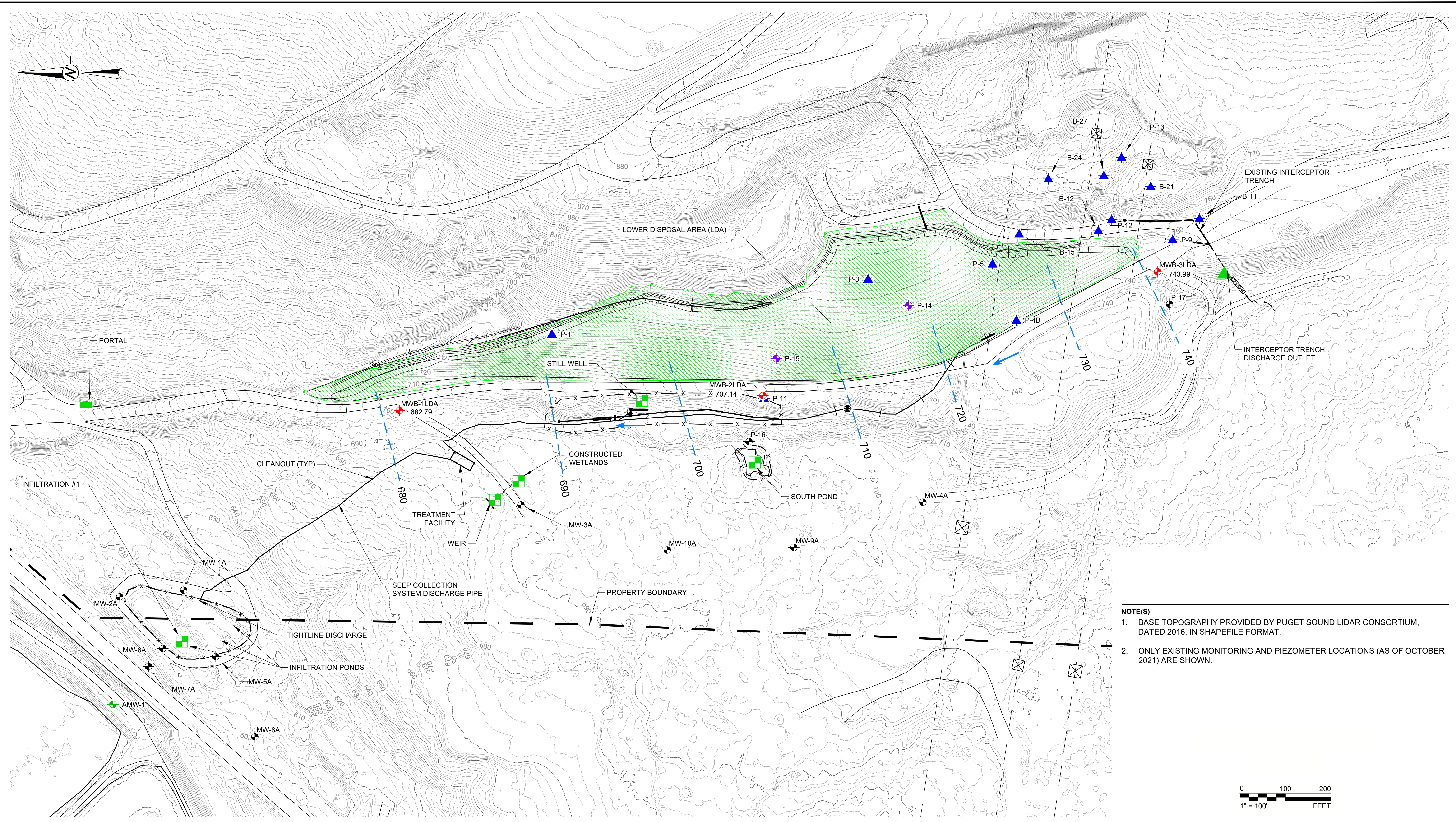
TITLE
DSP BEDROCK GROUNDWATER ELEVATIONS

PROJECT NO.	PHASE	REV.
152030402	004	A

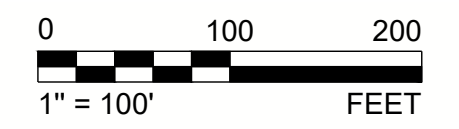
FIGURE
3A

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

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- NOTE(S)**
1. BASE TOPOGRAPHY PROVIDED BY PUGET SOUND LIDAR CONSORTIUM, DATED 2016, IN SHAPEFILE FORMAT.
 2. ONLY EXISTING MONITORING AND PIEZOMETER LOCATIONS (AS OF OCTOBER 2021) ARE SHOWN.



LEGEND	
	COVER AREA
	MW-1A ALLUVIAL MONITORING WELL
	MWB-1DDSP BEDROCK MONITORING WELL
	P-14 LDA MONITORING WELL
	AMW-1 PLANT SITE MONITORING WELLS
	P-1 GOLDER PIEZOMETER
	LDA SURFACE WATER SAMPLING LOCATION
	DSP BEDROCK SAMPLING LOCATION (PORTAL)
	INTERCEPTOR TRENCH SAMPLING LOCATION
	FENCE LINE

CLIENT
HOLCIM

CONSULTANT



YYYY-MM-DD	2022-04-12
DESIGNED	JX
PREPARED	REDMOND
REVIEWED	JX
APPROVED	GZ

PROJECT
**MARCH 16, 2022 GROUNDWATER ELEVATIONS
RAVENSDALE, WA**

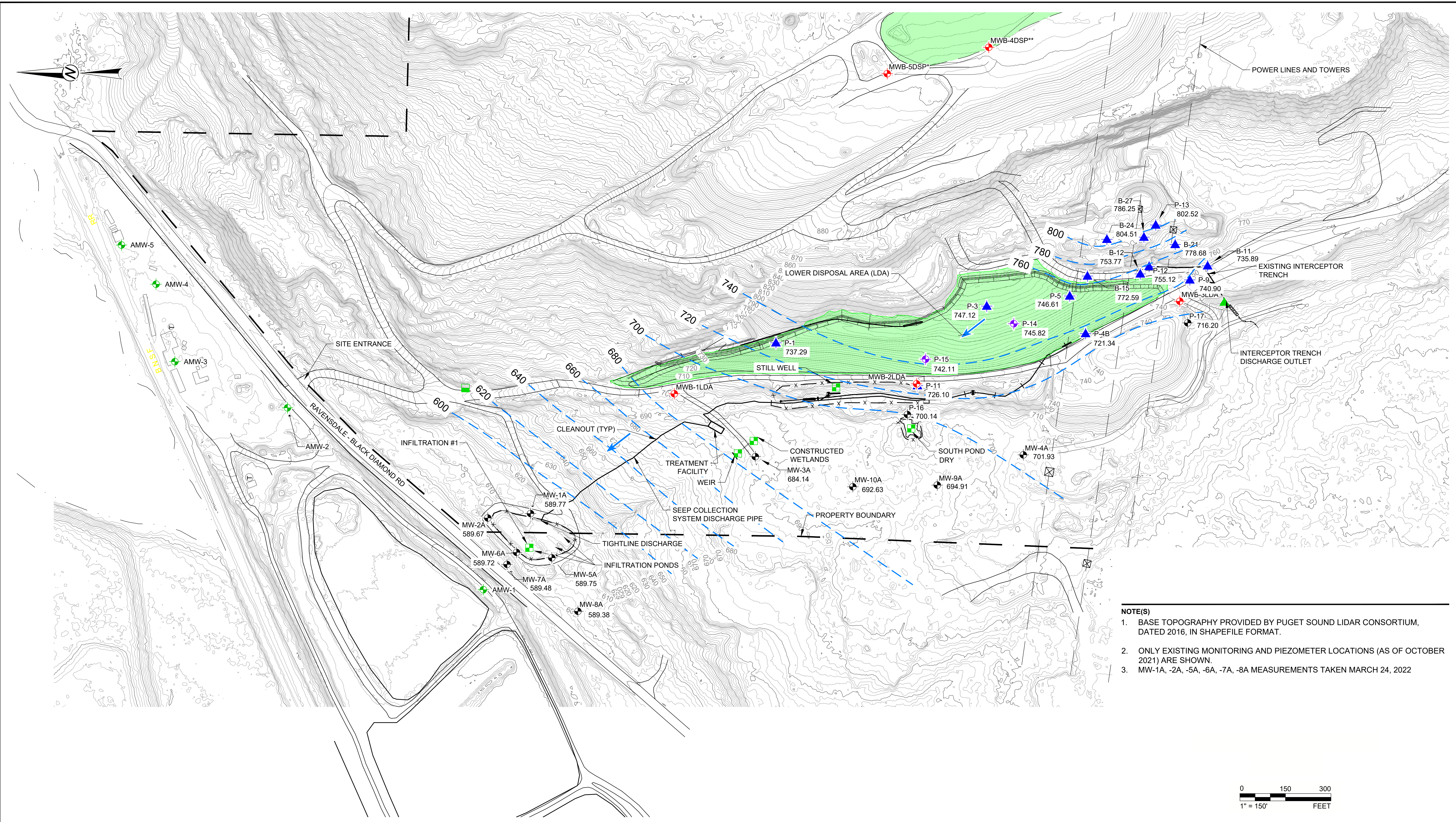
TITLE
LDA BEDROCK GROUNDWATER ELEVATIONS

PROJECT NO.	PHASE	REV.
152030402	004	A

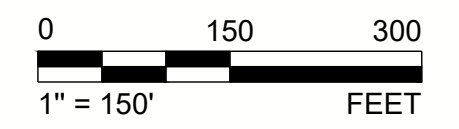
FIGURE
3B

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

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- NOTE(S)**
1. BASE TOPOGRAPHY PROVIDED BY PUGET SOUND LIDAR CONSORTIUM, DATED 2016, IN SHAPEFILE FORMAT.
 2. ONLY EXISTING MONITORING AND PIEZOMETER LOCATIONS (AS OF OCTOBER 2021) ARE SHOWN.
 3. MW-1A, -2A, -5A, -6A, -7A, -8A MEASUREMENTS TAKEN MARCH 24, 2022



LEGEND	
	COVER AREA
	MW-1A ALLUVIAL MONITORING WELL
	MWB-1DDSP BEDROCK MONITORING WELL
	P-14 LDA MONITORING WELL
	AMW-1 PLANT SITE MONITORING WELLS
	P-1 GOLDER PIEZOMETER
	LDA SURFACE WATER SAMPLING LOCATION
	DSP BEDROCK SAMPLING LOCATION (PORTAL)
	INTERCEPTOR TRENCH SAMPLING LOCATION
	FENCE LINE

CLIENT
HOLCIM

CONSULTANT



YYYY-MM-DD	2022-04-12
DESIGNED	JX
PREPARED	REDMOND
REVIEWED	JX
APPROVED	GZ

PROJECT
MARCH 16, 2022 GROUNDWATER ELEVATIONS
RAVENSDALE, WA

TITLE
ALLUVIAL/SHALLOW GROUNDWATER ELEVATIONS

PROJECT NO.	PHASE	REV.	FIGURE
152030402	004	A	3C

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

APPENDIX A

**Summary Data Tables for Individual
Wells and Monitoring Locations**

APPENDIX A-1

Summary of Lower Disposal Area – Surface Water Sampling Results

Table A-1A Still Well
Table A-1B Infiltration Ponds
Table A-1C Weir
Table A-1D South Pond

**Table A-1a: Summary of Lower Disposal Area - Surface Water Sampling Results - Still Well
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters						Gen-Chem Total Dissolved Solids (mg/L)	Metals (ug/L)						
	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Antimony	Arsenic	Iron	Lead	Manganese	Potassium	Vanadium
Preliminary Screening Level ^c	-	-	-	-	-	6.5-8.5	-	6	5	-	15	-	-	80
1-Feb-05	8.1	10658	-	-	6.59	12.87	2860	-	49.9	100 U	5.52	10 U	-	-
9-Mar-05	13.23	7393	-	-	7.42	12.51	2860	-	115	228	14.7	10 U	-	-
5-Apr-05	9.5	11310	-	-	10.9	12.44	2900	-	55.6	100 U	11.6	20 U	-	-
10-May-05	13.99	11871	-	-	3.6	12.53	2810	-	55.4	100 U	12.5	20 U	-	-
7-Jun-05	13.83	10888	-	-	22.6	12.54	2490	-	5 U	100 U	5 U	20 U	-	-
15-Jul-05 ^a	18.21	11331	-	-	14.8	12.5	3800	-	2.72	150 U	6.07	10 U	-	-
15-Jul-05 ^b	-	-	-	-	-	-	2540	-	39.8	100 U	7.57	20 U	-	-
9-Aug-05 ^a	21.45	12087	-	-	17.9	11.78	3500	-	120	288	10.9	10.1	-	-
9-Aug-05 ^b	-	-	-	-	-	-	2820	-	91.5	100 U	9.53	20 U	-	-
14-Sept-05 ^a	17.38	9507	-	-	14	12.36	3600	-	118	750 U	11.2	50 U	-	-
14-Sept-05 ^b	-	-	-	-	-	-	2830	-	115	363	14.4	-	-	-
5-Oct-05	13.31	11481	-	-	62.7	12.47	3020	-	85.2	100 U	11.9	20 U	-	-
9-Nov-05	9.58	14417	-	-	11	12.34	3400	-	74	150 U	10 U	10 U	-	-
9-Dec-05	6.18	7138	-	-	12.5	12.82	2800	-	14.5	150 U	1.07	10 U	-	-
19-Jan-06	8.66	8265	1.74	-	11.8	13.06	1900 J	-	15.2 J	150 U	1 U	10 U	-	-
16-Feb-06	8.13	9019	2.81	195.6	6.16	12.27	3200 J	-	13.4 J	150 U	1.89	10 U	-	-
15-Mar-06	7.98	9033	0.79	114.8	8.93	12.6	3300 J	-	2.36	150 U	2.5 J	10 U	-	-
7-Apr-06	9.98	10450	0.57	34.8	6.08	12.51	3400	-	15.2	150 U	2.83	10 U	-	-
16-May-06	12.79	11060	0.14	45.4	9.28	12.4	3500	-	4.04	150 U	1.59	10 U	-	-
23-Jun-06	13.29	11680	0.44	-	14.6	12.9	3600	-	52.6	150 U	16.5	10 U	-	-
20-Jul-06	16.2	12240	0.14	-217.8	10.4	12.47	4300	-	19.3	150 U	3.57	10 U	-	-
22-Aug-06	17.14	10920	1.22	-146	13.3	12.66	3800	-	144	150 U	9.14 J	10 U	-	-
26-Sep-06	15.72	9599	0.42	-263.3	61.4	12.59	3800	-	123	171	4.63	15.4	-	-
26-Oct-06	10.99	9955	0.88	-207.5	82.3	12.93	3600	-	161	1500 U	19.5	10 U	-	-
15-Nov-06	10.58	12040	1.82	149.2	188	12.87	3400	-	30.6 J	150 U	4.5	10 U	-	-
20-Dec-06	8.85	10990	0.71	-152	32.8	13.02	2600 J	-	52.6	150 U	13	10 U	-	-
24-Jan-07	8.29	10440	0.97	-139.8	13.7	13.05	2500 J	-	58.6	150 U	13.1	10 U	-	-
12-Feb-07	8.88	10590	0.86	-125.8	56.4	13.06	3400	-	61.3	150 U	14	10 U	-	-
27-Mar-07	9.45	9163	1.25	-42.4	18.4	11.53	2900 J	-	44.1	150 U	1.81	10 U	-	-
18-Apr-07	8.9	8155	2.63	2.3	37.2	12.77	3300 J	-	29.3	150 U	1.98	10 U	-	-
31-May-07	20.12	11050	5.3	-153.9	9.31	11.59	2800 J	-	48.5	150 U	15.1 J	10 U	-	-
20-Jun-07	18.28	12000	5.41	-122.5	16.1	12.04	4300 J	-	26.8	150 U	2.33	10 U	-	-
31-Jul-07	16.53	12200	1.7	-151.6	24.8	12.48	6000	-	87.6	150 U	1.03	10 U	-	-
29-Aug-07	17	9570	1.12	-183.1	268	12.78	4600 J	-	106	150 U	9.46	10 U	-	-
27-Sep-07	14.49	8263	52.4	-183	211	12.42	2800	-	125	150 U	15.4	10 U	-	-
26-Oct-07	9.49	6144	4.88	-147.2	92.4	12.85	3300 J	-	124	260	24.9	10.1	-	-
30-Nov-07	5.53	7703	2.13	-122.6	127	12.67	2200	-	174	184	14.1	10 U	-	-
12-Dec-07	5.24	11609	3.43	-144.8	116	12.6	4100	-	110	150 U	11.3	10 U	-	-
24-Jan-08	3.73	9649	13.81	-138	-	10.74	2500	-	101	1530	9.74	81.5	-	-
28-Feb-08	-	-	-	-	51.2	-	2900	-	58.5	150 U	12.6	10 U	-	-
25-Mar-08	7.06	8623	5.52	-11.2	17.4	11.26	3400	-	74.3	150 U	10.4	10 U	-	-
29-Apr-08	9.74	11332	4.29	-1.3	27.7	12.82	3000 J	-	76.6	150 U	13.3	10 U	-	-
20-May-08	14.53	11955	1.74	-35.8	72.7	12.82	3400	-	87.3	150 U	15.1	10 U	-	-
18-Jun-08	12.77	10267	3.34	-27	34	12.86	3200 J	-	63.2	150 U	16.9	10 U	-	-
26-Aug-08	15.86	7703	1.06	-72.8	38.3	12.67	2600 J	-	430	1220	35	49.7	759000	-
20-Nov-08	9.59	8762	0.91	-65.6	74.1	13.32	3500	-	70	150 U	16.8	10 U	848000	-
12-Feb-09	3.25	554	14.29	-	108	13.03	550	-	47.2	150 U	13.7	10 U	551000	-
19-May-09	11.53	276	8.8	26	43.4	9.83	2500 J	-	37.8	150 U	15	10 U	689000	-
22-Sep-09	12.47	9760	1.5	159.1	625	12.47	3000	-	160	200	37	10 J	990000	-
15-Dec-09	5.2	11650	1.9	237	26.3	12.85	3000	-	86	67 J	21	4.7 J	900000 J	-
22-Mar-10	9.7	1035	-	182	19.4	12.58	3000	-	73	200 U	17	20 U	870000	-
17-Jun-10	11.7	9610	0.08	-	6.59	12.48	2700	-	66	95 J	15	2 J	780000	-
21-Sep-10	15	6710	1.26	152.6	140	12.29	2400	-	300	1100 J+	39	30 J+	570000	-
8-Dec-10	8.3	10110	1	-	5.44	12.63	2600	-	64	200 U	10	20 U	860000	-
30-Mar-11	8.6	4810	0.46	136.3	13.7	14.31	2500 J	-	65	200 U	9.6	20 U	720000	-
21-Jun-11	16.6	10420	1.63	111.9	3.4	12.36	5200	-	60	200 U	9.1	1.7 J	770000	-
28-Sep-11	14.8	5270	2.34	70	66.7	12.17	2200	-	220	360	11	7.2 J	1000000	-
15-Dec-11	6	7330	2.47	104.2	18.3	13.09	2800	-	83	200 U	2.9	20 U	880000	-
21-Mar-12	5.5	11040	3.15	294.2	12	12.39	2600	-	67	200 U	4.7	20 U	760000	-
19-Jun-12	5.5	11040	3.15	294.2	12	12.39	2600	-	58	200 U	6.7	20 U	690000	-
20-Sep-12	16.1	9560	3.27	76	10.7	12.35	2900	-	84	200 U	3	20 U	830000	-
19-Dec-12	4.1	1320	10.11	303.1	5.86	9.69	700	-	75	690	4.3	71	250000	-
26-Feb-13	7.3	9950	1.77	161.8	25.5	12.66	2000	-	70	500 U	0.29 J	20 U	720000	-
23-May-13	11.5	8040	2.23	266.8	22.7	12.47	2500	-	57	500 U	3.4	20 U	690000	-
22-Aug-13	17.4	8810	2.42	10.8	38.5	12.79	2590	-	57.8	100 U	1.5	2	863000	-
19-Nov-13	9	7090	2.47	79	62.8	12.54	2720	-	52.5	100 U	4.2	2 U	909000	-
1-Apr-14	10.3	6080	0.55	128.2	37.1	6.08	1890	-	54.6	100 U	1.1	1.3 U	687000	-
22-May-14	13.6	7360	1.22	34.4	-	11.75	2330	-	60.9	100 U	2	2 U	689000	-
13-Aug-14	18.26	7844	0.33	1.2	7.3	12.53	2770	-	70	100 U	2.1	2 U	849000	-
12-Nov-14	9	585	3.17	-47.8	17.5	12.93	2450	-	83.2	100 U	3.9	2 U	837000	-
12-Feb-15	10.7	7540	2.68	-18.6	9.64	12.71	2150	-	51.6	100 U	0.3	2 U	690000	-
4-May-15	12.9	9140	2.73	110.4	26.8	13.02	2520	-	54.6	100 U	0.22 J	2 U	734000	-
5-Aug-15	19.5	8060	2.58	-29.8	61.1	12.62	2980	-	63.9	250 U	1.7	4.7 J	898000	-
3-Nov-15	11.1	5150	0.37	38.6	171	8.93	1840	-	109	270	21.7	13	747000	-
9-Feb-16	9.7	7390	0.78	80.8	7.79	13.07	2170	-	53.6	100 U	1.2	6	601000	-
3-May-16	14.7	7530	1.4	358.1	2.65	12.98	2480	-	54.2	100 U	1.7 J	2	711000	-
22-Aug-16	20.5	7.91	2.1	-	59	12.95	2780	-	91.3	250 U	5.87	2.3 J	831000	-

**Table A-1a: Summary of Lower Disposal Area - Surface Water Sampling Results - Still Well
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters						Gen-Chem Total Dissolved Solids (mg/L)	Metals (ug/L)						
	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Antimony	Arsenic	Iron	Lead	Manganese	Potassium	Vanadium
1-Nov-16	12.3	2884	2.66	-72.1	19.1	13.17	2620	-	46.2	100 U	9.64	2 U	841000	-
31-Jan-17	7.4	8510	2.37	-167	7.35	13.17	2050	-	52.5	26 J	1.19	1.6 J	582000	-
31-May-17	14.6	7500	2.44	-	4.17	12.89	1900	-	45.4	11 J	0.68 J+	0.7 J	615000	-
17-Aug-17	18.3	8460	3.35	-84	15.9	12.79	2680	-	56.8	3 J	2.14	1.3 J	750000	-
9-Nov-17	8.2	7215	3.48	90.9	18.2	12.65	2360	-	62.1	100 U	3.52	2.5	822000	-
27-Feb-18	6.6	5312	3.75	2.3	2.49	12.11	1970	-	50.2	100 U	7.53	2.5	521000	-
2-May-18	11.1	8260	1.7	-	13	12.92	2360	-	43.4	133	21.7 J+	8.8	552000	-
21-Aug-18	20.22	6260	4.71	-42.1	5.84	12.58	2100	-	52.2	100 U	0.138	2 U	629000	-
7-Nov-18	9.7	995	6.72	126.8	20.6	9.15	1880	-	644	1350	80.2	49.1	502000 J+	-
11-Mar-19	10.6	1354	5.93	-18.7	7.19	10.31	1710	-	52.8	9.1 J	21.2	1.3 J	501000	-
9-May-19	13.8	6973	6.4	18.1	16.7	12.36	1980	-	41.6	7.9 J	13.4	0.8 J	521000	-
26-Aug-19	17.8	6405	3.91	Note 1	5.15	12.56	2570	-	42.5	100 U	15.4	1 J	722000	-
14-Nov-19	9.7	6065	0.41	-53.3	12	12.67	1750	-	167	121 J	23.9	6.5	563000	-
13-Feb-20	7.6	4936	0.37	-139	2.56	12.66	1630	-	48.6	13.6 J	6.08	3.1	490000	-
13-Aug-20	15	6817	2.55	-42.8	2.02	12.39	2620	-	41.9	6.3 J	0.86	0.9 J	659000	-
10-Dec-20	8.8	4534	0.55	-26.2	5.87	12.79	1670	-	82.7	241	11.1	10.8	510000	-
4-Mar-21	7.7	4728	0.05	-42	0.85	11.94	1470	-	61.8	100 U	1.49	8 U	512000	-
9-Jun-21	13.4	5213	0.89	-148.4	4.06	12.56	1600	-	91.7	-	5.72	-	471000	-
13-Oct-21	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	-	DRY	DRY
7-Jan-22	8.8	4103	2.53	55.4	3.04	12.88	1900	8.39	50.3	-	4.26	-	486000	3.34
17-Mar-22	9	4955	7.42	153.1	1.88	13.71	2070	8.23	51.7	-	5.88	-	517000	3.02

Notes:

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- Not analyzed or not available
- Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL.
- a North Creek Analytical, Inc.
- b Severn Trent Laboratories
- c Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.
- U Data validation code; not detected at the Reporting Limit (RL)
- J Data validation code; estimated value
- J+ Data validation code; estimated value with positive bias
- °C Degrees Celsius
- Note 1 ORP measurements not available due to faulty sensor.
- µmhos/cm Micromhos per centimeter
- feet bmp Feet below measuring point
- feet NAVD88 Feet NAVD88 Datum
- mg/L
- mV
- NTU

Table A-1b: Summary of Lower Disposal Area - Surface Water Sampling Results - Infiltration Ponds #1 Ravensdale Site, Ravensdale, Washington

Date Sampled	Field Parameters						Gen-Chem Total Dissolved Solids (mg/L)	Metals (ug/L)				
	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Antimony	Arsenic	Lead	Potassium	Vanadium
Preliminary Screening Level ^c	-	-	-	-	-	6.5-8.5	-	6	5	15	-	80
1-Feb-05	8.17	1315	-	-	8.13	9.95	874	-	84.9	4.99	-	-
9-Mar-05	14.04	1183	-	-	23.00	9.59	960	-	96.2	3.92	-	-
5-Apr-05	11.00	1115	-	-	43.70	9.80	800	-	62.3	3.21	-	-
10-May-05	14.91	1275	-	-	564.00	9.83	844	-	76.5	5 U	-	-
7-Jun-05	15.11	1140	-	-	239.00	9.61	804	-	84.3	5 U	-	-
15-Jul-05 ^a	23.56	1276	-	-	94.40	9.30	1100	-	92.5	4.14	-	-
15-Jul-05 ^b	-	-	-	-	-	-	874	-	99.9	3.82	-	-
9-Aug-05 ^a	19.05	1744	-	-	57.20	9.44	1000	-	123	5.1	-	-
9-Aug-05 ^b	-	-	-	-	-	-	1030	-	140	6.12	-	-
14-Sept-05 ^a	13.59	1154	-	-	99.80	8.97	790	-	110	3.54	-	-
14-Sept-05 ^b	-	-	-	-	-	-	806	-	118	5.18	-	-
5-Oct-05	14.82	970	-	-	82.70	8.98	736	-	89.3	2.83	-	-
9-Nov-05	8.43	1285	-	-	135.00	8.83	970	-	46	10 U	-	-
9-Dec-05	2.12	1361	-	-	14.20	9.71	980	-	64.6	3.11	-	-
19-Jan-06	6.66	728	7.96	-	64.70	10.13	470 J	-	40.7	2.29	-	-
16-Feb-06	2.63	624	9.75	30.3	25.20	8.54	530 J	-	13.3	1 U	-	-
15-Mar-06	7.16	639	11.61	236.8	23.10	9.22	530 J	-	22.5	1 U	-	-
7-Apr-06	11.91	1013	10.81	27.8	18.80	9.98	780	-	63.8	3.24	-	-
16-May-06	15.58	1160	7.58	50.6	16.50	9.57	950	-	77.9	2.49	-	-
23-Jun-06	18.63	1261	7.41	-	126.00	9.85	920	-	70.7	3.65	-	-
20-Jul-06	20.65	932	5.36	-35.1	279.00	8.94	980	-	108	3.48	-	-
22-Aug-06	15.65	860	7.64	86.5	218.00	9.22	760	-	116	3.84	-	-
26-Sep-06	21.86	903	8.98	-72.8	263.00	8.89	820	-	75.8	3.06	-	-
26-Oct-06	11.04	702	9.97	90.4	221.00	8.56	760	-	68.3	1.66	-	-
15-Nov-06	7.73	715	9.21	149.2	33.60	9.07	500	-	20.8	2.29	-	-
20-Dec-06	4.98	1082	9.05	86.3	9.29	9.78	680	-	51.3	2.67	-	-
24-Jan-07	2.12	1058	10.71	130.4	20.50	9.97	640 J	-	66.1	7.58	-	-
12-Feb-07	10.10	1218	12.40	-61.8	103.00	9.98	860	-	90.1	4.49	-	-
27-Mar-07	7.94	772	9.67	13.3	25.50	8.27	540 J	-	49.8	2.74	-	-
18-Apr-07	7.52	2418	9.23	84.4	58.10	11.73	1400	-	79.2	10.5	-	-
31-May-07	15.45	1879	6.47	-92.2	3.15	9.79	1300	-	165	8.11	-	-
20-Jun-07	24.18	1925	10.88	-52.1	251.00	10.24	1300 J	-	144	5.34	-	-
31-Jul-07	19.05	1418	5.97	-36.1	128.00	9.81	1200	-	140	7.23	-	-
29-Aug-07	18.00	1193	5.60	-35.4	158.00	9.29	1300 J	-	164	7.01	-	-
27-Sep-07	14.97	987	5.44	45.9	186.00	8.99	970	-	196	5.49	-	-
26-Oct-07	2.66	504	6.02	63.1	282.00	8.64	770 J	-	42.9	2.25	-	-
30-Nov-07	1.86	955	9.77	190.1	163.00	10.02	570	-	48.9	1.62	-	-
12-Dec-07	4.22	790	11.11	126.8	56.00	9.40	520	-	34.3	1.67	-	-
24-Jan-08	2.12	875	19.35	142.0	-	8.68	640	-	42.8	1.66	-	-
28-Feb-08	-	-	-	-	25.60	-	510	-	41.3	2.66	-	-
25-Mar-08	5.27	937	14.46	91.0	86.80	9.60	630	-	50.2	2.15	-	-
29-Apr-08	9.02	1079	10.56	190.8	61.30	9.87	670 J	-	66	2.87	-	-
20-May-08	15.42	1191	7.58	160.0	91.40	9.75	820	-	85.9	4.85	-	-
18-Jun-08	12.94	1124	9.62	167.3	76.90	9.65	810 J	-	77.6	3.67	-	-
26-Aug-08	15.95	880	3.75	53.5	490.00	8.00	650 J	-	76.9	1.64	144000	-
20-Nov-08	6.91	897	7.02	183.5	376.00	10.22	960	-	87.2	4.21	313000	-
12-Feb-09	1.29	-	13.72	-	10.20	10.52	800	-	118	5.84	271000	-
19-May-09	11.90	862	6.52	71.9	133.00	9.59	840 J	-	91.3	3.99	238000	-
18-Nov-09	5.70	852	6.61	185.9	68.00	9.88	490	-	40	4.4	160000	-
15-Dec-09	2.30	1162	8.22	460.1	63.30	9.97	640	-	71	7.2	220000	-
24-Mar-10	13.00	1299	5.83	408.2	13.00	10.48	1000	-	140	8.5	340000	-
17-Jun-10	12.00	947	4.45	332.1	33.60	10.56	540	-	62	6.2	220000	-
22-Sep-10	15.60	1736	3.14	342.5	33.00	9.84	1300	-	130	21	360000	-
8-Dec-10	5.40	1382	7.73	371.1	12.10	10.75	870	-	100	12	300000	-
29-Mar-11	9.60	627	5.16	577.6	19.80	11.05	760 J	-	78	3.1	270000	-
21-Jun-11	21.00	1778	5.46	239.1	11.60	10.44	1700 J	-	78	11	340000	-
27-Sep-11	14.80	1382	3.98	239.8	33.40	9.58	1600	-	120	13	670000	-
14-Dec-11	3.10	1046	5.60	281.7	15.70	9.93	1100	-	87	14	330000	-
20-Mar-12	6.10	986	11.04	271.1	11.70	10.32	500	-	71	3.3	180000	-
19-Jun-12	14.80	862	7.83	352.2	38.80	9.57	500	-	64	3.7	180000	-
20-Sep-12	12.40	1961	1.81	419.0	10.30	9.43	4600 J	-	130	2.1	440000	-
19-Dec-12	4.10	1320	10.11	303.1	5.86	9.69	700	-	75	4.3	250000	-
25-Feb-13	7.10	1963	9.30	234.7	26.60	11.30	1000	-	90	6	370000	-
22-May-13	10.50	4380	7.72	411.7	202.00	12.56	1400	-	25	11	530000	-
21-Aug-13	20.10	12850	1.24	-2.3	18.20	12.18	3430	-	106	47.5	1180000	-
20-Nov-13	5.70	1198	8.03	131.9	22.20	10.23	704	-	41.3	6.2	260000	-
1-Apr-14	9.80	1708	9.77	136.4	8.79	12.26	832	-	24.1	3	317000	-
23-May-14	12.63	6574	8.63	120.8	-	12.61	2120	-	4.8	35.4	811000	-

Table A-1b: Summary of Lower Disposal Area - Surface Water Sampling Results - Infiltration Ponds #1 Ravensdale Site, Ravensdale, Washington

Date Sampled	Field Parameters						Gen-Chem Total Dissolved Solids (mg/L)	Metals (ug/L)				
	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Antimony	Arsenic	Lead	Potassium	Vanadium
13-Aug-14	18.99	3273	6.29	77.7	89.00	12.34	1660	-	71.4	6.3 J	548000	-
11-Nov-14	8.80	578	3.55	179.2	62.50	12.73	2000	-	56.7	20.4	739000	-
11-Feb-15	9.70	487	9.97	66.2	42.00	9.40	337	-	9.1	0.9	87700	-
4-May-15	14.30	4210	5.60	281.2	7.67	12.53	1670	-	35.3	7.4	589000	-
5-Aug-15	19.90	4890	5.14	18.8	89.80	11.79	3080	-	85.4	18.1	1150000	-
3-Nov-15	9.20	760	6.39	129.9	34.60	9.78	707	-	23.5	5.3	235000	-
9-Feb-16	10.20	-	10.29	100.3	8.01	12.78	1330	-	5.3	24.8	530000	-
2-May-16 ^d	-	-	-	-	-	-	2490	-	24	37 J-	996000	-
23-Aug-16	19.30	4250	3.95	386.5	46.30	11.76	2970	-	105	14.3	989000	-
1-Nov-16	11.70	229	9.26	185.2	48.90	10.33	508	-	12.6	0.792	164000	-
1-Feb-17	2.40	8890	10.78	26.1	3.17	13.36	2220	-	10.1	46.8	854000	-
30-May-17	14.70	6800	56.90	17.7	1.38	12.73	1720	-	1.75	31.6 J+	759000	-
17-Aug-17	18.10	5410	3.88	-19.5	14.90	11.93	3080	-	62.6	32.8	1150000	-
10-Nov-17	7.90	2016	7.72	64.4	30.70	12.00	1520	-	63	32.2	578000	-
27-Feb-18	5.70	5062	8.76	42.0	3.74	12.28	1620	-	15	54.6	678000	-
1-May-18	12.30	6620	5.25	-	1.94	12.73	2070	-	2.42	30.1 J+	745000	-
21-Aug-18	23.85	5058	2.95	106.0	5.62	11.64	3090	-	77.3	28.8	1200000	-
6-Nov-18	11.70	1078	3.50	-5.4	46.90	8.48	1180	-	6.03	5.44	359000 J+	-
13-Mar-19	3.90	331	8.08	183.7	29.10	10.72	455	-	11.9	2.21	185000	-
8-May-19	17.20	6113	6.38	6.4	6.17	12.39	2040	-	7.7	26.8	830000	-
26-Aug-19	24.22	4177	2.47	Note 1	7.21	9.12	2840	-	17.2 J	5.27 J	1020000	-
13-Nov-19	8.70	2523	1.61	-201.7	33.00	8.67	1930	-	32.5	4.44	726000	-
12-Feb-20	7.80	971	7.99	150.3	16.00	7.92	836	-	14.3	3.96	243000	-
12-Aug-20	18.30	3655	4.33	123.5	5.74	8.98	2570	-	20.8	2.59	988000	-
9-Dec-20	8.30	740	7.80	202.0	18.40	8.21	632	-	14.9	5.11	207000	-
3-Mar-21	8.30	1446	7.87	217.0	15.50	8.56	1310	-	35.3	6.11	509000	-
9-Jun-21	15.10	2963	4.88	174.9	4.37	8.79	2400	-	23.7	1.51	923000	-
13-Oct-21	9.30	2563	4.73	34.2	39.30	8.84	2610 J-	16.1	19.7	6.12	831000	3.11
5-Jan-22	1.20	510	9.85	236.4	14.00	8.01	679	6.32	12.1	6.31	226000	3.36
16-Mar-22	11.10	786	10.41	172.1	12.8	7.45	733	7.59	10.6	4.77	236000	1.82

Notes:

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- Not analyzed or not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above

a North Creek Analytical, Inc.

b Severn Trent Laboratories

c Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

d Field parameters for Infiltration Ponds #1 were inadvertently not collected during May 2016 sampling

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

Note 1 ORP measurements not available due to faulty sensor.

µmhos/cm Micromhos per centimeter mg/L

feet bmp Feet below measuring point mV

feet NAVD88 Feet NAVD88 Datum NTU

**Table A-1c: Summary of Lower Disposal Area - Surface Water Sampling Results - Weir
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters							Gen-Chem	Metals (ug/L)				
	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	pH (standard units)	Weir Flow Rate (gpm)	Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium	Vanadium
Preliminary Screening Level ^a	-	-	-	-	-	6.5-8.5	-	-	6	5	15	-	80
1-Feb-05	8.47	2205	-	-	6.24	10.23	-	1440	-	149	10.7	-	-
9-Mar-05	11.38	2054	-	-	7.80	10.15	2.64	1630	-	200	11.9	-	-
5-Apr-05	7.7	2169	-	-	7.99	10.42	10.00	1420	-	129	8.61	-	-
10-May-05	14.1	1912	-	-	562.00	9.87	25.00	1210	-	105	7.63	-	-
7-Jun-05	15.74	2588	-	-	11.60	10.03	6.82	1570	-	138	10.1	-	-
15-Jul-05 ^a	20.38	3184	-	-	8.91	10.36	0.94	3200	-	192	9.98	-	-
15-Jul-05 ^b	-	-	-	-	-	-	-	1990	-	189	10.8	-	-
9-Aug-05 ^a	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	-	-
9-Aug-05 ^b	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	-	-
14-Sept-05 ^a	15.60	3792	-	-	14.50	9.92	0.07	2800	-	208	57.8	-	-
14-Sept-05 ^b	-	-	-	-	-	-	-	2730	-	223	73.3	-	-
5-Oct-05	12.96	3237	-	-	4.99	9.89	0.32	2150	-	170	12.5	-	-
9-Nov-05	8.40	2545	-	-	13.80	9.64	7.50	1900	-	78.2	10 U	-	-
9-Dec-05	3.34	1377	-	-	8.03	10.43	5.00	1700	-	130	6.12	-	-
19-Jan-06	7.37	1424	7.92	-	12.20	10.61	7.50	1000 J	-	89.5	4.81	-	-
16-Feb-06	3.74	1680	12.19	*	14.60	10.78	7.50	1400 J	-	105	5.46	-	-
15-Mar-06	7.21	1634	12.61	194.4	7.44	10.63	5.28	1300 J	-	128	6.38	-	-
7-Apr-06	14.33	2055	8.54	55.3	9.21	10.84	3.17	1500	-	143	6.63	-	-
16-May-06	21.65	2474	6.09	11.6	9.37	10.69	0.83	2000	-	157	8.19	-	-
23-Jun-06	24.58	2820	6.66	-	15.40	11.64	0.63	1400	-	154	13.1	-	-
20-Jul-06	21.17	3291	8.56	-85.5	68.30	10.75	DRY*	2300	-	131	9.41	-	-
22-Aug-06	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	-	-
26-Sep-06	16.38	2997	3.00	-57.1	31.60	9.92	DRY*	2900	-	103	16.8	-	-
26-Oct-06	11.00	2650	5.35	59.6	25.80	9.65	0.63	2300	-	132	26.3	-	-
15-Nov-06	8.51	1708	8.16	-35.7	34.70	10.15	17.14	1200	-	67.4	8.07	-	-
20-Dec-06	5.07	1927	8.84	14.8	7.94	10.67	10.91	1200	-	99.7	4.78	-	-
24-Jan-07	2.30	1846	10.72	5.9	11.70	10.37	9.00	1100 J	-	126	16.1	-	-
12-Feb-07	9.26	1777	11.75	-91.3	26.70	10.56	6.00	1100	-	139	7.12	-	-
27-Mar-07	8.71	1219	9.18	-12.6	13.80	8.70	24.00	840 J	-	88.5	4.86	-	-
18-Apr-07	7.39	4563	8.65	41.0	16.80	12.12	9.00	2000	-	97.5	32.5	-	-
31-May-07	-	3916	6.33	-149.5	10.70	10.96	1.36	2100	-	275	22.9	-	-
20-Jun-07	22.59	3336	8.50	-20.4	42.50	10.46	0.29	2400 J	-	255	27.4	-	-
31-Jul-07	18.94	3915	7.85	-69.2	41.30	10.92	0.06	3300	-	236	12.6	-	-
29-Aug-07	21.52	2406	5.75	-5.3	24.10	9.72	DRY*	2300 J	-	129	8.45	-	-
27-Sep-07	13.88	2009	5.75	15.5	28.30	9.56	0.06	1600	-	207	4.37	-	-
26-Oct-07	7.68	1662	9.06	80.5	13.00	9.92	2.04	1800 J	-	132	7.53	-	-
30-Nov-07	4.34	2446	9.63	26.7	11.70	9.86	2.63	1600	-	135	8.27	-	-
12-Dec-07	5.88	2056	10.34	39.3	10.30	10.18	2.63	1500	-	105	5.73	-	-
24-Jan-08	3.05	1601	15.03	42.3	-	9.40	2.63	1000	-	87.4	4.06	-	-
28-Feb-08	-	-	-	-	9.22	-	4.13	1200	-	118	8.92	-	-
25-Mar-08	6.80	1622	12.37	95.1	16.40	9.98	5.25	1100	-	110	3.86	-	-
29-Apr-08	7.53	1997	9.10	137.4	11.90	10.29	7.50	1100 J	-	124	7.05	-	-
20-May-08	16.35	2504	9.03	77.4	32.90	10.92	7.50	1700	-	146	14.7	-	-
18-Jun-08	11.82	2925	8.32	68.3	25.70	11.14	1.69	1800 J	-	208	8.48	-	-
26-Aug-08	17.69	3376	7.98	62.8	41.10	10.43	0.84	2200 J	-	287	13.2	647000	-
20-Nov-08	8.10	1447	9.65	112.0	43.70	11.00	11.25	1400	-	121	16.2	485000	-
12-Feb-09	2.99	1214	14.46	-	14.60	10.93	4.06	1200	-	219	11.8	434000	-
19-May-09	13.05	1962	7.92	32.6	36.70	10.23	7.50	1800 J	-	210	13.7	521000	-
24-Sep-09	16.30	2792	1.59	263.8	13.70	8.82	DRY*	2400	-	130	53	730000	-
15-Dec-09	2.80	1702	7.47	343.0	-	10.18	6.67	1200	-	170	22	330000	-
24-Mar-10	13.80	2629	2.09	270.7	263.00	11.46	6.03	1800	-	180	20	600000	-
17-Jun-10	12.00	1876	0.01	-	157.00	10.76	14.15	1200	-	27	3.9	410000	-
20-Sep-10	11.40	3100	6.34	198.6	12.20	10.63	2.38	2800	-	250	40	580000	-
7-Dec-10	6.60	2455	4.03	154.0	11.00	11.61	16.69	1600	-	240	26	510000	-
30-Mar-11	8.10	848	0.22	136.1	31.50	13.08	58.61	940 J	-	91	9.9	330000	-
22-Jun-11	14.40	2286	5.68	164.2	13.20	11.28	5.68	2600 J	-	120	25	490000	-
27-Sep-11	16.20	1911	4.62	253.4	39.10	10.07	13.40	2100	-	170	45	880000	-
15-Dec-11	4.10	1439	7.40	139.4	10.60	10.33	6.65	1400	-	180	21	500000	-
20-Mar-12	5.20	1687	8.50	27.5	9.60	11.17	60.00	410	-	130	7.4	290000	-
18-Jun-12	14.70	2336	0.11	326.9	15.60	11.25	60.00	410	-	130	9.8	430000	-
20-Sep-12	15.30	2972	7.81	106.0	12.10	9.55	0.10	1400 J	-	130	2.2	450000	-
18-Dec-12	4.80	1908	9.34	-14.2	7.41	10.28	18.50	870	-	120	8.1	390000	-
26-Feb-13	5.80	6470	11.27	161.6	22.00	12.46	9.90	1800	-	99	62	710000	-
23-May-13	10.50	1625	9.14	291.8	14.40	9.93	4.84	980	-	94	21	310000	-
21-Aug-13	15.70	7260	7.69	51.6	9.00	10.71	0.32	2780	-	342	18.3	954000	-
19-Nov-13	8.10	2032	10.00	87.4	9.95	11.19	25.40	1270	-	70.8	16.9	487000	-
1-Apr-14	13.70	3420	9.11	129.4	59.00	12.57	20.77	1300	-	37.3	12	572000	-
23-May-14	12.83	986	11.63	105.7	-	9.36	-	822	-	47	13.9	274000	-
13-Aug-14	18.38	2000	5.52	63.6	8.93	8.02	2.00	1250	-	13.4	0.6	326000	-
11-Nov-14	6.70	259	9.77	164.8	4.27	8.09	1.50	955	-	19	0.2	315000	-
12-Feb-15	10.00	669	11.13	142.9	2.75	8.62	40.00	1490	-	14.9	1.8	155000	-

**Table A-1c: Summary of Lower Disposal Area - Surface Water Sampling Results - Weir
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters							Gen-Chem Total Dissolved Solids (mg/L)	Metals (ug/L)				
	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	pH (standard units)	Weir Flow Rate (gpm)		Antimony	Arsenic	Lead	Potassium	Vanadium
4-May-15	13.70	1293	8.69	181.7	155.00	9.38	0.09	1100	-	43.3	11.3	292000	-
5-Aug-15	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	DRY	-
3-Nov-15	9.70	1296	7.66	165.6	13.70	8.03	1.98	1200	-	11.4	0.8	355000	-
9-Feb-16	9.10	838	8.79	181.4	2.17	7.87	0.69	529	-	7.8	0.5 J+	145000	-
2-May-16	23.40	1126	6.16	128.1	7.59	7.63	DRY*	688	-	7.6	0.06 J-	162000	-
23-Aug-16	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	DRY	-
1-Nov-16	11.70	332	7.12	97.5	7.71	7.76	7.24	703	-	9.18	0.3	207000	-
1-Feb-17	2.30	925	11.55	39.1	2.04	7.71	0.30	567	-	4.9	0.09 J	135000	-
30-May-17	13.30	817	57.50	8.3	22.20	7.40	0.30	516	-	13.1	0.08 J+	94300	-
17-Aug-17	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	DRY	-
9-Nov-17	7.00	851	7.57	88.0	67.30	8.43	-	865	-	36.6	10.7	236000	-
27-Feb-18	5.50	498	10.68	106.0	5.39	8.60	-	503	-	9.7	1.23	127000	-
1-May-18	12.80	894	8.87	-	2.39	7.97	-	656	-	7.81	0.1 UJ	195000	-
21-Aug-18	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	DRY	-
7-Nov-18	8.50	1079	7.37	166.6	5.48	7.94	-	1030	-	15.7	0.089 J	322000 J+	-
11-Mar-19	5.00	525	9.79	146.3	1.28	7.76	-	541	-	4.21	0.1 U	133000	-
9-May-19	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	DRY	-
26-Aug-19	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	DRY	-
14-Nov-19	7.40	842	4.10	214.3	19.00	7.74	DRY*	783	-	11.3	0.076 J	242000	-
12-Feb-20	7.20	401	8.41	-38.3	2.47	7.53	3.96	348	-	4.81	0.1 U	86900	-
13-Aug-20	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	DRY	-
10-Dec-20	7.20	581	6.72	185.0	0.96	7.80	8	560	-	5.13	0.1 U	126000	-
4-Mar-21	4.90	427	7.11	146.0	2.50	7.86	3	424	-	3.7	0.114	80600	-
10-Jun-21	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	DRY	-
13-Oct-21	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
6-Jan-22	4.90	269	10.81	211.8	15.90	7.63	300	228	6	4.33	0.698	50500	1
17-Mar-22	7.00	410	9.46	157.2	0.91	7.43	7.58	394	5.37	3.5	0.055 J	86000	0.92

Notes:

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- * Sample collected from constructed wetland (alternative sampling location) upstream of weir
- Not analyzed or not available
- Dry Weir dry; unable to collect field parameters or samples
- Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below
- a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.
- U Data validation code; not detected at the Reporting Limit (RL)
- J Data validation code; estimated value
- J+ Data validation code; estimated value with positive bias
- °C Degrees Celsius
- µmhos/cm Micromhos per centimeter
- feet bmp Feet below measuring point
- feet NAVD88 Feet NAVD88 Datum
- gpm Gallons per minute
- mg/L Milligrams per liter
- mV Millivolts
- NTU Nephelometric Turbidity Unit

Table A-1d: Summary of Lower Disposal Area - Surface Water Sampling Results - South Pond Ravensdale Site, Ravensdale, Washington

Date Sampled	Field Parameters						Gen-Chem Total Dissolved Solids (mg/L)	Metals (ug/L)				
	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Antimony	Arsenic	Lead	Potassium	Vanadium
Preliminary Screening Level ^c	-	-	-	-	-	6.5-8.5	-	6	5	15	-	80
1-Feb-05	7.13	9580	-	-	4.19	13.02	4080	-	174	24.3	-	-
9-Mar-05	14.28	9979	-	-	6.79	12.52	4640	-	240	42.1	-	-
5-Apr-05	9.90	10820	-	-	43.50	11.99	3830	-	133	9.85	-	-
10-May-05	15.10	6091	-	-	45.60	12.14	3270	-	92.9	25.5	-	-
7-Jun-05	14.49	8257	-	-	24.20	12.19	3780	-	132	24.7	-	-
15-Jul-05 ^a	18.34	6937	-	-	6.89	11.69	5000	-	281	31.8	-	-
15-Jul-05 ^b	-	-	-	-	-	-	4260	-	237	34.2	-	-
9-Aug-05 ^a	23.53	7654	-	-	17.1	10.26	6600	-	322	44.5	-	-
9-Aug-05 ^b	-	-	-	-	-	-	5580	-	340	37.1	-	-
14-Sept-05 ^a	18.55	6730	-	-	10.00	10.51	5100	-	235	19.3	-	-
14-Sept-05 ^b	-	-	-	-	-	-	4750	-	268	34.2	-	-
5-Oct-05	12.14	4323	-	-	17.60	9.80	3090	-	130	26.5	-	-
9-Nov-05	6.78	3784	-	-	11.80	11.12	2600	-	121	21.7	-	-
9-Dec-05	3.22	8745	-	-	12.90	12.85	3900	-	175	14.1	-	-
19-Jan-06	7.73	5215	5.43	-	13.30	12.52	2000 J	-	20.3	3.24	-	-
16-Feb-06	3.96	9342	8.97	231.2	9.08	12.30	4100 J	-	43	25.6	-	-
15-Mar-06	8.72	12910	9.59	222.1	7.64	12.60	5100 J	-	38.6	41.8	-	-
7-Apr-06	14.26	15220	6.90	18.9	3.65	12.92	5700	-	48.5	65.6	-	-
16-May-06	19.75	10880	2.61	33.8	15.40	12.46	5100	-	130	92.1	-	-
23-Jun-06	22.76	7586	2.98	-	14.10	12.65	5100	-	130	57.9	-	-
20-Jul-06	24.33	7457	0.73	-148.4	16.70	11.33	6400	-	272	51.3	-	-
22-Aug-06	15.03	7481	3.75	61.0	14.10	10.40	6100	-	318	33.2	-	-
26-Sep-06	17.30	8409	1.31	-312.4	15.10	12.38	5500	-	230	45.7	-	-
26-Oct-06	10.95	6075	4.10	-265.6	13.30	12.18	4600	-	243	41.5	-	-
15-Nov-06	8.07	5022	7.71	-152.7	21.50	12.24	2600	-	76.2	3.68	-	-
20-Dec-06	6.32	9148	5.73	-139.6	12.20	12.85	2900 J	-	46.1	1.28	-	-
24-Jan-07	2.15	12690	9.24	-98.4	9.74	13.10	3000 J	-	19.2	26.8	-	-
12-Feb-07	9.35	14110	8.43	-86.7	32.50	13.13	4700	-	96.2	83.5	-	-
27-Mar-07	9.16	10560	8.41	-46.2	7.42	11.31	2900 J	-	5.98	14.5	-	-
18-Apr-07	8.27	14570	8.32	10.8	10.30	12.79	5200	-	19.8	22.1	-	-
31-May-07	23.66	13410	6.42	-95.0	31.20	11.77	5100	-	78.4	50.4	-	-
20-Jun-07	26.35	10050	5.53	-195.7	27.90	12.29	5300 J	-	112	38.2	-	-
31-Jul-07	21.39	6666	4.76	-106.4	72.00	10.86	6300	-	208	68.8	-	-
29-Aug-07	22.61	6950	1.57	-193.4	61.80	12.05	6300 J	-	149	30.6	-	-
27-Sep-07	11.45	5059	2.66	-180.4	78.40	11.43	4800	-	190	17.4	-	-
26-Oct-07	6.98	4147	1.44	-204.7	39.50	12.48	3900 J	-	168	25.5	-	-
30-Nov-07	2.86	5030	8.50	-74.9	12.40	12.20	2600	-	121	14.3	-	-
12-Dec-07	4.45	3564	2.03	-141.8	20.70	10.93	2700	-	79.3	9.87	-	-
24-Jan-08	1.13	4859	4.10	-186.8	-	11.19	2200	-	86.1	6.79	-	-
28-Feb-08	-	-	-	-	18.10	-	2800	-	183	73.4	-	-
25-Mar-08	7.37	5413	7.88	-58.2	122.00	12.29	2900	-	182	13	-	-
29-Apr-08	8.43	3685	9.04	59.3	19.20	11.63	2400 J	-	152	16	-	-
20-May-08	18.03	3554	6.69	58.0	156.00	11.01	2100	-	137	38.3	-	-
18-Jun-08	13.01	5680	6.46	57.5	71.80	11.14	4000 J	-	279	34.4	-	-
26-Aug-08	18.02	2800	5.72	16.9	49.80	10.08	2500 J	-	91.7	18.6	557000	-
20-Nov-08	7.46	2011	9.04	38.3	23.60	10.49	2300	-	72.9	9.2	566000	-
12-Feb-09	1.63	1870	11.74	-	46.10	10.83	2300	-	129	17.2	738000	-
19-May-09	12.73	1895	5.37	-16.4	168.00	9.82	1700 J	-	78.9	11.3	515000	-
23-Sep-09	21.50	4190	0.09	175.1	14.40	9.70	4100	-	120	99	1300000	-
14-Dec-09	+	+	+	+	+	+	+	-	+	+	+	-
22-Mar-10	13.10	2480	-	342.0	15.60	10.05	1700	-	76	34	520000	-
17-Jun-10	13.40	2429	5.14	-	26.10	10.77	2100	-	120	89	630000	-
21-Sep-10	16.30	2733	1.10	216.8	21.50	9.81	2200	-	25	27	510000	-
8-Dec-10	6.00	1994	2.70	-	18.70	10.05	1400	-	53	18	490000	-
30-Mar-11	9.10	509	0.37	179.2	13.80	12.04	730 J	-	36	14	260000	-
21-Jun-11	21.60	2092	1.90	192.2	13.60	10.07	2800 J	-	62	29	380000	-
27-Sep-11	14.60	1516	9.34	220.4	32.50	9.34	1800	-	78	36	780000	-
15-Dec-11	3.00	1449	1.90	94.6	13.80	10.75	2100	-	140	74	630000	-
21-Mar-12	2.60	1088	8.10	285.7	13.10	9.95	780	-	30	7.2	240000	-
19-Jun-12	17.10	1747	5.54	345.3	10.80	9.93	780	-	70	29	400000	-
20-Sep-12	-	-	-	-	-	-	-	-	-	-	-	-
19-Dec-12	4.00	1771	6.37	104.0	6.12	10.71	1300	-	47	18	440000	-
26-Feb-13	6.90	3720	5.40	196.7	10.60	11.86	1100	-	140	39	690000	-
23-May-13	11.50	2335	5.21	323.5	44.10	12.48	1800	-	130	50	530000	-
22-Aug-13	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	DRY	-
19-Nov-13	8.20	1256	4.12	79.3	18.20	9.89	1260	-	39.8	20.4	487000	-
1-Apr-14	15.30	2053	4.42	130.9	772.00	11.27	1800	-	113	42.2	649000	-
23-May-14	14.15	2187	5.50	77.3	-	10.19	1860	-	112	23.6	623000	-

Table A-1d: Summary of Lower Disposal Area - Surface Water Sampling Results - South Pond Ravensdale Site, Ravensdale, Washington

Date Sampled	Field Parameters						Gen-Chem Total Dissolved Solids (mg/L)	Metals (ug/L)				
	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Antimony	Arsenic	Lead	Potassium	Vanadium
13-Aug-14	20.29	1298	5.35	40.1	24.80	9.63	949	-	44.9	22.8	306000	-
12-Nov-14	1.30	315	4.55	-0.5	22.10	10.45	2440	-	122	34.2	804000	-
12-Feb-15	11.10	1267	4.01	-8.2	23.90	10.20	905	-	27.2	9.6	320000	-
4-May-15	15.60	3200	4.35	240.5	9.21	10.42	2280	-	154	30.8	774000	-
5-Aug-15	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	DRY	-
3-Nov-15	8.30	1143	2.01	88.1	35.40	9.22	1050	-	28	28.2	364000	-
9-Feb-16	7.30	1672	3.45	95.9	7.79	10.45	1170	-	51 J+	34	410000	-
3-May-16	14.20	3150	3.61	335.2	63.80	10.35	2260	-	148	97.9 J-	777000	-
24-Aug-16	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	DRY	-
1-Nov-16	12.10	401	5.56	-65.9	15.00	9.43	742	-	21.9	14.1	356000	-
1-Feb-17	2.10	2064	4.82	5.0	17.80	10.27	1330	-	57.6	139	455000	-
31-May-17	14.50	2594	5.36	-	22.70	9.93	1920	-	105	51.5 J+	664000	-
17-Aug-17	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	DRY	-
9-Nov-17	6.50	1049	6.38	92.3	14.40	10.13	1260	-	58.8	53.4 J+	441000	-
27-Feb-18	6.50	1379	4.05	-71.0	6.11	10.94	865	-	61.7	47.7 J-	429000	-
2-May-18	11.60	2547	-	-	25.30	10.36	1860	-	85.9	26.7 J+	611000	-
22-Aug-18	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	DRY	-
7-Nov-18	9.70	995	6.72	126.8	20.60	9.15	1040	-	76	65.5	333000 J+	-
11-Mar-19	10.60	1354	5.93	-18.7	7.19	10.31	1270	-	49.3	41.7	458000	-
9-May-19	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	DRY	-
26-Aug-19	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	DRY	-
14-Nov-19	8.70	1180	5.98	30.9	7.38	9.03	1120	-	67.2	76.4	418000	-
13-Feb-20	4.30	1032	2.51	-126.9	6.10	10.46	927	-	28.1	13	348000	-
13-Aug-20	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	DRY	-
10-Dec-20	5.60	1000	2.52	66.8	6.02	9.66	952	-	12	6.63	318000	-
4-Mar-21	8.10	1271	1.98	38.0	8.02	10.35	4820	-	50.6	35.7	435000	-
10-Jun-21	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	DRY	-
13-Oct-21	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
6-Jan-22	4.50	305	10.57	-30.2	4.07	9.42	300	2.29	4.42	2.29	77100	4.27
17-Mar-22	8.8	997	8.53	-66.4	4.54	11.32	912	4.85	22.6	16.7	358000	37.8

Notes:

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- Not analyzed or not available
- Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above
- + South Pond frozen; unable to collect field parameters or samples
- Dry South Pond dry; unable to collect field parameters or samples
- a North Creek Analytical, Inc.
- b Severn Trent Laboratories
- c Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.
- U Data validation code; not detected at the Reporting Limit (RL)
- J Data validation code; estimated value
- J+ Data validation code; estimated value with positive bias
- °C Degrees Celsius
- µmhos/cm Micromhos per centimeter
- feet bmp Feet below measuring point
- feet NAVD88 Feet NAVD88 Datum
- mg/L
- mV
- NTU

APPENDIX A-2

**Summary of Lower Disposal Area –
Shallow/Alluvial Groundwater
Sampling Results**

Table A-2A Well MW-1A
Table A-2B Well MW-2A
Table A-2C Well MW-3A
Table A-2D Well MW-4A
Table A-2E Well MW-5A
Table A-2F Well MW-6A
Table A-2G Well MW-7A
Table A-2H Well MW-8A
Table A-2I Well MW-9A
Table A-2J Well MW-10A
Table A-2K Well P-16
Table A-2L Well P-17

**Table A-2b: Summary of Lower Disposal Area - Shallow/Alluvial Groundwater Sampling Results - Well MW-2A
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)				
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	6	5	15	-	80
15-Jul-05	29.18	578.03	13.78	853	-	-	28.3	7.7	606	-	2 U	2 U	-	-
9-Nov-05	25.64	581.57	10.95	860	-	-	3.82	7.43	550	-	1.31	1 U	-	-
15-Feb-06	17.64	589.57	7.81	709	0.82	467.7	3.96	7.86	520 J	-	1.06	1 U	-	-
17-May-06	25.76	581.45	9.67	810	2.17	246.1	3.01	7.06	490	-	1.13	1 U	-	-
23-Aug-06	29.13	578.08	12.86	759	2.6	12	9.82	7.4	570	-	1.54	1 U	-	-
14-Nov-06	13.74	593.47	10.44	649	3.72	63.6	9.78	7.72	460	-	1.36	1 U	-	-
14-Feb-07	22.09	585.12	10.77	648	1.69	11.5	52.4	7.51	380	-	1.07	1 U	-	-
30-May-07	26.72	580.49	11.46	732	2.05	72.2	12.8	7.44	480	-	1.17	1 U	-	-
27-Aug-07	29.45	577.76	10.8	829	7.41	62.8	117	7.58	590 J	-	1.09	1 U	-	-
29-Nov-07	26.57	580.64	10.74	899	2	81.1	392	6.05	490	-	1.03	1 U	-	-
27-Feb-08	21.45	585.76	-	-	-	-	446	-	400	-	1.09	1 U	-	-
20-May-08	25.73	581.48	9.48	706	3.07	110.2	419	7.26	420 J	-	1.21	1 U	-	-
27-Aug-08	29.84	577.37	9.87	824	4.74	91.5	571	7.43	550 J	-	1.3	1 U	65100	-
26-Sep-08	Test Trench Drain Line Installed													
16-Oct-08	29.13	578.08	9.76	820	4.56	53.6	227	7.33	520 J	-	1.3	1 U	76300	-
20-Nov-08	19.48	587.73	9.31	462	5.24	240.1	6.16	7.35	360	-	1.76	1 U	67000	-
30-Dec-08	16.93	590.28	9.85	480	6.18	66.8	56.1	7.35	390 J	-	1.55	1 U	61500	-
15-Jan-09	14.46	592.75	7.71	402	7.47	177.8	1.61	7.61	360	-	1.57	1 U	58500	-
12-Feb-09	23.84	583.37	9.63	-	8.72	-	74.9	7.54	390	-	1.3	1 U	48100	-
12-Mar-09	25.15	582.06	9.11	454	7.22	163.7	573	7.19	400	-	1.17	1 U	43100	-
16-Apr-09	17.72	589.49	8.4	417	8.27	126.4	128	7.26	400	-	1.4	1 U	48800	-
19-May-09	24.38	582.83	8.8	448	6.88	72	178	7.95	410 J	-	1.1	1 U	44000	-
23-Jun-09	27.85	579.36	8.95	507	7.76	61.9	256	8.07	490	-	2 U	2 U	39000	-
25-Aug-09	30.68	576.53	10.5	707	6.94*	307.4	4.38	7.17	530 J+	-	2 U	0.18 J	49000	-
23-Sep-09	30.84	576.37	11.2	661	5.41	374.7	15	7.28	500	-	2 U	2 U	51000	-
15-Dec-09	22.10	585.11	9.5	720	5.1	579	39	6.92	380	-	2 U	2 U	42000	-
24-Mar-10	23.82	583.39	10	602	4.1	535.3	43.3	6.93	370	-	1.7 J	2 U	39000	-
17-Jun-10	17.45	589.76	9.3	547	4.06	-	157	6.57	350	-	3.9	2 U	39000	-
22-Sep-10	29.66	577.55	10.2	722	5.77	360.2	7.2	7.22	450	-	3.3	2 U	55000	-
8-Dec-10	22.10	585.11	9.9	566	6.69	-	64.6	7.09	350	-	2 U	2 U	35000	-
29-Mar-11	19.94	587.27	8.4	251.3	6.95	620	28	7.13	250 J	-	1.4 J	2 U	30000	-
21-Jun-11	24.25	582.96	9.9	628	5.23	344.3	37	7.29	410 J	-	5 U	2 U	28000	-
28-Sep-11	30.41	576.8	9.5	57.5	6.54	481.7	13.8	7.24	500	-	5 U	2 U	54000	-
14-Dec-11	25.35	581.86	9.3	441	3.86	346.5	386	7.26	440	-	5 U	2 U	29000	-
20-Mar-12	15.45	591.76	7.7	580	1.53	382	32.3	7.4	280	-	2.2	0.4 U	26000	-
19-Jun-12	23.88	583.33	9	590	1.85	388.1	55.7	7.74	320	-	2.5	0.4 U	23000	-
19-Sep-12	30.18	577.03	11.1	695	7.03	297	9.31	7.41	420	-	2.7	0.4 U	42000	-
19-Dec-12	17.24	589.97	9.4	704	6.33	317	55.2	7.4	310	-	1.7	0.4 U	25000	-
25-Feb-13	23.12	584.09	9.1	585	6.04	339	110	7.46	370	-	2.5	0.4 U	24000	-
22-May-13	25.05	582.16	8.6	537	8.41	391.5	12.3	7.51	310	-	1.9	0.4 U	22000	-
21-Aug-13	30.75	576.46	10.6	684	8.42	150.2	5.85	7.74	419	-	1.5	0.2	27700	-
20-Nov-13	23.51	583.7	9.6	513	6.19	230.4	32.1	6.81	364	-	1.3	0.1 U	27500	-
1-Apr-14	17.11	590.1	8.5	386	7.32	243.1	14.6	7.46	294	-	1.4	0.1 U	31700	-
21-May-14	22.07	585.14	9.1	365	6.02	212.7	-	6.93	273	-	1.3	0.1 U	24700	-
12-Aug-14	31.32	575.89	13.16	552	6.56	76.7	6.8	7.36	394	-	1.5	0.1 U	25300	-
13-Nov-14	25.48	581.73	12.3	459.5	7.22	189.8	7.2	7.19	367	-	1.4	0.1 U	25500	-
11-Feb-15	16.83	590.38	9.3	447	6.76	134.4	36.6	7.52	286	-	1.7	0.1 U	30400	-
4-May-15	25.78	581.43	10.2	619	6.27	407.1	7.7	7.36	382	-	1.4	0.1 U	25200	-
6-Aug-15	31.87	575.34	11.3	500	9.18	207.1	28.1	7.23	394	-	1.5	0.1 U	22000	-
4-Nov-15	26.74	580.47	9.9	481	8.76	222.6	16.8	6.88	381	-	1.1	0.1 U	21800	-
10-Feb-16	19.19	588.02	9	376	7.35	206	40.2	7.68	261	-	3.6	0.1 U	37100	-
2-May-16	26.14	581.07	11.3	552	3.19	194.5	87.8	7.35	344	-	2.1	0.01 J-	31200	-
23-Aug-16	31.64	575.57	10.5	545	7.62	486.5	10.8	7.18	412	-	1.54	0.1 U	32600	-
2-Nov-16	25.12	582.09	10.2	220	4.01	238.9	245	7.19	431	-	1.4	0.1 U	30600	-
1-Feb-17	22.84	584.37	9.1	580	5.06	186.3	13.6	7.35	317	-	3.17	0.1 U	51100	-
30-May-17	22.31	584.9	9.4	520	7.01	4.99	40.2	7.18	322	-	1.78	0.1 U	34100	-
17-Aug-17	30.08	577.13	10.6	626	5.63	134.2	32.3	7.21	370	-	1.28	0.1 U	28900	-
9-Nov-17	26.04	581.17	9.8	479.5	5.79	74.4	68.8	7	391	-	1.39	0.1 U	25400	-
27-Feb-18	19.03	588.18	8.8	293.1	7.43	185.2	15.1	6.9	254	-	3.98	0.1 U	41900	-
1-May-18	20.84	586.37	9.1	531	7.46	-	25	7.35	316	-	3	0.1 U	40600	-
21-Aug-18	31.09	576.12	10.39	437	7.33	115.2	19.1	7.04	358	-	1.48	0.1 U	26900	-
6-Nov-18	28.00	579.21	9.7	420.1	8.17	210.3	6.74	6.97	418	-	1.3	0.1 U	23400	-
11-Mar-19	21.61	585.6	9	351.2	9.2	187.1	20.6	7.11	312	-	1.57	0.1 U	32700	-
8-May-19	23.88	583.33	9.8	443.1	8.05	109.6	7.79	7.06	316	-	1.66	0.1 U	32900	-
26-Aug-19	30.90	576.31	10.91	495	8.65	Note 1	12.7	6.91	394	-	1.28	0.1 U	21100	-
13-Nov-19	28.91	578.3	9.8	506	7.81	180.4	14.4	6.87	429	-	1.34	0.1 U	22900	-

Table A-2b: Summary of Lower Disposal Area - Shallow/Alluvial Groundwater Sampling Results - Well MW-2A Ravensdale Site, Ravensdale, Washington

Date Sampled	Field Parameters									Gen. Chem.	Metals (ug/L)				
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)	Total Dissolved Solids (mg/L)		Antimony	Arsenic	Lead	Potassium	Vanadium
12-Feb-20	14.21	593	8.1	319.3	9.95	189.3	14.6	7.27	277	-	1.95	0.1 U	56300	-	
12-Aug-20	30.41	576.8	9.5	463.3	6.6	185.5	72.9	7.03	359	-	1.2	0.1 U	22400	-	
9-Dec-20	25.91	581.3	9.4	533	6.44	213	9.96	6.97	400	-	1.38	0.49 J	26800	-	
3-Mar-21	20.83	586.38	8.9	330	5.24	216.5	12.4	7.18	268	-	1.8	0.219	61100	-	
9-Jun-21	29.14	578.07	9.1	459.8	8.65	193.6	1.34	6.88	360 J	-	1.25	0.058 J	21800	-	
12-Oct-21	27.75	579.46	10.4	595	9.33	188.2	0.56	6.53	439 J-	1.19	1.1	0.1 U	21900	1.07	
6-Jan-22	19.05	588.16	10.2	466.3	4.66	197.7	2.69	7.14	368	3.24	1.89	0.1 U	80700	1.19	
16-Mar-22	17.54	589.67	8.4	304.1	9.88	154.6	6.43	6.00	291	3.26	1.85	0.218	60900	1.15	

Notes:

Top of casing elevation (feet NAVD88): 607.21

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- Not measured or not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL.

* Dissolved Oxygen meter working incorrectly at the time of sample collection

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

Note 1 ORP measurements not available due to faulty sensor.

µmhos/cm Micromhos per centimeter

feet bmp Feet below measuring point

feet NAVD88 Feet NAVD88 Datum

mg/L Milligrams per liter

mV Millivolts

NTU Nephelometric Turbidity Unit

**Table A-2c: Summary of Lower Disposal Area - Shallow/Alluvial Groundwater Sampling Results - Well MW-3A
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)					
	Depth to Water (feet brec)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium	Vanadium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	6	5	15	-	80	
15-Jul-05	6.09	683.02	13.8	1124	-	-	30.3	6.96	922	-	2.41	2 U	-	-	
10-Nov-05	5.50	683.61	10.8	1518	-	-	2.32	6.88	960	-	10.5	1 U	-	-	
15-Feb-06	5.31	683.80	9.52	1357	0.46	217.4	58.2	6.33	930 J	-	6.66	1 U	-	-	
16-May-06	6.25	682.86	10.4	1296	0.96	91	11.4	6.91	910	-	10.1	1 U	-	-	
22-Aug-06	8.85	680.26	12.84	1362	1.28	-64.8	56	6.97	900	-	12.1	1 U	-	-	
13-Nov-06	5.03	684.08	11.24	1392	2.12	-74.4	234	6.89	910	-	5.73	1 U	-	-	
16-Feb-07	5.55	683.56	8.99	1155	0.75	-71.3	12.3	6.96	770	-	3.74	1 U	-	-	
30-May-07	6.72	682.39	11.86	1297	0.75	-25.2	12.5	7.04	790	-	5.2	1 U	-	-	
27-Aug-07	8.38	680.73	12.65	1483	0.71	-96.3	15.3	6.73	1100 J	-	8.74	1 U	-	-	
28-Nov-07	5.66	683.45	10.47	1363	1.05	-72.9	26.9	7.31	730	-	4.24	1 U	-	-	
27-Feb-08	5.57	683.54	-	-	-	-	121	-	860	-	9.76	1 U	-	-	
19-May-08	5.94	683.17	9.39	1346	0.66	-52.6	20	6.93	820 J	-	6.64	1 U	-	-	
26-Aug-08	6.44	682.67	12.15	1495	0.85	-53.6	5.85	6.88	820	-	3.42	1 U	30300	-	
18-Nov-08	5.50	683.61	10.5	975	1.87	-67.4	225	6.93	880 J	-	7.48	1 U	62500	-	
11-Feb-09	5.62	683.49	7.67	877	0.98	-	68	7.28	810	-	5.2	1 U	50600	-	
19-May-09	5.60	683.51	8.52	847	0.91	-63.4	52	8.21	750 J	-	2.51	1 U	49500	-	
22-Sep-09	8.36	680.75	15.7	1149	0.1	132.1	75.1	7.05	910	-	6.6	2 U	53000	-	
17-Dec-09	4.59	684.52	8.9	1300	0.4	194	401	7.08	710	-	2 U	2 U	62000	-	
24-Mar-10	5.40	683.71	11.2	1010	0.12	-	226	6.76	800	-	3.8	2 U	46000	-	
16-Jun-10	5.27	683.84	10.1	1123	0.2	188	6.19	8.43	570	-	13	2 U	49000	-	
21-Sep-10	6.01	683.10	12.7	1314	0.19	177.7	2.97	6.91	1,000	-	6.2	0.19 J	160000	-	
7-Dec-10	5.23	683.88	9.7	1183	0.23	182.7	25.3	6.86	840	-	3.2	2 U	82000	-	
30-Mar-11	5.04	684.07	8.3	498	0.28	174	4.93	7.89	700	-	3.6	2 U	36000	-	
22-Jun-11	6.77	682.34	9.7	895	0.43	172.2	9.18	7.01	700 J	-	5 U	2 U	34000	-	
28-Sep-11	7.83	681.28	12.6	99	0.18	141.8	6.07	6.83	840	-	8.8	2 U	83000	-	
15-Dec-11	5.40	683.71	9	785	0.6	179.8	24.4	6.98	760	-	4.5 J	2 U	73000	-	
20-Mar-12	4.96	684.15	7.1	1092	0.16	22.6	12.1	7.11	470	-	5.2	2 U	73000	-	
19-Jun-12	6.76	682.35	10.3	1077	0.11	198.6	11.3	7.07	660	-	12	0.4 U	78000	-	
20-Sep-12	8.67	680.44	12.3	1235	0.15	111	1.96	6.99	710	-	11	0.05 J	100000	-	
18-Dec-12	4.98	684.13	8.7	1450	0.3	-40.6	18.7	7.25	740	-	4.8	0.4 U	150000	-	
26-Feb-13	5.25	683.86	7.8	1211	0.15	186.6	27.8	7.21	740	-	4.7	0.4 U	98000	-	
23-May-13	6.56	682.55	9.9	1000	0.18	242.3	16.9	7.21	460	-	14	2.8	150000	-	
21-Aug-13	9.01	680.10	12.1	917	0.12	-14.2	1.24	7.27	772	-	7.6	0.05 J	94000	-	
19-Nov-13	6.09	683.02	9.9	697	0.07	61.8	2.93	6.77	852	-	12.3	0.2	169000	-	
1-Apr-14	5.75	683.36	9	722	0.1	131.3	4.47	7.07	624	-	10.5	0.06 J	104000	-	
22-May-14	5.80	683.31	9.8	580	1.08	185.3	-	6.85	494	-	5.2	0.1	66500	-	
13-Aug-14	8.54	680.57	11.48	915	2.85	-67.6	8.16	7.09	740	-	6.9	0.1 U	116000	-	
12-Nov-14	5.97	683.14	11.1	313.7	2.79	-85.1	15.3	6.87	744	-	6.9	0.1 U	89100	-	
12-Feb-15	5.50	683.61	9.8	980	0.52	-54.5	1.28	7.04	696	-	4.2	0.1 U	73200	-	
4-May-15	5.80	683.31	10.8	994	0.17	143.4	15.4	7.12	701	-	9.3	0.1 U	100000	-	
5-Aug-15	10.12	678.99	12.6	881	0.13	-90.4	0.89	7.07	724	-	7.3	0.1 U	70300	-	
3-Nov-15	5.30	683.81	12	865	1.23	105.5	5.06	6.97	1020	-	1.7	0.2	195000	-	
9-Feb-16	5.14	683.97	9.1	954	0.55	154.6	4.82	7.03	625	-	3.4	0.1 U	92700	-	
2-May-16	4.74	684.37	11.3	844	0.19	96.8	2.21	7.16	621	-	10.5	0.04 J	105000	-	
23-Aug-16	9.04	680.07	13.2	946	0.03	156.2	3.48	6.97	924	-	8.19	0.09 J	148000	-	
1-Nov-16	6.18	682.93	11.9	349	0.15	18.5	2.43	7.11	744	-	2.63	0.1 U	180000	-	
1-Feb-17	5.91	683.20	7.5	1114	0.17	-67.4	6.05	7.08	694	-	6.4	0.1 U	100000	-	
30-May-17	7.40	681.71	10.4	753	2.2	8.59	3.28	7.12	465	-	9.52	0.1 U	89300	-	
17-Aug-17	9.71	679.40	12.4	1101	0.25	-60.2	3.39	7.01	737	-	8.47	0.1 U	72000	-	
9-Nov-17	6.06	683.05	9.6	833	0.64	75.3	2.01	7.08	748	-	1.84	0.1 U	191000	-	
27-Feb-18	5.16	683.95	7.6	791	0.21	-75.4	9.52	6.64	506	-	2.97	0.1 U	92000	-	
1-May-18	5.41	683.70	10	847	0.93	-	5.82	7.36	547	-	3.81	0.1 U	120000	-	
21-Aug-18	10.81	678.30	14.54	909	2.96	-17.2	1.67	6.92	722	-	6.48	0.1 U	101000	-	
7-Nov-18	5.85	683.26	11.2	931	0.66	179	0.87	6.97	828	-	2.03	0.073 J	202000 J+	-	
11-Mar-19	5.26	683.85	6.1	477.5	1.25	53.7	2.39	7.34	486	-	1.44	0.1 U	125000	-	
9-May-19	5.44	683.67	10.2	678	3.72	-9.4	1.85	7.04	574	-	3.02	0.083 J	143000	-	
26-Aug-19	9.30	679.81	13.96	1041	0.6	Note 1	0.02	6.83	843	-	6.15	0.1 U	142000	-	
13-Nov-19	5.58	683.53	9.4	803	0.31	12.8	0.02	6.97	724	-	2.2	0.077 J	174000	-	
12-Feb-20	5.10	684.01	7.8	349.3	0.37	-62.4	1.4	7.25	287	-	1.86	0.1 U	74200	-	
13-Aug-20	9.33	679.78	11.8	884	0.64	-81.6	4.28	6.76	683	-	10.9	0.1 U	119000	-	
10-Dec-20	5.08	684.03	8.5	688	3.06	210	0.9	7.29	566	-	2.36	0.159	128000	-	
4-Mar-21	5.26	683.85	7	364	0.59	47	1.54	7.42	319	-	1.52	0.134	74200	-	
9-Jun-21	6.24	682.87	11.4	706	0.96	-50.2	4.12	7.03	540	-	6.48	0.204	124000	-	
12-Oct-21	5.34	683.77	12.3	1611	2.92	133.4	5.25	6.63	1070 J	-	15.6	3.31	0.4	93200	2.14
6-Jan-22	5.10	684.01	7.5	269.6	2.33	189.1	1.84	7.38	242	-	8.89	2.04	0.265	53400	2.61
17-Mar-22	4.97	684.14	7.5	269.6	2.33	189.1	1.84	7.38	252	-	3.39	1.98	0.169	53200	0.879

Notes:

Top of casing elevation (feet NAVD88): 689.11

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- Not measured or not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL

**Table A-2c: Summary of Lower Disposal Area - Shallow/Alluvial Groundwater Sampling Results - Well MW-3A
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters									Gen. Chem.	Metals (ug/L)				
	Depth to Water (feet btpc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)	Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium	Vanadium	

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

Note 1 ORP measurements not available due to faulty sensor.

µmhos/cm Micromhos per centimeter

feet bmp Feet below measuring point

feet NAVD88 Feet NAVD88 Datum

mg/L Milligrams per liter

mV Millivolts

NTU Nephelometric Turbidity Unit

**Table A-2d: Summary of Lower Disposal Area - Shallow/Alluvial Groundwater Sampling Results - Well MW-4A
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem. Total Dissolved Solids (mg/L)	Metals (ug/L)				
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Antimony	Arsenic	Lead	Potassium	Vanadium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	6	5	15	-	80
15-Jul-05	4.60	700.85	12.43	629	-	-	6.07	6.45	490	-	2 U	2 U	-	-
10-Nov-05	3.70	701.75	11.98	441	-	-	7.4	6.22	290	-	1 U	1 U	-	-
19-Jan-06	3.56	701.89	8.29	319	0.42	-	1.46	6.53	290 J	-	1 U	1 U	-	-
15-Feb-06	3.82	701.63	8.32	326	0.62	99.7	3.5	7.39	220 J	-	1 U	1 U	-	-
15-Mar-06	3.79	701.66	7.58	254	0.87	201.9	0.82	6.65	210 J	-	1 U	1 U	-	-
7-Apr-06	3.87	701.58	9.36	295	0.55	157.4	0.24	6.34	220	-	1 U	1 U	-	-
16-May-06	4.92	700.53	10.8	321	0.45	142.1	0.99	6.36	220	-	1 U	1 U	-	-
23-Jun-06	4.41	701.04	12.62	316	0.57	-	2.05	6.25	200	-	1 U	2.64	-	-
20-Jul-06	6.90	698.55	13.43	347	0.23	-20.9	0.32	6.11	120	-	1 U	1 U	-	-
22-Aug-06	8.46	696.99	13.68	406	0.9	153.5	2.2	6.13	280	-	1 U	1 U	-	-
26-Sep-06	6.50	698.95	14.59	417	2.47	-35.2	2.42	6.33	290	-	1 U	1 U	-	-
26-Oct-06	5.98	699.47	12.82	434	3.3	124.1	0.82	6.12	320	-	1 U	1 U	-	-
13-Nov-06	3.02	702.43	11.7	386	5.06	187.8	2.47	6.13	280	-	1 U	1 U	-	-
20-Dec-06	3.60	701.85	9.64	379	4.3	150.5	1.03	6.07	250	-	1 U	1 U	-	-
23-Jan-07	3.68	701.77	8.37	239	3.96	58.9	0.66	6.28	220	-	1 U	1 U	-	-
14-Feb-07	3.74	701.71	8.18	325	2.85	110.8	0.53	6.25	210	-	1 U	1 U	-	-
27-Mar-07	3.32	702.13	8.27	289	2.07	61.5	0.88	6.83	210 J	-	1 U	1 U	-	-
17-Apr-07	3.89	701.56	9.59	306	1.8	102.3	2.31	6.34	190	-	1 U	1 U	-	-
30-May-07	4.70	700.75	11.27	285	1.78	101.7	1.37	6.37	180	-	1 U	1 U	-	-
20-Jun-07	4.69	700.76	12.37	350	1.67	9.3	1.25	6.9	240 J	-	1 U	1 U	-	-
31-Jul-07	6.38	699.07	14.57	402	1.15	5.5	0.6	6.37	250	-	1.29	1 U	-	-
29-Aug-07	7.44	698.01	13.78	353	1.11	128.3	1.87	6.18	280 J	-	1 U	1 U	-	-
27-Sep-07	8.25	697.20	13.6	375	0.96	142.6	0.7	6.7	300	-	1 U	1 U	-	-
26-Oct-07	4.09	701.36	12.16	343	2.27	75.9	3.93	6.1	310 J	-	1 U	1 U	-	-
29-Nov-07	3.93	701.52	10.13	428	3.17	197.3	1.63	6.32	270	-	1 U	1 U	-	-
12-Dec-07	5.82	699.63	9.51	384	3.37	185	0.8	6.06	260	-	1 U	1 U	-	-
24-Jan-08	3.86	701.59	7.74	354	3.09	109	-	6.35	250	-	1 U	1 U	-	-
28-Feb-08	4.04	701.41	-	-	-	-	1.06	-	220	-	1 U	1 U	-	-
19-May-08	4.35	701.10	9.79	329	1.38	209.2	1.2	6.08	200 J	-	1 U	1 U	-	-
26-Aug-08	7.83	697.62	12.66	431	1.38	210.5	0.28	6.19	270	-	1 U	1 U	3000 U	-
18-Nov-08	3.64	701.81	10.43	235	3.95	217.5	0.66	6.03	210	-	1 U	1 U	3000 U	-
11-Feb-09	4.09	701.36	7.24	188	2.13	-	0.12	6.54	180	-	1 U	1 U	3000 U	-
19-May-09	3.79	701.66	8.19	173	1.28	111.9	1.78	7.18	170 J	-	1 U	1 U	3000 U	-
22-Sep-09	9.70	695.75	16.5	440	0.82	383.3	12.5	6.31	370 J	-	2 U	2 U	1200 J	-
17-Dec-09	3.47	701.98	9.2	311	4.37	470	16	6.25	110	-	2 U	2 U	700 J	-
24-Mar-10	3.87	701.58	9.4	410	0.34	204.8	30.7	6.65	240	-	0.81 J	2 U	1300 J	-
16-Jun-10	3.77	701.68	10.3	298	0.99	397.8	1.11	7.4	180	-	3.6	2 U	900 J	-
21-Sep-10	5.82	699.63	13.7	350	1.01	302.5	1.04	6.25	200	-	1.4 J	0.2 J	1200 J	-
7-Dec-10	3.83	701.62	9.6	283	0.72	405.6	0.42	6.16	190	-	2 U	2 U	800 J	-
30-Mar-11	3.91	701.54	8.2	133.3	0.51	248.2	0.29	9.87	140 J	-	0.35 J	2 U	5000	-
22-Jun-11	3.99	701.46	11	219.3	0.16	222.5	0.22	6.13	160	-	5 U	2 U	700 J	-
28-Sep-11	8.54	696.91	14.3	34.5	0.26	333.9	2.45	6.3	270	-	5 U	2 U	2100 J	-
15-Dec-11	4.12	701.33	9.4	217	1.15	414.3	2.74	6.28	200	-	5 U	2 U	1200 J	-
21-Mar-12	3.35	702.10	8.4	346	0.42	438.4	0.48	6.14	220	-	4.8	0.4 U	1300 J	-
19-Jun-12	3.78	701.67	11.3	290.1	0.09	314	0.46	6.28	170 J+	-	1.3	0.4 U	3300 U	-
20-Sep-12	8.53	696.92	14.4	419	0.26	309	1.07	6.39	240	-	1.6	0.4 U	2900 J	-
18-Dec-12	3.49	701.96	9.1	491	2.56	264.4	1.38	6.63	170	-	1 U	0.4 U	1200 J	-
26-Feb-13	3.91	701.54	8.4	324	2.59	404.2	1.01	7.03	140	-	1.1	0.4 U	3400	-
23-May-13	3.76	701.69	10.6	338	1.15	465.9	0.57	6.31	190	-	1 U	0.4 U	3300 U	-
22-Aug-13	8.28	697.17	13.1	284.2	0.33	32.2	0.89	6.34	220	-	0.4	0.1 U	1260	-
19-Nov-13	3.33	702.12	10.3	323	1.7	109.2	0.64	6.27	200	-	0.2	0.1 U	750	-
1-Apr-14	3.69	701.76	8.2	243.6	0.45	180.7	0.28	6.33	173	-	0.18 J	0.1 U	710	-
22-May-14	4.52	700.93	10.8	195	0.65	75	-	7.2	152	-	0.3	0.1	600	-
13-Aug-14	7.56	697.89	12.62	269	0.44	37.7	1.12	5.89	181	-	0.8	0.1 U	890	-
12-Nov-14	3.73	701.72	11.7	230.9	1.29	108.2	1.32	6.17	191	-	0.3	0.1 U	950	-
11-Feb-15	3.50	701.95	9.2	270.4	0.53	-34.2	0.73	6.3	170	-	0.2	0.1 U	680	-
4-May-15	4.69	700.76	10.9	249.5	0.28	378.1	0.57	6.29	341	-	0.2	0.1 U	610	-
5-Aug-15	9.44	696.01	13.9	316	0.72	-38.1	1.16	6.45	262	-	0.3	0.1 U	1230	-
3-Nov-15	4.21	701.24	11.8	192.2	8.59	205.6	5.39	6.34	166	-	0.2 J	0.1 U	790	-
9-Feb-16	3.82	701.63	9.2	291.8	4.61	230.7	0.49	6.45	164	-	0.17 J	0.1 U	790	-
3-May-16	4.61	700.84	10.9	310	2.39	253	1.01	6.34	178	-	0.3	0.01 J	940	-
24-Aug-16	8.76	696.69	13.2	286.7	1.24	490.4	1.01	6.35	177	-	0.2 J	0.1 U	840	-
1-Nov-16	3.34	702.11	12.2	100	3.69	177.2	0.4	6.38	205	-	0.19 J	0.1 U	971	-
2-Feb-17	3.94	701.51	7.8	363	3.11	190	0.1	6.39	223	-	0.17 J	0.1 U	819	-
31-May-17	4.68	700.77	10.3	300	4.5	-	2.48	6.3	182	-	0.203	0.1 U	795	-
18-Aug-17	8.61	696.84	12.7	393	0.51	120.2	0.87	6.44	228	-	0.308	0.1 U	1300	-
10-Nov-17	3.58	701.87	11	264.4	3.88	56.5	0.76	6.01	217	-	0.186 J	0.1 U	669	-
27-Feb-18	3.76	701.69	8.3	302.1	3.19	221.1	0.55	6.29	238	-	0.176 J	0.1 U	875	-
2-May-18	4.02	701.43	10	343	3.02	-	0.59	6.36	215	-	0.15 J	0.1 UJ	980	-
22-Aug-18	9.35	696.10	12.17	330	1.99	142	2.31	6.27	265	-	0.315	0.1 U	1230	-
7-Nov-18	5.25	700.20	11.7	316.7	5.45	124.4	0.76	6.23	250	-	0.199 J	0.1 U	843	-
11-Mar-19	3.96	701.49	7.6	226.3	3.96	220.8	0.7	6.38	233	-	0.146 J	0.1 U	918	-
9-May-19	4.70	700.75	12.5	282.5	3.6	82.3	1.56	6.14	230	-	0.154 J	0.1 U	816	-
26-Aug-19	8.20	697.25	13.13	374	0.86	Note 1	0.02	6.3	264	-	0.3	0.1 U	928	-
14-Nov-19	4.35	701.10	10.8	309.4	3.19	109.5	0.02	6.15	240	-	0.251	0.1 U	894	-

Table A-2d: Summary of Lower Disposal Area - Shallow/Alluvial Groundwater Sampling Results - Well MW-4A Ravensdale Site, Ravensdale, Washington

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)				
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium
13-Feb-20	3.70	701.75	7.9	283.7	2.98	102.2	0.91	6.18	283	-	0.176 J	0.1 U	859	-
13-Aug-20	7.73	697.72	13.5	334.3	0.62	58.3	0.51	6.19	238	-	0.711	0.1 U	921	-
10-Dec-20	3.45	702.00	9.8	364	6.11	169	1.56	6.51	297	-	0.296	0.1 U	1260	-
4-Mar-21	3.72	701.73	8.3	304	2.83	137	0.49	6.47	255	-	0.192 J	0.1 U	876	-
10-Jun-21	5.32	700.13	11.9	338.7	1.23	108.5	0.73	6.09	220	-	0.228	0.1 U	787	-
15-Oct-21	7.69	697.76	12.6	341.3	6.91	133.9	20.5	6.37	363 J-	0.18 J	0.99	0.151	1480	4.09
7-Jan-22	3.40	702.05	8.7	248.4	4.37	211.1	3.08	6.29	270	0.2 U	0.383	0.1 U	774 J	1.73
18-Mar-22	3.52	701.93	9.1	340.6	3.26	123.8	1.85	6.63	320	0.2 U	0.279	0.1 U	1140	1.53

Notes:

Top of casing elevation (feet NAVD88): 705.45

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- Not measured or not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL.

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

Note 1 ORP measurements not available due to faulty sensor.

µmhos/cm Micromhos per centimeter

mg/L Milligrams per liter

feet bmp Feet below measuring point

mV Millivolts

feet NAVD88 Feet NAVD88 Datum

NTU Nephelometric Turbidity Unit

Table A-2e: Summary of Lower Disposal Area - Shallow/Alluvial Groundwater Sampling Results - Well MW-5A Ravensdale Site, Ravensdale, Washington

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)				
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	6	5	15	-	80
15-Jul-05	33.33	577.90	12.02	956	-	-	496	7.34	600	-	2.01	2 U	-	-
10-Nov-05	29.62	581.61	11.24	1212	-	-	27.6	7.32	800	-	8.4	1 U	-	-
15-Feb-06	21.70	589.53	6.45	665	2.59	280.3	11.1	7.86	520 J	-	22.3	1 U	-	-
17-May-06	29.80	581.43	7.74	831	0.88	101.9	8.67	7.79	580	-	11	1 U	-	-
23-Aug-06	33.25	577.98	15.19	737	1.76	33.5	19.6	7.32	660	-	2.53	1 U	-	-
14-Nov-06	17.79	593.44	10.86	699	4.5	76.3	38.7	7.55	490	-	3.15	1 U	-	-
16-Feb-07	27.08	584.15	8.08	630	6.07	2.3	57.6	8.26	500	-	14.4	1 U	-	-
30-May-07	30.75	580.48	9.6	894	2.59	13.3	13.4	7.76	540	-	8.43	1 U	-	-
29-Aug-07	33.60	577.63	9.56	684	7.64	67	-	7.1	670 J	-	1.97	1 U	-	-
29-Nov-07	30.60	580.63	11	1075	3.53	151.5	23.5	8.37	560	-	5.17	1 U	-	-
27-Feb-08	25.68	585.55	-	-	-	-	29.9	-	400	-	10.7	1 U	-	-
20-May-08	29.73	581.50	7.93	768	4.27	180.7	77.8	7.39	480 J	-	5.67	1 U	-	-
27-Aug-08	33.97	577.26	10.17	862	4.07	81.2	-	7.43	540 J	-	1.17	1 U	87500	-
26-Sep-08	Test Trench Drain Line Installed													
16-Oct-08	33.55	577.68	8.89	845	5.39	86.3	852	7.53	440 J	-	1.03	1 U	90700	-
20-Nov-08	23.48	587.75	9.34	577	5.27	234.3	9.48	7.5	470	-	6.24	2 U	138000	-
30-Dec-08	20.88	590.35	8.39	510	8.89	99	44.8	8.02	430 J	-	14.2	1.11	138000	-
15-Jan-09	18.50	592.73	4.97	347	8.9	154.8	17.2	8.47	380	-	24.4	1 U	104000	-
12-Feb-09	27.90	583.33	8.47	-	10.21	-	22	7.6	420 J	-	6.11	1 U	99000	-
12-Mar-09	29.19	582.04	7.47	521	6.15	171.7	26.8	7.39	480	-	8.97	1 U	124000	-
16-Apr-09	21.70	589.53	6.99	456	7.6	151.6	72.7	8.66	470	-	28.2	1.01	126000	-
19-May-09	28.37	582.86	8.08	509	6.38	64.4	31.3	8.07	450 J	-	9.19	1 U	105000	-
23-Jun-09	31.95	579.28	8.84	551	5.97	69.1	74.3	8.28	500	-	4.3	2 U	71000	-
25-Aug-09	35.08	576.15	-	-	-	-	-	-	-	-	-	-	-	-
24-Sep-09	35.29	575.94	11.7	714	2.28	371.9	258	7.26	550 J	-	0.76 J	0.17 J	88000	-
15-Dec-09	26.11	585.12	8.6	928	2.89	544	89	7.14	450	-	1.1 J	2 U	110000	-
24-Mar-10	27.86	583.37	8.3	697	3.52	505.1	18.1	7.47	450	-	23	0.46 J	110000	-
16-Jun-10	21.35	589.88	10.7	783	2.07	379	41.4	7.73	340	-	53	0.0021	150000	-
22-Sep-10	33.88	577.35	10.4	938	4.3	467.1	7.93	7.1	620	-	5	2 U	100000	-
7-Dec-10	25.22	586.01	10.2	781	3.86	353.7	11.1	7.39	500	-	12	0.53 J	130000	-
29-Mar-11	23.59	587.64	7	354	3.47	708	22.22	9.52	440 J	-	63	1.4 J	140000	-
21-Jun-11	28.33	582.90	11.6	1000	2.22	285.3	10.6	9.06	1100 J	-	43	1.2 J	180000	-
27-Sep-11	34.70	576.53	12.7	641	1.46	307.2	12.8	7.3	680	-	5 U	0.23 J	100000	-
14-Dec-11	29.46	581.77	9.5	691	1.95	757.1	9.69	7.35	690	-	6.9	0.18 J	180000	-
20-Mar-12	19.50	591.73	6.2	841	3.98	320.2	8.52	8.25	350	-	26	1 J	140000	-
19-Jun-12	27.91	583.32	10.2	800	3.22	365.9	2.76	7.66	510	-	8.7	0.4 U	120000	-
20-Sep-12	34.53	576.70	11	859	0.73	387	46.8	7.64	530	-	2.6	0.4 U	100000	-
19-Dec-12	21.26	589.97	8.9	983	1.73	279	778	7.71	530	-	11	0.62	180000	-
25-Feb-13	27.19	584.04	7.5	682	7.61	330.5	4.36	7.85	380	-	13	0.15 J	74000	-
22-May-13	29.09	582.14	8.8	828	3.88	411.4	8.11	8.29	350	-	25	0.53	100000	-
21-Aug-13	35.15	576.08	17.1	1248	3.41	114.2	144	7.78	1060	-	1.5	0.05 J	95000	-
20-Nov-13	27.45	583.78	10	1032	4.13	196.5	31.7	7.18	699	-	14.5	1.4	202000	-
1-Apr-14	21.08	590.15	8.4	567	3.04	168.2	15.7	10.24	413	-	62.7	1.5	150000	-
21-May-14	26.11	585.12	10.3	670	0.49	198.4	-	7.45	565	-	95	1.6	166000	-
12-Aug-14	34.56	576.67	14.07	812	3.64	87.7	1519	7.51	560	-	3	0.1 U	107000	-
13-Nov-14	29.48	581.75	12.9	1135	3.5	241.7	10.46	7.69	956	-	20.8	0.1	295000	-
11-Feb-15	20.81	590.42	7.7	619	6.17	81.4	18	9.63	430	-	39.2	1.3	126000	-
4-May-15	29.80	581.43	10.5	924	2.54	361.3	8.7	9.74	623	-	42.3	0.5	192000	-
6-Aug-15	36.08	575.15	12.8	781	2.4	129.6	261	7.24	DRY	-	DRY	DRY	DRY	-
4-Nov-15	30.80	580.43	10.7	1234	4.98	205.6	11.8	7.13	1130	-	6.6	0.3	318000	-
10-Feb-16	23.56	587.67	6.4	602	1.62	197.7	11.9	10.19	451	-	132	1.4	148000	-
2-May-16	30.19	581.04	11.5	1008	0.8	110.6	9.76	10.14	751	-	171	2.7 J	232000	-
23-Aug-16	35.79	575.44	13.1	729	2	436.2	51.4	7.2	1010	-	4.01	0.1 U	137000	-
2-Nov-16	29.06	582.17	10.9	570	4.98	103.1	32.1	7.55	1180	-	11.2	0.56	372000	-
1-Feb-17	26.86	584.37	8.1	992	2.21	99.7	7.19	9.73	632	-	109	0.971	194000	-
30-May-17	26.86	584.37	10.5	814	6.12	5.83	5.74	9.73	487	-	42.5	0.36 J+	168000	-
17-Aug-17	34.23	577.00	11.7	1054	5.43	125.1	5.68	7.65	731	-	6.52	0.1 U	156000	-
10-Nov-17	29.96	581.27	10	1077	4.65	85.2	10.5	7.18	953	-	5.82	0.338	308000	-
27-Feb-18	23.02	588.21	7.7	584	1.91	120.4	12.6	9.96	530	-	86.3	0.642	174000	-
1-May-18	24.85	586.38	9.1	1082	2.16	-	11.8	10.34	682	-	113	0.775 J+	196000	-
21-Aug-18	35.17	576.06	14.83	1095	4.02	131	123	7.4	936	-	3.65	0.1 U	214000	-
6-Nov-18	32.00	579.23	10.3	1192	5.93	198.1	2.35	7.49	1200	-	4.87	0.077 J	863000 J+	-
13-Mar-19	25.12	586.11	7.4	695	2.19	189.7	15.8	9.48	632	-	44.1	0.633	200000	-
8-May-19	27.89	583.34	10.7	844	4.95	60.5	5.19	9.3	697	-	41.9	0.677	182000	-
26-Aug-19	35.02	576.21	11.89	1111	1.52	Note 1	22.9	7.26	995	-	2.46	0.1 U	177000	-
13-Nov-19	33.00	578.23	9.8	932	5.27	66.1	0.02	7.18	776	-	3.89	0.1 U	211000	-

Table A-2e: Summary of Lower Disposal Area - Shallow/Alluvial Groundwater Sampling Results - Well MW-5A Ravensdale Site, Ravensdale, Washington

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)				
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium
12-Feb-20	18.23	593.00	7	533	7.58	140.4	10.6	8.32	463	-	6.31	0.145	183000	-
12-Aug-20	34.50	576.73	11.2	1381	4	125	2.75	7.52	1250	-	5.37	0.1 U	333000	-
9-Dec-20	29.90	581.33	9.8	1105	4.51	222	8.32	7.29	897	-	3.12	0.295	263000	-
3-Mar-21	24.81	586.42	9.2	899	3.04	225	3.09	7.6	792	-	3.74	0.132	247000	-
9-Jun-21	33.20	578.03	9.3	875	5.23	184	1.26	7.27	700	-	2.62	0.063 J	205000	-
13-Oct-21	31.70	579.53	9.5	1934	5.97	194	9.56	7.22	DRY	DRY	DRY	DRY	DRY	DRY
5-Jan-22	23.00	588.23	9.2	972	4.7	271.1	1.4	7.18	829	6.42	3.38	0.085 J	252000	1.8
16-Mar-22	21.48	589.75	7.8	724	7.0	187	2.65	6.6	711	6.01	4.02	0.11	223000	1.52

Notes:

Top of casing elevation (feet NAVD88): 611.23

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- Not measured or not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL

Dry Well went dry during sampling. Unable to collect sample.

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

Note 1 ORP measurements not available due to faulty sensor.

µmhos/cm Micromhos per centimeter

mg/L Milligrams per liter

feet bmp Feet below measuring point

mV Millivolts

feet NAVD88 Feet NAVD88 Datum

NTU Nephelometric Turbidity Unit

**Table A-2f: Summary of Lower Disposal Area - Shallow/Alluvial Groundwater Sampling Results - Well MW-6A
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)				
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	6	5	15	-	80
15-Jul-05	30.89	578.06	15.26	735	-	-	303	7.6	612	-	2 U	2 U	-	-
10-Nov-05	27.25	581.70	11.79	700	-	-	13.7	7.51	460	-	2.16	1 U	-	-
15-Feb-06	19.42	589.53	6.17	759	2	162.9	9.42	8.27	550 J	-	7.54	1 U	-	-
17-May-06	27.55	581.40	11.99	835	1.31	248.3	4.16	7.46	550	-	11	1 U	-	-
23-Aug-06	30.99	577.96	15.92	862	1.6	-26.4	15.5	7.4	810	-	1.34	1 U	-	-
14-Nov-06	15.30	593.65	10.56	712	4.59	84.1	14.5	7.32	500	-	1.71	1 U	-	-
16-Feb-07	24.22	584.73	8.49	581	3.64	38.6	139	7.21	420	-	1.6	1 U	-	-
30-May-07	28.50	580.45	13.93	1092	2.72	180.7	210	7.4	740	-	16.2	1 U	-	-
29-Aug-07	31.34	577.61	10.15	701	4.48	84.8	662	7.8	620 J	-	1.41	1 U	-	-
29-Nov-07	28.32	580.63	11.3	731	6.23	154	-	6.26	420	-	1.78	1 U	-	-
27-Feb-08	23.42	585.53	-	-	-	-	-	-	410	-	1.47	1 U	-	-
20-May-08	27.49	581.46	8.14	791	3.93	176.5	-	7.64	540 J	-	8.18	1 U	-	-
27-Aug-08	31.72	577.23	9.33	776	4.83	142	-	7.32	660 J	-	1.86	1 U	109000	-
26-Sep-08	Test Trench Drain Line Installed													
16-Oct-08	31.29	577.66	9.17	923	4.6	115.4	-	7.13	590 J	-	1.85	1 U	106000	-
20-Nov-08	21.18	587.77	9.7	578	5.22	249.4	11.7	7.4	460	-	4.42	2 U	110000	-
30-Dec-08	18.64	590.31	8.45	448	9.27	137.9	75.8	7.89	370 J	-	11.9	1.14	106000	-
15-Jan-09	16.23	592.72	6.84	344	9.25	181.9	2.77	7.47	320	-	4.88	1 U	72900	-
12-Feb-09	25.64	583.31	7.89	-	10.82	-	71.7	7.7	420	-	11	1 U	103000	-
12-Mar-09	26.92	582.03	7.27	524	8.31	166.7	116	7.76	500	-	23.5	1 U	125000	-
16-Apr-09	19.46	589.49	7.33	406	7.57	182.8	91.8	8.33	430	-	24.1	1.09	101000	-
19-May-09	26.10	582.85	9.07	554	6.39	65.6	161	8.32	550 J	-	13.4	1 U	115000	-
23-Jun-09	29.67	579.28	9.51	522	6.05	71.4	-	8.17	540	-	3.1	2 U	74000	-
25-Aug-09	32.72	576.23	14.8	795	3.25	282.7	22	7.28	630 J	-	0.75 J	2 U	100000	-
24-Sep-09	32.93	576.02	10.6	745	4.02	361.3	29.8	7.27	560 J	-	0.28 J	2 U	100000	-
15-Dec-09	23.87	585.08	9.5	815	4.2	556	20	7.15	450	-	2 U	2 U	120000	-
24-Mar-10	25.61	583.34	8.5	704	4.93	205.6	20.5	8.53	490	-	47	0.9 J	140000	-
16-Jun-10	19.11	589.84	10.4	553	4.79	399.8	13.4	7.22	310	-	16	2 U	90000	-
22-Sep-10	31.61	577.34	11.3	1019	3.89	413.8	20.3	7.1	770	-	6.2	0.24 J	130000	-
8-Dec-10	23.10	585.85	87.9	751	6.24	437.1	9.55	8.77	520	-	43	1.3 J	130000	-
29-Mar-11	21.32	587.63	7.1	303	4.76	809.4	13.4	9.35	350 J	-	43	0.55 J	110000	-
21-Jun-11	26.04	582.91	11.2	840	3.24	300.2	8.5	8.4	790	-	18	0.58 J	110000	-
28-Sep-11	32.43	576.52	10.9	66.6	3.92	415.6	8.32	7.3	590	-	5 U	0.19 J	110000	-
14-Dec-11	27.19	581.76	9	605	1.56	329.9	21.9	7.89	570	-	11	0.79 J	150000	-
20-Mar-12	17.23	591.72	6.7	639	5.03	362.5	59.9	7.79	200	-	17	2 U	79000	-
19-Jun-12	25.63	583.32	9.6	681	5.24	373.2	5.94	7.43	430	-	7.4	0.4 U	76000	-
19-Sep-12	32.12	576.83	11.7	786	3.49	290	7.36	7.38	460	-	5.7	0.4 U	81000	-
19-Dec-12	19.00	589.95	8.9	977	4.55	308	26.9	7.98	440	-	20	1.3	150000	-
25-Feb-13	24.93	584.02	7.1	766	7.59	306.9	6.18	8.2	450	-	34	0.73	120000	-
22-May-13	26.84	582.11	9.1	705	3.94	412.9	5.97	9.33	430	-	43	0.52	140000	-
21-Aug-13	32.84	576.11	11.2	879	4.54	110.2	8.28	8.28	548	-	9.5	0.1 U	106000	-
20-Nov-13	25.21	583.74	11.1	1264	4.69	201.4	30.8	7.55	640	-	24.9	1.9	163000	-
1-Apr-14	18.81	590.14	8.4	448	3.5	194.9	14.7	8.87	342	-	14.8	0.3	78400	-
21-May-14	23.84	585.11	10.6	122	1.32	199.3	-	8.46	352	-	18	0.2	80400	-
13-Aug-14	32.25	576.70	12.46	796	5.77	54	8.01	8.68	628	-	16.1	0.1 U	165000	-
13-Nov-14	27.21	581.74	13.3	837	4.02	234.3	11.4	8.63	711	-	44.1	0.4	203000	-
11-Feb-15	18.54	590.41	8.4	609	1.75	16	87.4	9.71	435	-	36.2	1	117000	-
4-May-15	27.52	581.43	9.9	974	3.27	356.5	12.3	10.14	654	-	41.6	0.5	199000	-
6-Aug-15	33.98	574.97	11.7	822	1.77	113.7	4.02	8.83	670	-	19.1	0.1 U	210000	-
4-Nov-15	28.51	580.44	11.7	1207	4.85	206.3	21.2	7.48	1090	-	7.7	1	370000	-
10-Feb-16	20.96	587.99	6.9	712	2.3	145.8	20.1	10.82	575	-	121	1.1	173000	-
2-May-16	28.91	580.04	10.6	1856	0.19	111.2	15.6	11.53	1010	-	199	2.5 J-	347000	-
23-Aug-16	33.58	575.37	11.4	1241	0.43	462	8.89	9.51	1150	-	38.9	0.341	349000	-
2-Nov-16	26.92	582.03	11.6	409	5.05	14.4	40.6	9.15	911	-	25.6	1.49	297000	-
1-Feb-17	24.61	584.34	6.2	1757	2.34	72.1	11.7	11.97	880	-	141	0.336	283000	-
30-May-17	24.56	584.39	10.8	1026	2.45	5.69	16.9	10.5	629	-	72.8	0.52 J+	210000	-
17-Aug-17	32.04	576.91	13.1	1019	3.94	87.3	42.7	9.36	726	-	20.3	0.15	219000	-
10-Nov-17	27.72	581.23	11.6	1090	4.17	109.6	38.2	9.12	931	-	24.3	2.77	356000	-
27-Feb-18	20.78	588.17	7	823	3.99	59.3	12	11.29	635	-	99.3	0.561	203000	-
1-May-18	22.58	586.37	8.9	1442	3.52	-	17.7	11.49	817	-	119	0.831 J+	250000	-
21-Aug-18	33.09	575.86	13.18	1153	1.01	139.8	9.68	10.06	989	-	53.6	0.345	334000	-
6-Nov-18	29.74	579.21	11.1	1719	3.85	218.4	6.49	8.13	1860	-	3.04	0.367	701000 J+	-
13-Mar-19	22.90	586.05	5.8	748	5.04	145.7	32	10.55	737	-	39.1	0.455	246000	-
8-May-19	25.63	583.32	9.1	936	5.95	75.9	7.6	10.38	747	-	54.7	1.27	246000	-
26-Aug-19	32.90	576.05	11.18	1622	0.88	Note 1	6.57	8.97	1510	-	18.8	0.507	478000	-
13-Nov-19	30.92	578.03	10.2	1320	1.45	172.7	5.1	8.33	1140	-	6.31	0.1 U	422000	-

**Table A-2f: Summary of Lower Disposal Area - Shallow/Alluvial Groundwater Sampling Results - Well MW-6A
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters									Gen. Chem.	Metals (ug/L)				
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)	Total Dissolved Solids (mg/L)		Antimony	Arsenic	Lead	Potassium	Vanadium
12-Feb-20	15.95	593.00	7.7	437.7	1.4	150.6	19.7	8.13	379	-	2.12	0.1 U	122000	-	
12-Aug-20	32.30	576.65	11	2360	2.25	162.9	13.4	8.16	2060	-	6.28	0.088 J	709000	-	
9-Dec-20	27.60	581.35	10.8	1750	1.95	209	22	8.22	1500	-	3.14	0.984	539000	-	
3-Mar-21	22.58	586.37	7.1	760	1.74	208	5.6	8.04	722	-	3.09	0.307	243000	-	
9-Jun-21	31.07	577.88	9.8	2077	4.83	197.3	1.81	8.08	1900	-	5.03	0.094 J	707000	-	
13-Oct-21	29.39	579.56	11.2	2509	4.77	188.6	13.1	7.64	DRY	DRY	DRY	DRY	DRY	DRY	
6-Jan-22	20.72	588.23	7.3	1136	8.21	229.4	2.04	7.98	1040	7.89	2.41	0.115	333000	0.912	
16-Mar-22	19.23	589.72	7.3	828	7.3	176.4	3.63	7.57	808	7.90	2.85	0.155	255000	0.935	

Notes:

Top of casing elevation (feet NAVD88): 608.95

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- Not measured or not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL.

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

Note 1 ORP measurements not available due to faulty sensor.

µmhos/cm Micromhos per centimeter

mg/L Milligrams per liter

feet bmp Feet below measuring point

mV Millivolts

feet NAVD88 Feet NAVD88 Datum

NTU Nephelometric Turbidity Unit

**Table A-2g: Summary of Lower Disposal Area - Shallow/Alluvial Groundwater Sampling Results - Well MW-7A
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)				
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	6	5	15	-	80
13-Oct-21	13.61	579.08	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
10-Jan-22	4.73	587.96	7.00	467	5.45	197.0	2.99	7.34	419	3.89	2.07	0.1 U	98000	1.04
21-Mar-22	3.21	589.48	7.3	691	6.38	66.2	1.52	7.46	632	6.23	2.88	0.071 J	179000	1.34

Notes:

Top of casing elevation (feet NAVD88): 592.69

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- Not measured or not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

µmhos/cm Micromhos per centimeter

feet bmp Feet below measuring point

feet NAVD88 Feet NAVD88 Datum

mg/L Milligrams per liter

mV Millivolts

NTU Nephelometric Turbidity Unit

**Table A-2h: Summary of Lower Disposal Area - Shallow/Alluvial Groundwater Sampling Results - Well MW-8A
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)				
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	6	5	15	-	80
13-Oct-21	23.91	577.58	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
6-Jan-22	13.55	587.94	9.5	670	3.99	239.1	4.50	7.05	595	5.21	6.64	0.1 U	169000	3.87
21-Mar-22	12.11	589.38	8.0	587	7.13	45	3.32	7.71	536	4.76	7.48	0.1 U	163000	3.84

Notes:

Top of casing elevation (feet NAVD88): 601.49

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- Not measured or not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

µmhos/cm Micromhos per centimeter

feet bmp Feet below measuring point

feet NAVD88 Feet NAVD88 Datum

mg/L Milligrams per liter

mV Millivolts

NTU Nephelometric Turbidity Unit

**Table A-2i: Summary of Lower Disposal Area - Shallow/Alluvial Groundwater Sampling Results - Well MW-9A
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)				
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	6	5	15	-	80
15-Oct-21	4.38	692.91	12.20	956	1.45	-93.2	2.70	7.11	981 J-	0.659	4.79	0.139	16000	1.2
7-Jan-22	2.45	694.84	8.50	381	4.86	189.9	1.43	6.95	404	0.181 J	1.02	0.056 J	2910	1.03
18-Mar-22	2.38	694.91	8.5	423.1	5.19	138.3	1.17	7.16	403	0.154 J	0.788	0.1 U	2470	0.776

Notes:

Top of casing elevation (feet NAVD88): 697.29

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- Not measured or not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

µmhos/cm Micromhos per centimeter

feet bmp Feet below measuring point

feet NAVD88 Feet NAVD88 Datum

mg/L Milligrams per liter

mV Millivolts

NTU Nephelometric Turbidity Unit

**Table A-2j: Summary of Lower Disposal Area - Shallow/Alluvial Groundwater Sampling Results - Well MW-10A
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)				
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	6	5	15	-	80
15-Oct-21	19.04	678.98	10.7	390	4.24	-115.0	27.80	7.93	383 J-	0.705	4.04	0.383	9700	2.87
6-Jan-22	5.55	692.47	9.3	168	7.06	94.6	6.90	7.50	141	0.151 J	1.13	0.109	2660	1.03
17-Mar-22	5.39	692.63	9.4	150.8	7.12	95.1	6.21	6.50	139	0.2 U	0.91	0.061 J	1880	0.807

Notes:

Top of casing elevation (feet NAVD88): 698.02

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- Not measured or not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

µmhos/cm Micromhos per centimeter

feet bmp Feet below measuring point

feet NAVD88 Feet NAVD88 Datum

mg/L Milligrams per liter

mV Millivolts

NTU Nephelometric Turbidity Unit

**Table A-2k: Summary of Lower Disposal Area - Shallow/Alluvial Groundwater Sampling Results - Well P-16
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)				
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)	Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium	Vanadium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	6	5	15	-	80
15-Oct-21	2.41	700.46	12.30	2622	0.71	-261.2	56.2	12.11	2640 J-	9.16	232	41.1	826000	445
6-Jan-22	2.35	700.52	8.10	2804	1.06	-409.7	1.1	12.75	2420	9.63	109	14.6	809000	292
17-Mar-22	2.73	700.14	8.4	2600	1.16	-421.2	23.5	13.71	2570	8.14	124	10.5	771000	255

Notes:

Top of casing elevation (feet NAVD88): 702.87

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- Not measured or not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

µmhos/cm Micromhos per centimeter

feet bmp Feet below measuring point

feet NAVD88 Feet NAVD88 Datum

mg/L Milligrams per liter

mV Millivolts

NTU Nephelometric Turbidity Unit

**Table A-2I: Summary of Lower Disposal Area - Shallow/Alluvial Groundwater Sampling Results - Well P-17
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)				
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	6	5	15	-	80
15-Oct-21	4.89	715.43	14.00	464	0.98	-97.5	38.1	6.49	444 J-	1 U	16.4	13.1	9700	105
7-Jan-22	3.65	716.67	6.90	389	1.13	-60.4	4.1	6.46	388	1.26	2.81	0.1 U	8030	1.8
18-Mar-22	4.12	716.2	8.4	404.4	1.46	23.7	5.41	7.33	362	1.38	1.34	0.1 U	13300	1.08

Notes:

Top of casing elevation (feet NAVD88): 720.32

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- Not measured or not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

µmhos/cm Micromhos per centimeter

feet bmp Feet below measuring point

feet NAVD88 Feet NAVD88 Datum

mg/L Milligrams per liter

mV Millivolts

NTU Nephelometric Turbidity Unit

APPENDIX A-3

**Summary of Lower Disposal Area –
Bedrock Groundwater Sampling
Results**

Table A-3A Well MWB-1LDA
Table A-3B Well MWB-2LDA
Table A-3C Well MWB-3LDA

**Table A-3a: Summary of Lower Disposal Area - Bedrock Groundwater Sampling Results
- Well MWB-1LDA Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem. Total Dissolved Solids (mg/L)	Metals (ug/L)		
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Arsenic	Lead	Potassium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	5	15	-
19-Dec-06	26.51	678.17	10.96	546	0.43	-115.4	1.05	7.70	310	151	1 U	-
14-Feb-07	26.08	678.60	10.62	397	1.02	-90.8	3.07	7.53	240	160	1 U	-
31-May-07	25.96	678.72	10.83	386	0.36	-172.8	4.20	8.20	220	122	1 U	-
27-Aug-07	25.66	679.02	10.97	372	0.76	-128.2	1.08	7.51	240	89.9	1 U	-
28-Nov-07	26.81	677.87	10.56	371	0.42	-121.2	1.29	8.03	220	88.3	1 U	-
27-Feb-08	25.80	678.88	10.62	371	2.01	-	1.07	-	230	80.9	1 U	3000 U
20-May-08	25.62	679.06	10.61	391	0.36	-53.0	1.11	7.28	230	64.3	1 U	-
27-Aug-08	26.14	678.54	10.58	394	0.50	-63.9	1.02	7.35	230 J	64	1 U	3000 U
19-Nov-08	25.16	679.52	10.33	269	0.45	-88.6	0.48	7.51	230	59.6	1 U	3000 U
11-Feb-09	25.08	679.60	10.04	268	0.48	-	0.97	7.89	230	56	1 U	3000 U
18-May-09	24.83	679.85	10.10	271	0.42	-50.5	1.81	8.05	230 J	46.6	1 U	3000 U
24-Sep-09	26.32	678.36	11.80	323	0.24	202.0	3.59	7.57	260	27	2 U	1100 J
17-Dec-09	25.06	679.62	10.10	370	0.94	179.0	4.16	7.77	<40	34	2 U	1200 J
23-Mar-10	24.83	679.85	10.90	344	0.21	397.4	3.17	7.57	240	25	2 U	1300 J
15-Jun-10	24.38	680.30	10.50	355	0.08	195.5	0.42	7.66	150	27	2 U	1100 J
20-Sep-10	25.74	678.94	10.50	354	0.06	192.9	0.20	7.65	200	22	2 U	1100 J
6-Dec-10	24.59	680.09	10.00	347	0.09	99.3	0.17	7.86	230	22	2 U	1000 J
28-Mar-11	24.01	680.67	10.00	173	0.16	90.6	0.88	7.58	200	22	2 U	1000 J
20-Jun-11	24.11	680.57	10.30	330	0.07	121.5	0.17	7.65	250	22	2 U	900 J
26-Sep-11	25.39	679.29	10.40	2906	0.06	123.6	0.43	7.65	280	15	2 U	1100 J
14-Dec-11	24.61	680.07	9.90	245	0.10	193.8	1.76	7.57	230	21	2 U	1200 J
21-Mar-12	23.70	680.98	10.10	392	0.07	392.0	0.22	7.47	240	23	2 U	1100 J
18-Jun-12	23.90	680.78	10.50	383	0.02	342.8	0.30	7.67	230	20	0.4 U	3300 U
19-Sep-12	25.38	679.30	10.30	402	0.01	151.0	0.44	7.63	220	19	0.4 U	1000 J
18-Dec-12	23.59	681.09	10.10	492	0.00	-45.7	0.16	7.70	92	17	0.4 U	1200 J
25-Feb-13	23.73	680.95	9.90	377	0.00	177.1	0.37	7.53	270 J	19	0.4 U	1000 J
22-May-13	23.85	680.83	9.90	398	0.00	430.4	0.44	7.73	290	17	0.4 U	3300 U
21-Aug-13	25.34	679.34	10.40	467	0.01	-31.7	0.55	7.68	238	16.8	0.08 J	1060
19-Nov-13	24.25	680.43	10.10	361	0.00	70.3	0.32	7.30	232	15.7	0.1 U	1040
31-Mar-14	22.36	682.32	10.70	286	0.01	107.4	0.21	7.79	211	13.8	0.1 U	1020
21-May-14	23.29	681.39	8.54	271	1.35	54.3	-	7.14	198	13.1	0.1 U	1000
12-Aug-14	24.87	679.81	14.79	335	0.41	-16.0	2.02	7.05	216	11.9	0.1 U	1010
11-Nov-14	24.96	679.72	10.10	262	0.79	11.1	1.51	7.49	221	13.6	0.1 U	1090
10-Feb-15	23.23	681.45	10.40	319	0.25	-114.0	0.36	7.70	240	13.3	0.1 U	960
4-May-15	23.62	681.06	10.20	370	0.05	175.1	0.16	7.70	224	11.7	0.1 U	960
4-Aug-15	25.30	679.38	11.00	279	0.06	-30.5	0.72	7.72	234	14.4	0.1 U	990
4-Nov-15	25.35	679.33	10.60	263	0.00	51.2	0.46	7.46	233	11	0.1 U	1150
8-Feb-16	23.03	681.65	10.20	319	0.03	206.5	0.20	7.77	210	12.1	0.1 U	1050
2-May-16	23.49	681.19	Monitored Semi-Annually ¹						Monitored Annually ¹			
22-Aug-16	25.00	679.68	11.10	323	0.02	-55.2	1.10	7.64	Monitored Annually ¹			
1-Nov-16	24.29	680.39	Monitored Semi-Annually ¹						Monitored Annually ¹			
31-Jan-17	23.06	681.62	10.20	391	0.05	169.3	0.13	7.66	223	11.9	0.1 U	1030
30-May-17	22.45	682.23	Monitored Semi-Annually ¹						Monitored Annually ¹			
16-Aug-17	24.27	680.41	10.70	385	0.15	123.4	0.40	7.64	Monitored Annually ¹			
9-Nov-17	21.89	680.27	Monitored Semi-Annually ¹						Monitored Annually ¹			
28-Feb-18	22.04	682.64	10.10	276	0.20	-96.4	0.25	7.44	221	10.8	0.1 U	951
1-May-18	22.11	682.57	Monitored Semi-Annually ¹						Monitored Annually ¹			
22-Aug-18	24.42	680.26	11.37	277	5.25	-59.6	0.18	7.61	Monitored Annually ¹			
6-Nov-18	24.57	680.11	Monitored Semi-Annually ¹						Monitored Annually ¹			
11-Mar-19	22.61	682.07	10.10	248	0.60	-70.8	0.68	7.60	224	8.74	0.1 U	1070
8-May-19	22.68	682.00	Monitored Semi-Annually ¹						Monitored Annually ¹			
27-Aug-19	24.54	680.14	11.45	282	0.58	Note 1	0.04	7.30	Monitored Annually ¹			
13-Nov-19	24.15	680.53	Monitored Semi-Annually ¹						Monitored Annually ¹			

**Table A-3a: Summary of Lower Disposal Area - Bedrock Groundwater Sampling Results
- Well MWB-1LDA Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)		
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Arsenic	Lead
13-Feb-20	22.04	682.64	10.10	280	0.34	-133.4	0.57	7.51	207	8.82	0.1 U	1050
13-Aug-20	23.92	680.76	11.00	284	0.60	-113.5	0.44	7.55	Monitored Annually ¹			
9-Dec-20	23.35	681.33	Monitored Semi-Annually ¹						Monitored Annually ¹			
5-Mar-21	22.01	682.67	10.20	266	0.04	-50.0	0.42	7.64	214	10.5	0.1 U	1120
10-Jun-21	23.17	681.51	Monitored Semi-Annually ¹						Monitored Annually ¹			
13-Oct-21	24.41	680.27	10.90	327.2	0.91	-76.1	0.33	7.48	Monitored Annually ¹			
5-Jan-22	22.00	682.68	Monitored Semi-Annually ¹						Monitored Annually ¹			
17-Mar-22	21.89	682.79	10.7	259.6	1.24	-60.4	0.22	6.52	220	8.2	0.1 U	925

Note:

Top of casing elevation (feet NAVD88): 704.68

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021.

Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

1 Reduction in monitoring frequency approved by Public Health – Seattle and King County in a letter to Golder Associates Inc. dated April 7, 2016. Field parameters collected semi-annually, analytical samples collected annually. Sampling schedule follows the Golder 2021 RI Work Plan starting in Q3 2021.

- Not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL.

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

Note 1 ORP measurements not available due to faulty sensor.

µmhos/cm Micromhos per centimeter

feet bmp Feet below measuring point

feet NAVD88 Feet NAVD88 Datum

mg/L Milligrams per liter

mV Millivolts

NTU Nephelometric Turbidity Unit

**Table A-3b: Summary of Lower Disposal Area - Bedrock Groundwater Sampling Results
- Well MWB-2LDA Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)		
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Arsenic	Lead
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	5	15	-
19-Dec-06	36.82	704.84	12.15	394	0.57	114.6	1.84	7.58	230	8.49	1 U	-
14-Feb-07	36.30	705.36	11.69	339	1.40	-85.7	2.72	7.39	200	6.09	1 U	-
31-May-07	36.93	704.73	12.13	346	0.20	-223.7	3.04	8.28	210	6.95	1 U	-
27-Aug-07	37.99	703.67	12.18	336	0.49	-169.7	0.84	7.54	210	7.49	1 U	-
28-Nov-07	37.89	703.77	11.82	338	0.28	-146.6	1.32	7.93	250	6.91	1 U	-
27-Feb-08	37.24	704.42	11.87	340	0.23	-	0.87	7.41	210	7.46	1 U	3000 U
20-May-08	37.31	704.35	11.91	359	0.23	-86.6	0.67	7.27	200	6.31	1 U	-
27-Aug-08	38.37	703.29	11.84	362	0.35	-77.6	0.70	7.21	210 J	6.36	1 U	3000 U
19-Nov-08	37.50	704.16	11.53	254	0.44	-105.9	2.08	7.45	200	5.86	1 U	3000 U
11-Feb-09	37.10	704.56	11.25	254	0.48	-	0.63	7.91	220	5.61	1 U	3000 U
18-May-09	37.00	704.66	11.42	258	0.42	-71.9	1.11	8.00	210 J	5.17	1 U	3000 U
25-Sep-09	38.88	702.78	13.10	297	0.14	140.7	3.09	7.54	230	6.5	2 U	1200 J
17-Dec-09	37.19	704.47	10.80	341	0.51	129.0	4.85	7.71	74	4.3	2 U	1100 J
23-Mar-10	36.60	705.06	12.60	323	0.27	355.0	5.28	7.54	110	7.6	2 U	1200 J
15-Jun-10	36.25	705.41	11.40	326	0.08	171.1	-	7.62	98	8.8	2 U	1100 J
20-Sep-10	37.85	703.81	11.60	324	0.08	144.0	0.16	7.61	160	6.5	2 U	1200 J
6-Dec-10	36.60	705.06	11.00	319	0.21	78.3	0.20	7.81	210	2.9	2 U	900 J
29-Mar-11	35.98	705.68	11.20	156	0.15	215.0	0.75	7.48	200	5.6	2 U	1500 J
21-Jun-11	36.34	705.32	11.80	352	0.06	101.5	0.24	7.59	220	5 U	2 U	1000 J
27-Sep-11	38.14	703.52	11.50	2484	0.06	114.4	0.45	7.60	220	5 U	2 U	1000 J
14-Dec-11	36.91	704.75	11.00	228	0.05	127.2	4.04	7.54	190	6.7	2 U	1200 J
21-Mar-12	35.68	705.98	11.00	359	0.05	93.9	0.30	7.43	210	6.9	2 U	1100 J
18-Jun-12	36.06	705.60	11.70	350	0.02	211.9	0.23	7.62	220	6.2	0.4 U	3300 U
19-Sep-12	38.07	703.59	11.60	367	0.00	102.0	0.34	7.59	200	6.5	0.4 U	1000 J
18-Dec-12	34.88	706.78	10.90	463	0.00	-97.8	0.17	7.81	68	6	0.4 U	1200 J
25-Feb-13	35.70	705.96	10.90	347	0.09	112.6	0.27	7.56	190	6.6	0.4 U	1100 J
22-May-13	36.24	705.42	11.00	412	0.00	412.5	0.43	7.71	190	6	0.4 U	3300 U
20-Aug-13	38.13	703.53	12.20	406	0.02	-41.5	0.64	7.48	211	5.5	0.1 U	1030
19-Nov-13	36.56	705.10	11.10	344	0.01	43.6	0.32	7.35	206	5.2	0.1 U	1090
31-Mar-14	35.36	706.30	11.50	285	0.00	93.1	0.31	7.71	207	5.1	0.1 U	1100
22-May-14	35.80	705.86	10.05	260	0.24	17.5	-	7.22	186	5	0.1 U	1000
13-Aug-14	37.50	704.16	13.10	294	0.57	-37.5	3.28	7.19	190	5.4	0.1 U	1110
11-Nov-14	37.06	704.60	10.10	241	0.68	-39.7	2.10	7.48	206	5.4	0.1 U	1090
10-Feb-15	35.70	705.96	11.40	295	0.11	-123.2	2.11	7.69	206	5.1	0.1 U	1020
4-May-15	36.34	705.32	11.70	336	0.05	340.2	0.72	7.73	204	4.8	0.1 U	1040
4-Aug-15	38.42	703.24	12.70	263	0.04	-81.8	0.77	7.72	204	5.8	0.1 U	1040
4-Nov-15	37.81	703.85	11.60	244	0.04	26.9	2.13	7.45	201	4.7	0.1 U	1070
8-Feb-16	35.68	705.98	11.60	307	0.00	208.4	0.74	7.68	186	5.5	0.1 U	1110
2-May-16	36.03	705.63	Monitored Semi-Annually ¹						Monitored Annually ¹			
22-Aug-16	37.92	703.74	12.20	306	0.02	-137.6	1.58	7.67	Monitored Annually ¹			
1-Nov-16	37.07	704.59	Monitored Semi-Annually ¹						Monitored Annually ¹			
31-Jan-17	36.00	705.66	10.90	348	0.10	120.5	0.86	7.67	195	5.66	0.1 U	1110
30-May-17	35.44	706.22	Monitored Semi-Annually ¹						Monitored Annually ¹			
16-Aug-17	37.69	703.97	12.30	356	0.14	-77.2	3.27	7.67	Monitored Annually ¹			
9-Nov-17	37.11	704.55	Monitored Semi-Annually ¹						Monitored Annually ¹			
28-Feb-18	34.95	706.71	10.90	261	0.21	-115.5	0.80	7.48	205	5.69	0.1 U	992
1-May-18	35.11	706.55	Monitored Semi-Annually ¹						Monitored Annually ¹			
22-Aug-18	37.90	703.76	12.31	262	1.64	-80.3	0.92	7.56	Monitored Annually ¹			
6-Nov-18	37.66	704.00	Monitored Semi-Annually ¹						Monitored Annually ¹			
12-Mar-19	35.68	705.98	10.70	239	0.58	-75.1	0.59	7.48	188	5.5	0.1 U	1080
8-May-19	35.86	705.80	Monitored Semi-Annually ¹						Monitored Annually ¹			
27-Aug-19	37.85	703.81	12.30	265	0.43	Note 1	0.02	7.46	Monitored Annually ¹			
13-Nov-19	37.22	704.44	Monitored Semi-Annually ¹						Monitored Annually ¹			

**Table A-3b: Summary of Lower Disposal Area - Bedrock Groundwater Sampling Results
- Well MWB-2LDA Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)		
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Arsenic	Lead
13-Feb-20	35.10	706.56	10.80	261	0.39	-135.9	0.96	7.50	185	5.45	0.1 U	1150
13-Aug-20	37.21	704.45	11.60	266	0.54	-118.2	1.35	7.50	Monitored Annually ¹			
9-Dec-20	36.55	705.11	Monitored Semi-Annually ¹						Monitored Annually ¹			
5-Mar-21	35.02	706.64	11.10	255	0.04	-80.0	2.29	7.65	176	5.52	0.1 U	1090
10-Jun-21	36.29	705.37	Monitored Semi-Annually ¹						Monitored Annually ¹			
13-Oct-21	37.76	703.90	11.70	308	3.66	-44.7	0.32	7.43	Monitored Annually ¹			
5-Jan-22	35.31	706.35	Monitored Semi-Annually ¹						Monitored Annually ¹			
17-Mar-22	34.52	707.14	11.6	244.3	2.84	-60.6	3.21	6.56	201	5.53	0.071 J	1060

Note:

Top of casing elevation (feet NAVD88): 741.66

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021.

Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

1 Reduction in monitoring frequency approved by Public Health – Seattle and King County in a letter to Golder Associates Inc. dated April 7, 2016. Field parameters collected semi-annually, analytical samples collected

- Not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL.

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

Note 1 ORP measurements not available due to faulty sensor.

µmhos/cm Micromhos per centimeter

mg/L Milligrams per liter

feet bmp Feet below measuring point

mV Millivolts

feet NAVD88 Feet NAVD88 Datum

NTU Nephelometric Turbidity Unit

**Table A-3c: Summary of Lower Disposal Area - Bedrock Groundwater Sampling Results
- Well MWB-3LDA Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)		
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	5	15	-
19-Dec-06	7.08	737.11	11.37	670	0.42	-171.2	1.20	9.23	500	25.7	1 U	-
23-Jan-07	5.62	738.57	13.07	383	0.51	-275.0	1.53	8.63	270	18.4	1 U	-
14-Feb-07	5.81	738.38	12.57	328	1.09	-158.2	115.00	7.86	310	15.1	1 U	-
29-Mar-07	4.78	739.41	12.44	458	0.57	-140.8	4.25	7.78	260 J	37.9	1 U	-
17-Apr-07	4.86	739.33	12.79	389	0.27	-102.4	1.22	7.46	240	23	1 U	-
31-May-07	6.39	737.80	12.98	394	0.29	-223.8	3.32	8.14	240	21.2	1 U	-
20-Jun-07	6.86	737.33	13.41	412	6.10	-128.5	1.35	8.02	230 J	23.8	1 U	-
31-Jul-07	7.96	736.23	13.47	417	0.77	-174.1	0.92	7.64	250	18.9	1 U	-
27-Aug-07	8.50	735.69	12.84	395	0.46	-132.4	1.97	7.43	250	17.6	1 U	-
27-Sep-07	9.58	734.61	12.68	294	0.51	-133.8	0.53	7.87	250	19.3	1 U	-
26-Oct-07	9.65	734.54	12.49	288	0.84	-111.9	9.83	7.60	240 J	11	1 U	-
28-Nov-07	10.23	733.96	11.95	362	0.64	-86.1	1.58	7.87	200	17.8	1 U	-
12-Dec-07	9.66	734.53	11.83	334	0.26	-93.2	0.63	7.63	280 J	17.4	1 U	-
24-Jan-08	8.20	735.99	11.09	335	0.44	-108.3	-	7.46	220	19.2	1 U	-
26-Feb-08	7.61	736.58	12.26	337	0.48	-	2.40	7.45	210	22	1 U	3000 U
25-Mar-08	7.22	736.97	11.94	337	1.01	-48.6	2.80	7.51	210	17.8	1 U	-
29-Apr-08	6.75	737.44	12.53	332	0.77	-50.3	1.95	7.41	200 J	18.2	1 U	-
19-May-08	7.17	737.02	12.37	336	0.57	-57.2	2.19	7.34	200 J	18.7	1 U	-
18-Jun-08	7.26	736.93	12.11	323	0.48	-64.1	0.83	7.13	190 J	19.5	1 U	-
26-Aug-08	8.78	735.41	12.31	329	1.16	-36.5	2.89	7.30	200 J	17.7	1 U	3000 U
19-Nov-08	9.03	735.16	11.91	243	0.52	-93.1	1.69	7.40	190	18.2	1 U	3000 U
11-Feb-09	7.07	737.12	11.74	227	0.65	-	1.03	7.76	180	17.7	1 U	3000 U
18-May-09	6.50	737.69	12.11	225	0.67	-63.9	1.51	7.83	190 J	12.9	1 U	3000 U
25-Sep-09	10.47	733.72	13.50	260.1	0.36	215.3	4.14	7.61	220	17	0.94 J	12000
17-Dec-09	8.39	735.80	11.50	301.0	0.44	110.0	3.10	7.71	270	23	2 U	1300 J
23-Mar-10	6.46	737.73	12.20	294.8	0.43	332.5	3.52	7.57	150 J	27	2 U	1300 J
16-Jun-10	5.34	738.85	11.10	281.7	0.05	117.0	-	7.71	160	27	2 U	1300 J
21-Sep-10	7.72	736.47	11.80	276.3	0.06	169.5	0.36	7.54	140	23	2 U	1300 J
7-Dec-10	6.48	737.71	11.00	263.0	0.15	77.2	0.38	7.58	180	20	2 U	1200 J
28-Mar-11	4.42	739.77	10.80	134.0	0.44	75.6	1.06	7.46	160 J	21	2 U	1700 J
20-Jun-11	4.76	739.43	12.10	252.7	0.07	68.4	0.13	7.48	200 J	16	2 U	1000 J
27-Sep-11	7.86	736.33	11.90	2064.0	0.04	102.6	0.37	7.48	170	18	2 U	1100 J
14-Dec-11	7.17	737.02	11.00	188.2	0.03	140.8	1.87	7.50	770	22	2 U	1300 J
21-Mar-12	4.68	739.51	10.70	297.8	0.07	130.6	0.41	7.39	170	21	2 U	1100 J
18-Jun-12	4.75	739.44	11.60	289.0	0.16	271.3	0.55	7.54	150 J+	19	0.4 U	3300 U
19-Sep-12	7.65	736.54	12.60	299.9	0.10	121.0	0.42	7.50	160	18	0.4 U	1100 J
18-Dec-12	5.58	738.61	10.90	384.0	0.03	15.6	1.39	7.50	200	19	0.4 U	1300 J
25-Feb-13	4.80	739.39	10.60	284.2	0.03	140.4	0.30	7.53	150	22	0.4 U	1200 J
22-May-13	4.81	739.38	11.00	294.9	0.14	387.7	0.52	7.61	160	18	0.4 U	3300 U
20-Aug-13	7.63	736.56	12.60	383.0	0.81	-8.4	0.80	7.26	164	16.7	0.1 U	1060
19-Nov-13	7.11	737.08	11.30	218.1	0.14	54.3	0.73	7.20	169	16.6	0.1 U	1130
1-Apr-14	4.08	740.11	10.70	222.6	0.15	158.5	1.12	7.50	168	13.3	0.1 U	1070
22-May-14	4.21	739.98	9.98	206.0	1.59	27.1	-	7.17	158	11.2	0.1 U	1000
13-Aug-14	6.95	737.24	13.50	237.0	1.14	9.8	4.70	6.92	154	10.5	0.1 U	990
12-Nov-14	6.04	738.15	8.40	185.1	0.28	-10.1	3.42	7.36	162	16.1	0.1 U	1050
11-Feb-15	4.62	739.57	11.50	205.1	1.20	68.1	1.32	7.41	169	9	0.1 U	1100
4-May-15	4.93	739.26	12.20	262.0	1.64	190.2	0.84	7.43	168	10.9	0.1 U	1010
4-Aug-15	7.44	736.75	13.20	211.3	1.62	81.9	2.02	7.39	173	6.8	0.1 U	1020
5-Nov-15	8.14	736.05	12.50	186.0	1.49	166.9	1.87	7.10	162	3.5	0.1 U	1040
8-Feb-16	3.20	740.99	11.70	240.5	2.13	196.9	0.88	7.23	150	11.2	0.1 U	980
2-May-16	3.77	740.42	Monitored Semi-Annually ¹						Monitored Annually ¹			
22-Aug-16	6.81	737.38	13.10	238.0	2.40	168.5	2.39	7.41	Monitored Annually ¹			
1-Nov-16	6.59	737.60	Monitored Semi-Annually ¹						Monitored Annually ¹			
31-Jan-17	4.02	740.17	11.30	265.8	2.79	218.2	1.39	7.34	154	3.23	0.1 U	953
30-May-17	2.32	741.87	Monitored Semi-Annually ¹						Monitored Annually ¹			
16-Aug-17	5.48	738.71	13.20	258.4	3.54	92.2	2.50	7.41	Monitored Annually ¹			
9-Nov-17	6.00	738.19	Monitored Semi-Annually ¹						Monitored Annually ¹			
28-Feb-18	1.13	743.06	10.80	186.9	4.11	142.0	1.83	7.18	159	2.53	0.1 U	848
1-May-18	1.60	742.59	Monitored Semi-Annually ¹						Monitored Annually ¹			
22-Aug-18	5.93	738.26	13.55	194	7.63	16.9	0.77	7.11	Monitored Annually ¹			
6-Nov-18	6.78	737.41	Monitored Semi-Annually ¹						Monitored Annually ¹			
12-Mar-19	2.32	741.87	10.50	166	4.32	167.7	1.34	7.14	149	1.87	0.1 U	953
8-May-19	2.57	741.62	Monitored Semi-Annually ¹						Monitored Annually ¹			
27-Aug-19	5.76	738.43	13.62	192	3.94	Note 1	0.02	7.09	Monitored Annually ¹			
13-Nov-19	6.00	738.19	Monitored Semi-Annually ¹						Monitored Annually ¹			

**Table A-3c: Summary of Lower Disposal Area - Bedrock Groundwater Sampling Results
- Well MWB-3LDA Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)		
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
13-Feb-20	1.69	742.50	10.70	180	3.20	88.5	1.21	7.11	140	1.69	0.1 U	915
13-Aug-20	4.59	739.60	13.60	188.7	4.26	50.3	1.60	7.19	Monitored Annually ¹			
9-Dec-20	4.22	739.97	Monitored Semi-Annually ¹						Monitored Annually ¹			
5-Mar-21	1.06	743.13	10.90	172.0	3.43	132	0.69	7.26	136	1.84	0.1 U	877
10-Jun-21	3.46	740.73	Monitored Semi-Annually ¹						Monitored Annually ¹			
13-Oct-21	6.17	738.02	12.90	215.1	4.10	148.3	0.96	7.05	Monitored Annually ¹			
5-Jan-22	0.80	743.39	Monitored Semi-Annually ¹						Monitored Annually ¹			
17-Mar-22	0.2	743.99	11.4	166.1	5.44	58.3	0.79	7.54	151	1.58	0.1 U	1200

Note:

Top of casing elevation (feet NAVD88): 744.19

Dissolved metals were analyzed at the site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021.

Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the

1 Reduction in monitoring frequency approved by Public Health – Seattle and King County in a letter to Golder

Associates Inc. dated April 7, 2016. Field parameters collected semi-annually, analytical samples collected

- Not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL.

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

Note 1 ORP measurements not available due to faulty sensor.

µmhos/cm Micromhos per centimeter

feet bmp Feet below measuring point

feet NAVD88 Feet NAVD88 Datum

mg/L Milligrams per liter

mV Millivolts

NTU Nephelometric Turbidity Unit

APPENDIX A-4

Summary of Dale Strip Pit – Bedrock Groundwater Sampling Results

Table A-4A Well MWB-1SDSP
Table A-4B Well MWB-1DDSP
Table A-4C Well MWB-5DSP
Table A-4D Well MWB-6DSP
Table A-4E Portal
Table A-4F Well MWB-2DSP
Table A-4G Well MWB-4SDSP

**Table A-4a: Summary of Dale Strip Pit - Bedrock Groundwater Sampling Results - Well MWB-1SDSP
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)		
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Arsenic	Lead
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	5	15	-
2-Dec-02	69.87	866.42	9.5	1690	-	-	-	7.29	910	46.6	2.68	-
3-Mar-03	36.83	899.46	11.5	1260	-	-	24.10	7.15	860	9.73	-	-
3-May-03	34.88	901.41	12.8	1520	-	-	38.00	7.09	950	-	-	-
3-Aug-03	52.02	884.27	19.19	1460	-	-	11.40	7.01	990	-	-	-
1-Nov-03	53.61	882.68	11.60	915	-	-	8.97	7.19	1010	8.58	0.695	-
1-Feb-04	32.75	903.54	11.52	1033	-	-	7.36	6.78	1060	-	-	-
1-May-04	42.50	893.79	14.87	1126	-	-	7.53	7.23	1020	-	-	-
1-Aug-04	49.26	887.03	13.72	1234	-	-	8.07	6.98	981	-	-	-
1-Nov-04	42.81	893.48	11.88	1429	-	-	9.06	6.92	1060	10	1 U	-
1-Feb-05	33.62	902.67	13.06	1615	-	-	7.11	7.01	1020	-	-	-
1-May-05	34.88	901.41	12.91	1459	-	-	6.54	6.85	1000	-	-	-
1-Aug-05	43.80	892.49	10.40	1472	-	-	10.40	6.80	1090	-	-	-
1-Nov-05	52.80	883.49	10.40	1458	-	-	6.02	6.64	1100	10.3	1 U	-
1-Feb-06	42.70	893.59	10.40	1343	1.10	48.3	11.10	7.08	1100 J	-	-	-
1-May-06	37.81	898.48	11.52	1686	1.64	49.2	10.50	6.83	1100	-	-	-
1-Aug-06	46.11	890.18	14.10	1357	2.33	43.0	10.70	7.11	1100	-	-	-
1-Nov-06	46.47	889.82	-	-	-	-	-	-	-	-	-	-
28-Dec-06	33.20	903.09	-	-	-	-	-	-	-	-	-	-
7-Feb-07	34.50	901.79	-	-	-	-	-	-	-	-	-	-
7-May-07	36.48	899.81	15.19	1484	0.52	-83.4	6.78	7.60	1100	-	-	-
7-Aug-07	47.57	888.72	11.21	1488	8.80	107.4	9.53	6.51	1200	-	-	-
27-Nov-07	51.25	885.04	13.60	1483	1.82	-129.5	434.00	7.11	1000 J	5.72	1 U	-
8-Feb-08	35.12	901.17	14.71	1489	3.11	-	10.20	6.97	1100	-	-	-
8-May-08	37.60	898.69	14.50	1594	3.99	112.5	4.71	6.90	1200 J	-	-	-
8-Aug-08	46.98	889.31	13.27	1617	2.49	105.3	5.32	6.96	1200 J	7.82	1 U	5570
1-Nov-08	43.35	892.94	11.17	1096	7.29	127.1	47.30	7.70	1100	9.8	1 U	5610
11-Feb-09	37.00	899.29	10.28	1112	4.15	-	7.68	7.25	1100	7.52	1 U	5560
9-May-09	36.53	899.76	13.87	1209	2.93	89.0	5.45	7.41	990 J	7.57	1 U	5580
24-Sep-09	53.61	882.68	12.10	1328	1.98	331.0	3.26	6.92	1200	7.9	2 U	5700
14-Dec-09	33.72	902.57	10.20	1519	0.55	393.0	2.82	6.99	1100	3.4	2 U	5700
22-Mar-10	35.11	901.18	10.90	1463	-	508.0	3.95	6.94	1200	10	2 U	5600
15-Jun-10	33.26	903.03	11.00	1485	0.20	210.3	1.50	7.02	1100	11	2 U	5900
20-Sep-10	45.81	890.48	11.30	1484	0.06	159.7	0.91	6.98	1100	9.1	0.48 J	6000
6-Dec-10	36.20	900.09	10.70	1494	0.08	35.4	0.24	7.21	1200	6.8	0.48 J	5200
28-Mar-11	35.07	901.22	10.70	749	0.08	136.8	0.16	6.88	1100	6.8	2 U	5500
20-Jun-11	38.53	897.76	11.40	1439	0.08	-19.2	0.21	6.99	1400	4.6 J	2 U	5500
26-Sep-11	50.43	885.86	11.20	1249	0.07	38.5	0.41	7.01	1200	4.5 J	2 U	5700
13-Dec-11	51.30	884.99	10.40	1308	0.06	50.3	2.03	7.07	530	7.6	2 U	6100
22-Mar-12	43.75	892.54	10.60	1695	0.08	125.1	0.28	6.99	1200	12	2 U	5700
18-Jun-12	44.86	891.43	Monitored Semiannually ¹									
18-Sep-12	55.74	880.55	12.90	1506	0.05	99.5	0.36	7.08	1300	10	0.4 U	5800
18-Dec-12	41.94	894.35	Monitored Semiannually ¹									
21-Feb-13	37.86	898.43	10.40	1730	0.02	131.5	0.41	7.27	1200	13	0.4 U	6300
22-May-13	39.34	896.95	Monitored Semiannually ¹									
20-Aug-13	49.40	886.89	11.90	1707	0.05	-37.6	0.69	7.00	1240	10.2	0.1 U	6000
19-Nov-13	44.94	891.35	Monitored Semiannually ¹									
31-Mar-14	33.31	902.98	11.20	1256	0.01	103.5	0.27	7.00	1200	13.1	0.1 U	6580
21-May-14	33.37	902.92	Monitored Semiannually ¹									
15-Aug-14	45.31	890.98	13.43	1467	0.71	-1.1	2.32	6.79	1150	13.4	0.1 U	6100
14-Nov-14	44.83	891.46	Monitored Semiannually ¹									
10-Feb-15	35.97	900.32	11.00	1423	0.04	-109.4	2.16	7.00	1200	13	0.1 U	6260
4-May-15	38.67	897.62	Monitored Semiannually ¹									
4-Aug-15	49.21	887.08	12.50	1253	0.04	-100.7	0.26	7.07	1230	13.9	0.1 U	6070
5-Nov-15	56.85	879.44	11.20	1159	0.02	57.4	0.91	6.75	1190	14.9	0.1 U	6990
8-Feb-16	33.02	903.27	11.60	1429	0.00	167.6	0.10	7.05	1190	19.4	0.1 U	6730
2-May-16	37.48	898.81	Monitored Semiannually ²									
22-Aug-16	49.78	886.51	12.10	1232	0.06	-143.8	0.77	7.00	Monitored Annually ²			
1-Nov-16	47.49	888.80	Monitored Semiannually ²									
31-Jan-17	35.57	900.72	11.10	1620	0.05	-241.6	0.24	6.99	1260	21.8	0.1 U	6690
30-May-17	34.70	901.59	Monitored Semiannually ²									
16-Aug-17	44.32	891.97	11.90	1621	0.12	-144.5	0.47	6.97	Monitored Annually ²			
9-Nov-17	44.71	891.58	Monitored Semiannually ²									
28-Feb-18	32.04	904.25	10.70	1278	0.16	-58.5	0.11	6.82	1244	22.4	0.1 U	6530
1-May-18	33.99	902.30	Monitored Semiannually ²									
22-Aug-18	47.95	888.34	11.97	1246	1.17	4.10	0.17	6.88	Monitored Annually ²			

Table A-4a: Summary of Dale Strip Pit - Bedrock Groundwater Sampling Results - Well MWB-1SDSP Ravensdale Site, Ravensdale, Washington

Date Sampled	Field Parameters									Gen. Chem.	Metals (ug/L)			
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)	Total Dissolved Solids (mg/L)		Arsenic	Lead	Potassium	
6-Nov-18	52.94	883.35	Monitored Semiannually ²									Monitored Annually ²		
12-Mar-19	33.09	903.20	10.40	1157	0.55	-23.0	0.62	6.81	1200	20.7	0.1 U	951		
8-May-19	34.37	901.92	Monitored Semiannually ²									Monitored Annually ²		
27-Aug-19	47.88	888.41	12.51	1314	0.15	Note 1	0.39	6.80	Monitored Annually ²					
13-Nov-19	47.03	889.26	Monitored Semiannually ²									Monitored Annually ²		
14-Feb-20	31.08	905.21	10.60	1249	0.38	-82.2	0.10	6.61	1230	18.3	0.1 U	6360		
13-Aug-20	43.99	892.30	11.70	1176	0.56	-67.7	0.18	6.78	Monitored Annually ²					
9-Dec-20	39.67	896.62	Monitored Semiannually ²									Monitored Annually ²		
5-Mar-21	34.96	901.33	11.00	1257	0.26	-38	0.24	6.95	1200	19.5	0.1 U	6150		
10-Jun-21	42.65	893.64	Monitored Semiannually ²									Monitored Annually ²		
18-Oct-21	55.97	880.32	11.7	858	0.86	-92.3	0.48	6.84	Monitored Annually ²					
5-Jan-22	33.64	902.65	Monitored Semiannually ²									Monitored Annually ²		
18-Mar-22	38.2	898.09	11.5	1096	1.17	-40.8	0.31	7.18	1260	16.6	0.1 U	6400		

Notes:

Top of casing elevation (feet NAVD88): 936.29

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- Not measured or not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL.

1 Reduction in monitoring frequency approved by Public Health – Seattle and King County in a letter to Golder Associates Inc. dated May 16, 2012

2 Reduction in monitoring frequency approved by Public Health – Seattle and King County in a letter to Golder Associates Inc. dated April 7, 2016. Field parameters collected semi-annually, analytical samples collected annually. Sampling schedule follows the Golder 2021 RI Work Plan starting in Q3 2021.

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

Note 1 ORP measurements not available due to faulty sensor.

µmhos/cm Micromhos per centimeter

feet bmp Feet below measuring point

feet NAVD88 Feet NAVD88 Datum

mg/L Milligrams per liter

mV Millivolts

NTU Nephelometric Turbidity Unit

**Table A-4b: Summary of Dale Strip Pit - Bedrock Groundwater Sampling Results - Well MWB-1DDSP
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem. Total Dissolved Solids (mg/L)	Metals (ug/L)			
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Arsenic	Lead	Potassium	
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	5	15	-	
2-Dec-02	87.28	848.09	11.1	557	-	-	-	7.72	540	32.7	0.5 U	-	
3-Mar-03	48.63	886.74	12.0	623	-	-	24.00	7.48	370	7.08	-	-	
3-May-03	47.12	888.25	12.1	548	-	-	264.00	7.54	440	-	-	-	
3-Aug-03	64.60	870.77	23.23	675	-	-	195.00	7.36	450	-	-	-	
1-Nov-03	66.14	869.23	11.0	400	-	-	15.50	8.10	437	6.03	0.5 U	-	
1-Feb-04	46.55	888.82	10.68	455	-	-	8.70	7.15	440	-	-	-	
1-May-04	55.82	879.55	13.61	508	-	-	12.40	7.58	429	-	-	-	
1-Aug-04	61.89	873.48	13.15	585	-	-	15.70	7.47	399	-	-	-	
1-Nov-04	56.83	878.54	10.94	655	-	-	9.40	7.22	477	3.08	1 U	-	
1-Feb-05	47.31	888.06	12.80	778	-	-	8.39	7.35	451	-	-	-	
1-May-05	48.60	886.77	12.86	743	-	-	4.22	7.25	432	-	-	-	
1-Aug-05	56.80	878.57	14.17	746	-	-	3.10	6.99	518	-	-	-	
1-Nov-05	66.85	868.52	10.20	702	-	-	5.36	7.11	470	3.6	1 U	-	
1-Feb-06	47.88	887.49	10.11	648	0.71	109.4	2.72	7.53	450 J	-	-	-	
1-May-06	52.23	883.14	12.22	686	1.82	43.7	3.68	7.43	450	-	-	-	
1-Aug-06	59.41	875.96	12.28	665	1.06	-74.0	14.20	7.36	480	-	-	-	
1-Nov-06	61.84	873.53	-	-	-	-	-	-	-	-	-	-	
28-Dec-06	48.26	887.11	-	-	-	-	-	-	-	-	-	-	
7-Feb-07	49.64	885.73	-	-	-	-	-	-	-	-	-	-	
7-May-07	53.24	882.13	12.44	722	0.74	-150.8	6.06	7.94	470	-	-	-	
7-Aug-07	60.45	874.92	13.76	712	0.79	-50.0	4.53	7.28	500	-	-	-	
27-Nov-07	63.40	871.97	14.41	711	0.45	-194.4	7.07	7.34	470 J	2.89	1 U	-	
8-Feb-08	49.23	886.14	14.07	737	0.62	-	6.28	7.46	500	-	-	-	
8-May-08	51.31	884.06	13.52	793	0.55	27.9	4.42	7.40	520 J	-	-	-	
8-Aug-08	59.69	875.68	13.73	812	0.67	-24.7	9.33	7.37	560 J	2.26	1 U	3000 U	
1-Nov-08	57.38	877.99	14.75	619	0.89	-42.5	4.40	7.45	480	2.22	1 U	3000 U	
10-Feb-09	50.92	884.45	6.50	618	10.51	-	655.00	7.69 J	530	2.19	1 U	3010	
9-May-09	51.25	884.12	13.95	637	2.21	39.3	5.87	7.74	540 J	2.42	1 U	3000 U	
25-Sep-09	65.46	869.91	13.20	678	2.25	331.8	2.29	7.15	570	1.8 J	2 U	3300	
17-Dec-09	49.40	885.97	10.60	794	0.99	224.0	3.97	7.58	440	0.7 J	2 U	3200 J	
22-Mar-10	49.18	886.19	10.40	762	-	245.0	0.74	7.39	580	4.5	2 U	3200 J	
15-Jun-10	46.88	888.49	12.10	762	0.05	142.1	0.47	7.50	420	5.5	2 U	3300	
20-Sep-10	58.97	876.40	11.40	765	0.07	89.6	0.47	7.47	520	4.7	0.27 J	3400	
6-Dec-10	50.66	884.71	10.20	763	0.19	58.9	0.32	7.72	550	1.3 J	2 U	3200 J	
28-Mar-11	48.89	886.48	10.50	376	0.55	165.0	0.73	7.53	470	3.7	2 U	3000 J	
20-Jun-11	52.13	883.24	13.40	718	0.45	-65.1	0.75	7.53	600 J	5 U	2 U	3500	
26-Sep-11	63.02	872.35	11.80	633	1.73	-6.0	1.72	7.61	560	5 U	2 U	3500	
13-Dec-11	63.88	871.49	8.60	678	0.69	-24.7	1.95	7.56	530	5.7	2 U	4100	
22-Mar-12	56.96	878.41	5.60	877	1.89	-26.6	0.84	7.69	540	3.4	0.4 U	3000 J	
18-Jun-12	58.01	877.36	Monitored Semiannually ¹										
18-Sep-12	67.78	867.59	26.30	838	3.62	12.4	1.27	7.70	540	3.1	0.4 U	3100 J	
18-Dec-12	56.10	879.27	Monitored Semiannually ¹										
21-Feb-13	51.62	883.75	4.30	895	7.54	31.3	0.83	8.04	510	3.6	0.4 U	3600	
22-May-13	53.14	882.23	Monitored Semiannually ¹										
20-Aug-13	62.35	873.02	12.30	526	0.08	-60.4	2.91	7.47	585	3.2	0.1 U	3200	
19-Nov-13	58.70	876.67	Monitored Semiannually ¹										
31-Mar-14	46.60	888.77	11.10	622	0.04	48.4	0.45	7.52	561	1.8	0.1 U	3340	
21-May-14	46.96	888.41	Monitored Semiannually ¹										
15-Aug-14	58.62	876.75	12.48	732	0.90	-62.4	2.04	7.16	564	2	0.2	3140	
14-Nov-14	59.59	875.78	Monitored Semiannually ¹										
10-Feb-15	49.61	885.76	10.90	717	0.03	-114.4	1.82	7.48	551	2.9	0.1 U	3270	
4-May-15	52.25	883.12	Monitored Semiannually ¹										
4-Aug-15	61.71	873.66	12.00	618	0.04	-115.0	0.35	7.56	552	3	0.1 U	3360	
5-Nov-15	68.72	866.65	11.10	625	0.05	27.5	1.26	7.21	603	1.6	0.1 U	3590	
8-Feb-16	46.93	888.44	11.40	794	0.00	155.1	0.17	7.57	599	2.1	0.1 U	3800	
2-May-16	50.77	884.60	Monitored Semiannually ²						Monitored Annually ²				
22-Aug-16	62.11	873.26	11.60	770	0.04	-251.0	0.86	7.50	Monitored Annually ²				
1-Nov-16	61.71	873.66	Monitored Semiannually ²						Monitored Annually ²				
31-Jan-17	49.02	886.35	10.60	916	0.13	-310.4	0.35	7.47	676	1.87	0.1 U	3410	
30-May-17	48.11	887.26	Monitored Semiannually ²						Monitored Annually ²				
16-Aug-17	57.17	878.20	11.80	898	0.12	-210.9	0.22	7.42	Monitored Annually ²				
9-Nov-17	58.71	876.66	Monitored Semiannually ²						Monitored Annually ²				
28-Feb-18	45.21	890.16	10.20	758	0.19	-166.6	0.20	7.26	694	2.87	0.1 U	3340	
1-May-18	47.40	887.97	Monitored Semiannually ²						Monitored Annually ²				
22-Aug-18	60.25	875.12	11.58	705	2.22	-153.0	0.14	7.37	Monitored Annually ²				

Table A-4b: Summary of Dale Strip Pit - Bedrock Groundwater Sampling Results - Well MWB-1DDSP Ravensdale Site, Ravensdale, Washington

Date Sampled	Field Parameters								Gen. Chem. Total Dissolved Solids (mg/L)	Metals (ug/L)		
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Arsenic	Lead	Potassium
6-Nov-18	65.30	870.07	Monitored Semiannually ²						Monitored Annually ²			
12-Mar-19	46.35	889.02	9.80	707	0.58	-119.9	0.16	7.24	668	4.96	0.1 U	4210
8-May-19	47.20	888.17	Monitored Semiannually ²						Monitored Annually ²			
27-Aug-19	59.87	875.50	11.95	762	0.39	Note 1	0.02	7.20	Monitored Annually ²			
13-Nov-19	60.20	875.17	Monitored Semiannually ²						Monitored Annually ²			
14-Feb-20	44.28	891.09	10.30	760	0.30	-169.3	1.09	7.11	717	4.56	0.1 U	4070
13-Aug-20	57.57	877.80	11.10	739	0.91	-145.8	0.31	7.17	Monitored Annually ²			
9-Dec-20	54.25	881.12	Monitored Semiannually ²						Monitored Annually ²			
5-Mar-21	48.74	886.63	10.70	724	0.27	-222	0.61	7.36	592	4.06	0.1 U	3880
10-Jun-21	59.90	875.47	Monitored Semiannually ²						Monitored Annually ²			
18-Oct-21	67.32	868.05	11.60	561	0.83	-149	0.33	7.23	Monitored Annually ²			
5-Jan-22	47.77	887.60	Monitored Semiannually ²						Monitored Annually ²			
18-Mar-22	48.37	887	11.3	741	1.2	-93.4	0.39	7.52	781	4.64	0.1 U	4240

Notes:

Top of casing elevation (feet NAVD88): 935.37

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- Not measured or not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL.

1 Reduction in monitoring frequency approved by Public Health – Seattle and King County in a letter to Golder Associates Inc. dated May 16, 2012

2 Reduction in monitoring frequency approved by Public Health – Seattle and King County in a letter to Golder Associates Inc. dated April 7, 2016. Field parameters collected semi-annually, analytical samples collected annually. Sampling schedule follows the Golder 2021 RI Work Plan starting in Q3 2021.

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

Note 1 ORP measurements not available due to faulty sensor.

µmhos/cm Micromhos per centimeter

feet bmp Feet below measuring point

feet NAVD88 Feet NAVD88 Datum

mg/L Milligrams per liter

mV Millivolts

NTU Nephelometric Turbidity Unit

**Table A-4c: Summary of Dale Strip Pit - Bedrock Groundwater Sampling Results - Well MWB-5DSP
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem. Total Dissolved Solids (mg/L)	Metals (ug/L)			
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Arsenic	Lead	Potassium	
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	5	15	-	
18-Dec-06	20.56	914.49	11.30	1054	0.59	-10.5	6.76	7.01	630	4.46	1 U	-	
7-Jan-07	18.48	916.57	12.53	700	0.61	-70.6	33.50	7.11	540	5.19	1 U	-	
7-Feb-07	21.53	913.52	11.59	557	0.57	-59.1	33.50	6.88	530	5.19	1 U	-	
7-Mar-07	15.34	919.71	11.71	817	0.45	-2.4	91.20	6.52	550 J	4.91	1 U	-	
7-Apr-07	17.97	917.08	11.96	909	0.25	0.2	121.00	6.91	560	4.75	1 U	-	
1-May-07	26.92	908.13	12.55	880	4.20	-14.3	63.70	7.13	540	4.9	1 U	-	
7-Jun-07	29.94	905.11	13.12	1016	3.20	-5.6	3.58	7.52	600 J	4.37	1 U	-	
7-Jul-07	35.27	899.78	13.00	910	1.74	-27.4	9.97	7.24	550	4.91	1 U	-	
7-Aug-07	39.55	895.50	12.40	1065	0.92	-14.6	4.62	6.99	590	4.46	1 U	-	
7-Sep-07	44.69	890.36	12.36	696	0.68	-33.3	3.22	7.29	590	4.92	1 U	-	
26-Oct-07	38.90	896.15	11.46	667	0.56	-18.3	22.60	6.98	620 J	4.43	1 U	-	
27-Nov-07	38.79	896.26	11.71	914	0.56	-46.7	3.32	6.91	560 J	4.9	1 U	-	
12-Dec-07	35.33	899.72	12.61	909	0.53	-27.3	4.28	6.87	820	4.09	1 U	-	
24-Jan-08	28.97	906.08	10.72	872	0.78	-49.1	-	7.14	550	4.72	1 U	-	
8-Feb-08	26.00	909.05	11.25	888	0.44	-	4.18	6.85	550	4.5	1 U	-	
8-Mar-08	26.03	909.02	10.94	915	0.59	-95.6	3.19	6.89	550	5.21	1 U	-	
8-Apr-08	25.03	910.02	11.27	931	0.61	-20.1	3.44	6.89	550 J	4.88	1 U	-	
8-May-08	27.33	907.72	11.68	949	0.68	-6.7	5.37	6.62	580 J	5.34	1 U	-	
8-Jun-08	28.38	906.67	11.40	948	0.75	-50.4	1.59	6.68	580 J	4.45	1 U	-	
8-Aug-08	39.80	895.25	11.80	970	0.68	-78.6	1.72	6.84	610 J	4.64	1 U	3000 U	
1-Nov-08	33.96	901.09	11.20	682	0.63	-115.4	0.95	6.82	540	4.8	1 U	3000 U	
10-Feb-09	25.56	909.49	10.54	671	0.71	-71.7	0.98	7.05	610	4.73	1 U	3000 U	
9-May-09	25.79	909.26	11.23	682	0.55	-5.8	0.86	7.68	560 J	3.4	1 U	3000 U	
22-Sep-09	46.68	888.37	18.70	737	0.64	214.5	0.99	6.91	580 J	3.9	2 U	2700 J	
14-Dec-09	30.45	904.60	9.80	901	0.18	200.0	0.70	6.96	450	1.7 J	2 U	2500 J	
23-Mar-10	19.92	915.13	11.30	773	0.25	148.0	4.40	6.86	510	5.6	2 U	2600 J	
15-Jun-10	16.74	918.31	11.00	838	0.10	202.3	2.89	7.01	860 J	8.2	2 U	2800 J	
20-Sep-10	33.31	901.74	11.20	852	0.09	174.7	0.60	6.97	540	6.2	2 U	2700 J	
6-Dec-10	19.81	915.24	10.80	838	0.10	30.5	0.47	7.17	530	3.8	2 U	2300 J	
28-Mar-11	17.16	917.89	10.80	403	0.15	48.4	1.13	6.89	500 J	2.3	2 U	2300 J	
20-Jun-11	18.95	916.10	11.10	775	0.05	-29.1	0.37	7.01	610 J	5 U	2 U	2400 J	
26-Sep-11	33.71	901.34	11.20	690	0.03	-8.7	0.54	7	560	4.1 J	2 U	2800 J	
13-Dec-11	24.48	910.57	10.50	730	0.05	93.6	1.92	7.07	520	6.1	2 U	2800 J	
21-Mar-12	15.54	919.51	10.70	883	0.06	106.9	0.34	6.9	500	6.5	2 U	2400 J	
19-Jun-12	17.01	918.04	Monitored Semiannually ¹										
19-Sep-12	29.82	905.23	11.90	877	0.00	122.0	0.47	7.08	490	6.9	0.4 U	2600 J	
18-Dec-12	17.39	917.66	Monitored Semiannually ¹										
21-Feb-13	18.84	916.21	10.60	875	0.05	103.3	0.40	7.32	510	5.9	0.4 U	2600 J	
22-May-13	20.25	914.80	Monitored Semiannually ¹										
20-Aug-13	30.15	904.90	12.10	530	0.06	-50.3	0.75	6.98	510	5.6	0.1 U	2500	
19-Nov-13	22.73	912.32	Monitored Semiannually ¹										
31-Mar-14	15.50	919.55	11.30	574	0.06	95.7	0.53	7.15	447	5.6	0.1 U	2720	
21-May-14	14.83	920.22	Monitored Semiannually ¹										
15-Aug-14	25.16	909.89	14.49	741	0.48	-24.0	2.92	6.87	477	5.9	0.1 U	2550	
14-Nov-14	22.25	912.80	Monitored Semiannually ¹										
10-Feb-15	15.98	919.07	11.40	693	0.04	-117.5	0.80	7.13	503	5.9	0.1 U	2560	
4-May-15	20.05	915.00	Monitored Semiannually ¹										
4-Aug-15	31.90	903.15	11.90	620	0.16	-71.1	0.47	7.13	517	6.4	0.1 U	2670	
5-Nov-15	32.00	903.05	11.40	605	0.00	37.5	1.16	6.84	511	5.3	0.1 U	3060	
8-Feb-16	17.13	917.92	11.80	720	0.00	160.4	0.08	7.34	480	6	0.1 U	3020	
2-May-16	23.31	911.74	Monitored Semiannually ²						Monitored Annually ²				
22-Aug-16	34.07	900.98	12.50	571	0.00	-	0.66	7.11	Monitored Annually ²				
1-Nov-16	26.04	909.01	Monitored Semiannually ²										
31-Jan-17	19.36	915.69	12.20	808	0.07	-219.2	0.30	7.21	509	6.76	0.1 U	2840	
30-May-17	17.31	917.74	Monitored Semiannually ²										
16-Aug-17	28.13	906.92	12.40	826	0.12	-71.9	0.66	7.10	Monitored Annually ²				
9-Nov-17	27.17	907.88	Monitored Semiannually ²										
28-Feb-18	16.55	918.50	10.90	657	0.15	-97.6	0.35	7.02	528	5.39	0.1 U	2550	
1-May-18	17.69	917.36	Monitored Semiannually ²										
22-Aug-18	32.63	902.42	12.46	655	0.81	-46.4	0.26	7.01	Monitored Annually ²				
6-Nov-18	32.44	902.61	Monitored Semiannually ²										
12-Mar-19	18.84	916.21	10.90	597	0.56	-28.1	0.86	6.96	512	4.51	0.1 U	2890	
8-May-19	19.75	915.30	Monitored Semiannually ²										
27-Aug-19	33.26	901.79	13.08	688	0.26	Note 1	0.02	6.89	Monitored Annually ²				

**Table A-4c: Summary of Dale Strip Pit - Bedrock Groundwater Sampling Results - Well MWB-5DSP
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)		
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
13-Nov-19	33.03	902.02	Monitored Semiannually ²						Monitored Annually ²			
14-Feb-20	16.70	918.35	10.90	626	0.34	-99.8	0.33	6.88	524	4.31	0.1 U	2650
13-Aug-20	27.37	907.68	11.80	619	0.55	-70.6	0.40	6.89	Monitored Annually ²			
9-Dec-20	24.68	910.37	Monitored Semiannually ²						Monitored Annually ²			
5-Mar-21	16.91	918.14	11.30	641	0.19	-77.0	0.45	7.09	473	4.84	0.1 U	2450
10-Jun-21	24.68	910.37	Monitored Semiannually ²						Monitored Annually ²			
18-Oct-21	29.11	905.94	11.9	440.1	0.87	-86.2	0.35	6.96	Monitored Annually ²			
5-Jan-22	16.88	918.17	Monitored Semiannually ²						Monitored Annually ²			
21-Mar-22	17.14	917.91	11.3	601	1.28	-42.9	0.82	6.26	513	4.79	0.1 U	2560

Notes:

Top of casing elevation (feet NAVD88): 935.05

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- Not measured or not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL.

1 Reduction in monitoring frequency approved by Public Health – Seattle and King County in a letter to Golder Associates Inc. dated May 16, 2012

2 Reduction in monitoring frequency approved by Public Health – Seattle and King County in a letter to Golder Associates Inc. dated April 7, 2016. Field parameters collected semi-annually, analytical samples collected annually. Sampling schedule follows the Golder 2021 RI Work Plan starting in Q3 2021.

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

Note 1 ORP measurements not available due to faulty sensor.

µmhos/cm Micromhos per centimeter

feet bmp Feet below measuring point

feet NAVD88 Feet NAVD88 Datum

mg/L Milligrams per liter

mV Millivolts

NTU Nephelometric Turbidity Unit

**Table A-4d: Summary of Dale Strip Pit - Bedrock Groundwater Sampling Results - Well MWB-6DSP
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem. Total Dissolved Solids (mg/L)	Metals (ug/L)			
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Arsenic	Lead	Potassium	
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	5	15	-	
18-Dec-06	8.13	897.82	9.93	525	0.54	-54.5	0.61	7.78	300	5.37	1 U	-	
7-Feb-07	9.40	896.55	11.79	479	1.19	-30.0	7.40	7.41	330	6.01	1 U	-	
7-May-07	10.73	895.22	12.26	729	2.83	-103.6	16.40	7.63	480	10.1	1 U	-	
7-Aug-07	15.14	890.81	11.42	882	0.75	-11.5	1.82	7.10	470	3.25	1 U	-	
27-Nov-07	16.16	889.79	10.98	748	0.37	-47.9	0.83	6.99	440 J	2.82	1 U	-	
8-Feb-08	9.66	896.29	11.01	645	0.31	-	0.90	7.05	380	2.68	1 U	-	
8-May-08	10.34	895.61	11.27	665	0.64	13.4	1.52	6.93	380 J	2.40	1 U	-	
8-Aug-08	14.17	891.78	11.23	683	0.72	-8.2	2.49	7.05	390 J	2.18	1 U	3000 U	
1-Nov-08	12.98	892.97	10.61	488	0.60	-45.6	1.35	6.80	380	2.04	1 U	3000 U	
10-Feb-09	9.64	896.31	10.32	398	0.52	-57.0	1.20	7.31	350	2.00	1 U	3000 U	
9-May-09	9.91	896.04	10.50	405	0.73	-4.0	1.26	7.77	320 J	1.69	1 U	3000 U	
23-Sep-09	17.16	888.79	12.50	541	0.25	216.2	5.38	7.14	400 J	0.91 J	2 U	1300 J	
14-Dec-09	12.73	893.22	9.10	580	0.47	231.0	2.70	7.23	270	2 U	2 U	1300 J	
22-Mar-10	9.62	896.33	10.90	504	-	321.7	3.50	7.22	320	2.00	2 U	1200 J	
15-Jun-10	8.30	897.65	11.00	495	0.11	205.1	1.41	7.29	320	4.20	2 U	1300 J	
20-Sep-10	14.90	891.05	10.90	560	0.10	187.2	0.28	7.29	270	3.00	2 U	1400 J	
6-Dec-10	10.47	895.48	10.50	515	0.12	87.8	0.14	7.47	300	2 U	2 U	1100 J	
28-Mar-11	8.71	897.24	10.30	241	0.19	58.9	1.86	7.19	300	2 U	2 U	1100 J	
20-Jun-11	9.87	896.08	10.80	477	0.06	141.2	0.20	7.27	340	5 U	2 U	1100 J	
26-Sep-11	14.82	891.13	10.80	467	0.05	114.8	0.92	7.26	380	5 U	2 U	1500 J	
13-Dec-11	13.02	892.93	10.20	491	0.06	131.3	1.69	7.29	340	5 U	2 U	1600 J	
21-Mar-12	8.13	897.82	10.20	550	0.09	160.0	0.07	7.14	310	2.50	0.4 U	1200 J	
18-Jun-12	-	-	Monitored Semiannually ¹										
18-Sep-12	14.76	891.19	12.50	587	0.00	122.0	0.35	7.31	370	2.80	0.4 U	1300 J	
18-Dec-12	8.16	897.79	Monitored Semiannually ¹										
21-Feb-13	8.45	897.50	10.10	594	0.02	152.7	0.28	7.49	300	1.90	0.4 U	1300 J	
22-May-13	9.36	896.59	Monitored Semiannually ¹										
20-Aug-13	13.28	892.67	11.70	478	0.01	-43.8	0.54	7.22	349 J	1.60	0.1 U	1300	
19-Nov-13	9.71	896.24	Monitored Semiannually ¹										
31-Mar-14	8.42	897.53	10.70	455	0.06	166.1	0.27	7.35	315	1.40	0.1 U	1290	
21-May-14	5.99	899.96	Monitored Semiannually ¹										
14-Aug-14	12.03	893.92	13.45	512	0.56	-21.4	1.99	6.95	317	1.70	0.1 U	1270	
14-Nov-14	10.68	895.27	Monitored Semiannually ¹										
10-Feb-15	7.39	898.56	10.90	482	0.03	-86.2	0.59	7.32	337	1.40	0.1 U	1230	
4-May-15	9.17	896.78	Monitored Semiannually ¹										
4-Aug-15	13.64	892.31	12.40	449	0.18	-81.7	0.27	7.33	385	1.70	0.1 U	1280	
5-Nov-15	13.98	891.97	11.50	435	2.23	85.2	1.09	7.04	354	1.30	0.1 U	1470	
8-Feb-16	6.74	899.21	11.50	495	0.03	187.2	0.25	7.39	297	1.40	0.1 U	1350	
2-May-16	8.64	897.31	Monitored Semiannually ²						Monitored Annually ²				
22-Aug-16	13.27	892.68	12.20	559	0.03	-52.7	0.80	7.28	Monitored Annually ²				
1-Nov-16	11.36	894.59	Monitored Semiannually ²						Monitored Annually ²				
31-Jan-17	7.91	898.04	10.90	539	0.08	124.4	0.18	7.31	321	1.48	0.1 U	1300	
30-May-17	2.65	903.30	Monitored Semiannually ²						Monitored Annually ²				
16-Aug-17	12.08	893.87	12.10	573	0.12	-46.9	1.39	7.26	Monitored Annually ²				
9-Nov-17	11.70	894.25	Monitored Semiannually ²						Monitored Annually ²				
28-Feb-18	6.50	899.45	11.00	423	0.19	-61.0	0.18	7.12	138	1.56	0.1 U	1200	
1-May-18	6.80	899.15	Monitored Semiannually ²						Monitored Annually ²				
22-Aug-18	13.47	892.48	11.61	441	7.44	26.6	0.21	7.11	Monitored Annually ²				
6-Nov-18	13.96	891.99	Monitored Semiannually ²						Monitored Annually ²				
12-Mar-19	7.30	898.65	10.30	363	0.56	-25.1	0.27	7.16	294	1.47	0.1 U	1340	
8-May-19	7.77	898.18	Monitored Semiannually ²						Monitored Annually ²				
27-Aug-19	13.16	892.79	12.19	454	0.45	Note 1	0.02	7.05	Monitored Annually ²				
13-Nov-19	26.35	894.30	Monitored Semiannually ²						Monitored Annually ²				

**Table A-4d: Summary of Dale Strip Pit - Bedrock Groundwater Sampling Results - Well MWB-6DSP
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)		
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
13-Feb-20	20.79	899.86	10.60	387	0.39	-76.5	1.05	7.13	313	1.40	0.1 U	1330
13-Aug-20	25.94	894.71	11.70	403	0.65	-64.3	0.60	7.07	Monitored Annually ²			
9-Dec-20	24.06	896.59	Monitored Semiannually ²						Monitored Annually ²			
4-Mar-21	21.56	899.09	10.80	363	0.16	-9.0	1.29	7.30	280	1.10	0.1 U	1240
10-Jun-21	24.55	896.10	Monitored Semiannually ²						Monitored Annually ²			
18-Oct-21	28.08	892.57	11.6	273.8	0.96	-73.8	1.38	7.15	Monitored Annually ²			
5-Jan-22	21.36	899.29	Monitored Semiannually ²						Monitored Annually ²			
21-Mar-22	20.7	899.95	10.9	348.2	1.41	102.1	1.4	6.42	297	1.06	0.1 U	1090

Notes:

Top of casing elevation (feet NAVD88) prior to raising casing: 905.95
 Top of casing elevation (feet NAVD88) after raising casing (post-Q3 2019): 920.65

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- Not measured or not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL.

1 Reduction in monitoring frequency approved by Public Health – Seattle and King County in a letter to Golder Associates Inc. dated May 16, 2012

2 Reduction in monitoring frequency approved by Public Health – Seattle and King County in a letter to Golder Associates Inc. dated April 7, 2016. Field parameters collected semi-annually, analytical samples collected annually. Sampling schedule follows the Golder 2021 RI Work Plan starting in Q3 2021.

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

Note 1 ORP measurements not available due to faulty sensor.

µmhos/cm Micromhos per centimeter mg/L Milligrams per liter

feet bmp Feet below measuring point mV Millivolts

feet NAVD88 Feet NAVD88 Datum NTU Nephelometric Turbidity Unit

Table A-4e: Summary of Dale Strip Pit - Bedrock Groundwater Sampling Results - Portal Ravensdale Site, Ravensdale, Washington

Date Sampled	Field Parameters								Gen. Chem. Total Dissolved Solids (mg/L)	Metals (ug/L)		
	Depth to Water (feet btoc)	Groundwater Elevation (feet msl)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Arsenic	Lead	Potassium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	5	15	-
1-Mar-02	-	-	-	653	-	-	-	7.29	586	-	-	-
1-Jun-02	-	-	12	920	-	-	-	7.20	583	-	-	-
1-Sep-02	-	-	11	920	-	-	-	7.10	651	-	-	-
2-Dec-02	-	-	9.1	900	-	-	-	7.03	570	4.44	0.5 U	-
3-Mar-03	-	-	10.1	873	-	-	-	7.09	530	-	-	-
3-May-03	-	-	11.2	981	-	-	10.00	6.94	590	-	-	-
3-Aug-03	-	-	12.78	1030	-	-	13.00	7.17	630	-	-	-
1-Nov-03	-	-	10.2	569	-	-	4.65	7.53	592	3.33	0.5 U	-
1-Feb-04	-	-	9.31	568	-	-	5.41	6.85	560	-	-	-
1-May-04	-	-	10.93	952	-	-	5.98	7.12	615	-	-	-
1-Aug-04	-	-	12.10	835	-	-	6.29	7.11	601	-	-	-
1-Nov-04	-	-	10.20	941	-	-	6.58	6.94	656	3.41	1 U	-
1-Feb-05	-	-	10.52	889	-	-	8.72	7.41	541	-	-	-
1-May-05	-	-	13.08	953	-	-	8.15	7.31	548	-	-	-
1-Aug-05	-	-	11.08	988	-	-	7.40	7.23	644	-	-	-
1-Nov-05	-	-	9.53	958	-	-	8.58	7.61	640	3.15	1 U	-
1-Feb-06	-	-	9.23	669	7.88	*	7.93	6.78	450 J	-	-	-
1-May-06	-	-	11.49	947	7.60	38.5	10.40	7.01	570	-	-	-
1-Aug-06	-	-	10.52	835	8.82	-39.8	14.10	7.26	640	-	-	-
1-Nov-06	-	-	9.41	740	9.57	-32.2	12.50	7.23	510	2.45	1 U	-
7-Feb-07	-	-	9.90	815	10.99	-6.2	27.80	7.74	510	-	-	-
7-May-07	-	-	18.39	810	11.05	-6.2	11.80	7.61	510	-	-	-
7-Aug-07	-	-	10.42	870	8.72	-44.9	25.20	7.42	560	-	-	-
30-Nov-07	-	-	9.41	783	9.56	-18.7	48.30	-	520	3.17	1 U	-
8-Feb-08	-	-	10.02	708	10.04	-	50.00	7.20	420	-	-	-
8-May-08	-	-	10.83	815	12.13	0.1	7.28	7.29	480 J	-	-	-
8-Aug-08	-	-	10.63	906	11.05	-5.6	11.00	7.05	560 J	3.69	1 U	41600
1-Nov-08	-	-	9.79	553	10.70	-21.1	16.90	7.40	460	3.2	1 U	35500
11-Feb-09	-	-	9.16	488	6.99	-	15.40	7.52	430	2.97	1 U	34200
9-May-09	-	-	9.64	522	10.56	13.4	9.77	7.39	440 J	2.01	1 U	32400
23-Sep-09	-	-	10.70	745	8.95	271.7	14.70	6.88	570	2 U	2 U	40000
15-Dec-09	-	-	8.60	713	5.20	279.0	12.50	6.67	350	2 U	2 U	30000
24-Mar-10	-	-	9.90	681	6.14	370.7	-	6.57	470	4.2	2 U	39000
17-Jun-10	-	-	10.00	623	9.58	-	26.30	7.50	380	5.9	2 U	28000
22-Sep-10	-	-	10.00	783	9.02	225.9	17.40	7.00	510	5.2	2 U	42000
7-Dec-10	-	-	9.90	662	9.15	186.0	13.60	6.95	450	2 U	2 U	32000
29-Mar-11	-	-	9.90	292	5.90	370.8	4.44	6.73	360 J	4.1	2 U	25000
20-Jun-11	-	-	10.50	591	6.42	219.1	4.44	7.01	420	5 U	2 U	26000
26-Sep-11	-	-	10.70	623	5.76	240.5	11.90	6.83	520	5 U	2 U	39000
15-Dec-11	-	-	8.80	472	4.92	310.4	7.32	6.78	430	4.7 J	2 U	32000
21-Mar-12	-	-	8.90	611	5.24	313.3	9.16	6.49	330	4.8	0.4 U	20000
18-Jun-12	Monitored Semiannually ¹											
18-Sep-12	-	-	14.20	652	9.70	148.0	20.80	7.48	450	5	0.4 U	29000
18-Dec-12	Monitored Semiannually ¹											
25-Feb-13	-	-	9.20	648	10.10	209.6	4.12	7.58	300	5	0.4 U	25000
25-Feb-13	Monitored Semiannually ¹											
21-Feb-13	-	-	9.20	648	10.10	209.6	4.12	7.58	300	5	0.4 U	25000
22-May-13	Monitored Semiannually ¹											
20-Aug-13	-	-	10.80	635	9.31	170.1	8.46	7.11	458	3.9	0.1 U	32300
19-Nov-13	Monitored Semiannually ¹											
31-Mar-14	-	-	10.60	448	9.29	213.5	87.20	7.30	321	3.7	0.18 J	21100
21-May-14	Monitored Semiannually ¹											
15-Aug-14	-	-	10.01	595	10.01	-35.2	6.43	6.99	427	3.5	0.1 U	31500
14-Nov-14	Monitored Semiannually ¹											
10-Feb-15	-	-	10.60	515	9.88	183.5	6.84	7.26	363	2.8	0.07 J	27200
4-May-15	Monitored Semiannually ¹											
4-Aug-15	-	-	10.90	554	9.98	95.8	8.68	7.48	438	2.6	0.1 U	34700
5-Nov-15	-	-	10.30	503	10.24	177.6	13.40	7.46	449	2.8	0.1 U	31800
8-Feb-16	-	-	9.30	541	11.30	215.0	5.12	7.30	293	3.2	0.1 U	23100
-	Monitored Semiannually ²								Monitored Annually ²			
24-Aug-16	-	-	13.40	585	9.32	410.0	8.50	7.23	Monitored Annually ²			
1-Nov-16	-	-	10.90	242	9.13	51.4	7.57	7.41	Monitored Annually ²			
31-Jan-17	-	-	8.90	663	10.87	-57.4	6.23	7.50	3390	3.97	0.1 U	29200
-	Monitored Semiannually ²								Monitored Annually ²			
17-Aug-17	-	-	11.40	712	9.67	-12.4	9.87	7.30	Monitored Annually ²			

Table A-4e: Summary of Dale Strip Pit - Bedrock Groundwater Sampling Results - Portal Ravensdale Site, Ravensdale, Washington

Date Sampled	Field Parameters									Gen. Chem. Total Dissolved Solids (mg/L)	Metals (ug/L)		
	Depth to Water (feet btoc)	Groundwater Elevation (feet msl)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)	Arsenic		Lead	Potassium	
9-Nov-17	Monitored Semiannually ²									Monitored Annually ²			
27-Feb-18	-	-	9.50	427	9.94	-46.4	16.70	7.72	354	4.11	0.1 U	20400	
1-May-18	Monitored Semiannually ²									Monitored Annually ²			
21-Aug-18	-	-	13.13	582	12.46	-23.0	23.10	7.24	Monitored Annually ²				
6-Nov-18	Monitored Semiannually ²									Monitored Annually ²			
12-Mar-19	-	-	8.00	406	11.35	-2.8	10.70	7.97	388	1.56	0.1 U	24700	
8-May-19	Monitored Semiannually ²									Monitored Annually ²			
27-Aug-19	-	-	10.55	576	11.80	Note 1	154.00	6.78	Monitored Annually ²				
13-Nov-19	Monitored Semiannually ²									Monitored Annually ²			
13-Feb-20	-	-	9.20	382	9.19	-1.3	13.40	6.93	259	3.65	0.1 U	16700	
13-Aug-20	-	-	10.10	569	10.01	-27.0	12.20	7.12	Monitored Annually ²				
9-Dec-20	Monitored Semiannually ²									Monitored Annually ²			
4-Mar-21	-	-	9.30	416	5.80	33.0	17.1	6.89	364	4.14	0.1 U	20000	
10-Jun-21	Monitored Semiannually ²									Monitored Annually ²			
18-Oct-21	-	-	10.9	386.7	5.11	-28.4	86.1	6.45	Monitored Annually ²				
5-Jan-22	Monitored Semiannually ²									Monitored Annually ²			
16-Mar-22	-	-	12	402.9	6.78	70.7	19.8	5.81	348	5.32	0.1 U	18800	

Notes:

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- Not measured or not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL.

* Measurement invalid and not shown

1 Reduction in monitoring frequency approved by Public Health – Seattle and King County in a letter to Golder Associates Inc. dated May 16, 2012

2 Reduction in monitoring frequency approved by Public Health – Seattle and King County in a letter to Golder Associates Inc. dated April 7, 2016. Field parameters collected semi-annually, analytical samples collected annually. Sampling schedule follows the Golder 2021 RI Work Plan starting in Q3 2021.

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

Note 1 ORP measurements not available due to faulty sensor.

µmhos/cm Micromhos per centimeter

feet bmp Feet below measuring point

feet NAVD88 Feet NAVD88 Datum

mg/L Milligrams per liter

mV Millivolts

NTU Nephelometric Turbidity Unit

**Table A-4f: Summary of Dale Strip Pit - Bedrock Groundwater Sampling Results - Well MWB-2DSP
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem. Total Dissolved Solids (mg/L)	Metals (ug/L)		
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Arsenic	Lead	Potassium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	5	15	-
1-Mar-02	-	-	-	542	-	-	-	7.22	467	-	-	-
1-Jun-02	197.34	735.48	12.00	750	-	-	-	7.10	459	-	-	-
1-Sep-02	199.29	733.53	14.00	660	-	-	-	6.90	499	-	-	-
2-Dec-02	200.09	732.73	10.80	675	-	-	-	6.89	440	1 U	0.5 U	-
3-Mar-03	190.21	742.61	11.90	763	-	-	-	6.98	450	-	-	-
3-May-03	191.78	741.04	12.30	730	-	-	233.00	6.98	550	-	-	-
3-Aug-03	199.82	733.00	16.50	848	-	-	17.00	6.92	520	-	-	-
1-Nov-03	199.97	732.85	11.60	559	-	-	9.20	7.04	522	0.98	0.5 U	-
1-Feb-04	188.78	744.04	11.96	608	-	-	4.86	6.68	560	-	-	-
1-May-04	198.45	734.37	13.69	614	-	-	6.17	6.80	478	-	-	-
1-Aug-04	199.17	733.65	14.38	731	-	-	5.48	6.71	460	-	-	-
1-Nov-04	197.92	734.90	11.62	785	-	-	12.30	6.75	512	1 U	1 U	-
1-Feb-05	186.36	746.46	11.64	806	-	-	1.47	6.94	487	-	-	-
1-May-05	-	-	12.87	790	-	-	15.80	6.89	338	-	-	-
1-Aug-05	196.10	736.72	15.01	603	-	-	45.70	6.44	388	-	-	-
1-Nov-05	196.78	736.04	9.91	549	-	-	13.30	6.66	350	1 U	1 U	-
1-Feb-06	193.93	738.89	8.10	641	2.11	269.2	35.70	6.82	400 J	-	-	-
1-May-06	197.90	734.92	10.88	798	1.67	27.3	5.38	6.50	380	-	-	-
1-Aug-06	198.80	734.02	11.44	534	2.52	205.7	8.74	6.67	360	-	-	-
1-Nov-06	187.36	745.46	10.77	680	2.12	-19.9	18.90	7.06	430	1 U	1 U	-
28-Dec-06	192.37	740.45	-	-	-	-	-	-	-	-	-	-
7-Feb-07	197.46	735.36	10.24	621	0.64	-16.7	27.80	6.89	420	-	-	-
7-May-07	198.49	734.33	-	-	-	-	-	-	-	-	-	-
1-Aug-07	198.45	734.37	-	-	-	-	-	-	-	-	-	-
27-Nov-07	196.48	736.34	-	-	-	-	-	-	-	-	-	-
8-Feb-08	191.30	741.52	-	-	-	-	-	-	-	-	-	-
8-May-08	193.95	738.87	-	-	-	-	-	-	-	-	-	-
27-Sep-11	197.32	735.50	-	-	-	-	-	-	-	-	-	-
13-Dec-11	192.15	740.67	9.6	421	2.10	313.0	16.10	7.49	-	-	-	-
22-Mar-12	183.35	751.47	8.9	546	12.83	166.3	0.56	7.47	-	-	-	-
18-Jun-12	192.54	742.28	-	-	-	-	-	-	-	-	-	-
18-Sep-12	199.51	735.31	16.2	508	2.21	120.0	1.27	7.58	-	-	-	-
18-Dec-12	184.52	750.30	-	-	-	-	-	-	-	-	-	-
21-Feb-13	190.65	744.17	7.6	678	5.33	342.6	6.61	8.02	-	-	-	-
22-May-13	198.05	736.77	-	-	-	-	-	-	-	-	-	-
20-Aug-13	200.47	734.35	13.0	488	3.26	90.2	8.47	7.42	-	-	-	-
19-Nov-13	196.59	738.23	-	-	-	-	-	-	-	-	-	-
31-Mar-14	186.78	748.04	11.4	421	7.28	195.1	1.70	7.47	-	-	-	-
21-May-14	192.27	742.55	-	-	-	-	-	-	-	-	-	-
15-Aug-14	199.97	734.85	18.9	492	0.97	1.4	52.50	7.01	-	-	-	-
14-Nov-14	196.60	738.22	-	-	-	-	-	-	-	-	-	-
10-Feb-15	183.97	750.85	10.2	450	7.65	121.4	1.02	7.34	-	-	-	-
4-May-15	194.19	740.63	-	-	-	-	-	-	-	-	-	-
4-Aug-15	198.35	736.47	13.6	432	3.07	18.6	0.27	7.47	-	-	-	-
3-Nov-15	198.25	736.57	10.3	405	2.57	106.2	7.07	7.35	-	-	-	-
8-Feb-16	188.43	746.39	12.5	536	2.77	189.8	0.25	7.78	-	-	-	-
2-May-16	195.72	739.10	Monitored Semiannually ¹						-	-	-	-
22-Aug-16	197.89	736.93	14.0	418	1.27	-123.1	4.36	7.32	-	-	-	-
1-Nov-16	195.49	739.33	Monitored Semiannually ¹						-	-	-	-
31-Jan-17	186.94	747.88	9.2	506	5.26	-45.4	0.38	7.45	-	-	-	-
30-May-17	190.62	744.20	Monitored Semiannually ¹						-	-	-	-
16-Aug-17	197.55	737.27	13.3	540	2.31	37.3	3.42	7.37	-	-	-	-
9-Nov-17	197.11	737.71	Monitored Semiannually ¹						-	-	-	-
28-Feb-18	185.96	748.86	10.1	390	5.95	204.7	1.62	7.15	-	-	-	-
1-May-18	184.95	749.87	Monitored Semiannually ¹						-	-	-	-
22-Aug-18	197.40	737.42	13.7	412	3.10	85.5	1.66	7.27	-	-	-	-
6-Nov-18	197.94	736.88	Monitored Semiannually ¹						-	-	-	-
12-Mar-19	182.84	751.98	8.7	332	6.25	148.4	1.93	7.28	-	-	-	-
8-May-19	185.36	749.46	Monitored Semiannually ¹						-	-	-	-
27-Aug-19	196.56	738.26	11.92	411	8.82	Note 1	0.02	7.28	-	-	-	-
13-Nov-19	196.74	738.08	Monitored Semiannually ¹						-	-	-	-

**Table A-4f: Summary of Dale Strip Pit - Bedrock Groundwater Sampling Results - Well MWB-2DSP
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)		
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
13-Feb-20	177.10	757.72	9.3	453	3.03	91.0	2.31	7.56	-	-	-	-
13-Aug-20	200.97	733.85	12.2	422	3.04	35.0	0.96	7.42	-	-	-	-
9-Dec-20	197.86	736.96	Monitored Semiannually ¹						-	-	-	-
5-Mar-21	197.42	737.40	10.0	398	3.79	112.0	1.17	7.37	-	-	-	-
10-Jun-21	199.94	734.88	Monitored Semiannually ¹						-	-	-	-
18-Oct-21	200.24	734.58	12.6	307.7	6.06	161.4	12.3	7.35	-	-	-	-
5-Jan-22	192.66	742.16	Monitored Semiannually ¹						-	-	-	-
21-Mar-22	193.68	741.14	9.6	369	7.04	125.6	5.95	6.63	-	-	-	-

Notes:

Top of casing elevation (feet NAVD88) prior to raising casing: 932.82
 Top of casing elevation (feet NAVD88) after raising casing (December 14, 2011): 934.82

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

1 Reduction in monitoring frequency approved by Public Health – Seattle and King County in a letter to Golder Associates Inc. dated April 7, 2016. Field parameters collected semi-annually, analytical samples collected annually. Sampling schedule follows the Golder 2021 RI Work Plan starting in Q3 2021.

- Not measured or not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL.

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

Note 1 ORP measurements not available due to faulty sensor.

µmhos/cm Micromhos per centimeter mg/L Milligrams per liter

feet bmp Feet below measuring point mV Millivolts

feet NAVD88 Feet NAVD88 Datum NTU Nephelometric Turbidity Unit

Table A-4g: Summary of Dale Strip Pit - Bedrock Groundwater Sampling Results - Well MWB-4SDSP Ravensdale Site, Ravensdale, Washington

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)		
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Arsenic	Lead
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	5	15	-
26-Sep-11	25.77	906.64	11.40	553	0.86	197.2	-	7.21	-	-	-	-
13-Dec-11	24.94	907.47	9.70	625	1.73	658.0	22.70	7.68	-	-	-	-
22-Mar-12	23.80	908.61	9.60	785	3.71	242.6	8.14	7.30	-	-	-	-
19-Jun-12	24.09	908.32	-	-	-	-	-	-	-	-	-	-
18-Sep-12	25.68	906.73	16.50	664	2.37	150.0	19.20	7.34	-	-	-	-
18-Dec-12	23.02	909.39	-	-	-	-	-	-	-	-	-	-
21-Feb-13	23.50	908.91	10.00	840	6.55	352.4	3.42	7.42	-	-	-	-
22-May-13	23.84	908.57	-	-	-	-	-	-	-	-	-	-
20-Aug-13	25.08	907.33	13.50	539	2.91	45.1	1.87	7.22	-	-	-	-
19-Nov-13	22.76	909.65	-	-	-	-	-	-	-	-	-	-
31-Mar-14	21.39	911.02	12.20	511	6.31	197.3	1.38	7.58	-	-	-	-
21-May-14	19.82	912.59	-	-	-	-	-	-	-	-	-	-
15-Aug-14	24.00	908.41	12.81	647	0.82	7.5	5.42	6.62	-	-	-	-
14-Nov-14	22.28	910.13	-	-	-	-	-	-	-	-	-	-
10-Feb-15	21.10	911.31	12.30	636	2.56	-71.9	1.11	7.11	-	-	-	-
4-May-15	22.65	909.76	-	-	-	-	-	-	-	-	-	-
5-Aug-15	24.65	907.76	13.50	563	3.21	116.4	55.20	7.42	-	-	-	-
3-Nov-15	23.87	908.54	12.20	493	4.65	114.4	5.78	7.52	-	-	-	-
8-Feb-16	19.39	913.02	15.80	670	3.92	163.5	5.06	7.59	-	-	-	-
2-May-16	20.99	911.42	Monitored Semiannually ¹						-	-	-	-
22-Aug-16	24.42	907.99	17.60	527	5.01	106.0	1.39	7.44	-	-	-	-
1-Nov-16	21.31	911.10	Monitored Semiannually ¹						-	-	-	-
31-Jan-17	21.11	911.30	12.10	680	2.75	-146.1	1.48	7.35	-	-	-	-
30-May-17	18.49	913.92	Monitored Semiannually ¹						-	-	-	-
17-Aug-17	22.58	909.83	12.60	673	5.22	177.8	1.97	7.15	-	-	-	-
9-Nov-17	20.72	911.69	Monitored Semiannually ¹						-	-	-	-
28-Feb-18	17.09	915.32	11.10	509	8.34	29.0	0.72	7.37	-	-	-	-
1-May-18	17.76	914.65	Monitored Semiannually ¹						-	-	-	-
22-Aug-18	Could not be safely accessed due to wasp nests.											
6-Nov-18	21.70	910.71	Monitored Semiannually ¹						-	-	-	-
12-Mar-19	18.30	914.11	10.10	215	9.65	18.9	0.39	7.86	-	-	-	-
8-May-19	19.09	913.32	Monitored Semiannually ¹						-	-	-	-
27-Aug-19	22.85	909.56	14.79	562	8.59	Note 1	3.60	7.80	-	-	-	-
13-Nov-19	21.95	910.46	Monitored Semiannually ¹						-	-	-	-
13-Feb-20	16.60	915.81	10.80	458	8.74	68.0	1.98	7.83	-	-	-	-
13-Aug-20	21.96	910.45	12.60	503	8.74	-39.8	1.89	7.83	-	-	-	-
9-Dec-20	20.58	911.83	Monitored Semiannually ¹						-	-	-	-
5-Mar-21	17.69	914.72	11.30	497	6.84	90.0	1.46	7.91	-	-	-	-
10-Jun-21	21.47	910.94	Monitored Semiannually ¹						-	-	-	-
18-Oct-21	23.22	909.19	13.5	368.9	8.47	130.8	1.36	7.63	-	-	-	-
5-Jan-22	17.66	914.75	Monitored Semiannually ¹						-	-	-	-
21-Mar-22	16.7	915.71	10.7	456.3	9.94	115.5	2.79	7.05	-	-	-	-

Notes:

Top of casing elevation (feet NAVD88) prior to DSP Cover Upgrade: 939.42
 Top of casing elevation (feet NAVD88) after DSP Cover Upgrade (completed July 2011): 932.41

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

¹ Reduction in monitoring frequency approved by Public Health – Seattle and King County in a letter to Golder Associates Inc. dated April 7, 2016, extended October 10, 2019. Field parameters collected semi-annually, analytical samples collected annually. Sampling schedule follows the Golder 2021 RI Work Plan starting in Q3 2021.

- Not measured or not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL.

^a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

°C Degrees Celsius

Note 1 ORP measurements not available due to faulty sensor.

µmhos/cm Micromhos per centimeter

feet bmp Feet below measuring point

feet NAVD88 Feet NAVD88 Datum

mg/L Milligrams per liter

mV Millivolts

NTU Nephelometric Turbidity Unit

APPENDIX A-5

**Summary of Lower Disposal Area –
Disposal Area Groundwater
Sampling Results**

Table A-5A Well P-14
Table A-5B Well P-15

**Table A-5a: Summary of Lower Disposal Area - Disposal Area Groundwater Sampling Results - Well P-14
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)				
	Depth to Water (feet btp)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)	Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium	Vanadium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	6	5	15	-	80
11-Dec-20	32.53	740.79	11.6	18697	0.12	-61.2	17.9	13.30	6560	-	263	19.6	2540000	-
3-Mar-21	29.44	743.88	12.0	12836	0.05	-87.0	1.54	13.09	4060	-	84.1	9.64	1490000	-
10-Jun-21	33.57	739.75	12.9	18706	0.67	-175.2	1.88	13.06	6400	-	242	3.44	2460000	-
13-Oct-21	33.57	739.75	12.7	23225	0.77	-139.7	0.75	13.18	7240 J-	131	292	2.47	2560000	24.2
7-Jan-22	27.73	745.59	11.9	9778	0.96	-112.9	1.86	13.30	4850	51.8	76.3	9.19	1480000	6.77
21-Mar-22	27.5	745.82	12.5	11725	1.27	-25.3	2.18	14.52	4110	46.1	74.8	41.3	1430000	6.68

Notes:

Top of casing elevation (feet NAVD88): 773.32

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- Not measured or not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

µmhos/cm Micromhos per centimeter

feet bmp Feet below measuring point

feet NAVD88 Feet NAVD88 Datum

mg/L Milligrams per liter

mV Millivolts

NTU Nephelometric Turbidity Unit

**Table A-5b: Summary of Lower Disposal Area - Disposal Area Groundwater Sampling Results - Well P-15
Ravensdale Site, Ravensdale, Washington**

Date Sampled	Field Parameters								Gen. Chem.	Metals (ug/L)				
	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	6	5	15	-	80
15-Oct-21	30.03	726.52	13.00	15815	1.72	-147.5	5.08	13.17	7180 J-	2 U	6.57	94	2390000	3.65
7-Jan-22	15.32	741.23	10.20	7227	1.03	-116.3	1.84	13.28	3420	5.17	6.34	101	884000	0.515 J
17-Mar-22	14.44	742.11	11.8	9351	1.11	-70	1.88	14.60	3060	3.08	5.63	109	970000	0.406

Notes:

Top of casing elevation (feet NAVD88): 756.55

Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included as COPCs for surface water locations and shallow/alluvial groundwater monitoring wells at the Site beginning in Q3 2021.

- Not measured or not available

Orange shaded values indicate parameter results above the Preliminary Screening Level (PSL), except for pH, which could be above or below the PSL

a Preliminary Screening Level (PSL) obtained from Table 5-3 of Golder 2021 RI Work Plan.

U Data validation code; not detected at the Reporting Limit (RL)

J Data validation code; estimated value

J+ Data validation code; estimated value with positive bias

°C Degrees Celsius

µmhos/cm Micromhos per centimeter

feet bmp Feet below measuring point

feet NAVD88 Feet NAVD88 Datum

mg/L Milligrams per liter

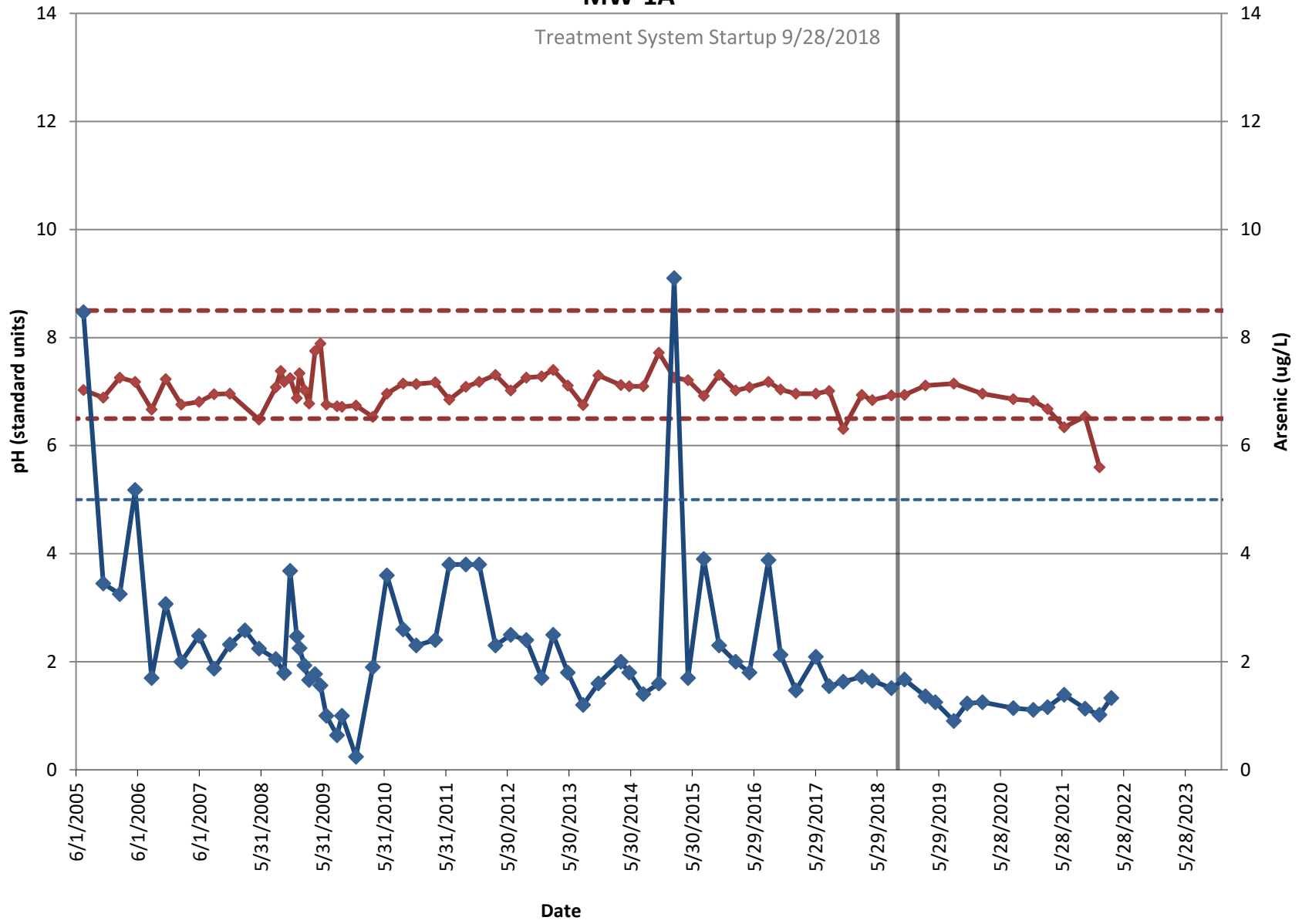
mV Millivolts

NTU Nephelometric Turbidity Unit

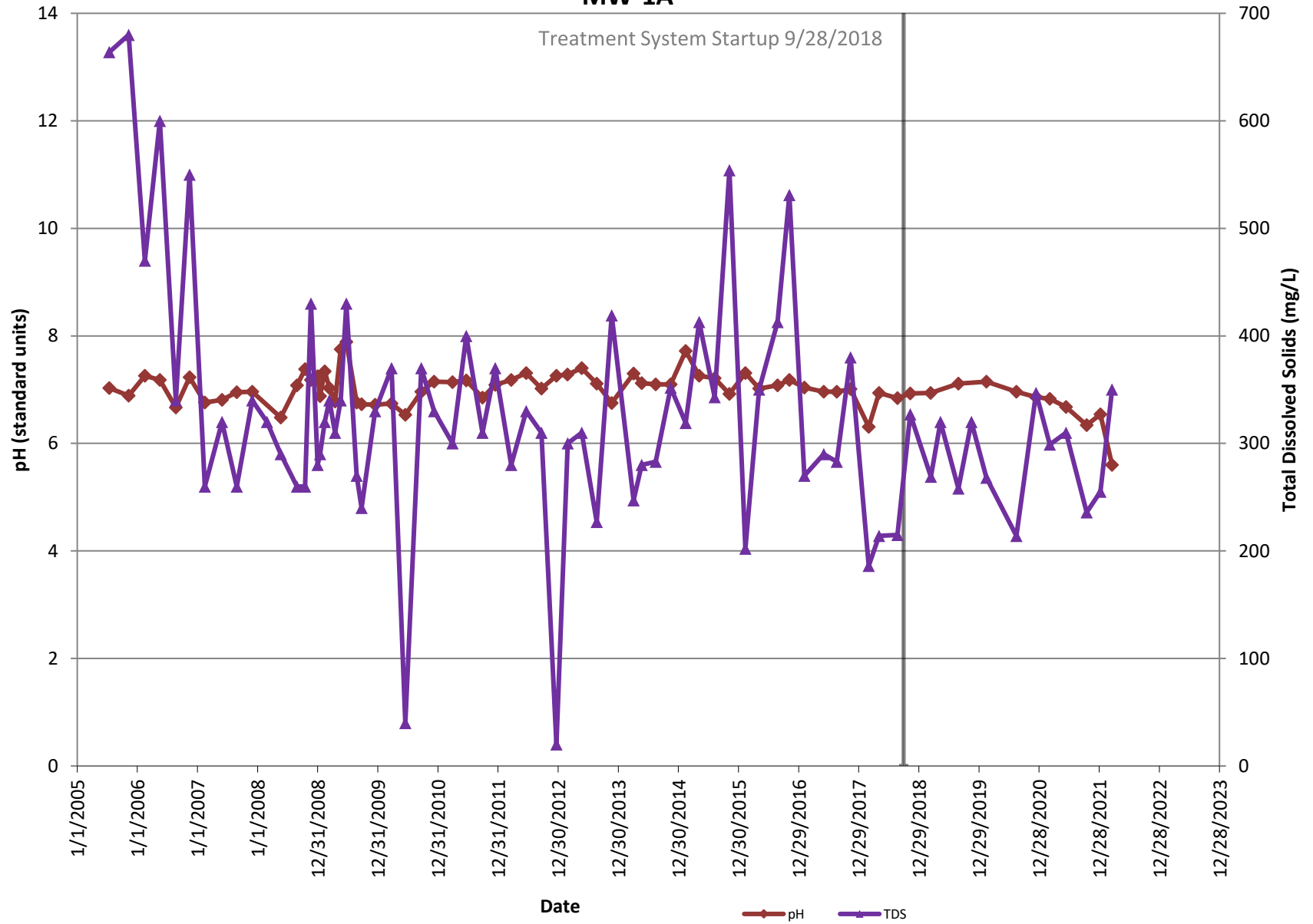
APPENDIX B

**LDA Shallow/Alluvial Monitoring
Wells Data Graphs**

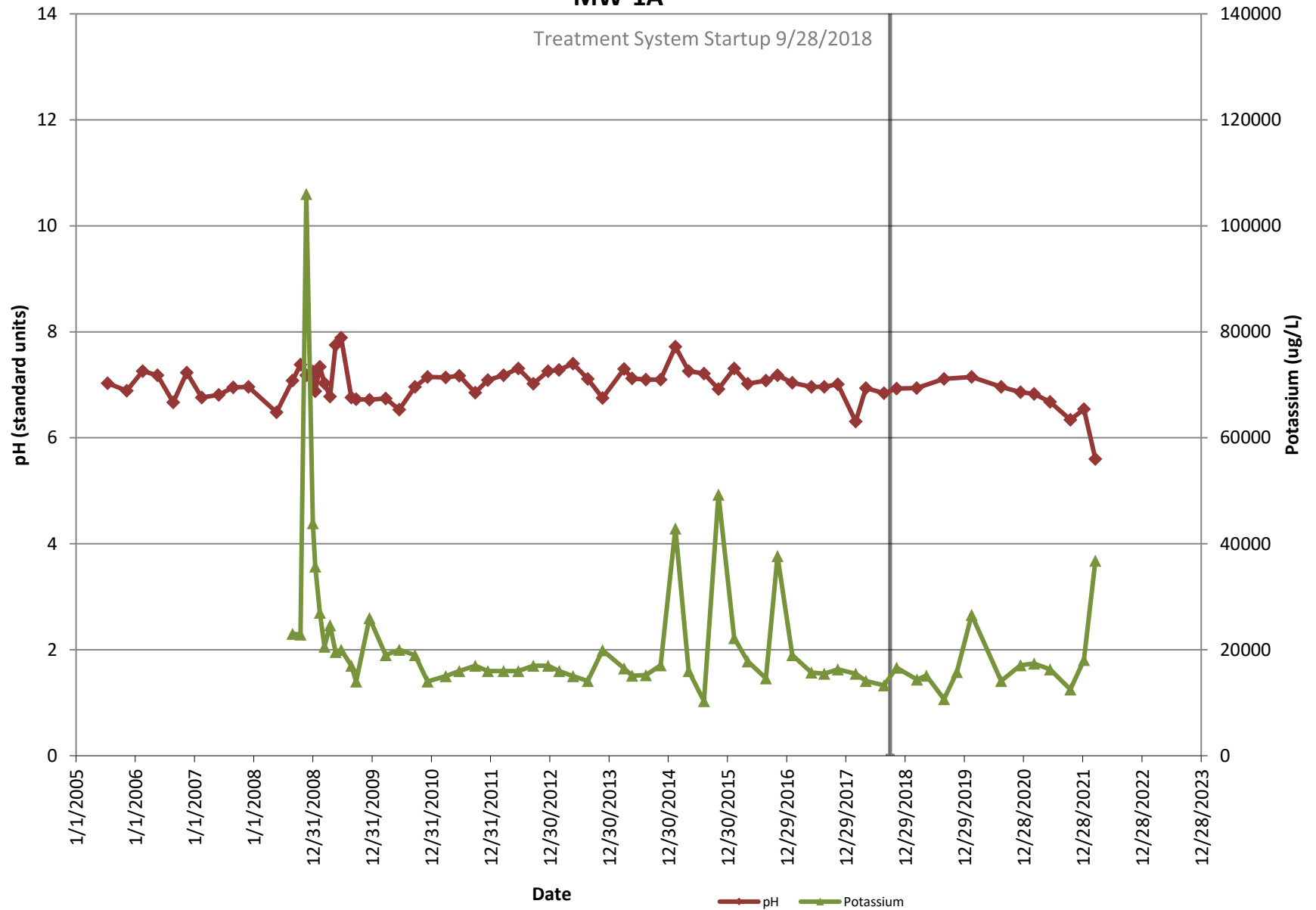
LDA Shallow/Alluvial Monitoring Wells MW-1A



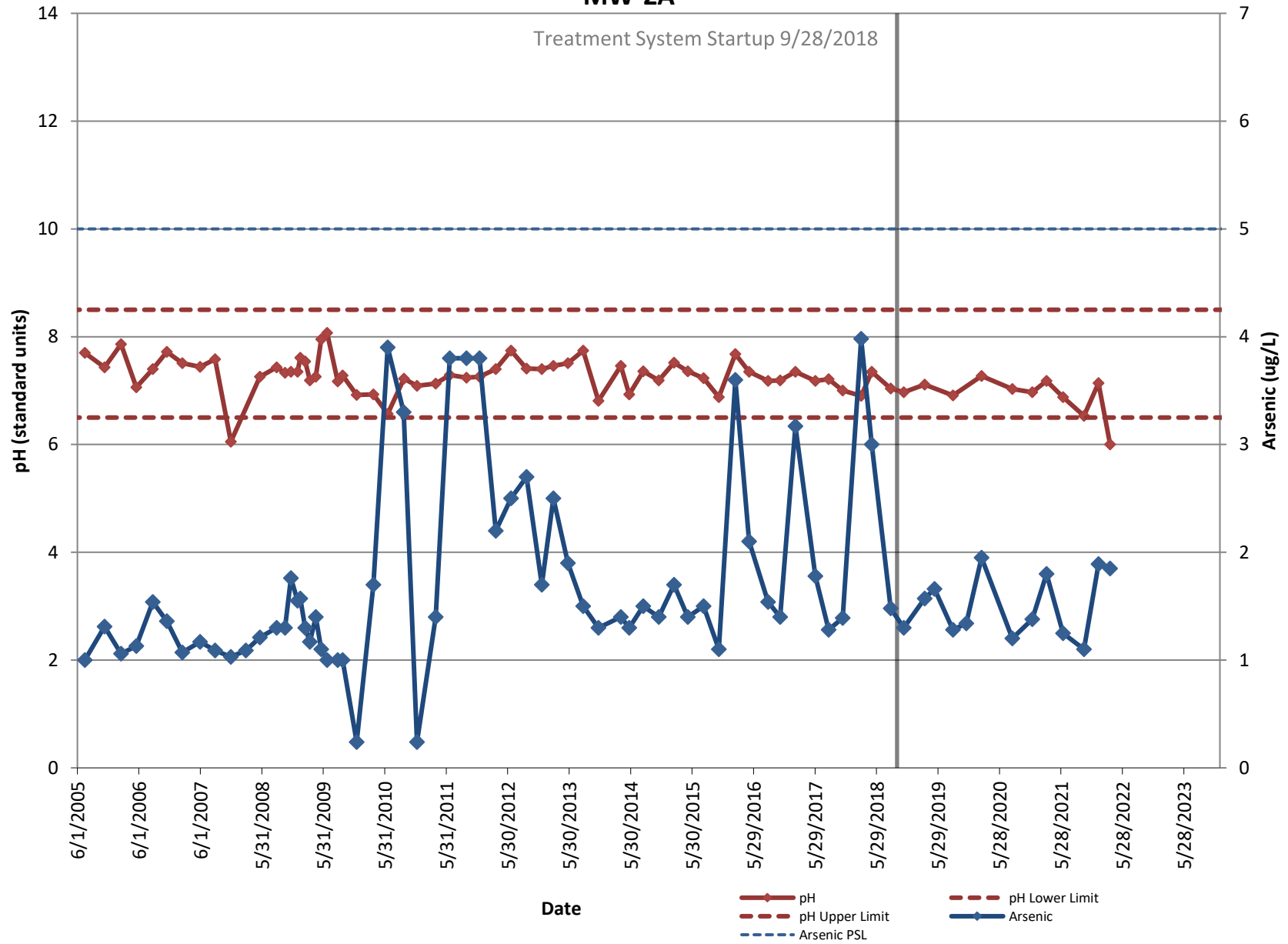
LDA Shallow/Alluvial Monitoring Wells MW-1A



LDA Shallow/Alluvial Monitoring Wells MW-1A

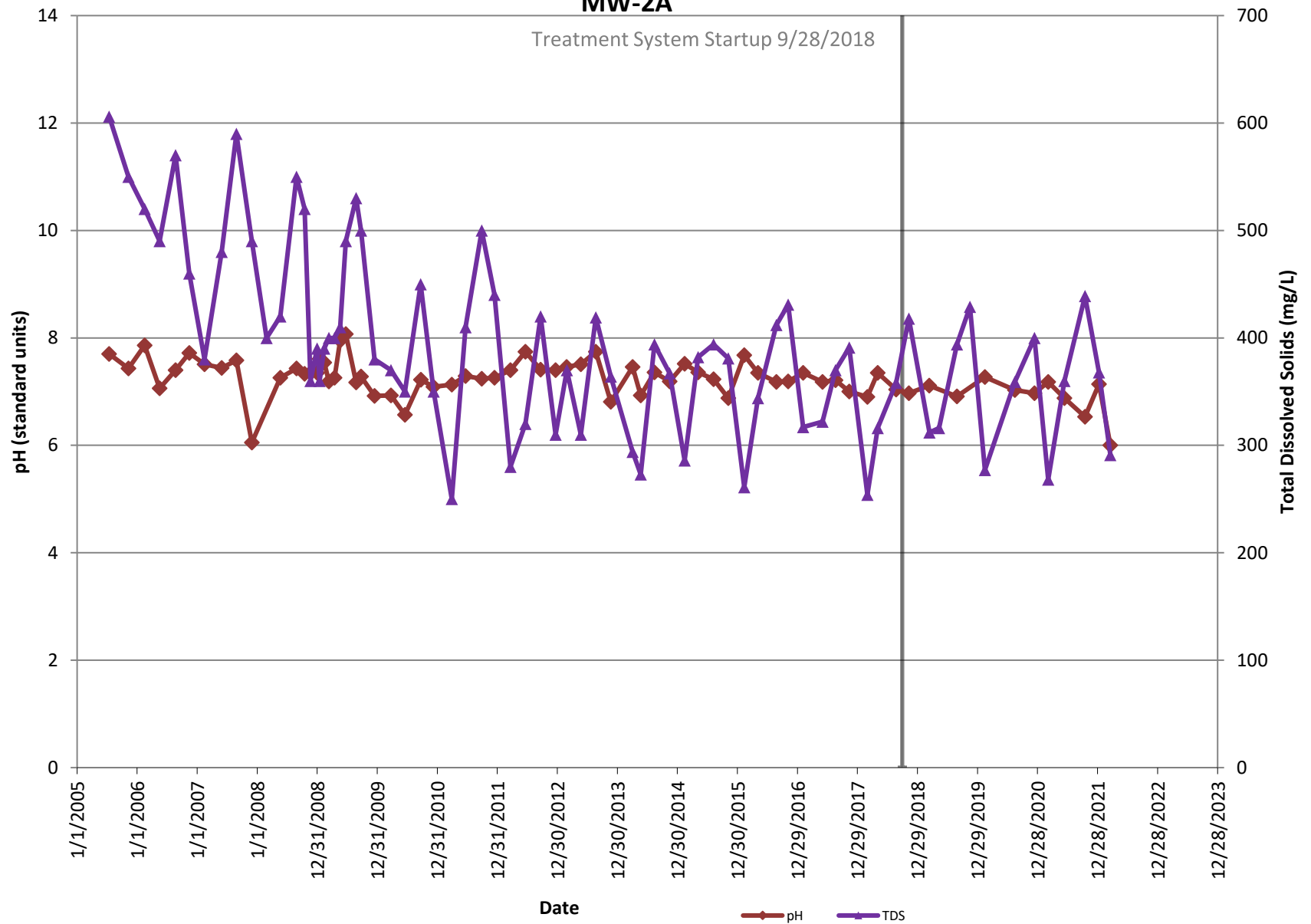


LDA Shallow/Alluvial Monitoring Wells MW-2A



LDA Shallow/Alluvial Monitoring Wells

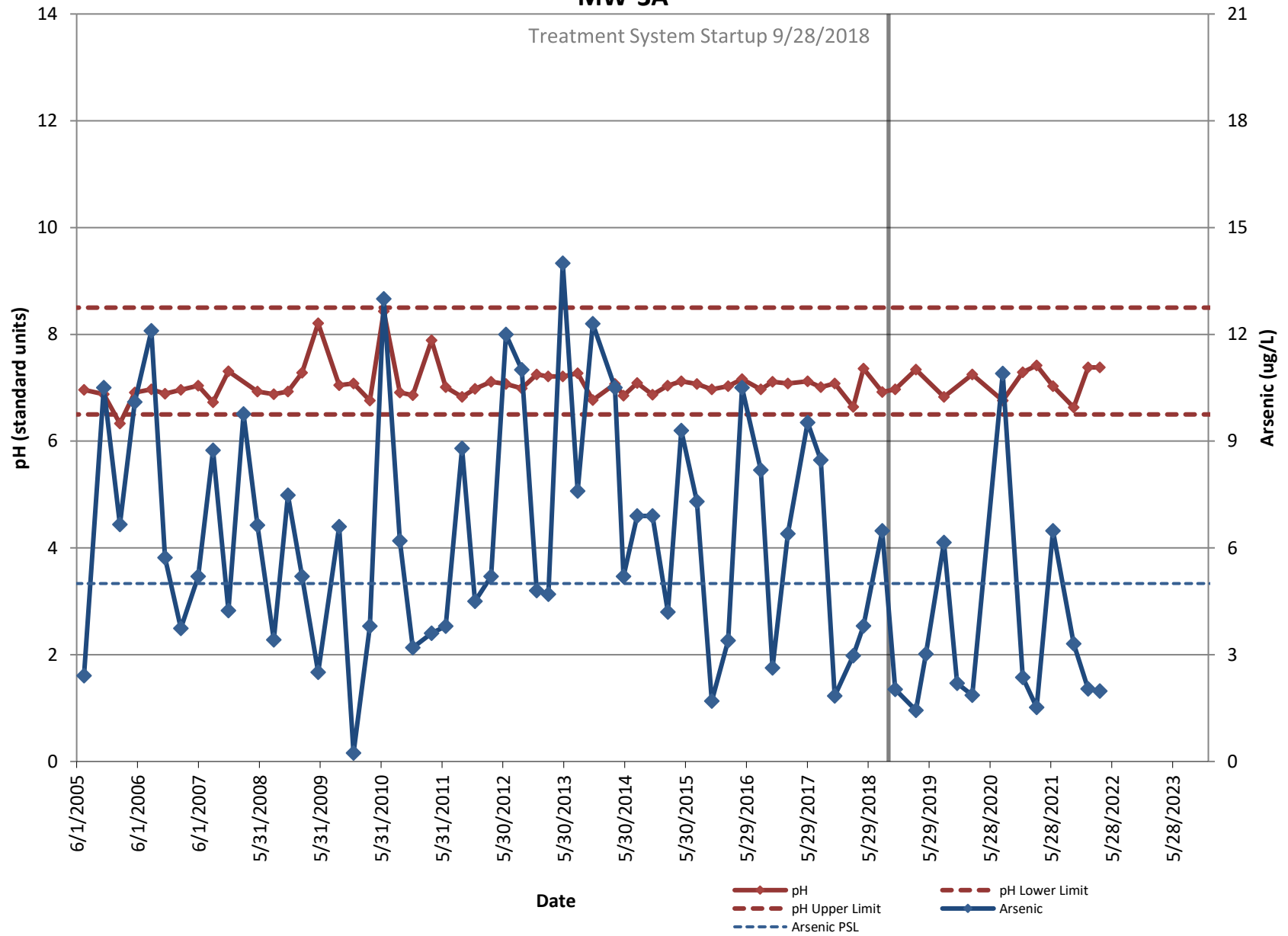
MW-2A



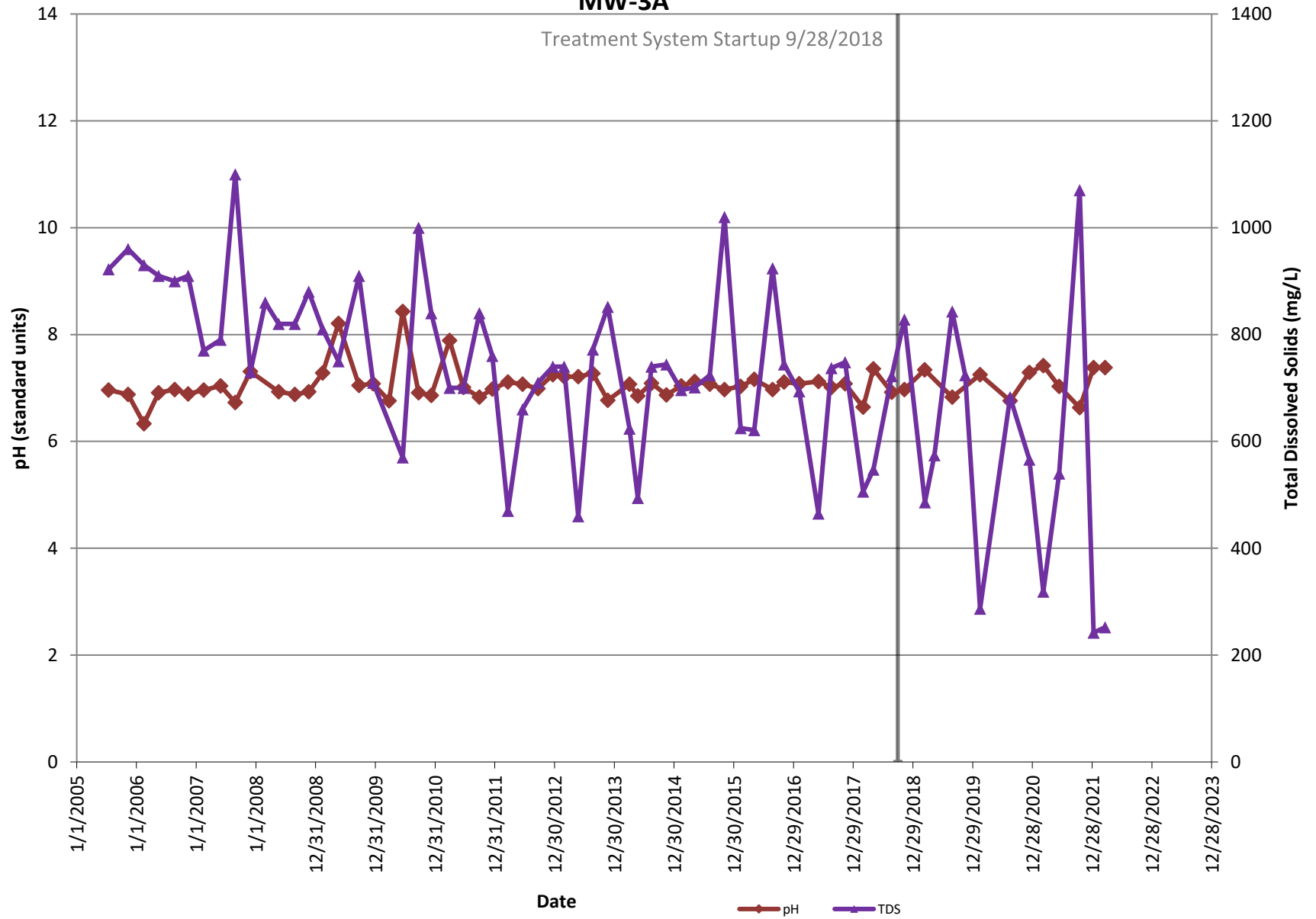
LDA Shallow/Alluvial Monitoring Wells MW-2A



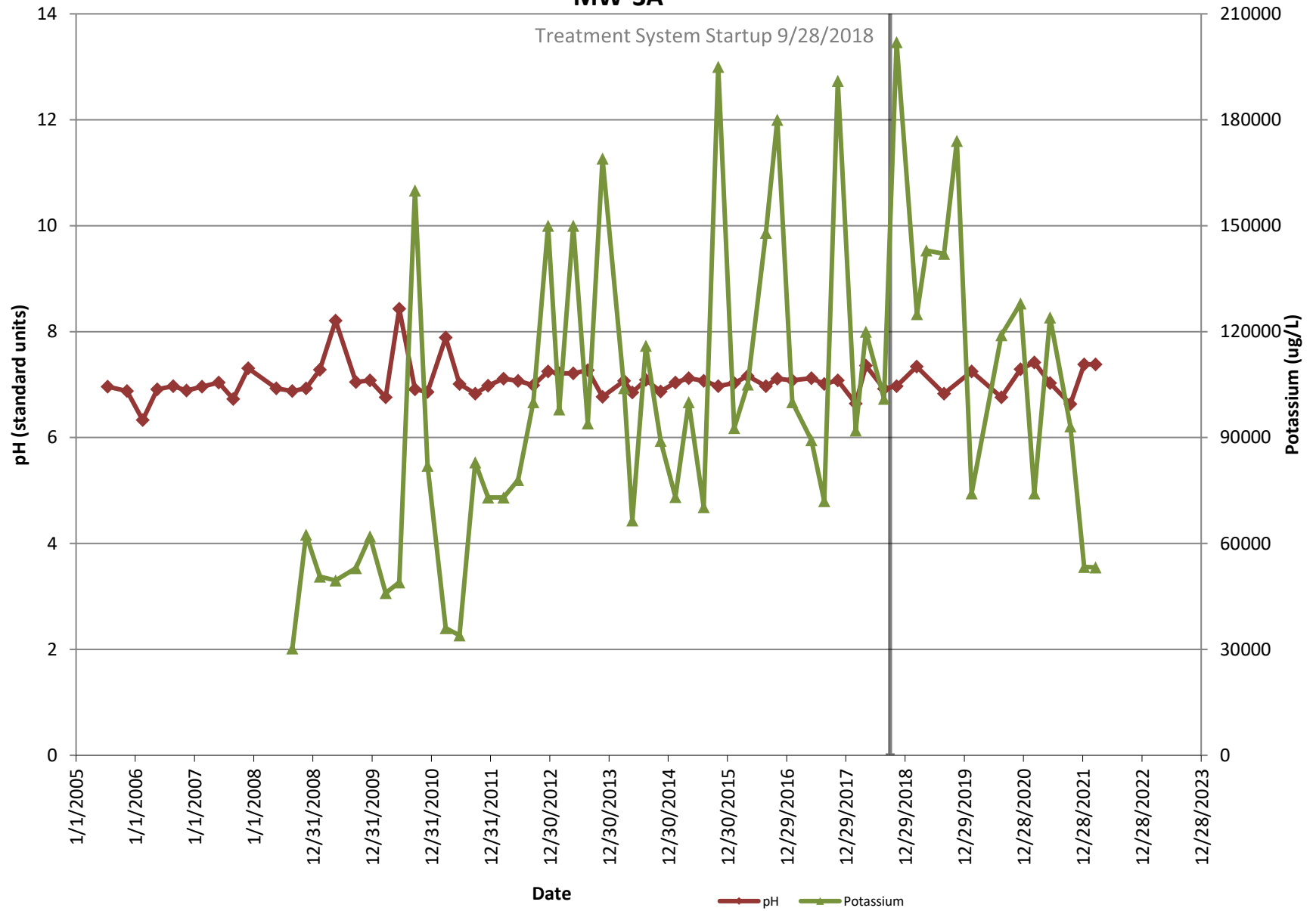
LDA Shallow/Alluvial Monitoring Wells MW-3A



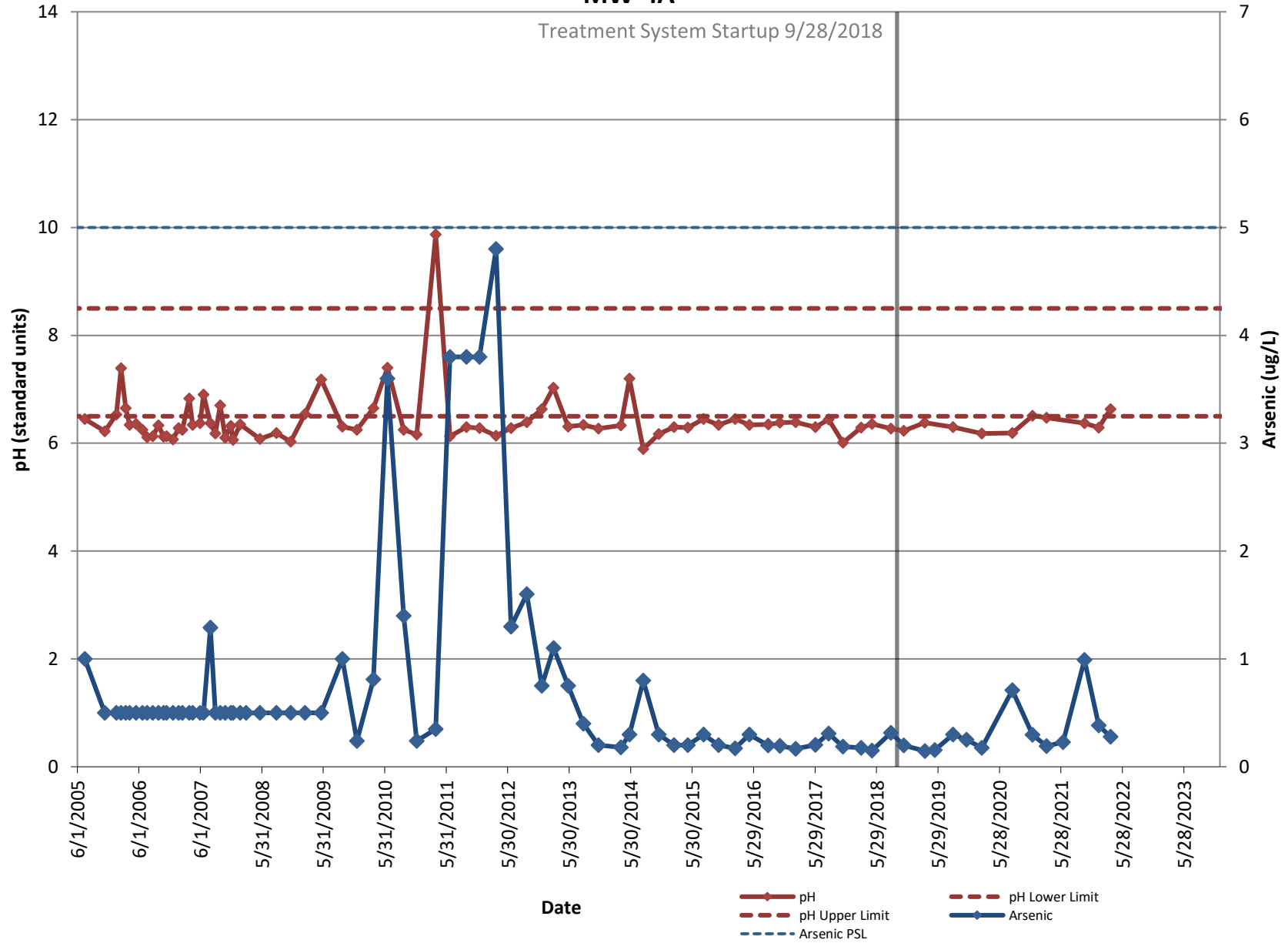
LDA Shallow/Alluvial Monitoring Wells MW-3A



LDA Shallow/Alluvial Monitoring Wells MW-3A

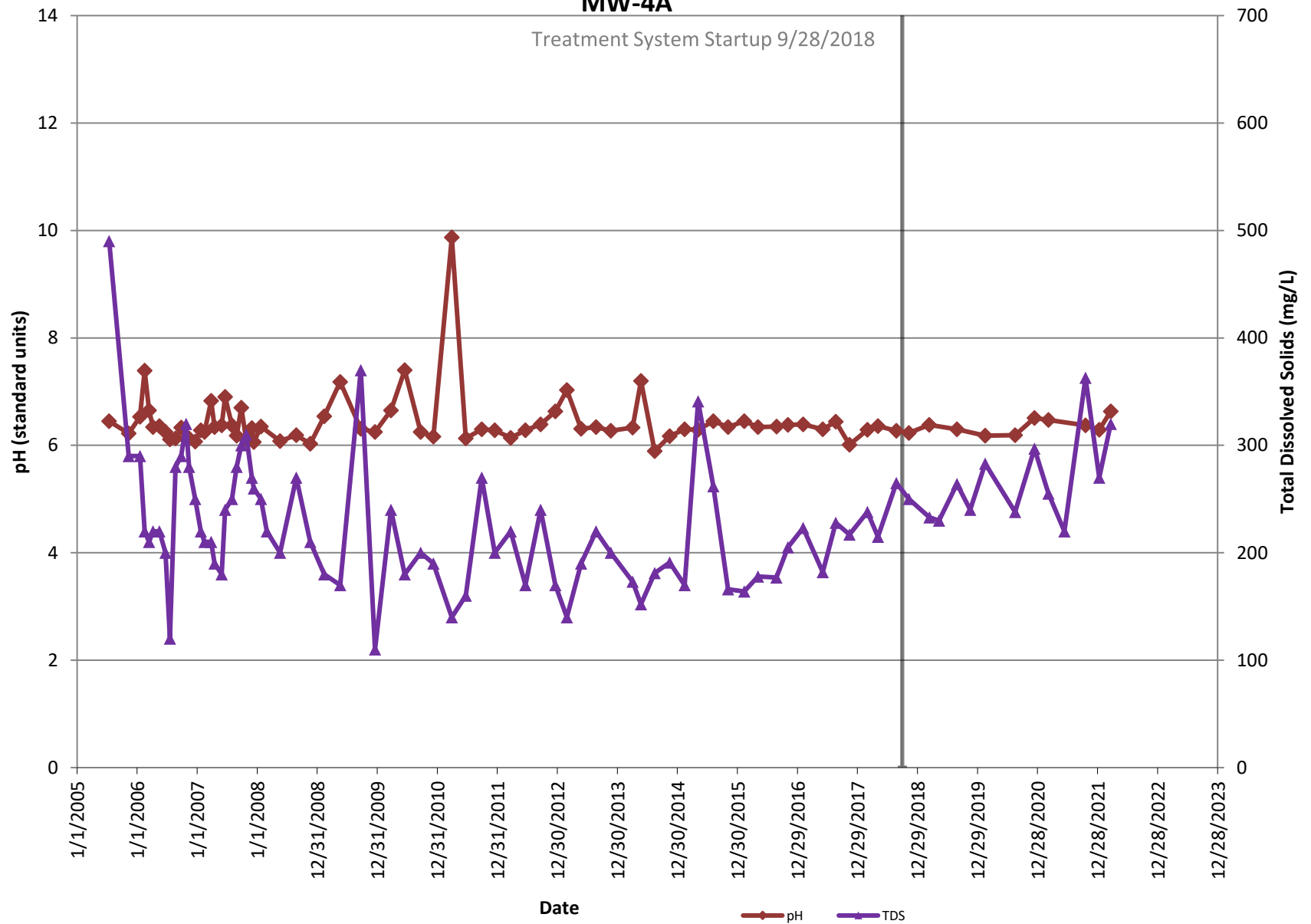


LDA Shallow/Alluvial Monitoring Wells MW-4A

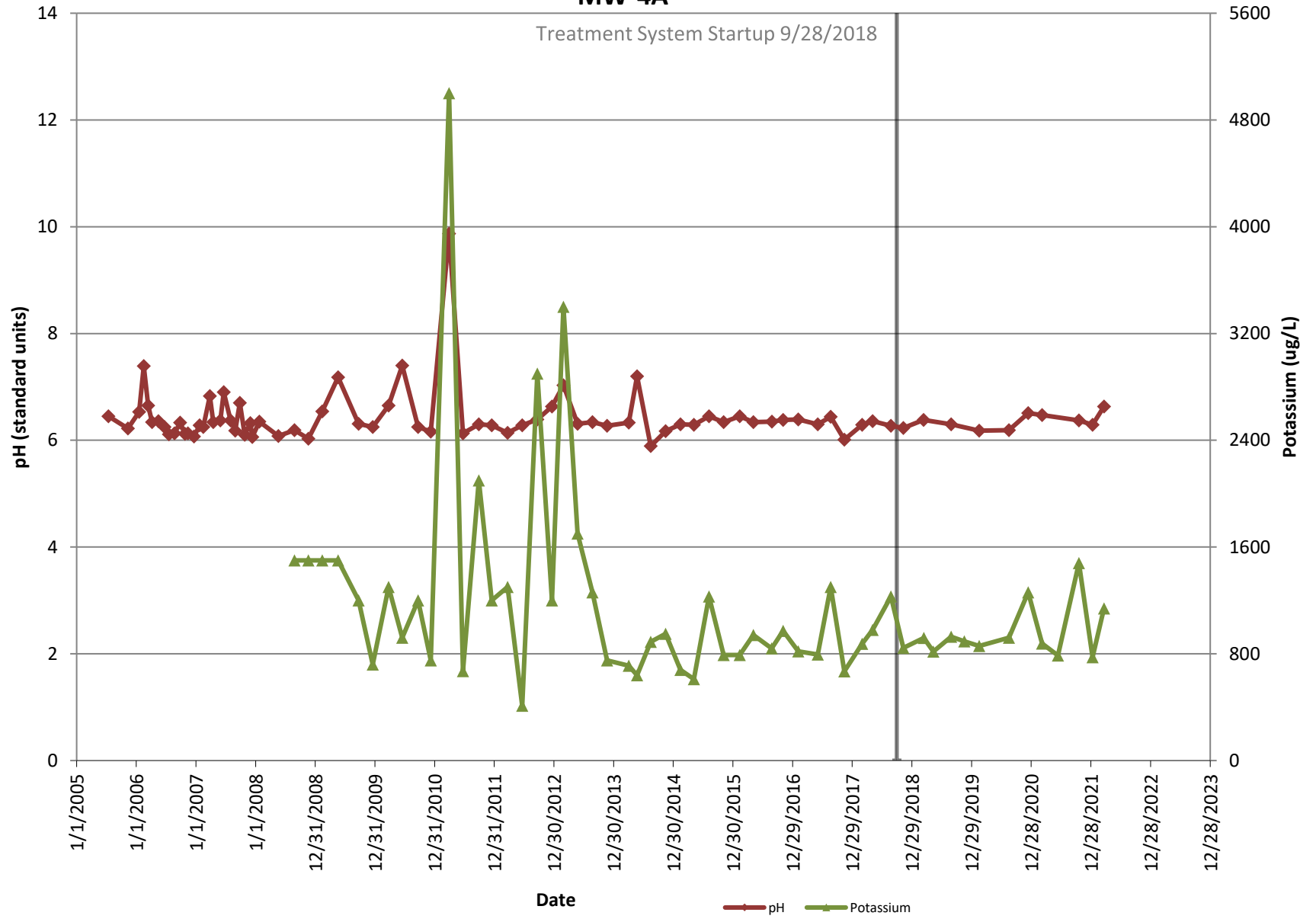


LDA Shallow/Alluvial Monitoring Wells

MW-4A

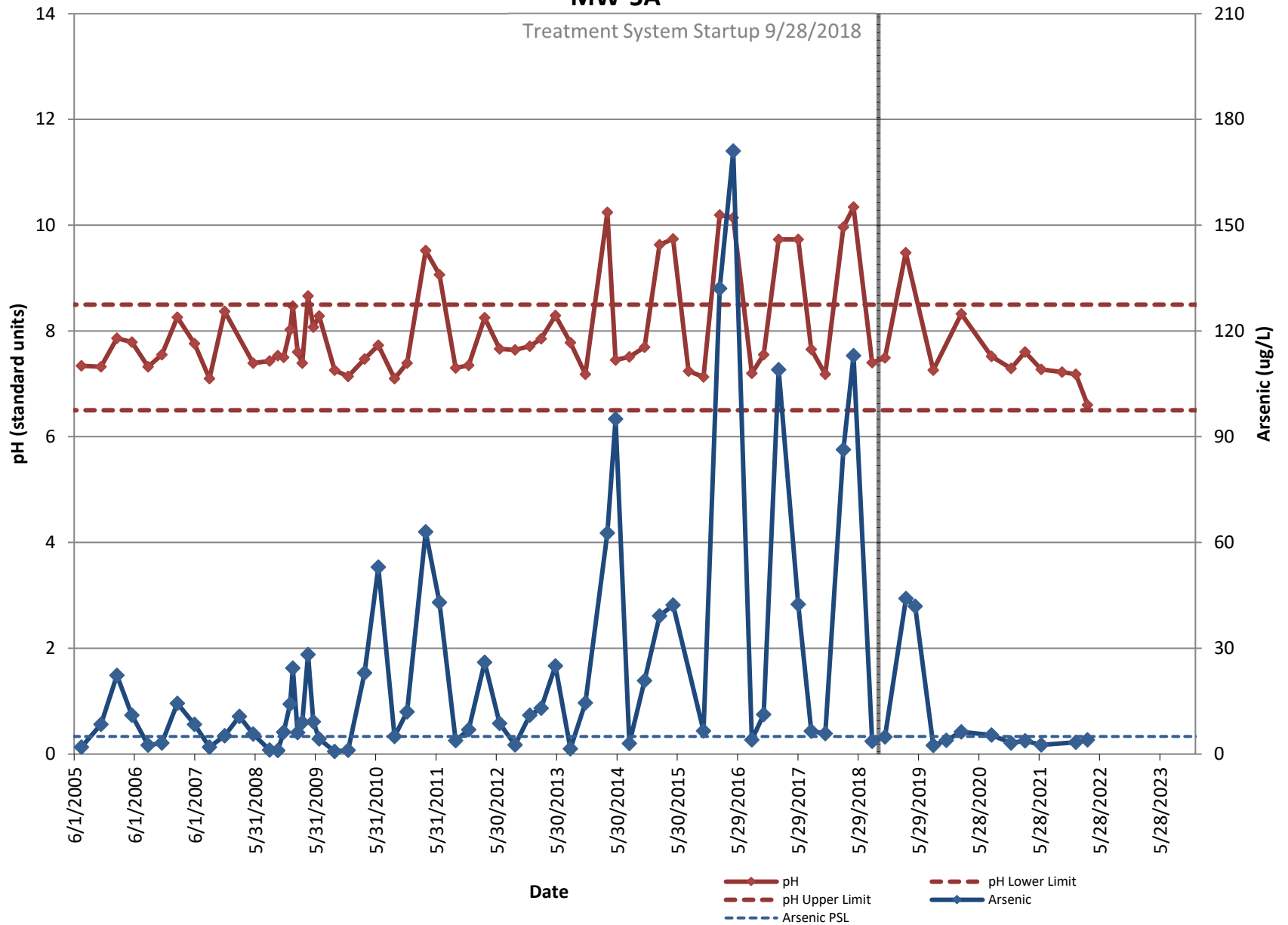


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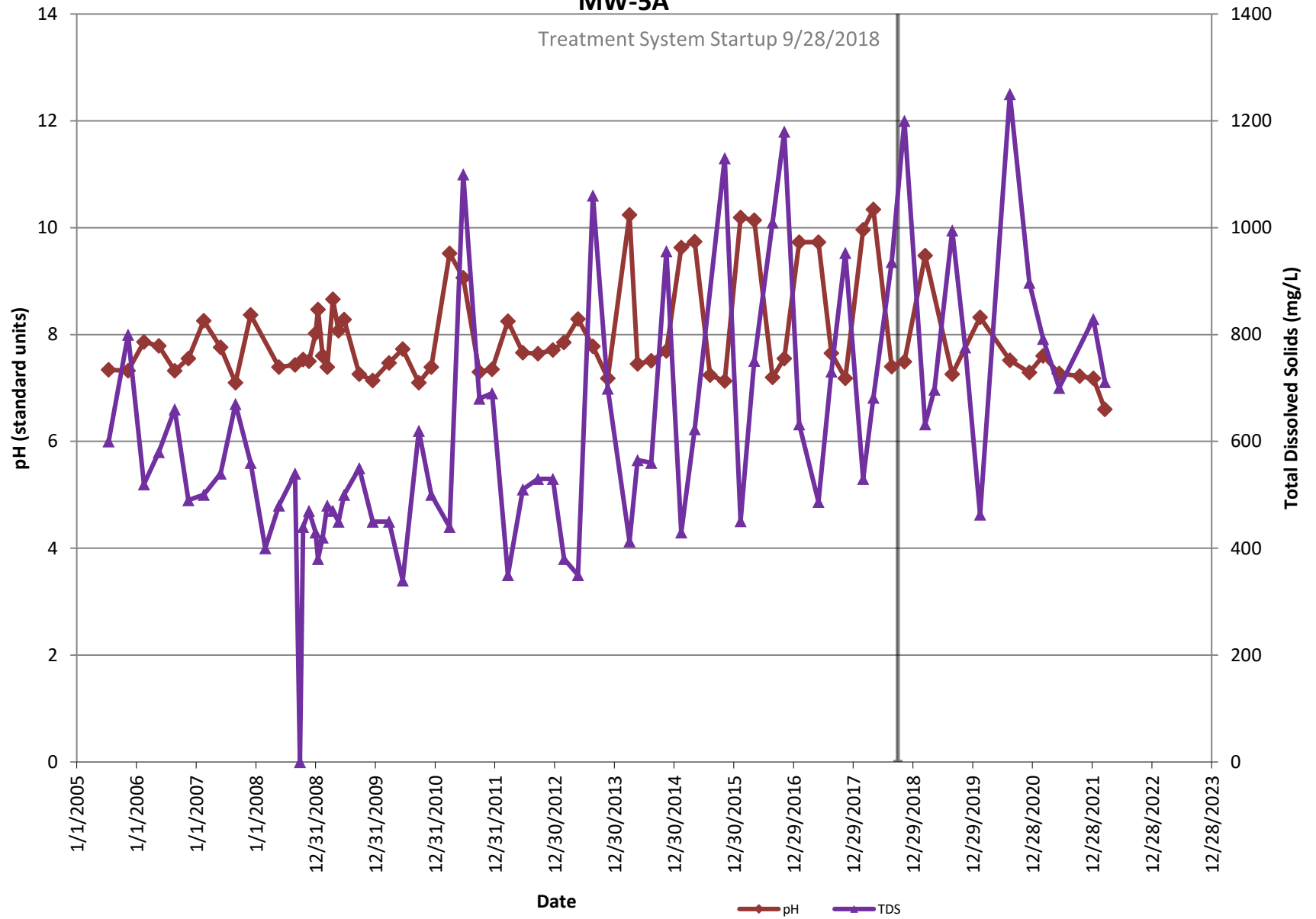


LDA Shallow/Alluvial Monitoring Wells

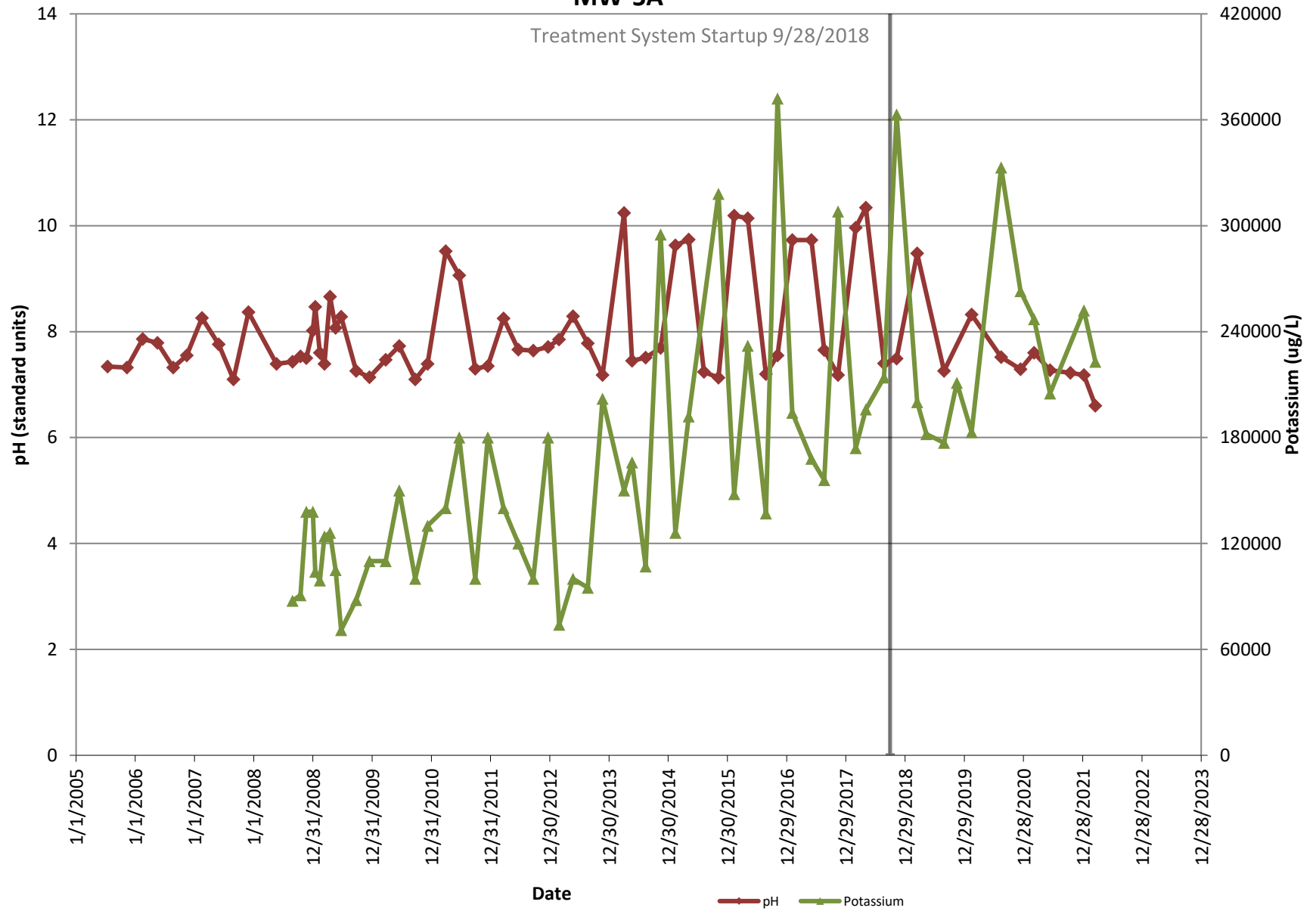
MW-5A



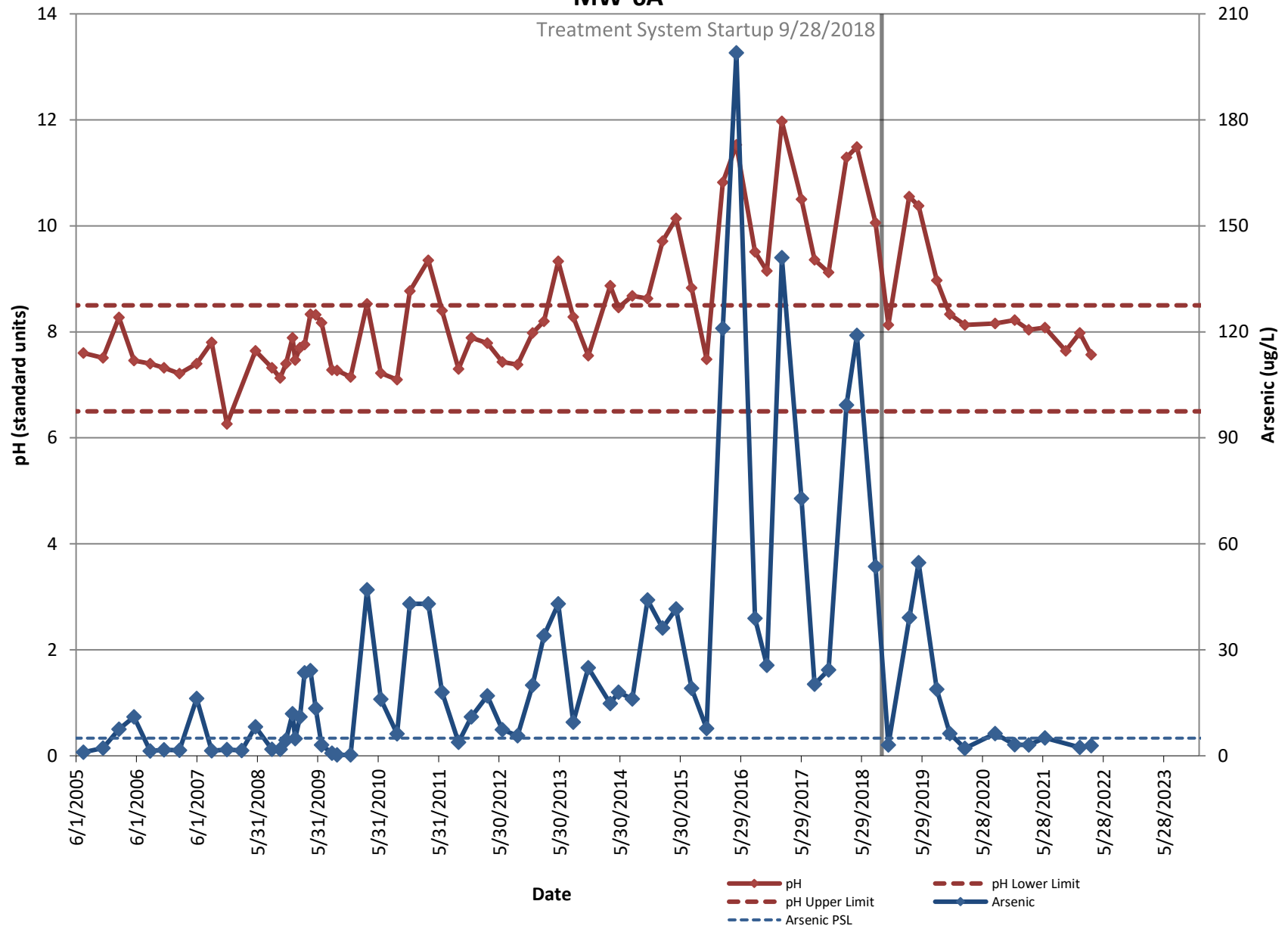
LDA Shallow/Alluvial Monitoring Wells MW-5A



LDA Shallow/Alluvial Monitoring Wells MW-5A

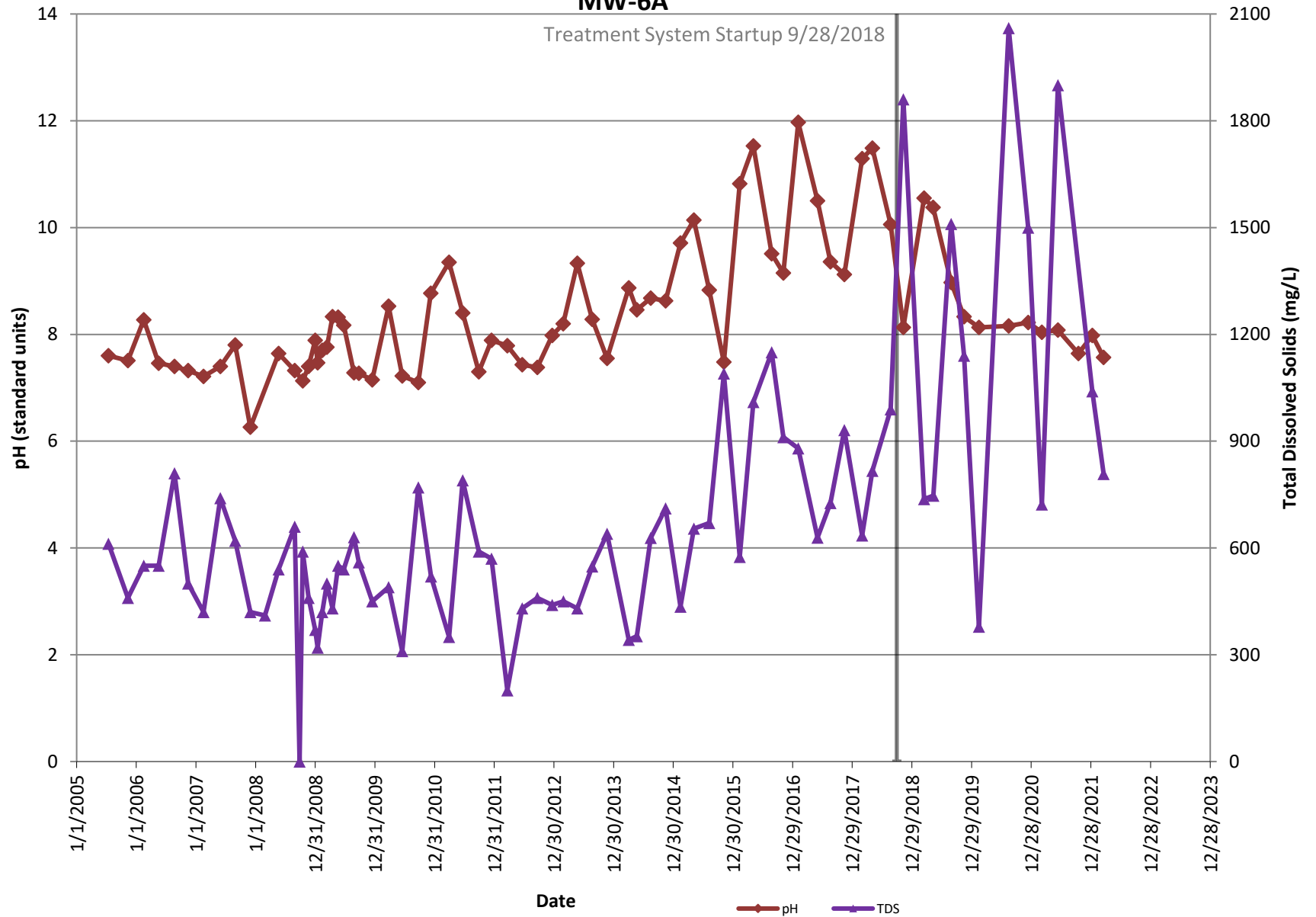


LDA Shallow/Alluvial Monitoring Wells MW-6A

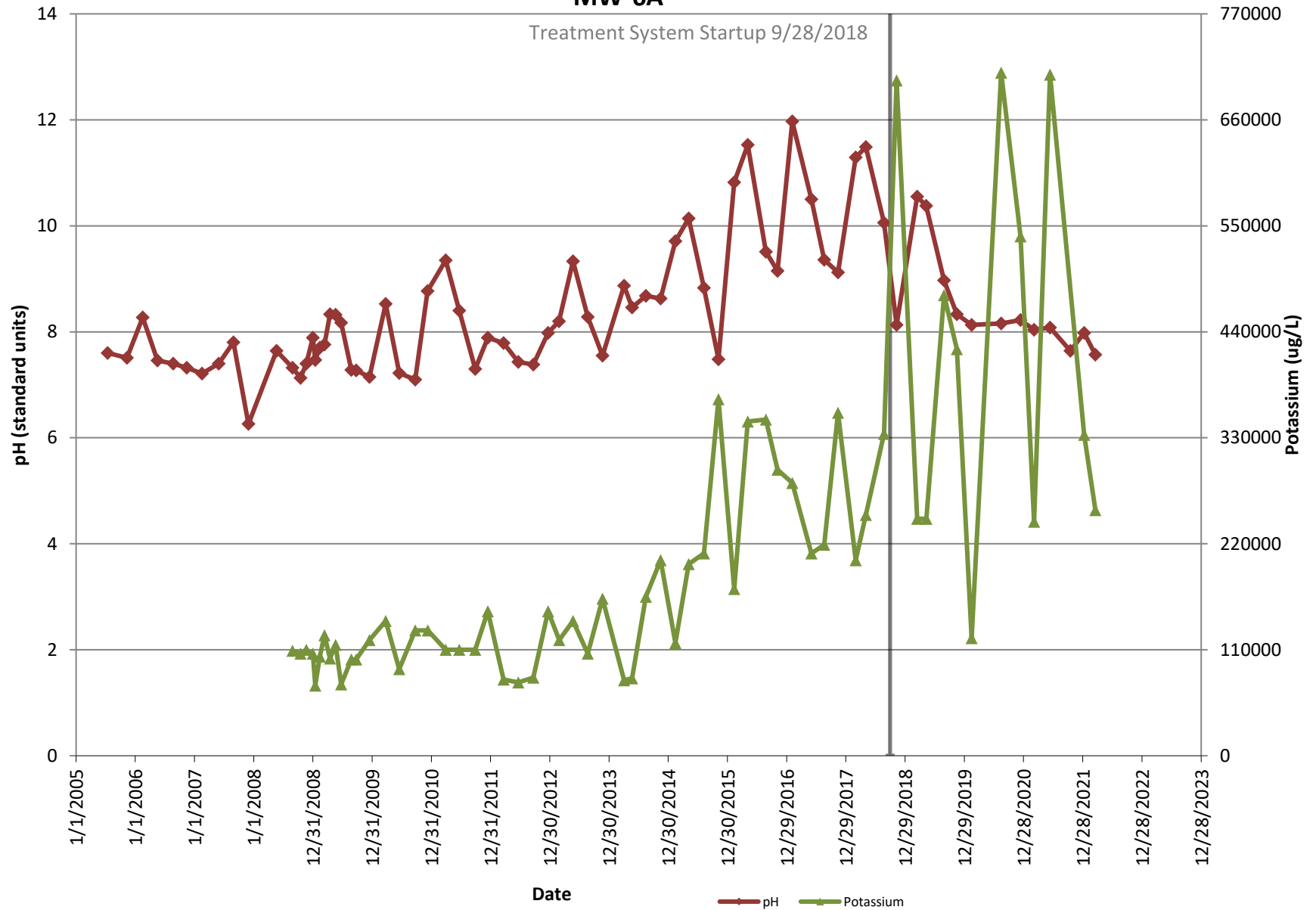


LDA Shallow/Alluvial Monitoring Wells

MW-6A



LDA Shallow/Alluvial Monitoring Wells MW-6A



APPENDIX C

**Data Validation Report and
Laboratory Analytical Results**

DATA VALIDATION CHECKLIST

Project Name:	Ravensdale Project
Project Number:	GL152030402
Sample Identification(s):	MW-5A-0322, Infiltration Ponds-0322, MW-35A-0322, MW-6A-0322, MW-2A-0322, MW-45A-0322, MW-1A-0322, Portal-0322, Still Well-0322, MW-3A-0322, Weir-0322, MW-99-1-0322, P-16-0322, South Pond-0322, MW-10A-0322, MWB-1LDA-0322, MWB-2LDA-0322, P-15-0322, Interceptor Trench-0322, MWB-3LDA-0322, P-17-0322, MW-4A-0322, MW-9A-0322, MWB-1DDSP-0322, MWB-1DSP-0322, P-11-0322, MWB-6DSP-0322, MW-55A-0322, MWB-5DSP-0322, P-14-0322, MW-8A-0322, and MW-7A-0322
Sample Date(s):	3/16/22, 3/17/22, 3/18/22, 3/21/22
Sample Team:	David Lam, Golder Associates
Sample Matrix:	Aqueous
Analyzing Laboratory:	Analytical Resources, Inc. – Tukwila, WA
Analyses:	TDS (SM2540C); Total Metals (SW6010D, E200.8); K, Na, Ca, Mg, Pb, Sb, V (E200.8 UCT-KED); As; Anions (EPA 300.0) Chloride, Sulfate; Alkalinity (SM2320B)
Laboratory Report No.:	22C0335, 22C0362

FIELD DATA PACKAGE DOCUMENTATION

Field Sampling Logs:	Reported		Performance Acceptable		Not Required
	NO	YES	NO	YES	
1. Sampling dates noted		X		X	
2. Sampling team indicated		X		X	
3. Sampling identification traceable to location collected		X		X	
4. Sample location		X		X	
5. Collection technique (bailer, pump, etc.)		X		X	
6. Sample container type		X		X	
7. Preservation methods		X		X	
8. Chain-of-custody form completed		X		X	
9. Required analytical methods requested		X		X	
10. Field sample logs completed properly and signed		X		X	
11. Number and type of field QC samples collected		X		X	
12. Field equipment calibration		X		X	
13. Field equipment decontamination		X		X	

QC – quality control

COMMENTS:

Performance was acceptable, with no exceptions.

ANALYTICAL DATA PACKAGE DOCUMENTATION

GENERAL INFORMATION

	Reported		Performance Acceptable		Not Required
	NO	YES	NO	YES	
1. Sample results		X		X	
2. Parameters analyzed		X		X	
3. Method of analysis		X		X	
4. Reporting limits of analysis		X		X	
5. Sample collection date		X	X		
6. Laboratory sample received date		X		X	
7. Sample preparation/extraction date		X		X	
8. Sample analysis date		X		X	
9. Copy of chain-of-custody form signed by lab sample custodian		X		X	
10. Narrative summary of QA or sample problems provided		X	X		

QA – quality assurance

COMMENTS:

Performance was acceptable, with the following notes:

- For lab report 22C0335, it was noted that the sample times for sample Interceptor Trench-0322 did not match between the chain of custody and the sample label on the bottles. The bottle label states the sampling time is 15:25 while the COC states it is 13:25. The laboratory reported the time on COC. This did not affect the holding time of the analysis (7 days for TDS). No further action is required other than to note.
- Sample MWB-3LDA-0322 failed preservation requirements for total metals upon receipt, however it was confirmed by the lab it was adjusted to a pH <2. No further action is required other than to note.
- For lab report 22C0335, sample MWB-1DSP-0322 was not on the COC but submitted for analysis. It was noted by the lab that this sample was added at the end of the sample chain, no further action is required other than to note.

INORGANIC ANALYSES

Metals (EPA 6010/200.8) (E200.8 UCT-KED)	Reported		Performance Acceptable		Not Required
	NO	YES	NO	YES	
1. Holding times		X		X	
2. Reporting limits		X		X	
3. Blanks					
a. Method blanks		X		X	
b. Equipment /Rinsate blanks		X	X		
4. Laboratory control sample (LCS) %R		X		X	
5. Matrix spike (MS) %R		X	X		
6. LCS duplicate (LCSD) %R	X				X
7. MS duplicate (MSD) %R		X	X		
8. MS / MSD RPD		X		X	
9. LCS / LCSD RPD	X				X
10. Laboratory Duplicate RPD		X		X	
11. Field duplicate comparison		X		X	

%R – percent recovery

RPD – relative percent difference

COMMENTS:

Performance was acceptable, with the following exceptions and/or notes:

- Potassium was detected in sample MW-99-0322 (equipment blank) at 0.115 mg/L. This was below the RL of 0.500mg/L and above the MDL of 0.107mg/L. Following Inorganic Guidelines, when the blank concentration was less than the RL, associated detected results greater than the RL did not require qualification.
- Total dissolved solids were detected in sample MW-99-0322 (equipment blank) at 13 mg/L, above the RL of 5 mg/L. However, all associated sample detect results were greater than 10x. Following Inorganic Guidelines when the blank concentration was greater than the RL and associated detected results were above the RL and 10x greater than the blank concentration, no qualification is required.
- The MS/MSDs of parent sample MW-5A-0322, the recoveries for potassium and sodium were less than lower control limit. However, the parent sample > 4x than the spike. No qualification is required.
- The MSD displayed a recovery greater than the upper control limit (125%) for sample MW-5A-0322 magnesium of 129%. When only one QC indicator does not meet criteria, qualification is not needed.
- The MSD displayed a recovery greater than the upper control limit (125%) for sample Weir-0322 for magnesium of 127%. When only one QC indicator does not meet criteria, qualification is not needed.
- Field duplicates are as followed: MW-35A-0322 is a duplicate to Infiltration Ponds-0322 and MW-45A-0322 is a field duplicate to MW-2A-0322, and MW-55A-0322 is a duplicate to MWB-6DSP-0322.

GENERAL WET CHEMISTRY

TDS (SM 2540C) Anions (EPA 300.0) Alkalinity (SM2320B)	Reported		Performance Acceptable		Not Required
	NO	YES	NO	YES	
1. Holding times		X		X	
2. Reporting limits		X		X	
3. Blanks					
a. Method blanks		X		X	
b. Equipment rinsate blanks		X		X	
4. Laboratory control sample (LCS) %R		X		X	
5. Matrix spike (MS) %R		X		X	
6. LCS duplicate (LCSD) %R	X				X
7. MS duplicate (MSD) %R		X		X	
8. MS/MSD RPD		X		X	
9. LCS/LCSD RPD	X				X
10. Laboratory Duplicate RPD		X		X	
11. Field duplicate comparison		X		X	

%R – percent recovery RPD – relative percent difference

COMMENTS:

Performance was acceptable, with the following exceptions and/or notes:

- Field duplicates are as followed: MW-35A-0322 is a duplicate to Infiltration Ponds-0322 and MW-45A-0322 is a field duplicate to MW-2A-0322, and MW-55A-0322 is a duplicate to MWB-6DSP-0322.

DATA VALIDATION CHECKLIST

SUMMARY AND DATA QUALIFIER CODES

Project Name:	Ravensdale Project
Project Number:	GL152030402
Sample Identification(s):	MW-5A-0322, Infiltration Ponds-0322, MW-35A-0322, MW-6A-0322, MW-2A-0322, MW-45A-0322, MW-1A-0322, Portal-0322, Still Well-0322, MW-3A-0322, Weir-0322, MW-99-1-0322, P-16-0322, South Pond-0322, MW-10A-0322, MWB-1LDA-0322, MWB-2LDA-0322, P-15-0322, Interceptor Trench-0322, MWB-3LDA-0322, P-17-0322, MW-4A-0322, MW-9A-0322, MWB-1DDSP-0322, MWB-1DSP-0322, P-11-0322, MWB-6DSP-0322, MW-55A-0322, MWB-5DSP-0322, P-14-0322, MW-8A-0322, and MW-7A-0322
Sample Date(s):	3/16/22, 3/17/22, 3/18/22, 3/21/22
Sample Team:	David Lam, Golder Associates
Sample Matrix:	Aqueous
Analyzing Laboratory:	Analytical Resources, Inc. – Tukwila, WA
Analyses:	TDS (SM2540C); Total Metals (SW6010D, E200.8):, K, Na, Ca, Mg, Pb, Sb, V (E200.8 UCT-KED); As; Anions (EPA 300.0) Chloride, Sulfate; Alkalinity (SM2320B)
Laboratory Report No.:	22C0335, 22C0362

Sample ID	Analyte(s)	Old Result	Old Qualifier	New Result	New Qualifier	Reason(s)

VALIDATION PERFORMED BY:	Julia Campbell, Golder Associates
DATE:	April 25, 2022
PEER REVIEW PERFORMED BY:	Michael Shadle, Golder Associates
DATE:	May 6, 2022

Infiltration Ponds MW-35A Duplicate

Client_Sample_ID	Analyte	Result	Result	RPD	Unit	Qualifier	RL	MDL
Infiltrationponds-0322	Antimony	7.59	7.95	5%	mg/L		0.2	0.101
Infiltrationponds-0322	Arsenic	10.6	10.9	3%	mg/L		0.2	0.0373
Infiltrationponds-0322	Potassium	236	231	2%	mg/L		0.5	0.107
Infiltrationponds-0322	Lead	4.77	4.81	1%	mg/L		0.1	0.0513
Infiltrationponds-0322	Vanadium	1.82	1.91	5%	mg/L		0.2	0.0556
Infiltrationponds-0322	Total Dissolved Solids	733	743	1%	mg/L		13	13

MW-2A MW-45A Duplicate

Client_Sample_ID	Analyte	Result	Result	RPD	Unit	Qualifier	RL	MDL
MW-2A-0322	Hardness, Total as CaCO3	112	112	0%	mg/L			
MW-2A-0322	Antimony	3.26	3.28	1%	ug/L		0.2	0.101
MW-2A-0322	Arsenic	1.85	1.8	3%	ug/L		0.2	0.0373
MW-2A-0322	Calcium	26	26.2	1%	mg/L		0.05	0.022
MW-2A-0322	Chromium	1.23	na	-	ug/L		0.5	0.26
MW-2A-0322	Magnesium	11.3	11.4	1%	mg/L		0.05	0.0209
MW-2A-0322	Potassium	60.9	61	0%	mg/L		0.5	0.107
MW-2A-0322	Lead	0.218	0.156	33%	ug/L		0.1	0.0513
MW-2A-0322	Sodium	20.4	20.6	1%	mg/L		0.5	0.105
MW-2A-0322	Vanadium	1.15	1.22	6%	ug/L		0.2	0.0556
MW-2A-0322	Total Dissolved Solids	291	284	2%	mg/L		10	10
MW-2A-0322	Alkalinity, Total as CaCO3	226	na	-	mg/L		1	1
MW-2A-0322	Chloride	1.88	na	-	mg/L		0.1	0.1
MW-2A-0322	Sulfate	16.4	na	-	mg/L		0.5	0.5

MWB-6DSP MW-55A Duplicate

Client_Sample_ID	Analyte	Result	Result	RPD	Unit	Qualifier	RL	MDL
MWB-6DSP-0322	Hardness, Total as CaCO3	256	252	2%	mg/L			
MWB-6DSP-0322	Arsenic	1.06	1.01	5%	ug/L		0.2	0.0373
MWB-6DSP-0322	Calcium	55.7	54.5	2%	mg/L		0.05	0.022
MWB-6DSP-0322	Magnesium	28.5	28.2	1%	mg/L		0.05	0.0209
MWB-6DSP-0322	Potassium	1.09	1.06	3%	mg/L		0.5	0.107
MWB-6DSP-0322	Sodium	11	10.8	2%	mg/L		0.5	0.105
MWB-6DSP-0322	Chloride	1.36	na	-	mg/L		0.1	0.1
MWB-6DSP-0322	Total Dissolved Solids	297	276	7%	mg/L		10	10
MWB-6DSP-0322	Sulfate	7.41	na	-	mg/L		0.1	0.1
MWB-6DSP-0322	Alkalinity, Total as CaCO3	262	na	-	mg/L		1	1

na- not analyzed, certain parameters were not requested for the field duplicates



Analytical Resources, LLC
Analytical Chemists and Consultants

12 April 2022

Gary Zimmerman
Golder Associates
18300 NE Union Hill Road Suite 200
Redmond, WA 98052-3333

RE: Ravensdale (Ravensdale)

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)
22C0362

Associated SDG ID(s)
N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclosed Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, LLC

Kelly Bottem, Client Services Manager

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



Chain of Custody Record & Laboratory Analysis Request



Analytical Resources, LLC
 Analytical Chemists and Consultants
 4611 South 134th Place, Suite 100
 Tukwila, WA 98168
 206-695-6200 206-695-6201 (fax)

ARI Assigned Number: 22C0362	Turn-around Requested: Standard	Page: 1 of 1
ARI Client Company: Golder	Phone:	Date: 3/21/22 Ice Present?
Client Contact: Joseph Xi		No. of Coolers: 2 Cooler Temps:

Client Project Name: Ravensdale					Analysis Requested							Notes/Comments				
Client Project #: 152030402		Samplers: MMR, DL			TDS	TOTAL AS, Pb, Sb, V, Cr	Mg, K, Na	DISSOLVED AS, Pb, Sb, V, Cr	Mg, K, Na	TOTAL	DISSOLVED*		ANIONS Cl, SO4	ALKALINITY		
Sample ID	Date	Time	Matrix	No. Containers												
P-11-0322	3/21/22	0825	water	5	X	X	X				X	X	*HOLD DISSOLVED			
MWB-6DSP-0322		0945		5	X	X	X				X	X	↓			
MW-55A-0322		0945		3	X	X	X									
MWB-5DSP-0322		1115		5							X	X				
P-14-0322		1235		5												
MW-8A-0322		1335		5												
MW-7A-0322		1425		5												
Comments/Special Instructions Analyze in accordance w/MSA between Golder & ARI Ecology EIM EDD					Relinquished by (Signature):			Received by (Signature):			Relinquished by (Signature):			Received by (Signature):		
					Printed Name: DAVID LAM			Printed Name: Isabella			Printed Name:			Printed Name:		
					Company: GOLDER			Company: ART			Company:			Company:		
					Date & Time: 3/21/22 1554			Date & Time: 3/21/22 1554			Date & Time:			Date & Time:		

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Golder Associates
18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Ravensdale
Project Number: Ravensdale
Project Manager: Gary Zimmerman

Reported:
12-Apr-2022 13:31

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
P-11-0322	22C0362-01	Water	21-Mar-2022 08:25	21-Mar-2022 15:54
P-11-0322	22C0362-02	Water	21-Mar-2022 08:25	21-Mar-2022 15:54
MWB-6DSP-0322	22C0362-03	Water	21-Mar-2022 09:45	21-Mar-2022 15:54
MWB-6DSP-0322	22C0362-04	Water	21-Mar-2022 09:45	21-Mar-2022 15:54
MW-55A-0322	22C0362-05	Water	21-Mar-2022 09:45	21-Mar-2022 15:54
MW-55A-0322	22C0362-06	Water	21-Mar-2022 09:45	21-Mar-2022 15:54
MWB-5DSP-0322	22C0362-07	Water	21-Mar-2022 11:15	21-Mar-2022 15:54
MWB-5DSP-0322	22C0362-08	Water	21-Mar-2022 11:15	21-Mar-2022 15:54
P-14-0322	22C0362-09	Water	21-Mar-2022 12:35	21-Mar-2022 15:54
P-14-0322	22C0362-10	Water	21-Mar-2022 12:35	21-Mar-2022 15:54
MW-8A-0322	22C0362-11	Water	21-Mar-2022 13:35	21-Mar-2022 15:54
MW-8A-0322	22C0362-12	Water	21-Mar-2022 13:35	21-Mar-2022 15:54
MW-7A-0322	22C0362-13	Water	21-Mar-2022 14:25	21-Mar-2022 15:54
MW-7A-0322	22C0362-14	Water	21-Mar-2022 14:25	21-Mar-2022 15:54



Golder Associates

18300 NE Union Hill Road Suite 200

Redmond WA, 98052-3333

Project: Ravensdale

Project Number: Ravensdale

Project Manager: Gary Zimmerman

Reported:

12-Apr-2022 13:31

Work Order Case Narrative

Total Metals - EPA Method 200.8 and 6010D

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

The matrix spike (MS) percent recoveries and the duplicate (DUP) relative percent difference (RPD) were within advisory control limits.

Wet Chemistry

The sample(s) were prepared and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

The reference material (SRM) percent recoveries were within control limits.

The matrix spike (MS) percent recoveries and the duplicate (DUP) relative percent difference (RPD) were within advisory control limits.



WORK ORDER

22C0362

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Golder Associates Project Manager: Kelly Bottem
Project: Ravensdale Project Number: Ravensdale

Preservation Confirmation

Container ID	Container Type	pH
22C0362-01 A	HDPE NM, 1000 mL	
22C0362-01 B	HDPE NM, 1000 mL	
22C0362-01 C	HDPE NM, 500 mL	
22C0362-01 D	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0362-02 A	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0362-03 A	HDPE NM, 1000 mL	
22C0362-03 B	HDPE NM, 1000 mL	
22C0362-03 C	HDPE NM, 500 mL	
22C0362-03 D	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0362-04 A	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0362-05 A	HDPE NM, 1000 mL	
22C0362-05 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0362-06 A	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0362-07 A	HDPE NM, 1000 mL	
22C0362-07 B	HDPE NM, 1000 mL	
22C0362-07 C	HDPE NM, 500 mL	
22C0362-07 D	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0362-08 A	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0362-09 A	HDPE NM, 1000 mL	
22C0362-09 B	HDPE NM, 1000 mL	
22C0362-09 C	HDPE NM, 500 mL	
22C0362-09 D	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0362-10 A	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0362-11 A	HDPE NM, 1000 mL	
22C0362-11 B	HDPE NM, 1000 mL	
22C0362-11 C	HDPE NM, 500 mL	
22C0362-11 D	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0362-12 A	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0362-13 A	HDPE NM, 1000 mL	
22C0362-13 B	HDPE NM, 1000 mL	
22C0362-13 C	HDPE NM, 500 mL	
22C0362-13 D	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0362-14 A	HDPE NM, 500 mL, 1:1 HNO3	L2 pass



WORK ORDER

22C0362

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Golder Associates

Project Manager: Kelly Bottem

Project: Ravensdale

Project Number: Ravensdale

Preservation Confirmed By

Date



Cooler Receipt Form

ARI Client: Golder
 COC No(s): _____ NA
 Assigned ARI Job No: 22C0362

Project Name: Ravensdale
 Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____
 Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler? YES NO
 Were custody papers included with the cooler? YES NO
 Were custody papers properly filled out (ink, signed, etc.) YES NO
 Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 1359 117 9.7
 If cooler temperature is out of compliance fill out form 00070F
 Cooler Accepted by: LB Date: 3/21/22 Time: 1359 Temp Gun ID#: D002565

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO
 What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____
 Was sufficient ice used (if appropriate)? NA YES NO
 How were bottles sealed in plastic bags? Individually Grouped Not
 Did all bottles arrive in good condition (unbroken)? YES NO
 Were all bottle labels complete and legible? YES NO
 Did the number of containers listed on COC match with the number of containers received? YES NO
 Did all bottle labels and tags agree with custody papers? YES NO
 Were all bottles used correct for the requested analyses? YES NO
 Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO
 Were all VOC vials free of air bubbles? NA YES NO
 Was sufficient amount of sample sent in each bottle? YES NO
 Date VOC Trip Blank was made at ARI NA
 Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: LB Date: 3/22/22 Time: 14:25 Labels checked by: _____

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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P-11-0322
22C0362-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/21/2022 08:25
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 01:52

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0362-01 D 01
Preparation Batch: BKD0021 Sample Size: 25 mL
Prepared: 04/01/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection		Reporting		Result	Units	Notes
			Limit	Limit	Limit	Limit			
Antimony	7440-36-0	5	0.505	1.00	198	ug/L	D		
Lead	7439-92-1	5	0.257	0.500	42.1	ug/L	D		
Vanadium	7440-62-2	5	0.278	1.00	91.4	ug/L	D		



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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P-11-0322
22C0362-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/21/2022 08:25
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/05/2022 22:31

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0362-01 D 01
Preparation Batch: BKD0021 Sample Size: 25 mL
Prepared: 04/01/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	50	1.87	10.0	1770	ug/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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P-11-0322
22C0362-01 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/21/2022 08:25
Instrument: ICP2 Analyst: SKD Analyzed: 04/07/2022 16:15

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0362-01 D 02
Preparation Batch: BKD0065 Sample Size: 25 mL
Prepared: 04/04/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	5	0.110	0.250	14.7	mg/L	D
Magnesium	7439-95-4	5	0.105	0.250	0.213	mg/L	J, D
Potassium	7440-09-7	5	0.534	2.50	1150	mg/L	D
Sodium	7440-23-5	5	9.50	250	467	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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P-11-0322
22C0362-01 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/21/2022 08:25
Instrument: [CALC] Analyst: SKD Analyzed: 04/07/2022 16:15

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0362-01
Preparation Batch: [CALC]
Prepared: 04/04/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		5		37.5	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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P-11-0322
22C0362-01 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/21/2022 08:25
Instrument: IC930 Analyst: BF Analyzed: 03/23/2022 18:29

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-01 B
Preparation Batch: BKC0570 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	5	0.500	0.500	10.6	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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P-11-0322
22C0362-01 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/21/2022 08:25
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 13:54

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-01 C
Preparation Batch: BKC0572 Sample Size: 50 mL
Prepared: 03/23/2022 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	2040	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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P-11-0322
22C0362-01 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/21/2022 08:25
Instrument: BAL2 Analyst: DOE Analyzed: 03/24/2022 08:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-01
Preparation Batch: BKC0586 Sample Size: 10 mL
Prepared: 03/24/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	100	100	2680	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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P-11-0322
22C0362-01RE2 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/21/2022 08:25
Instrument: IC930 Analyst: BF Analyzed: 03/30/2022 19:50

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-01RE2 B
Preparation Batch: BKC0570 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	20	2.00	2.00	121	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MWB-6DSP-0322
22C0362-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/21/2022 09:45
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 01:27

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0362-03 D 01
Preparation Batch: BKD0021 Sample Size: 25 mL
Prepared: 04/01/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	ND	ug/L	U
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	ND	ug/L	U



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MWB-6DSP-0322
22C0362-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/21/2022 09:45
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 01:27

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0362-03 D 01
Preparation Batch: BKD0021 Sample Size: 25 mL
Prepared: 04/01/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	1.06	ug/L	



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Redmond WA, 98052-3333

Project: Ravensdale
Project Number: Ravensdale
Project Manager: Gary Zimmerman

Reported:
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MWB-6DSP-0322
22C0362-03 (Water)

Metals and Metallic Compounds

Method: EPA 6010D

Sampled: 03/21/2022 09:45

Instrument: ICP2 Analyst: SKD

Analyzed: 04/06/2022 18:46

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BKD0065
Prepared: 04/04/2022

Sample Size: 25 mL
Final Volume: 25 mL

Extract ID: 22C0362-03 D 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	55.7	mg/L	
Magnesium	7439-95-4	1	0.0209	0.0500	28.5	mg/L	
Potassium	7440-09-7	1	0.107	0.500	1.09	mg/L	
Sodium	7440-23-5	1	0.105	0.500	11.0	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MWB-6DSP-0322
22C0362-03 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/21/2022 09:45
Instrument: [CALC] Analyst: SKD Analyzed: 04/06/2022 18:46

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0362-03
Preparation Batch: [CALC]
Prepared: 04/04/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		256	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MWB-6DSP-0322
22C0362-03 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/21/2022 09:45
Instrument: IC930 Analyst: BF Analyzed: 03/23/2022 20:28

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-03 B
Preparation Batch: BKC0570 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	1.36	mg/L	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	0.100	0.100	7.41	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MWB-6DSP-0322
22C0362-03 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/21/2022 09:45
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 13:54

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-03 C
Preparation Batch: BKC0572 Sample Size: 100 mL
Prepared: 03/23/2022 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	262	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MWB-6DSP-0322
22C0362-03 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/21/2022 09:45
Instrument: BAL2 Analyst: DOE Analyzed: 03/24/2022 08:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-03
Preparation Batch: BKC0586 Sample Size: 100 mL
Prepared: 03/24/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	297	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MW-55A-0322
22C0362-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/21/2022 09:45
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 21:15

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0362-05 B 01
Preparation Batch: BKD0021 Sample Size: 25 mL
Prepared: 04/01/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	ND	ug/L	U
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Vanadium	7440-62-2	2	0.111	0.400	ND	ug/L	U



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MW-55A-0322
22C0362-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/21/2022 09:45
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 21:15

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0362-05 B 01
Preparation Batch: BKD0021 Sample Size: 25 mL
Prepared: 04/01/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	1.01	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MW-55A-0322
22C0362-05 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/21/2022 09:45
Instrument: ICP2 Analyst: SKD Analyzed: 04/06/2022 18:02

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0362-05 B 02
Preparation Batch: BKD0065 Sample Size: 25 mL
Prepared: 04/04/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	54.5	mg/L	
Magnesium	7439-95-4	1	0.0209	0.0500	28.2	mg/L	
Potassium	7440-09-7	1	0.107	0.500	1.06	mg/L	
Sodium	7440-23-5	1	0.105	0.500	10.8	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MW-55A-0322
22C0362-05 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/21/2022 09:45
Instrument: [CALC] Analyst: SKD Analyzed: 04/06/2022 18:02

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0362-05
Preparation Batch: [CALC]
Prepared: 04/04/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		252	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MW-55A-0322
22C0362-05 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/21/2022 09:45
Instrument: BAL2 Analyst: DOE Analyzed: 03/24/2022 08:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-05
Preparation Batch: BKC0586 Sample Size: 100 mL
Prepared: 03/24/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	276	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MWB-5DSP-0322
22C0362-07 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/21/2022 11:15
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 01:32

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0362-07 D 01
Preparation Batch: BKD0021 Sample Size: 25 mL
Prepared: 04/01/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	ND	ug/L	U
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	ND	ug/L	U



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MWB-5DSP-0322
22C0362-07 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/21/2022 11:15
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 01:32

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0362-07 D 01
Preparation Batch: BKD0021 Sample Size: 25 mL
Prepared: 04/01/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	4.79	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MWB-5DSP-0322
22C0362-07 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/21/2022 11:15
Instrument: ICP2 Analyst: SKD Analyzed: 04/06/2022 18:40

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0362-07 D 02
Preparation Batch: BKD0065 Sample Size: 25 mL
Prepared: 04/04/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	112	mg/L	
Magnesium	7439-95-4	1	0.0209	0.0500	53.1	mg/L	
Potassium	7440-09-7	1	0.107	0.500	2.56	mg/L	
Sodium	7440-23-5	1	0.105	0.500	17.1	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MWB-5DSP-0322
22C0362-07 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/21/2022 11:15
Instrument: [CALC] Analyst: SKD Analyzed: 04/06/2022 18:40

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0362-07
Preparation Batch: [CALC]
Prepared: 04/04/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		499	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MWB-5DSP-0322
22C0362-07 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/21/2022 11:15
Instrument: IC930 Analyst: BF Analyzed: 03/23/2022 20:48

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-07 B
Preparation Batch: BKC0570 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	2.24	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MWB-5DSP-0322
22C0362-07 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/21/2022 11:15
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 13:54

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-07 C
Preparation Batch: BKC0572 Sample Size: 100 mL
Prepared: 03/23/2022 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	464	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MWB-5DSP-0322
22C0362-07 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/21/2022 11:15
Instrument: BAL2 Analyst: DOE Analyzed: 03/24/2022 08:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-07
Preparation Batch: BKC0586 Sample Size: 100 mL
Prepared: 03/24/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	513	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MWB-5DSP-0322
22C0362-07RE2 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/21/2022 11:15
Instrument: IC930 Analyst: BF Analyzed: 03/30/2022 21:50

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-07RE2 B
Preparation Batch: BKC0570 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	10	1.00	1.00	38.1	mg/L	D



Golder Associates
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Redmond WA, 98052-3333

Project: Ravensdale
Project Number: Ravensdale
Project Manager: Gary Zimmerman

Reported:
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P-14-0322
22C0362-09 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 03/21/2022 12:35

Instrument: ICPMS1 Analyst: MCB

Analyzed: 04/05/2022 22:36

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BKD0021
Prepared: 04/01/2022

Sample Size: 25 mL
Final Volume: 25 mL

Extract ID: 22C0362-09 D 01

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	5	0.505	1.00	46.1	ug/L	D
Lead	7439-92-1	5	0.257	0.500	41.3	ug/L	D
Vanadium	7440-62-2	5	0.278	1.00	6.68	ug/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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P-14-0322
22C0362-09 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/21/2022 12:35
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/05/2022 22:36

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0362-09 D 01
Preparation Batch: BKD0021 Sample Size: 25 mL
Prepared: 04/01/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	5	0.187	1.00	74.8	ug/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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P-14-0322
22C0362-09 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/21/2022 12:35
Instrument: ICP2 Analyst: SKD Analyzed: 04/07/2022 16:13

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0362-09 D 02
Preparation Batch: BKD0065 Sample Size: 25 mL
Prepared: 04/04/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	5	0.110	0.250	313	mg/L	D
Magnesium	7439-95-4	5	0.105	0.250	0.107	mg/L	J, D
Potassium	7440-09-7	5	0.534	2.50	1430	mg/L	D
Sodium	7440-23-5	5	9.50	250	507	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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P-14-0322
22C0362-09 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/21/2022 12:35
Instrument: [CALC] Analyst: SKD Analyzed: 04/07/2022 16:13

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0362-09
Preparation Batch: [CALC]
Prepared: 04/04/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		5		781	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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P-14-0322
22C0362-09 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/21/2022 12:35
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 13:54

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-09 C
Preparation Batch: BKC0572 Sample Size: 50 mL
Prepared: 03/23/2022 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	3440	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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P-14-0322
22C0362-09 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/21/2022 12:35
Instrument: BAL2 Analyst: DOE Analyzed: 03/24/2022 08:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-09
Preparation Batch: BKC0586 Sample Size: 10 mL
Prepared: 03/24/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	100	100	4110	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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P-14-0322
22C0362-09RE2 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/21/2022 12:35
Instrument: IC930 Analyst: BF Analyzed: 03/30/2022 22:10

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-09RE2 B
Preparation Batch: BKC0570 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	5	0.500	0.500	18.6	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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P-14-0322
22C0362-09RE3 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/21/2022 12:35
Instrument: IC930 Analyst: BF Analyzed: 04/04/2022 17:25

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-09RE3 B
Preparation Batch: BKC0570 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	10	1.00	1.00	58.8	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MW-8A-0322
22C0362-11 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/21/2022 13:35
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 01:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0362-11 D 01
Preparation Batch: BKD0021 Sample Size: 25 mL
Prepared: 04/01/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	4.76	ug/L	
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	3.84	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MW-8A-0322
22C0362-11 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/21/2022 13:35
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 01:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0362-11 D 01
Preparation Batch: BKD0021 Sample Size: 25 mL
Prepared: 04/01/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	7.48	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MW-8A-0322
22C0362-11 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/21/2022 13:35
Instrument: ICP2 Analyst: SKD Analyzed: 04/06/2022 19:16

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0362-11 D 02
Preparation Batch: BKD0065 Sample Size: 25 mL
Prepared: 04/04/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	25.9	mg/L	
Magnesium	7439-95-4	1	0.0209	0.0500	13.5	mg/L	
Potassium	7440-09-7	1	0.107	0.500	163	mg/L	
Sodium	7440-23-5	1	1.90	50.0	66.5	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MW-8A-0322
22C0362-11 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/21/2022 13:35
Instrument: [CALC] Analyst: SKD Analyzed: 04/06/2022 19:16

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0362-11
Preparation Batch: [CALC]
Prepared: 04/04/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		120	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MW-8A-0322
22C0362-11 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/21/2022 13:35
Instrument: IC930 Analyst: BF Analyzed: 03/23/2022 21:28

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-11 B
Preparation Batch: BKC0570 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	3.92	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MW-8A-0322
22C0362-11 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/21/2022 13:35
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 13:54

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-11 C
Preparation Batch: BKC0572 Sample Size: 100 mL
Prepared: 03/23/2022 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	383	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MW-8A-0322
22C0362-11 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/21/2022 13:35
Instrument: BAL2 Analyst: DOE Analyzed: 03/24/2022 08:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-11
Preparation Batch: BKC0586 Sample Size: 100 mL
Prepared: 03/24/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	536	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MW-8A-0322
22C0362-11RE2 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/21/2022 13:35
Instrument: IC930 Analyst: BF Analyzed: 03/30/2022 22:30

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-11RE2 B
Preparation Batch: BKC0570 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	5	0.500	0.500	29.0	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MW-7A-0322
22C0362-13 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/21/2022 14:25
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 01:47

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0362-13 D 01
Preparation Batch: BKD0021 Sample Size: 25 mL
Prepared: 04/01/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	6.23	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.0710	ug/L	J
Vanadium	7440-62-2	1	0.0556	0.200	1.34	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MW-7A-0322
22C0362-13 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/21/2022 14:25
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 01:47

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0362-13 D 01
Preparation Batch: BKD0021 Sample Size: 25 mL
Prepared: 04/01/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	2.88	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MW-7A-0322
22C0362-13 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/21/2022 14:25
Instrument: ICP2 Analyst: SKD Analyzed: 04/06/2022 19:19

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0362-13 D 02
Preparation Batch: BKD0065 Sample Size: 25 mL
Prepared: 04/04/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	33.2	mg/L	
Magnesium	7439-95-4	1	0.0209	0.0500	17.1	mg/L	
Potassium	7440-09-7	1	0.107	0.500	179	mg/L	
Sodium	7440-23-5	1	1.90	50.0	93.8	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MW-7A-0322
22C0362-13 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/21/2022 14:25
Instrument: [CALC] Analyst: SKD Analyzed: 04/06/2022 19:19

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0362-13
Preparation Batch: [CALC]
Prepared: 04/04/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		153	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MW-7A-0322
22C0362-13 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/21/2022 14:25
Instrument: IC930 Analyst: BF Analyzed: 03/23/2022 21:48

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-13 B
Preparation Batch: BKC0570 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	4.77	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MW-7A-0322
22C0362-13 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/21/2022 14:25
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 13:54

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-13 C
Preparation Batch: BKC0572 Sample Size: 100 mL
Prepared: 03/23/2022 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	482	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MW-7A-0322
22C0362-13 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/21/2022 14:25
Instrument: BAL2 Analyst: DOE Analyzed: 03/24/2022 08:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-13
Preparation Batch: BKC0586 Sample Size: 100 mL
Prepared: 03/24/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	632	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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MW-7A-0322
22C0362-13RE2 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/21/2022 14:25
Instrument: IC930 Analyst: BF Analyzed: 03/30/2022 22:50

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0362-13RE2 B
Preparation Batch: BKC0570 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	10	1.00	1.00	39.7	mg/L	D



Golder Associates
18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Ravensdale
Project Number: Ravensdale
Project Manager: Gary Zimmerman

Reported:
12-Apr-2022 13:31

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BKD0021 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKD0021-BLK1)						Prepared: 01-Apr-2022 Analyzed: 01-Apr-2022 17:24						
Antimony	121	ND	0.101	0.200	ug/L							U
Antimony	123	ND	0.102	0.200	ug/L							U
Lead	208	ND	0.0513	0.100	ug/L							U
Vanadium	51a	ND	0.0556	0.200	ug/L							U
Vanadium	51b	ND	0.0521	0.200	ug/L							U
Arsenic	75a	ND	0.0373	0.200	ug/L							U
LCS (BKD0021-BS1)						Prepared: 01-Apr-2022 Analyzed: 01-Apr-2022 17:28						
Antimony	121	25.2	0.101	0.200	ug/L	25.0		101	80-120			
Antimony	123	25.1	0.102	0.200	ug/L	25.0		100	80-120			
Lead	208	26.4	0.0513	0.100	ug/L	25.0		106	80-120			
Vanadium	51a	24.5	0.0556	0.200	ug/L	25.0		98.1	80-120			
Vanadium	51b	24.5	0.0521	0.200	ug/L	25.0		98.0	80-120			
Arsenic	75a	24.4	0.0373	0.200	ug/L	25.0		97.4	80-120			
Duplicate (BKD0021-DUP1)						Source: 22C0362-05 Prepared: 01-Apr-2022 Analyzed: 01-Apr-2022 21:20						
Antimony	121	ND	0.101	0.200	ug/L		ND					U
Lead	208	ND	0.0513	0.100	ug/L		ND					U
Arsenic	75a	0.936	0.0373	0.200	ug/L		1.01			7.70	20	
Duplicate (BKD0021-DUP2)						Source: 22C0362-05 Prepared: 01-Apr-2022 Analyzed: 05-Apr-2022 22:47						
Vanadium	51a	ND	0.111	0.400	ug/L		ND					U
Matrix Spike (BKD0021-MS1)						Source: 22C0362-05 Prepared: 01-Apr-2022 Analyzed: 01-Apr-2022 21:25						
Antimony	121	24.6	0.101	0.200	ug/L	25.0	ND	98.4	75-125			
Lead	208	25.3	0.0513	0.100	ug/L	25.0	ND	101	75-125			
Arsenic	75a	25.3	0.0373	0.200	ug/L	25.0	1.01	97.3	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike (BKD0021-MS2)						Source: 22C0362-05 Prepared: 01-Apr-2022 Analyzed: 05-Apr-2022 22:53						
Vanadium	51a	23.1	0.111	0.400	ug/L	25.0	ND	92.3	75-125			D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



Golder Associates
18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Ravensdale
Project Number: Ravensdale
Project Manager: Gary Zimmerman

Reported:
12-Apr-2022 13:31

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BKD0065 - TWC EPA 3010A

Instrument: ICP2 Analyst: SKD

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKD0065-BLK1)											
						Prepared: 04-Apr-2022 Analyzed: 06-Apr-2022 17:59					
Calcium	ND	0.0220	0.0500	mg/L							U
Magnesium	ND	0.0209	0.0500	mg/L							U
Potassium	ND	0.107	0.500	mg/L							U
Sodium	ND	0.105	0.500	mg/L							U
Sodium	ND	1.90	50.0	mg/L							U
LCS (BKD0065-BS1)											
						Prepared: 04-Apr-2022 Analyzed: 06-Apr-2022 18:27					
Calcium	10.1	0.0220	0.0500	mg/L	10.0		101	80-120			
Magnesium	10.6	0.0209	0.0500	mg/L	10.0		106	80-120			
Potassium	10.4	0.107	0.500	mg/L	10.0		104	80-120			
Sodium	10.7	0.105	0.500	mg/L	10.0		107	80-120			
Sodium	11.8	1.90	50.0	mg/L	10.0		118	80-120			J
Duplicate (BKD0065-DUP1)											
			Source: 22C0362-03			Prepared: 04-Apr-2022 Analyzed: 06-Apr-2022 18:43					
Calcium	56.0	0.0220	0.0500	mg/L		55.7			0.53	20	
Magnesium	28.8	0.0209	0.0500	mg/L		28.5			0.95	20	
Potassium	1.06	0.107	0.500	mg/L		1.09			2.84	20	
Sodium	11.0	0.105	0.500	mg/L		11.0			0.63	20	
Matrix Spike (BKD0065-MS1)											
			Source: 22C0362-03			Prepared: 04-Apr-2022 Analyzed: 06-Apr-2022 18:49					
Calcium	66.3	0.0220	0.0500	mg/L	10.0	55.7	106	75-125			
Magnesium	39.3	0.0209	0.0500	mg/L	10.0	28.5	107	75-125			
Potassium	11.6	0.107	0.500	mg/L	10.0	1.09	105	75-125			
Sodium	22.1	0.105	0.500	mg/L	10.0	11.0	112	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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Analysis by: Analytical Resources, LLC

Wet Chemistry - Quality Control

Batch BKC0570 - No Prep Wet Chem

Instrument: IC930 Analyst: BF

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKC0570-BLK1)						Prepared: 23-Mar-2022 Analyzed: 23-Mar-2022 17:49					
Chloride	ND	0.100	0.100	mg/L							U
Sulfate	ND	0.100	0.100	mg/L							U
LCS (BKC0570-BS1)						Prepared: 23-Mar-2022 Analyzed: 23-Mar-2022 18:09					
Chloride	4.93	0.100	0.100	mg/L	5.00		98.6	90-110			
Sulfate	5.08	0.100	0.100	mg/L	5.00		102	90-110			
Duplicate (BKC0570-DUP1)						Source: 22C0362-01 Prepared: 23-Mar-2022 Analyzed: 23-Mar-2022 18:49					
Chloride	10.5	0.500	0.500	mg/L		10.6			0.82	20	D
Duplicate (BKC0570-DUP3)						Source: 22C0362-01RE2 Prepared: 23-Mar-2022 Analyzed: 30-Mar-2022 20:10					
Sulfate	116	2.00	2.00	mg/L		121			4.13	20	D
Matrix Spike (BKC0570-MS1)						Source: 22C0362-01 Prepared: 23-Mar-2022 Analyzed: 23-Mar-2022 20:09					
Chloride	19.2	0.500	0.500	mg/L	10.0	10.6	85.8	75-125			D
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike (BKC0570-MS3)						Source: 22C0362-01RE2 Prepared: 23-Mar-2022 Analyzed: 30-Mar-2022 21:30					
Sulfate	213	5.00	5.00	mg/L	100	121	92.2	75-125			D
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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Analysis by: Analytical Resources, LLC

Wet Chemistry - Quality Control

Batch BKC0572 - No Prep Wet Chem

Instrument: Accumet AB150 Analyst: UW

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKC0572-BLK1)						Prepared: 23-Mar-2022 Analyzed: 23-Mar-2022 14:35					
Alkalinity, Total	ND	1.00	1.00	mg/L CaCO3							U
Reference (BKC0572-SRM1)						Prepared: 23-Mar-2022 Analyzed: 23-Mar-2022 13:54					
Alkalinity, Total	125	1.00	1.00	mg/L CaCO3	127		98.3	85.04-114.96			



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 12-Apr-2022 13:31
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Analysis by: Analytical Resources, LLC

Wet Chemistry - Quality Control

Batch BKC0586 - No Prep Wet Chem

Instrument: BAL2 Analyst: DOE

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKC0586-BLK1)						Prepared: 24-Mar-2022 Analyzed: 24-Mar-2022 08:42					
Dissolved Solids	ND	5	5	mg/L							U
LCS (BKC0586-BS1)						Prepared: 24-Mar-2022 Analyzed: 24-Mar-2022 08:42					
Dissolved Solids	481	10	10	mg/L	500		96.1	90-110			
Duplicate (BKC0586-DUP1)						Source: 22C0362-01 Prepared: 24-Mar-2022 Analyzed: 24-Mar-2022 08:42					
Dissolved Solids	2450	100	100	mg/L		2680			8.97	20	



Golder Associates
18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Ravensdale
Project Number: Ravensdale
Project Manager: Gary Zimmerman

Reported:
12-Apr-2022 13:31

Certified Analyses included in this Report

Analyte	Certifications
EPA 200.8 in Water	
Lead-208	NELAP,WADOE,WA-DW,DoD-ELAP
Antimony-121	NELAP,WADOE,WA-DW,DoD-ELAP
Vanadium-51a	NELAP,DoD-ELAP,WADOE
Vanadium-51b	NELAP,DoD-ELAP,WADOE
EPA 200.8 UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 300.0 in Water	
Chloride	DoD-ELAP,WADOE,WA-DW,NELAP
Sulfate	DoD-ELAP,WADOE,WA-DW,NELAP
EPA 6010D in Water	
Calcium	WADOE,NELAP,DoD-ELAP
Potassium	WADOE,NELAP,DoD-ELAP
Magnesium	WADOE,NELAP,DoD-ELAP
Sodium	DoD-ELAP,WADOE,NELAP
Sodium-1	DoD-ELAP
SM 2320 B-97 in Water	
Alkalinity, Total	DoD-ELAP,WADOE,WA-DW,NELAP
SM 2540 C-97 in Water	
Dissolved Solids	DoD-ELAP,WADOE,WA-DW,NELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2022
WADOE	WA Dept of Ecology	C558	06/30/2022
WA-DW	Ecology - Drinking Water	C558	06/30/2022



Golder Associates
18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Ravensdale
Project Number: Ravensdale
Project Manager: Gary Zimmerman

Reported:
12-Apr-2022 13:31

Notes and Definitions

- B This analyte was detected in the method blank.
- D The reported value is from a dilution
- J Estimated concentration value detected below the reporting limit.
- U This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- [2C] Indicates this result was quantified on the second column on a dual column analysis.



Analytical Resources, LLC
Analytical Chemists and Consultants

19 May 2022

Gary Zimmerman
Golder Associates
18300 NE Union Hill Road Suite 200
Redmond, WA 98052-3333

RE: Ravensdale (Ravensdale)

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)
22C0335

Associated SDG ID(s)
N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclosed Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, LLC

Kelly Bottem, Client Services Manager

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



Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: **22C0355**
 Turn-around Requested: **Standard**
 ARI Client Company: **Golder** Phone: **425.883.0777**
 Client Contact: **Joseph Xi**
 Client Project Name: **Ravensdale**
 Client Project #: **152030402** Samplers: **MMR, DL, EA**

Page: **1** of **3**
 Date: **3/16/22** Ice Present?
 No. of Coolers: **6-5** Cooler Temps:



Analytical Resources, LLC
 Analytical Chemists and Consultants
 4611 South 134th Place, Suite 100
 Tukwila, WA 98168
 206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested							Notes/Comments
					TDS	TOTAL AS, Pb, Sb, V, Cu Mg, K, NA	DISSOLVED* AS, Pb, Sb, V, Cu Mg, K, NA	TOTAL AS, Pb, Sb, V, K	DISSOLVED* AS, Pb, Sb, V, K	ANIONS (Cl, SO4)	ALKALINITY	
MW-5A-0322	3/16/22	1240	water	5	X	X	X			X	X	*HOLD ALL DISSOLVED
Infiltration Ponds-0322		1300		3	X			X	X			
MW-35A-0322		1305		3	X			X	X			
MW-6A-0322		1355		5	X	X	X			X	X	
MW-2A-0322		1450		5	X	X	X			X	X	
MW-45A-0322		1455		3	X	X	X					
MW-1A-0322		1541		5	X	X	X			X	X	
Portal-0322		1615		5	X	X	X			X	X	
Still Well-0322	3/17/22	0800		3	X			X	X			
MW-3A-0322		0850		5	X	X	X			X	X	
Comments/Special Instructions Analyze in accordance w/ MSA between Golder & ARI Ecology EIMEDD				Relinquished by (Signature): [Signature] Printed Name: DAVID LAM Company: GOLDER Date & Time: 3/18/22 1521	Received by (Signature): [Signature] Printed Name: Isomere Deasy Company: ARI Date & Time: 3/18/22 1521	Relinquished by (Signature): Printed Name: Company: Date & Time:	Received by (Signature): Printed Name: Company: Date & Time:					

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 22C0335	Turn-around Requested: Standard	Page: 2 of 3
ARI Client Company: Golder	Phone: 425.883.0777	Date: 3/17/22
Client Contact: Joseph Xi	No. of Coolers: 65	Ice Present? Cooler Temps:



Analytical Resources, LLC
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Client Project Name: Ravensdale					Analysis Requested							Notes/Comments
Client Project #: 152030402		Samplers: MMR, DL, EA			TDS	TOTAL As, Pb, Sb, V, Cu Mg, K, Na	DISSOLVED* As, Pb, Sb, V, Cu Mg, K, Na	TOTAL As, Pb, Sb, V, K	DISSOLVED* As, Pb, Sb, V, K	ANIONS Cl, SO4	ALKALINITY	
Sample ID	Date	Time	Matrix	No. Containers								
Weir-0322	3/17/22	0915	water	5	X			X	X		MS/MSO *HOLD DISSOLVED	
MW-99-1-0322		0942		2	X	X						
P-110-0322		1035		5	X	X	X			X	X	
SouthPond-0322		1055		3	X			X	X			
MW-1DA-0322		1140		5	X	X	X			X	X	
MWB-1LDA-0322		1240		5	X	X	X			X	X	
MWB-2LDA-0322		1325		5	X	X	X			X	X	
P-15-0322		1440		5	X	X	X			X	X	
P-Interceptor Trench-0322		1325		1	X							
MWB-3LDA-0322		1555		5	X	X	X			X	X	
Comments/Special Instructions: Analyze in accordance w/ MSA between Golder & ARI Ecology EIMEDD	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)	Printed Name: DAVID LAM	Printed Name: Isabelle Measley	Printed Name:	Printed Name:	Company: GOLDER	Company: ARI	Company:	Company:
	Date & Time: 3/18/22 1521	Date & Time: 3/18/22 1521	Date & Time:	Date & Time:								

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 2210335	Turn-around Requested: Standard	Page: 3 of 3
ARI Client Company: Golder	Phone: 425.883.0777	Date: 3/18/22
Client Contact: Joseph Xi	No. of Coolers: 65	Ice Present? Cooler Temps:



Analytical Resources, LLC
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested							Notes/Comments
					TDS	TOTAL AS, Pb, Sb, V, Cr, Mg, K, Na	DISSOLVED * AS, Pb, Sb, V, Cr, Mg, K, Na	TOTAL AS, Pb, Sb, V, Cr	DISSOLVED * AS, Pb, Sb, V, Cr	ANIONS Cl, SO4	ALKALINITY	
P-11-0322	3/18/22	0855	Water	5	X	X	X			X	X	* HOLD DISSOLVED
P-17-0322		0955		5	X	X	X			X	X	
MW-4A-0322		1105		5	X	X	X			X	X	
MW-9A-0322		1155		5	X	X	X			X	X	
MWB-1DDSP-0322		1325		5								
Comments/Special Instructions Analyze in accordance w/ MSA between Golder + ARI Ecology EIMEDD					Relinquished by: (Signature) [Signature]	Received by: (Signature) [Signature]		Relinquished by: (Signature)			Received by: (Signature)	
					Printed Name: DAVID LAM	Printed Name: Several people		Printed Name:			Printed Name:	
					Company: GOLDER	Company: ARF		Company:			Company:	
					Date & Time: 3/18/22 1521	Date & Time: 3/18/22 1521		Date & Time:			Date & Time:	

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Golder Associates
18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Ravensdale
Project Number: Ravensdale
Project Manager: Gary Zimmerman

Reported:
19-May-2022 08:11

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-5A-0322	22C0335-01	Water	16-Mar-2022 12:40	18-Mar-2022 15:21
MW-5A-0322	22C0335-02	Water	16-Mar-2022 12:40	18-Mar-2022 15:21
Infiltrationponds-0322	22C0335-03	Water	16-Mar-2022 13:00	18-Mar-2022 15:21
Infiltrationponds-0322	22C0335-04	Water	16-Mar-2022 13:00	18-Mar-2022 15:21
MW35A-0322	22C0335-05	Water	16-Mar-2022 13:05	18-Mar-2022 15:21
MW35A-0322	22C0335-06	Water	16-Mar-2022 13:05	18-Mar-2022 15:21
MW6A-0322	22C0335-07	Water	16-Mar-2022 13:55	18-Mar-2022 15:21
MW6A-0322	22C0335-08	Water	16-Mar-2022 13:55	18-Mar-2022 15:21
MW-2A-0322	22C0335-09	Water	16-Mar-2022 14:50	18-Mar-2022 15:21
MW-2A-0322	22C0335-10	Water	16-Mar-2022 14:50	18-Mar-2022 15:21
MW-45A-0322	22C0335-11	Water	16-Mar-2022 14:55	18-Mar-2022 15:21
MW-45A-0322	22C0335-12	Water	16-Mar-2022 14:55	18-Mar-2022 15:21
MW-1A-0322	22C0335-13	Water	16-Mar-2022 15:41	18-Mar-2022 15:21
MW-1A-0322	22C0335-14	Water	16-Mar-2022 15:41	18-Mar-2022 15:21
Portal-0322	22C0335-15	Water	16-Mar-2022 16:15	18-Mar-2022 15:21
Portal-0322	22C0335-16	Water	16-Mar-2022 16:15	18-Mar-2022 15:21
Stillwell-0322	22C0335-17	Water	17-Mar-2022 08:00	18-Mar-2022 15:21
Stillwell-0322	22C0335-18	Water	17-Mar-2022 08:00	18-Mar-2022 15:21
MW-3A-0322	22C0335-19	Water	17-Mar-2022 08:50	18-Mar-2022 15:21
MW-3A-0322	22C0335-20	Water	17-Mar-2022 08:50	18-Mar-2022 15:21
Weir-0322	22C0335-21	Water	17-Mar-2022 09:15	18-Mar-2022 15:21
Weir-0322	22C0335-22	Water	17-Mar-2022 09:15	18-Mar-2022 15:21
MW-99-1-0322	22C0335-23	Water	17-Mar-2022 09:42	18-Mar-2022 15:21
P-16-0322	22C0335-24	Water	17-Mar-2022 10:35	18-Mar-2022 15:21
P-16-0322	22C0335-25	Water	17-Mar-2022 10:35	18-Mar-2022 15:21
Southpond-0322	22C0335-26	Water	17-Mar-2022 10:55	18-Mar-2022 15:21
Southpond-0322	22C0335-27	Water	17-Mar-2022 10:55	18-Mar-2022 15:21
MW-10A-0322	22C0335-28	Water	17-Mar-2022 11:40	18-Mar-2022 15:21
MW-10A-0322	22C0335-29	Water	17-Mar-2022 11:40	18-Mar-2022 15:21
MWB-1LDA-0322	22C0335-30	Water	17-Mar-2022 12:40	18-Mar-2022 15:21
MWB-1LDA-0322	22C0335-31	Water	17-Mar-2022 12:40	18-Mar-2022 15:21
MWB-2LDA-0322	22C0335-32	Water	17-Mar-2022 13:25	18-Mar-2022 15:21
MWB-2LDA-0322	22C0335-33	Water	17-Mar-2022 13:25	18-Mar-2022 15:21
P-15-0322	22C0335-34	Water	17-Mar-2022 14:40	18-Mar-2022 15:21
P-15-0322	22C0335-35	Water	17-Mar-2022 14:40	18-Mar-2022 15:21
Interceptertrench-0322	22C0335-36	Water	17-Mar-2022 13:25	18-Mar-2022 15:21
MWB-3LDA-0322	22C0335-37	Water	17-Mar-2022 15:55	18-Mar-2022 15:21
MWB-3LDA-0322	22C0335-38	Water	17-Mar-2022 15:55	18-Mar-2022 15:21
P-17-0322	22C0335-39	Water	18-Mar-2022 09:55	18-Mar-2022 15:21



Golder Associates

18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Ravensdale

Project Number: Ravensdale

Project Manager: Gary Zimmerman

Reported:

19-May-2022 08:11

P-17-0322	22C0335-40	Water	18-Mar-2022 09:55	18-Mar-2022 15:21
MW-4A-0322	22C0335-41	Water	18-Mar-2022 11:05	18-Mar-2022 15:21
MW-4A-0322	22C0335-42	Water	18-Mar-2022 11:05	18-Mar-2022 15:21
MW-9A-0322	22C0335-43	Water	18-Mar-2022 11:55	18-Mar-2022 15:21
MW-9A-0322	22C0335-44	Water	18-Mar-2022 11:55	18-Mar-2022 15:21
MWB-1DDSP-0322	22C0335-45	Water	18-Mar-2022 13:25	18-Mar-2022 15:21
MWB-1DDSP-0322	22C0335-46	Water	18-Mar-2022 13:25	18-Mar-2022 15:21
MWB-1SDSP-0322	22C0335-47	Water	18-Mar-2022 13:55	18-Mar-2022 15:21
MWB-1SDSP-0322	22C0335-48	Water	18-Mar-2022 13:55	18-Mar-2022 15:21



Golder Associates
18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Ravensdale
Project Number: Ravensdale
Project Manager: Gary Zimmerman

Reported:
19-May-2022 08:11

Work Order Case Narrative

Total Metals - EPA Method 200.8 and 6010D

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

The matrix spike (MS) percent recoveries and the duplicate (DUP) relative percent difference (RPD) were within advisory control limits with the exception of analytes flagged on the associated forms.

Wet Chemistry

The sample(s) were prepared and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

The reference material (SRM) percent recoveries were within control limits.

The matrix spike (MS) percent recoveries and the duplicate (DUP) relative percent difference (RPD) were within advisory control limits.



WORK ORDER

22C0335

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Golder Associates

Project Manager: Kelly Bottem

Project: Ravensdale

Project Number: Ravensdale

Preservation Confirmation

Container ID	Container Type	pH
22C0335-01 A	HDPE NM, 1000 mL	
22C0335-01 B	HDPE NM, 1000 mL	
22C0335-01 C	HDPE NM, 500 mL, 1:1 HNO3	L2 PASS
22C0335-01 D	HDPE NM, 500 mL	
22C0335-02 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 PASS
22C0335-03 A	HDPE NM, 1000 mL	
22C0335-03 B	HDPE NM, 500 mL, 1:1 HNO3	L2 PASS
22C0335-04 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 PASS
22C0335-05 A	HDPE NM, 1000 mL	
22C0335-05 B	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 PASS
22C0335-06 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 PASS
22C0335-07 A	HDPE NM, 1000 mL	
22C0335-07 B	HDPE NM, 1000 mL	
22C0335-07 C	HDPE NM, 500 mL, 1:1 HNO3	L2 PASS
22C0335-07 D	HDPE NM, 500 mL	
22C0335-08 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 PASS
22C0335-09 A	HDPE NM, 1000 mL	
22C0335-09 B	HDPE NM, 1000 mL	
22C0335-09 C	HDPE NM, 500 mL, 1:1 HNO3	L2 PASS
22C0335-09 D	HDPE NM, 500 mL	
22C0335-10 A	HDPE NM, 500 mL, 1:1 HNO3	L2 PASS
22C0335-11 A	HDPE NM, 1000 mL	
22C0335-11 B	HDPE NM, 500 mL, 1:1 HNO3	L2 PASS
22C0335-12 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 PASS
22C0335-13 A	HDPE NM, 1000 mL	
22C0335-13 B	HDPE NM, 1000 mL	
22C0335-13 C	HDPE NM, 500 mL, 1:1 HNO3	L2 PASS
22C0335-13 D	HDPE NM, 500 mL	
22C0335-14 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 PASS
22C0335-15 A	HDPE NM, 1000 mL	
22C0335-15 B	HDPE NM, 1000 mL	
22C0335-15 C	HDPE NM, 500 mL, 1:1 HNO3	L2 PASS
22C0335-15 D	HDPE NM, 500 mL	
22C0335-16 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 PASS

Reviewed By _____

Date _____



WORK ORDER

22C0335

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: **Golder Associates** Project Manager: **Kelly Bottem**
Project: **Ravensdale** Project Number: **Ravensdale**

22C0335-17 A	HDPE NM, 1000 mL	
22C0335-17 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0335-18 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 pass
22C0335-19 A	HDPE NM, 1000 mL	
22C0335-19 B	HDPE NM, 1000 mL	
22C0335-19 C	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0335-19 D	HDPE NM, 500 mL	
22C0335-20 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 pass
22C0335-21 A	HDPE NM, 1000 mL	
22C0335-21 B	HDPE NM, 1000 mL	
22C0335-21 C	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0335-21 D	HDPE NM, 500 mL, 1:1 HNO3	
22C0335-22 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 pass
22C0335-23 A	HDPE NM, 1000 mL	
22C0335-23 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0335-24 A	HDPE NM, 1000 mL	
22C0335-24 B	HDPE NM, 1000 mL	
22C0335-24 C	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0335-24 D	HDPE NM, 500 mL	
22C0335-25 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 pass
22C0335-26 A	HDPE NM, 1000 mL	
22C0335-26 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0335-27 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 pass
22C0335-28 A	HDPE NM, 1000 mL	
22C0335-28 B	HDPE NM, 1000 mL	
22C0335-28 C	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0335-28 D	HDPE NM, 500 mL	
22C0335-29 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 pass
22C0335-30 A	HDPE NM, 1000 mL	
22C0335-30 B	HDPE NM, 1000 mL	
22C0335-30 C	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0335-30 D	HDPE NM, 500 mL	
22C0335-31 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 pass
22C0335-32 A	HDPE NM, 1000 mL	
22C0335-32 B	HDPE NM, 1000 mL	
22C0335-32 C	HDPE NM, 500 mL, 1:1 HNO3	L2 pass



WORK ORDER

22C0335

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Golder Associates	Project Manager: Kelly Bottem
Project: Ravensdale	Project Number: Ravensdale

22C0335-32 D	HDPE NM, 500 mL	
22C0335-33 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 pass
22C0335-34 A	HDPE NM, 1000 mL	
22C0335-34 B	HDPE NM, 1000 mL	
22C0335-34 C	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0335-34 D	HDPE NM, 500 mL	
22C0335-35 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 pass
22C0335-36 A	HDPE NM, 1000 mL	
22C0335-37 A	HDPE NM, 1000 mL	
22C0335-37 B	HDPE NM, 1000 mL	
22C0335-37 C	HDPE NM, 500 mL, 1:1 HNO3	72 fail
22C0335-37 D	HDPE NM, 500 mL	
22C0335-38 A	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0335-39 A	HDPE NM, 1000 mL	
22C0335-39 B	HDPE NM, 1000 mL	
22C0335-39 C	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0335-39 D	HDPE NM, 500 mL	
22C0335-40 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 pass
22C0335-41 A	HDPE NM, 1000 mL	
22C0335-41 B	HDPE NM, 1000 mL	
22C0335-41 C	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0335-41 D	HDPE NM, 500 mL	
22C0335-42 A	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0335-43 A	HDPE NM, 1000 mL	
22C0335-43 B	HDPE NM, 1000 mL	
22C0335-43 C	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0335-43 D	HDPE NM, 500 mL	
22C0335-44 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 pass
22C0335-45 A	HDPE NM, 1000 mL	
22C0335-45 B	HDPE NM, 1000 mL	
22C0335-45 C	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22C0335-45 D	HDPE NM, 500 mL	
22C0335-46 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 pass
22C0335-47 A	HDPE NM, 1000 mL	
22C0335-47 B	HDPE NM, 1000 mL	
22C0335-47 C	HDPE NM, 500 mL, 1:1 HNO3	L2 pass

Reviewed By _____

Date _____



WORK ORDER

22C0335

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: **Golder Associates**

Project Manager: **Kelly Bottem**

Project: **Ravensdale**

Project Number: **Ravensdale**

22C0335-47 D HDPE NM, 500 mL

22C0335-48 A HDPE NM, 500 mL, 1:1 HNO3

L2 pass

3/21/22

Preservation Confirmed By _____

Date



Cooler Receipt Form

ARI Client: Golder

Project Name: Ravensdale

COC No(s): _____ (NA)

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 22C0335

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were in tact, properly signed and dated custody seals attached to the outside of the cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) YES NO

Time 15:21 3.0 3.6 2.6 4.1 4.2

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: _____

Cooler Accepted by: LB Date: 3/18/22 Time: 15:21

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

How were bottles sealed in plastic bags? Individually Grouped Not

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO LB 3/21/22

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) ... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI: NA

Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: _____ Date: _____ Time: _____ Labels checked by: _____

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

Interceptor Trench-0322 sample time on bottle 1525
sample time on COC 1325

* MWB-18DSP-0322 NO analysis checked

* MWB-18DSP-0322 not on COC at all added to end of sample chain

By: LB Date: 3/21/22



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-5A-0322
22C0335-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/16/2022 12:40
Instrument: ICPMS1 Analyst: MCB Analyzed: 03/31/2022 18:16

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-01 C 02
Preparation Batch: BKC0789 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	6.01	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.110	ug/L	
Vanadium	7440-62-2	1	0.0556	0.200	1.52	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-5A-0322
22C0335-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/16/2022 12:40
Instrument: ICPMS1 Analyst: MCB Analyzed: 03/31/2022 18:16

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-01 C 02
Preparation Batch: BKC0789 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	4.02	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-5A-0322
22C0335-01 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/16/2022 12:40
Instrument: ICP2 Analyst: SKD Analyzed: 04/07/2022 17:30

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-01 C 01
Preparation Batch: BKC0735 Sample Size: 25 mL
Prepared: 03/29/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	30.0	mg/L	
Magnesium	7439-95-4	1	0.0209	0.0500	15.2	mg/L	
Potassium	7440-09-7	1	0.107	0.500	223	mg/L	
Sodium	7440-23-5	1	1.90	50.0	104	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-5A-0322
22C0335-01 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/16/2022 12:40
Instrument: [CALC] Analyst: SKD Analyzed: 04/07/2022 17:30

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0335-01
Preparation Batch: [CALC]
Prepared: 03/29/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		137	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-5A-0322
22C0335-01 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/16/2022 12:40
Instrument: IC930 Analyst: BF Analyzed: 03/24/2022 00:49

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-01 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	4.24	mg/L	



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MW-5A-0322
22C0335-01 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/16/2022 12:40
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 10:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-01 D
Preparation Batch: BKC0557 Sample Size: 100 mL
Prepared: 03/23/2022 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	528	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-5A-0322
22C0335-01 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/16/2022 12:40
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 10:10

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-01
Preparation Batch: BKC0518 Sample Size: 75 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	13	13	711	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-5A-0322
22C0335-01RE2 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/16/2022 12:40
Instrument: IC930 Analyst: BF Analyzed: 03/31/2022 03:10

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-01RE2 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	10	1.00	1.00	37.6	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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Infiltrationponds-0322
22C0335-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/16/2022 13:00
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 22:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-03 B 02
Preparation Batch: BKC0789 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	7.59	ug/L	
Lead	7439-92-1	1	0.0513	0.100	4.77	ug/L	
Vanadium	7440-62-2	1	0.0556	0.200	1.82	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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Infiltrationponds-0322
22C0335-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/16/2022 13:00
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 22:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-03 B 02
Preparation Batch: BKC0789 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	10.6	ug/L	



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Infiltrationponds-0322
22C0335-03 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/16/2022 13:00
Instrument: ICP2 Analyst: SKD Analyzed: 04/04/2022 19:44

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-03 B 03
Preparation Batch: BKC0800 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	1	0.107	0.500	236	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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Infiltrationponds-0322
22C0335-03 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/16/2022 13:00
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 10:10

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-03
Preparation Batch: BKC0518 Sample Size: 75 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	13	13	733	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW35A-0322
22C0335-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/16/2022 13:05
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 22:48

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-05 B 02
Preparation Batch: BKC0789 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	7.95	ug/L	
Lead	7439-92-1	1	0.0513	0.100	4.81	ug/L	
Vanadium	7440-62-2	1	0.0556	0.200	1.91	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW35A-0322
22C0335-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/16/2022 13:05
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 22:48

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-05 B 02
Preparation Batch: BKC0789 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	10.9	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW35A-0322
22C0335-05 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/16/2022 13:05
Instrument: ICP2 Analyst: SKD Analyzed: 04/04/2022 19:47

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-05 B 03
Preparation Batch: BKC0800 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	1	0.107	0.500	231	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW35A-0322
22C0335-05 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/16/2022 13:05
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 10:10

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-05
Preparation Batch: BKC0518 Sample Size: 75 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	13	13	743	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW6A-0322
22C0335-07 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/16/2022 13:55
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 23:13

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-07 C 02
Preparation Batch: BKC0789 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	7.90	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.155	ug/L	
Vanadium	7440-62-2	1	0.0556	0.200	0.935	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW6A-0322
22C0335-07 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/16/2022 13:55
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 23:13

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-07 C 02
Preparation Batch: BKC0789 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	2.85	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW6A-0322
22C0335-07 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/16/2022 13:55
Instrument: ICP2 Analyst: MVP Analyzed: 03/30/2022 19:26

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-07 C 02
Preparation Batch: BKC0735 Sample Size: 25 mL
Prepared: 03/29/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	17.0	mg/L	
Magnesium	7439-95-4	1	0.0209	0.0500	7.98	mg/L	
Potassium	7440-09-7	1	0.107	0.500	255	mg/L	
Sodium	7440-23-5	1	1.90	50.0	103	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW6A-0322
22C0335-07 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/16/2022 13:55
Instrument: [CALC] Analyst: MVP Analyzed: 03/30/2022 19:26

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0335-07
Preparation Batch: [CALC]
Prepared: 03/29/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		75.2	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW6A-0322
22C0335-07 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/16/2022 13:55
Instrument: IC930 Analyst: BF Analyzed: 03/24/2022 02:09

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-07 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	4.57	mg/L	



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MW6A-0322
22C0335-07 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/16/2022 13:55
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 10:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-07 D
Preparation Batch: BKC0557 Sample Size: 100 mL
Prepared: 03/23/2022 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	576	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW6A-0322
22C0335-07 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/16/2022 13:55
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 10:10

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-07
Preparation Batch: BKC0518 Sample Size: 75 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	13	13	808	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW6A-0322
22C0335-07RE2 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/16/2022 13:55
Instrument: IC930 Analyst: BF Analyzed: 03/31/2022 04:10

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-07RE2 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	10	1.00	1.00	46.6	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-2A-0322
22C0335-09 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/16/2022 14:50
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 23:18

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-09 C 02
Preparation Batch: BKC0789 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	3.26	ug/L	
Chromium	7440-47-3	1	0.260	0.500	1.23	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.218	ug/L	
Vanadium	7440-62-2	1	0.0556	0.200	1.15	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-2A-0322
22C0335-09 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/16/2022 14:50
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 23:18

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-09 C 02
Preparation Batch: BKC0789 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	1.85	ug/L	



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MW-2A-0322
22C0335-09 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/16/2022 14:50
Instrument: ICP2 Analyst: MVP Analyzed: 03/30/2022 19:29

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-09 C 02
Preparation Batch: BKC0735 Sample Size: 25 mL
Prepared: 03/29/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	26.0	mg/L	
Magnesium	7439-95-4	1	0.0209	0.0500	11.3	mg/L	
Potassium	7440-09-7	1	0.107	0.500	60.9	mg/L	
Sodium	7440-23-5	1	0.105	0.500	20.4	mg/L	



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MW-2A-0322
22C0335-09 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/16/2022 14:50
Instrument: [CALC] Analyst: MVP Analyzed: 03/30/2022 19:29

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0335-09
Preparation Batch: [CALC]
Prepared: 03/29/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		112	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-2A-0322
22C0335-09 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/16/2022 14:50
Instrument: IC930 Analyst: BF Analyzed: 03/24/2022 02:29

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-09 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	1.88	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-2A-0322
22C0335-09 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/16/2022 14:50
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 10:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-09 D
Preparation Batch: BKC0557 Sample Size: 50 mL
Prepared: 03/23/2022 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	226	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-2A-0322
22C0335-09 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/16/2022 14:50
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 10:10

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-09
Preparation Batch: BKC0518 Sample Size: 100 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	291	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-2A-0322
22C0335-09RE2 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/16/2022 14:50
Instrument: IC930 Analyst: BF Analyzed: 03/31/2022 04:30

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-09RE2 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	5	0.500	0.500	16.4	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-45A-0322
22C0335-11 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/16/2022 14:55
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 23:23

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-11 B 02
Preparation Batch: BKC0789 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	3.28	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.156	ug/L	
Vanadium	7440-62-2	1	0.0556	0.200	1.22	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-45A-0322
22C0335-11 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/16/2022 14:55
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 23:23

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-11 B 02
Preparation Batch: BKC0789 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	1.80	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-45A-0322
22C0335-11 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/16/2022 14:55
Instrument: ICP2 Analyst: MVP Analyzed: 03/30/2022 19:32

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-11 B 02
Preparation Batch: BKC0735 Sample Size: 25 mL
Prepared: 03/29/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	26.2	mg/L	
Magnesium	7439-95-4	1	0.0209	0.0500	11.4	mg/L	
Potassium	7440-09-7	1	0.107	0.500	61.0	mg/L	
Sodium	7440-23-5	1	0.105	0.500	20.6	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-45A-0322
22C0335-11 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/16/2022 14:55
Instrument: [CALC] Analyst: MVP Analyzed: 03/30/2022 19:32

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0335-11
Preparation Batch: [CALC]
Prepared: 03/29/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		112	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-45A-0322
22C0335-11 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/16/2022 14:55
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 10:10

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-11
Preparation Batch: BKC0518 Sample Size: 100 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	284	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-1A-0322
22C0335-13 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/16/2022 15:41
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 23:28

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-13 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	1.58	ug/L	
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	0.887	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-1A-0322
22C0335-13 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/16/2022 15:41
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 23:28

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-13 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	1.33	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-1A-0322
22C0335-13 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/16/2022 15:41
Instrument: ICP2 Analyst: SKD Analyzed: 04/05/2022 18:54

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-13 C 02
Preparation Batch: BKC0800 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	46.3	mg/L	
Magnesium	7439-95-4	1	0.0209	0.0500	22.8	mg/L	
Potassium	7440-09-7	1	0.107	0.500	36.8	mg/L	
Sodium	7440-23-5	1	0.105	0.500	33.8	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-1A-0322
22C0335-13 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/16/2022 15:41
Instrument: [CALC] Analyst: SKD Analyzed: 04/05/2022 18:54

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0335-13
Preparation Batch: [CALC]
Prepared: 03/30/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		209	mg/L CaCO3	



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MW-1A-0322
22C0335-13 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/16/2022 15:41
Instrument: IC930 Analyst: BF Analyzed: 03/24/2022 02:49

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-13 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	2.94	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-1A-0322
22C0335-13 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/16/2022 15:41
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 10:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-13 D
Preparation Batch: BKC0557 Sample Size: 50 mL
Prepared: 03/23/2022 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	287	mg/L CaCO3	



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MW-1A-0322
22C0335-13 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/16/2022 15:41
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 10:10

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-13
Preparation Batch: BKC0518 Sample Size: 100 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	350	mg/L	



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MW-1A-0322
22C0335-13RE2 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/16/2022 15:41
Instrument: IC930 Analyst: BF Analyzed: 03/31/2022 04:50

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-13RE2 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	5	0.500	0.500	27.0	mg/L	D



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Portal-0322
22C0335-15 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/16/2022 16:15
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 23:32

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-15 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	ND	ug/L	U
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	0.164	ug/L	J



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Portal-0322
22C0335-15 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/16/2022 16:15
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 23:32

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-15 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	5.32	ug/L	



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Portal-0322
22C0335-15 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/16/2022 16:15
Instrument: ICP2 Analyst: SKD Analyzed: 04/05/2022 18:57

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-15 C 02
Preparation Batch: BKC0800 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	51.5	mg/L	
Magnesium	7439-95-4	1	0.0209	0.0500	31.5	mg/L	
Potassium	7440-09-7	1	0.107	0.500	18.8	mg/L	
Sodium	7440-23-5	1	0.105	0.500	16.8	mg/L	



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Portal-0322
22C0335-15 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/16/2022 16:15
Instrument: [CALC] Analyst: SKD Analyzed: 04/05/2022 18:57

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0335-15
Preparation Batch: [CALC]
Prepared: 03/30/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		259	mg/L CaCO3	



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Portal-0322
22C0335-15 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/16/2022 16:15
Instrument: IC930 Analyst: BF Analyzed: 03/24/2022 03:09

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-15 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	2.87	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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Portal-0322
22C0335-15 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/16/2022 16:15
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 10:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-15 D
Preparation Batch: BKC0557 Sample Size: 50 mL
Prepared: 03/23/2022 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	275	mg/L CaCO3	



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Portal-0322
22C0335-15 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/16/2022 16:15
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 10:10

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-15
Preparation Batch: BKC0518 Sample Size: 100 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	348	mg/L	



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Portal-0322
22C0335-15RE2 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/16/2022 16:15
Instrument: IC930 Analyst: BF Analyzed: 03/31/2022 06:10

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-15RE2 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	5	0.500	0.500	35.7	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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Stillwell-0322
22C0335-17 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/17/2022 08:00
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 23:37

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-17 B 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	8.23	ug/L	
Lead	7439-92-1	1	0.0513	0.100	5.88	ug/L	
Vanadium	7440-62-2	1	0.0556	0.200	3.02	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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Stillwell-0322
22C0335-17 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/17/2022 08:00
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 23:37

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-17 B 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	51.7	ug/L	



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Stillwell-0322
22C0335-17 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/17/2022 08:00
Instrument: ICP2 Analyst: SKD Analyzed: 04/05/2022 21:33

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-17 B 02
Preparation Batch: BKC0800 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	2	0.0440	0.100	270	mg/L	D
Magnesium	7439-95-4	2	0.0418	0.100	ND	mg/L	U
Potassium	7440-09-7	2	0.214	1.00	517	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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Stillwell-0322
22C0335-17 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/17/2022 08:00
Instrument: [CALC] Analyst: SKD Analyzed: 04/05/2022 21:33

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0335-17
Preparation Batch: [CALC]
Prepared: 03/30/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		2		674	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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Stillwell-0322
22C0335-17 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/17/2022 08:00
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 10:10

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-17
Preparation Batch: BKC0518 Sample Size: 10 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	100	100	2070	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-3A-0322
22C0335-19 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/17/2022 08:50
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 23:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-19 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	3.39	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.169	ug/L	
Vanadium	7440-62-2	1	0.0556	0.200	0.879	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-3A-0322
22C0335-19 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/17/2022 08:50
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 23:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-19 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	1.98	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-3A-0322
22C0335-19 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/17/2022 08:50
Instrument: ICP2 Analyst: SKD Analyzed: 04/05/2022 19:03

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-19 C 02
Preparation Batch: BKC0800 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	33.5	mg/L	
Magnesium	7439-95-4	1	0.0209	0.0500	5.24	mg/L	
Potassium	7440-09-7	1	0.107	0.500	53.2	mg/L	
Sodium	7440-23-5	1	0.105	0.500	17.7	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-3A-0322
22C0335-19 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/17/2022 08:50
Instrument: [CALC] Analyst: SKD Analyzed: 04/05/2022 19:03

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0335-19
Preparation Batch: [CALC]
Prepared: 03/30/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		105	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-3A-0322
22C0335-19 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/17/2022 08:50
Instrument: IC930 Analyst: BF Analyzed: 03/24/2022 04:09

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-19 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	1.33	mg/L	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	0.100	0.100	8.11	mg/L	



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MW-3A-0322
22C0335-19 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/17/2022 08:50
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 10:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-19 D
Preparation Batch: BKC0557 Sample Size: 100 mL
Prepared: 03/23/2022 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	192	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-3A-0322
22C0335-19 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/17/2022 08:50
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 10:10

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-19
Preparation Batch: BKC0518 Sample Size: 200 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	252	mg/L	



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Weir-0322
22C0335-21 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/17/2022 09:15
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 19:52

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-21 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	5.37	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.0550	ug/L	J
Vanadium	7440-62-2	1	0.0556	0.200	0.920	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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Weir-0322
22C0335-21 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/17/2022 09:15
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 19:52

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-21 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	3.50	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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Weir-0322
22C0335-21 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/17/2022 09:15
Instrument: ICP2 Analyst: SKD Analyzed: 04/04/2022 19:53

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-21 C 02
Preparation Batch: BKC0800 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	1	0.107	0.500	86.0	mg/L	



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Weir-0322
22C0335-21 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/17/2022 09:15
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 10:10

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-21
Preparation Batch: BKC0518 Sample Size: 100 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	394	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-99-1-0322
22C0335-23 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/17/2022 09:42
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 23:48

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-23 B 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	ND	ug/L	U
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	ND	ug/L	U



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-99-1-0322
22C0335-23 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/17/2022 09:42
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 23:48

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-23 B 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	ND	ug/L	U



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-99-1-0322
22C0335-23 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/17/2022 09:42
Instrument: ICP2 Analyst: SKD Analyzed: 04/05/2022 19:06

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-23 B 02
Preparation Batch: BKC0800 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	ND	mg/L	U
Magnesium	7439-95-4	1	0.0209	0.0500	ND	mg/L	U
Potassium	7440-09-7	1	0.107	0.500	0.115	mg/L	J
Sodium	7440-23-5	1	0.105	0.500	ND	mg/L	U



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-99-1-0322
22C0335-23 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/17/2022 09:42
Instrument: [CALC] Analyst: SKD Analyzed: 04/05/2022 19:06

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0335-23
Preparation Batch: [CALC]
Prepared: 03/30/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		0.00	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-99-1-0322
22C0335-23 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/17/2022 09:42
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 10:10

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-23
Preparation Batch: BKC0518 Sample Size: 200 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	13	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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P-16-0322
22C0335-24 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/17/2022 10:35
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 02:12

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-24 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection		Reporting		Result	Units	Notes
			Limit	Limit	Limit	Limit			
Antimony	7440-36-0	5	0.505	1.00	8.14	ug/L	D		
Lead	7439-92-1	5	0.257	0.500	10.5	ug/L	D		
Vanadium	7440-62-2	5	0.278	1.00	255	ug/L	D		



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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P-16-0322
22C0335-24 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/17/2022 10:35
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 02:12

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-24 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	5	0.187	1.00	124	ug/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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P-16-0322
22C0335-24 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/17/2022 10:35
Instrument: ICP2 Analyst: SKD Analyzed: 04/05/2022 19:56

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-24 C 02
Preparation Batch: BKC0800 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	5	0.110	0.250	9.45	mg/L	D
Magnesium	7439-95-4	5	0.105	0.250	0.645	mg/L	D
Potassium	7440-09-7	5	0.534	2.50	771	mg/L	D
Sodium	7440-23-5	5	9.50	250	320	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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P-16-0322
22C0335-24 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/17/2022 10:35
Instrument: [CALC] Analyst: SKD Analyzed: 04/05/2022 19:56

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0335-24
Preparation Batch: [CALC]
Prepared: 03/30/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		5		26.2	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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P-16-0322
22C0335-24 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/17/2022 10:35
Instrument: IC930 Analyst: BF Analyzed: 03/24/2022 04:29

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-24 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	5	0.500	0.500	7.92	mg/L	D

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	5	0.500	0.500	49.5	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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P-16-0322
22C0335-24 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/17/2022 10:35
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 10:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-24 D
Preparation Batch: BKC0557 Sample Size: 50 mL
Prepared: 03/23/2022 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	1460	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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P-16-0322
22C0335-24 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/17/2022 10:35
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 10:10

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-24
Preparation Batch: BKC0518 Sample Size: 20 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	50	50	2570	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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Southpond-0322
22C0335-26 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/17/2022 10:55
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 02:05

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-26 B 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	2	0.202	0.400	4.85	ug/L	D
Lead	7439-92-1	2	0.103	0.200	16.7	ug/L	D
Vanadium	7440-62-2	2	0.111	0.400	37.8	ug/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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Southpond-0322
22C0335-26 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/17/2022 10:55
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 02:05

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-26 B 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	2	0.0746	0.400	22.6	ug/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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Southpond-0322
22C0335-26 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/17/2022 10:55
Instrument: ICP2 Analyst: SKD Analyzed: 04/05/2022 19:53

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-26 B 02
Preparation Batch: BKC0800 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	2	0.214	1.00	358	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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Southpond-0322
22C0335-26 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/17/2022 10:55
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 11:59

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-26
Preparation Batch: BKC0526 Sample Size: 75 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	13	13	912	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-10A-0322
22C0335-28 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/17/2022 11:40
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 23:54

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-28 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	ND	ug/L	U
Lead	7439-92-1	1	0.0513	0.100	0.0610	ug/L	J
Vanadium	7440-62-2	1	0.0556	0.200	0.807	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-10A-0322
22C0335-28 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/17/2022 11:40
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/01/2022 23:54

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-28 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	0.910	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-10A-0322
22C0335-28 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/17/2022 11:40
Instrument: ICP2 Analyst: SKD Analyzed: 04/05/2022 19:09

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-28 C 02
Preparation Batch: BKC0800 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	21.3	mg/L	
Magnesium	7439-95-4	1	0.0209	0.0500	7.10	mg/L	
Potassium	7440-09-7	1	0.107	0.500	1.88	mg/L	
Sodium	7440-23-5	1	0.105	0.500	9.88	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-10A-0322
22C0335-28 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/17/2022 11:40
Instrument: [CALC] Analyst: SKD Analyzed: 04/05/2022 19:09

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0335-28
Preparation Batch: [CALC]
Prepared: 03/30/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		82.4	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-10A-0322
22C0335-28 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/17/2022 11:40
Instrument: IC930 Analyst: BF Analyzed: 03/24/2022 04:49

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-28 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	2.03	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-10A-0322
22C0335-28 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/17/2022 11:40
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 10:09

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-28 D
Preparation Batch: BKC0557 Sample Size: 100 mL
Prepared: 03/23/2022 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	89.9	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-10A-0322
22C0335-28 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/17/2022 11:40
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 11:59

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-28
Preparation Batch: BKC0526 Sample Size: 200 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	139	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-10A-0322
22C0335-28RE2 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/17/2022 11:40
Instrument: IC930 Analyst: BF Analyzed: 03/31/2022 06:30

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-28RE2 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	2	0.200	0.200	11.6	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1LDA-0322
22C0335-30 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/17/2022 12:40
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 00:20

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-30 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	ND	ug/L	U
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	ND	ug/L	U



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1LDA-0322
22C0335-30 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/17/2022 12:40
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 00:20

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-30 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	8.20	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1LDA-0322
22C0335-30 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/17/2022 12:40
Instrument: ICP2 Analyst: SKD Analyzed: 04/05/2022 19:11

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-30 C 02
Preparation Batch: BKC0800 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	46.3	mg/L	
Magnesium	7439-95-4	1	0.0209	0.0500	14.5	mg/L	
Potassium	7440-09-7	1	0.107	0.500	0.925	mg/L	
Sodium	7440-23-5	1	0.105	0.500	13.1	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1LDA-0322
22C0335-30 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/17/2022 12:40
Instrument: [CALC] Analyst: SKD Analyzed: 04/05/2022 19:11

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0335-30
Preparation Batch: [CALC]
Prepared: 03/30/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		175	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1LDA-0322
22C0335-30 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/17/2022 12:40
Instrument: IC930 Analyst: BF Analyzed: 03/24/2022 05:09

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-30 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	1.87	mg/L	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	0.100	0.100	3.74	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1LDA-0322
22C0335-30 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/17/2022 12:40
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 10:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-30 D
Preparation Batch: BKC0557 Sample Size: 100 mL
Prepared: 03/23/2022 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	195	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1LDA-0322
22C0335-30 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/17/2022 12:40
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 11:59

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-30
Preparation Batch: BKC0526 Sample Size: 200 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	220	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-2LDA-0322
22C0335-32 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/17/2022 13:25
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 00:25

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-32 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	ND	ug/L	U
Lead	7439-92-1	1	0.0513	0.100	0.0710	ug/L	J
Vanadium	7440-62-2	1	0.0556	0.200	0.0810	ug/L	J



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-2LDA-0322
22C0335-32 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/17/2022 13:25
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 00:25

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-32 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	5.53	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-2LDA-0322
22C0335-32 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/17/2022 13:25
Instrument: ICP2 Analyst: SKD Analyzed: 04/05/2022 19:31

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-32 C 02
Preparation Batch: BKC0800 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	38.4	mg/L	
Magnesium	7439-95-4	1	0.0209	0.0500	15.8	mg/L	
Potassium	7440-09-7	1	0.107	0.500	1.06	mg/L	
Sodium	7440-23-5	1	0.105	0.500	9.72	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-2LDA-0322
22C0335-32 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/17/2022 13:25
Instrument: [CALC] Analyst: SKD Analyzed: 04/05/2022 19:31

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0335-32
Preparation Batch: [CALC]
Prepared: 03/30/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		161	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-2LDA-0322
22C0335-32 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/17/2022 13:25
Instrument: IC930 Analyst: BF Analyzed: 03/24/2022 05:29

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-32 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	1.82	mg/L	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	0.100	0.100	0.885	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-2LDA-0322
22C0335-32 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/17/2022 13:25
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 10:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-32 D
Preparation Batch: BKC0557 Sample Size: 100 mL
Prepared: 03/23/2022 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	182	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-2LDA-0322
22C0335-32 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/17/2022 13:25
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 11:59

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-32
Preparation Batch: BKC0526 Sample Size: 200 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	201	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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P-15-0322
22C0335-34 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/17/2022 14:40
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/05/2022 22:21

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-34 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	2	0.202	0.400	3.08	ug/L	D
Lead	7439-92-1	1	0.0513	0.100	109	ug/L	
Vanadium	7440-62-2	1	0.0556	0.200	0.406	ug/L	



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P-15-0322
22C0335-34 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/17/2022 14:40
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 00:30

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-34 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	5.63	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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P-15-0322
22C0335-34 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/17/2022 14:40
Instrument: ICP2 Analyst: SKD Analyzed: 04/06/2022 17:13

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-34 C 02
Preparation Batch: BKC0800 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	5	0.110	0.250	372	mg/L	D
Magnesium	7439-95-4	5	0.105	0.250	ND	mg/L	U
Potassium	7440-09-7	5	0.534	2.50	970	mg/L	D
Sodium	7440-23-5	5	9.50	250	399	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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P-15-0322
22C0335-34 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/17/2022 14:40
Instrument: [CALC] Analyst: SKD Analyzed: 04/06/2022 17:13

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0335-34
Preparation Batch: [CALC]
Prepared: 03/30/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		5		929	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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P-15-0322
22C0335-34 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/17/2022 14:40
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 10:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-34 D
Preparation Batch: BKC0557 Sample Size: 50 mL
Prepared: 03/23/2022 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	2740	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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P-15-0322
22C0335-34 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/17/2022 14:40
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 11:59

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-34
Preparation Batch: BKC0526 Sample Size: 5 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	200	200	3060	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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P-15-0322
22C0335-34RE2 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/17/2022 14:40
Instrument: IC930 Analyst: BF Analyzed: 03/31/2022 06:50

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-34RE2 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	10	1.00	1.00	10.8	mg/L	D

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	10	1.00	1.00	65.0	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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Interceptertrench-0322
22C0335-36 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/17/2022 13:25
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 11:59

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-36
Preparation Batch: BKC0526 Sample Size: 100 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	368	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-3LDA-0322
22C0335-37 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/17/2022 15:55
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 00:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-37 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	ND	ug/L	U
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	ND	ug/L	U



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-3LDA-0322
22C0335-37 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/17/2022 15:55
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 00:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-37 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	1.58	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-3LDA-0322
22C0335-37 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/17/2022 15:55
Instrument: ICP2 Analyst: SKD Analyzed: 04/05/2022 19:36

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-37 C 02
Preparation Batch: BKC0800 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	21.7	mg/L	
Magnesium	7439-95-4	1	0.0209	0.0500	10.4	mg/L	
Potassium	7440-09-7	1	0.107	0.500	1.20	mg/L	
Sodium	7440-23-5	1	0.105	0.500	10.9	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-3LDA-0322
22C0335-37 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/17/2022 15:55
Instrument: [CALC] Analyst: SKD Analyzed: 04/05/2022 19:36

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0335-37
Preparation Batch: [CALC]
Prepared: 03/30/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		97.3	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-3LDA-0322
22C0335-37 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/17/2022 15:55
Instrument: IC930 Analyst: BF Analyzed: 03/24/2022 06:09

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-37 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	2.17	mg/L	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	0.100	0.100	2.46	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-3LDA-0322
22C0335-37 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/17/2022 15:55
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 10:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-37 D
Preparation Batch: BKC0557 Sample Size: 100 mL
Prepared: 03/23/2022 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	ND	mg/L CaCO3	U



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-3LDA-0322
22C0335-37 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/17/2022 15:55
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 11:59

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-37
Preparation Batch: BKC0526 Sample Size: 200 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	151	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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P-17-0322
22C0335-39 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/18/2022 09:55
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 00:40

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-39 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	1.38	ug/L	
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	1.08	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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P-17-0322
22C0335-39 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/18/2022 09:55
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 00:40

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-39 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	1.34	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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P-17-0322
22C0335-39 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/18/2022 09:55
Instrument: ICP2 Analyst: SKD Analyzed: 04/05/2022 19:39

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-39 C 02
Preparation Batch: BKC0800 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	68.2	mg/L	
Magnesium	7439-95-4	1	0.0209	0.0500	39.1	mg/L	
Potassium	7440-09-7	1	0.107	0.500	13.3	mg/L	
Sodium	7440-23-5	1	0.105	0.500	21.1	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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P-17-0322
22C0335-39 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/18/2022 09:55
Instrument: [CALC] Analyst: SKD Analyzed: 04/05/2022 19:39

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0335-39
Preparation Batch: [CALC]
Prepared: 03/30/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		331	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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P-17-0322
22C0335-39 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/18/2022 09:55
Instrument: IC930 Analyst: BF Analyzed: 03/24/2022 06:29

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-39 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	1.57	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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P-17-0322
22C0335-39 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/18/2022 09:55
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 10:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-39 D
Preparation Batch: BKC0557 Sample Size: 50 mL
Prepared: 03/23/2022 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	343	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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P-17-0322
22C0335-39 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/18/2022 09:55
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 11:59

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-39
Preparation Batch: BKC0526 Sample Size: 100 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	362	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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P-17-0322
22C0335-39RE2 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/18/2022 09:55
Instrument: IC930 Analyst: BF Analyzed: 04/04/2022 18:45

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-39RE2 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	5	0.500	0.500	16.4	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-4A-0322
22C0335-41 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/18/2022 11:05
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 00:44

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-41 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	ND	ug/L	U
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	1.53	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-4A-0322
22C0335-41 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/18/2022 11:05
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 00:44

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-41 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	0.279	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-4A-0322
22C0335-41 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/18/2022 11:05
Instrument: ICP2 Analyst: SKD Analyzed: 04/05/2022 19:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-41 C 02
Preparation Batch: BKC0800 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	66.8	mg/L	
Magnesium	7439-95-4	1	0.0209	0.0500	24.7	mg/L	
Potassium	7440-09-7	1	0.107	0.500	1.14	mg/L	
Sodium	7440-23-5	1	0.105	0.500	12.7	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-4A-0322
22C0335-41 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/18/2022 11:05
Instrument: [CALC] Analyst: SKD Analyzed: 04/05/2022 19:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0335-41
Preparation Batch: [CALC]
Prepared: 03/30/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		268	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-4A-0322
22C0335-41 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/18/2022 11:05
Instrument: IC930 Analyst: BF Analyzed: 03/24/2022 06:49

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-41 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	1.80	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-4A-0322
22C0335-41 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/18/2022 11:05
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 10:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-41 D
Preparation Batch: BKC0557 Sample Size: 100 mL
Prepared: 03/23/2022 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	250	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-4A-0322
22C0335-41 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/18/2022 11:05
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 11:59

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-41
Preparation Batch: BKC0526 Sample Size: 100 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	320	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-4A-0322
22C0335-41RE2 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/18/2022 11:05
Instrument: IC930 Analyst: BF Analyzed: 03/31/2022 07:10

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-41RE2 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	5	0.500	0.500	30.3	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-9A-0322
22C0335-43 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/18/2022 11:55
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 00:49

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-43 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	0.154	ug/L	J
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	0.776	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-9A-0322
22C0335-43 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/18/2022 11:55
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 00:49

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-43 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	0.788	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-9A-0322
22C0335-43 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/18/2022 11:55
Instrument: ICP2 Analyst: SKD Analyzed: 04/05/2022 19:45

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-43 C 02
Preparation Batch: BKC0800 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	42.0	mg/L	
Magnesium	7439-95-4	1	0.0209	0.0500	15.4	mg/L	
Potassium	7440-09-7	1	0.107	0.500	2.47	mg/L	
Sodium	7440-23-5	1	1.90	50.0	122	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-9A-0322
22C0335-43 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/18/2022 11:55
Instrument: [CALC] Analyst: SKD Analyzed: 04/05/2022 19:45

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0335-43
Preparation Batch: [CALC]
Prepared: 03/30/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		168	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-9A-0322
22C0335-43 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/18/2022 11:55
Instrument: IC930 Analyst: BF Analyzed: 03/24/2022 07:09

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-43 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	5.59	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-9A-0322
22C0335-43 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/18/2022 11:55
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 10:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-43 D
Preparation Batch: BKC0557 Sample Size: 100 mL
Prepared: 03/23/2022 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	312	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-9A-0322
22C0335-43 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/18/2022 11:55
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 11:59

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-43
Preparation Batch: BKC0526 Sample Size: 100 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	403	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MW-9A-0322
22C0335-43RE2 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/18/2022 11:55
Instrument: IC930 Analyst: BF Analyzed: 03/31/2022 07:30

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-43RE2 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	10	1.00	1.00	57.3	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1DDSP-0322
22C0335-45 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/18/2022 13:25
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 00:55

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-45 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	ND	ug/L	U
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	ND	ug/L	U



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1DDSP-0322
22C0335-45 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/18/2022 13:25
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/05/2022 22:26

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-45 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	2	0.0746	0.400	4.64	ug/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1DDSP-0322
22C0335-45 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/18/2022 13:25
Instrument: ICP2 Analyst: SKD Analyzed: 04/05/2022 19:48

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-45 C 02
Preparation Batch: BKC0800 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	144	mg/L	
Magnesium	7439-95-4	1	0.0209	0.0500	66.3	mg/L	
Potassium	7440-09-7	1	0.107	0.500	4.24	mg/L	
Sodium	7440-23-5	1	0.105	0.500	27.6	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1DDSP-0322
22C0335-45 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/18/2022 13:25
Instrument: [CALC] Analyst: SKD Analyzed: 04/05/2022 19:48

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0335-45
Preparation Batch: [CALC]
Prepared: 03/30/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		632	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1DDSP-0322
22C0335-45 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/18/2022 13:25
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 10:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-45 D
Preparation Batch: BKC0557 Sample Size: 100 mL
Prepared: 03/23/2022 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	377	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1DDSP-0322
22C0335-45 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/18/2022 13:25
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 11:59

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-45
Preparation Batch: BKC0526 Sample Size: 75 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	13	13	781	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1DDSP-0322
22C0335-45RE2 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/18/2022 13:25
Instrument: IC930 Analyst: BF Analyzed: 03/31/2022 07:50

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-45RE2 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	50	5.00	5.00	240	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1DDSP-0322
22C0335-45RE3 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/18/2022 13:25
Instrument: IC930 Analyst: BF Analyzed: 03/31/2022 08:10

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-45RE3 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	5	0.500	0.500	11.7	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1SDSP-0322
22C0335-47 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/18/2022 13:55
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 01:01

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-47 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	ND	ug/L	U
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	ND	ug/L	U



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1SDSP-0322
22C0335-47 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 03/18/2022 13:55
Instrument: ICPMS1 Analyst: MCB Analyzed: 04/02/2022 01:01

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 22C0335-47 C 01
Preparation Batch: BKC0825 Sample Size: 25 mL
Prepared: 03/31/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	16.6	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1SDSP-0322
22C0335-47 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 03/18/2022 13:55
Instrument: ICP2 Analyst: SKD Analyzed: 04/05/2022 19:51

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22C0335-47 C 02
Preparation Batch: BKC0800 Sample Size: 25 mL
Prepared: 03/30/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Calcium	7440-70-2	1	0.0220	0.0500	242	mg/L	
Magnesium	7439-95-4	1	0.0209	0.0500	111	mg/L	
Potassium	7440-09-7	1	0.107	0.500	6.40	mg/L	
Sodium	7440-23-5	1	0.105	0.500	36.7	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1SDSP-0322
22C0335-47 (Water)

Metals and Metallic Compounds

Method: SM 2340 B-97 Sampled: 03/18/2022 13:55
Instrument: [CALC] Analyst: SKD Analyzed: 04/05/2022 19:51

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: [CALC] Extract ID: 22C0335-47
Preparation Batch: [CALC]
Prepared: 03/30/2022 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness		1		1060	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1SDSP-0322
22C0335-47 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 03/18/2022 13:55
Instrument: Accumet AB150 Analyst: UW Analyzed: 03/23/2022 10:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-47 D
Preparation Batch: BKC0557 Sample Size: 100 mL
Prepared: 03/23/2022 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	81.0	mg/L CaCO3	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1SDSP-0322
22C0335-47 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 03/18/2022 13:55
Instrument: BAL2 Analyst: DOE Analyzed: 03/22/2022 11:59

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-47
Preparation Batch: BKC0526 Sample Size: 75 mL
Prepared: 03/22/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	13	13	1260	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1SDSP-0322
22C0335-47RE2 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/18/2022 13:55
Instrument: IC930 Analyst: BF Analyzed: 03/31/2022 08:30

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-47RE2 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	100	10.0	10.0	414	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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MWB-1SDSP-0322
22C0335-47RE3 (Water)

Wet Chemistry

Method: EPA 300.0 Sampled: 03/18/2022 13:55
Instrument: IC930 Analyst: BF Analyzed: 03/31/2022 08:50

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22C0335-47RE3 D
Preparation Batch: BKC0571 Sample Size: 10 mL
Prepared: 03/23/2022 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	5	0.500	0.500	13.0	mg/L	D



Golder Associates
18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Ravensdale
Project Number: Ravensdale
Project Manager: Gary Zimmerman

Reported:
19-May-2022 08:11

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BKC0735 - TWC EPA 3010A

Instrument: ICP2 Analyst: MVP

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKC0735-BLK1)						Prepared: 29-Mar-2022 Analyzed: 30-Mar-2022 15:46					
Calcium	ND	0.0220	0.0500	mg/L							U
Magnesium	ND	0.0209	0.0500	mg/L							U
Potassium	ND	0.107	0.500	mg/L							U
Sodium	ND	0.105	0.500	mg/L							U
LCS (BKC0735-BS1)						Prepared: 29-Mar-2022 Analyzed: 30-Mar-2022 16:11					
Calcium	9.64	0.0220	0.0500	mg/L	10.0	96.4	80-120				
Magnesium	10.5	0.0209	0.0500	mg/L	10.0	105	80-120				
Potassium	9.95	0.107	0.500	mg/L	10.0	99.5	80-120				
Sodium	10.1	0.105	0.500	mg/L	10.0	101	80-120				
Duplicate (BKC0735-DUP1)						Source: 22C0335-01 Prepared: 29-Mar-2022 Analyzed: 07-Apr-2022 17:27					
Calcium	29.7	0.0220	0.0500	mg/L		30.0		0.90	20		
Magnesium	15.0	0.0209	0.0500	mg/L		15.2		1.08	20		
Potassium	221	0.107	0.500	mg/L		223		1.08	20		
Sodium	103	1.90	50.0	mg/L		104		1.35	20		
Matrix Spike (BKC0735-MS1)						Source: 22C0335-01 Prepared: 29-Mar-2022 Analyzed: 07-Apr-2022 17:33					
Calcium	39.7	0.0220	0.0500	mg/L	10.0	30.0	97.5	75-125			
Magnesium	27.3	0.0209	0.0500	mg/L	10.0	15.2	121	75-125			
Potassium	229	0.107	0.500	mg/L	10.0	223	59.7	75-125			HC
Sodium	101	1.90	50.0	mg/L	10.0	104	-28.9	75-125			HC
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BKC0735-MSD1)						Source: 22C0335-01 Prepared: 29-Mar-2022 Analyzed: 07-Apr-2022 17:36					
Calcium	40.3	0.0220	0.0500	mg/L	10.0	30.0	103	75-125	1.48	20	
Magnesium	28.0	0.0209	0.0500	mg/L	10.0	15.2	129	75-125	2.74	20	*
Potassium	233	0.107	0.500	mg/L	10.0	223	91.9	75-125	1.40	20	HC
Sodium	104	1.90	50.0	mg/L	10.0	104	-7.39	75-125	2.10	20	HC
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											



Golder Associates
18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Ravensdale
Project Number: Ravensdale
Project Manager: Gary Zimmerman

Reported:
19-May-2022 08:11

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BKC0789 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKC0789-BLK1)						Prepared: 30-Mar-2022 Analyzed: 30-Mar-2022 20:04						
Antimony	121	ND	0.101	0.200	ug/L							U
Antimony	123	ND	0.102	0.200	ug/L							U
Chromium	52	ND	0.260	0.500	ug/L							U
Chromium	53	ND	0.239	0.500	ug/L							U
Lead	208	ND	0.0513	0.100	ug/L							U
Vanadium	51a	ND	0.0556	0.200	ug/L							U
Vanadium	51b	ND	0.0521	0.200	ug/L							U
Arsenic	75a	ND	0.0373	0.200	ug/L							U

LCS (BKC0789-BS1)						Prepared: 30-Mar-2022 Analyzed: 30-Mar-2022 20:10						
Antimony	121	23.6	0.101	0.200	ug/L	25.0		94.6	80-120			
Antimony	123	23.9	0.102	0.200	ug/L	25.0		95.4	80-120			
Chromium	52	24.9	0.260	0.500	ug/L	25.0		99.5	80-120			
Chromium	53	26.3	0.239	0.500	ug/L	25.0		105	80-120			
Lead	208	25.4	0.0513	0.100	ug/L	25.0		102	80-120			
Vanadium	51a	24.2	0.0556	0.200	ug/L	25.0		96.8	80-120			
Vanadium	51b	24.6	0.0521	0.200	ug/L	25.0		98.4	80-120			
Arsenic	75a	25.7	0.0373	0.200	ug/L	25.0		103	80-120			

Duplicate (BKC0789-DUP1)						Source: 22C0335-01 Prepared: 30-Mar-2022 Analyzed: 31-Mar-2022 18:24						
Antimony	121	6.08	0.101	0.200	ug/L		6.01			1.16	20	
Chromium	52	1.95	0.260	0.500	ug/L		2.01			2.88	20	
Lead	208	0.108	0.0513	0.100	ug/L		0.110			1.83	20	
Vanadium	51a	1.51	0.0556	0.200	ug/L		1.52			0.60	20	
Arsenic	75a	4.00	0.0373	0.200	ug/L		4.02			0.67	20	

Matrix Spike (BKC0789-MS1)						Source: 22C0335-01 Prepared: 30-Mar-2022 Analyzed: 31-Mar-2022 18:29						
Antimony	121	31.3	0.101	0.200	ug/L	25.0	6.01	101	75-125			
Chromium	52	25.1	0.260	0.500	ug/L	25.0	2.01	92.4	75-125			
Lead	208	24.3	0.0513	0.100	ug/L	25.0	0.110	96.7	75-125			
Vanadium	51a	25.0	0.0556	0.200	ug/L	25.0	1.52	94.0	75-125			
Arsenic	75a	29.7	0.0373	0.200	ug/L	25.0	4.02	103	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BKC0789-MSD1)						Source: 22C0335-01 Prepared: 30-Mar-2022 Analyzed: 31-Mar-2022 18:34						
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Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 19-May-2022 08:11
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Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BKC0789 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BKC0789-MSD1)		Source: 22C0335-01			Prepared: 30-Mar-2022 Analyzed: 31-Mar-2022 18:34							
Antimony	121	31.7	0.101	0.200	ug/L	25.0	6.01	103	75-125	1.34	20	
Chromium	52	25.1	0.260	0.500	ug/L	25.0	2.01	92.6	75-125	0.13	20	
Lead	208	24.1	0.0513	0.100	ug/L	25.0	0.110	96.0	75-125	0.67	20	
Vanadium	51a	25.2	0.0556	0.200	ug/L	25.0	1.52	94.8	75-125	0.77	20	
Arsenic	75a	30.3	0.0373	0.200	ug/L	25.0	4.02	105	75-125	2.07	20	

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



Golder Associates
18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Ravensdale
Project Number: Ravensdale
Project Manager: Gary Zimmerman

Reported:
19-May-2022 08:11

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BKC0800 - TWC EPA 3010A

Instrument: ICP2 Analyst: SKD

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKC0800-BLK1)						Prepared: 30-Mar-2022 Analyzed: 04-Apr-2022 19:35					
Calcium	ND	0.0220	0.0500	mg/L							U
Magnesium	ND	0.0209	0.0500	mg/L							U
Potassium	ND	0.107	0.500	mg/L							U
Blank (BKC0800-BLK2)						Prepared: 30-Mar-2022 Analyzed: 05-Apr-2022 18:16					
Sodium	ND	0.105	0.500	mg/L							U
Sodium	ND	1.90	50.0	mg/L							U
LCS (BKC0800-BS1)						Prepared: 30-Mar-2022 Analyzed: 04-Apr-2022 20:03					
Calcium	9.94	0.0220	0.0500	mg/L	10.0		99.4	80-120			
Magnesium	10.9	0.0209	0.0500	mg/L	10.0		109	80-120			
Potassium	10.3	0.107	0.500	mg/L	10.0		103	80-120			
LCS (BKC0800-BS2)						Prepared: 30-Mar-2022 Analyzed: 05-Apr-2022 18:44					
Sodium	10.7	0.105	0.500	mg/L	10.0		107	80-120			
Sodium	11.6	1.90	50.0	mg/L	10.0		116	80-120			J
Duplicate (BKC0800-DUP1)						Source: 22C0335-21 Prepared: 30-Mar-2022 Analyzed: 04-Apr-2022 19:50					
Calcium	45.8	0.0220	0.0500	mg/L		47.2			2.99	20	
Magnesium	11.4	0.0209	0.0500	mg/L		11.9			4.78	20	
Potassium	83.5	0.107	0.500	mg/L		86.0			2.95	20	
Duplicate (BKC0800-DUP2)						Source: 22C0335-21 Prepared: 30-Mar-2022 Analyzed: 05-Apr-2022 18:28					
Sodium	30.9	0.105	0.500	mg/L		32.3			4.58	20	
Matrix Spike (BKC0800-MS1)						Source: 22C0335-21 Prepared: 30-Mar-2022 Analyzed: 04-Apr-2022 19:56					
Calcium	55.7	0.0220	0.0500	mg/L	10.0	47.2	85.2	75-125			
Magnesium	24.1	0.0209	0.0500	mg/L	10.0	11.9	122	75-125			
Potassium	95.6	0.107	0.500	mg/L	10.0	86.0	95.8	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike (BKC0800-MS2)						Source: 22C0335-21 Prepared: 30-Mar-2022 Analyzed: 05-Apr-2022 18:33					
Sodium	42.0	0.105	0.500	mg/L	10.0	32.3	96.6	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BKC0800-MSD1)						Source: 22C0335-21 Prepared: 30-Mar-2022 Analyzed: 04-Apr-2022 19:59					



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Project: Ravensdale
Project Number: Ravensdale
Project Manager: Gary Zimmerman

Reported:
19-May-2022 08:11

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BKC0800 - TWC EPA 3010A

Instrument: ICP2 Analyst: SKD

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BKC0800-MSD1)		Source: 22C0335-21			Prepared: 30-Mar-2022		Analyzed: 04-Apr-2022 19:59				
Calcium	57.0	0.0220	0.0500	mg/L	10.0	47.2	97.5	75-125	2.18	20	
Magnesium	24.6	0.0209	0.0500	mg/L	10.0	11.9	127	75-125	2.14	20	*
Potassium	97.3	0.107	0.500	mg/L	10.0	86.0	113	75-125	1.77	20	

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BKC0800-MSD2)		Source: 22C0335-21			Prepared: 30-Mar-2022		Analyzed: 05-Apr-2022 18:36				
Sodium	42.9	0.105	0.500	mg/L	10.0	32.3	106	75-125	2.21	20	

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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Project: Ravensdale
Project Number: Ravensdale
Project Manager: Gary Zimmerman

Reported:
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Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BKC0825 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKC0825-BLK1)						Prepared: 31-Mar-2022 Analyzed: 01-Apr-2022 18:32						
Antimony	121	ND	0.101	0.200	ug/L							U
Antimony	123	ND	0.102	0.200	ug/L							U
Lead	208	ND	0.0513	0.100	ug/L							U
Vanadium	51a	ND	0.0556	0.200	ug/L							U
Vanadium	51b	ND	0.0521	0.200	ug/L							U
Arsenic	75a	ND	0.0373	0.200	ug/L							U
LCS (BKC0825-BS1)						Prepared: 31-Mar-2022 Analyzed: 01-Apr-2022 18:52						
Antimony	121	25.3	0.101	0.200	ug/L	25.0		101	80-120			
Antimony	123	24.9	0.102	0.200	ug/L	25.0		99.6	80-120			
Lead	208	25.4	0.0513	0.100	ug/L	25.0		102	80-120			
Vanadium	51a	24.4	0.0556	0.200	ug/L	25.0		97.6	80-120			
Vanadium	51b	24.4	0.0521	0.200	ug/L	25.0		97.5	80-120			
Arsenic	75a	24.1	0.0373	0.200	ug/L	25.0		96.3	80-120			
Duplicate (BKC0825-DUP1)						Source: 22C0335-21 Prepared: 31-Mar-2022 Analyzed: 01-Apr-2022 19:58						
Antimony	121	5.25	0.101	0.200	ug/L		5.37			2.26	20	
Lead	208	ND	0.0513	0.100	ug/L		0.0550					U
Vanadium	51a	0.911	0.0556	0.200	ug/L		0.920			0.98	20	
Arsenic	75a	3.53	0.0373	0.200	ug/L		3.50			1.02	20	
Matrix Spike (BKC0825-MS1)						Source: 22C0335-21 Prepared: 31-Mar-2022 Analyzed: 01-Apr-2022 20:03						
Antimony	121	30.4	0.101	0.200	ug/L	25.0	5.37	100	75-125			
Lead	208	23.8	0.0513	0.100	ug/L	25.0	0.0550	95.0	75-125			
Vanadium	51a	24.1	0.0556	0.200	ug/L	25.0	0.920	92.6	75-125			
Arsenic	75a	28.0	0.0373	0.200	ug/L	25.0	3.50	98.0	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.												
Matrix Spike Dup (BKC0825-MSD1)						Source: 22C0335-21 Prepared: 31-Mar-2022 Analyzed: 01-Apr-2022 20:08						
Antimony	121	30.7	0.101	0.200	ug/L	25.0	5.37	101	75-125	0.95	20	
Lead	208	23.7	0.0513	0.100	ug/L	25.0	0.0550	94.6	75-125	0.44	20	
Vanadium	51a	24.6	0.0556	0.200	ug/L	25.0	0.920	94.8	75-125	2.25	20	
Arsenic	75a	27.7	0.0373	0.200	ug/L	25.0	3.50	96.8	75-125	1.09	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.												



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Analysis by: Analytical Resources, LLC

Wet Chemistry - Quality Control

Batch BKC0518 - No Prep Wet Chem

Instrument: BAL2 Analyst: DOE

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKC0518-BLK1)						Prepared: 22-Mar-2022 Analyzed: 22-Mar-2022 10:10					
Dissolved Solids	ND	5	5	mg/L							U
LCS (BKC0518-BS1)						Prepared: 22-Mar-2022 Analyzed: 22-Mar-2022 10:10					
Dissolved Solids	511	10	10	mg/L	500		102	90-110			
Duplicate (BKC0518-DUP1)						Source: 22C0335-21 Prepared: 22-Mar-2022 Analyzed: 22-Mar-2022 10:10					
Dissolved Solids	394	10	10	mg/L		394			0.00		



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Analysis by: Analytical Resources, LLC

Wet Chemistry - Quality Control

Batch BKC0526 - No Prep Wet Chem

Instrument: BAL2 Analyst: DOE

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKC0526-BLK1)						Prepared: 22-Mar-2022 Analyzed: 22-Mar-2022 11:59					
Dissolved Solids	ND	5	5	mg/L							U
LCS (BKC0526-BS1)						Prepared: 22-Mar-2022 Analyzed: 22-Mar-2022 11:59					
Dissolved Solids	495	10	10	mg/L	500		98.9	90-110			
Duplicate (BKC0526-DUP1)						Source: 22C0335-26 Prepared: 22-Mar-2022 Analyzed: 22-Mar-2022 11:59					
Dissolved Solids	940	13	13	mg/L		912			3.02	20	



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Analysis by: Analytical Resources, LLC

Wet Chemistry - Quality Control

Batch BKC0557 - No Prep Wet Chem

Instrument: Accumet AB150 Analyst: UW

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKC0557-BLK1)						Prepared: 23-Mar-2022 Analyzed: 23-Mar-2022 10:09					
Alkalinity, Total	ND	1.00	1.00	mg/L CaCO3							U
Duplicate (BKC0557-DUP1)						Source: 22C0335-01 Prepared: 23-Mar-2022 Analyzed: 23-Mar-2022 10:35					
Alkalinity, Total	524	1.00	1.00	mg/L CaCO3		528			0.67	20	
Reference (BKC0557-SRM1)						Prepared: 23-Mar-2022 Analyzed: 23-Mar-2022 10:35					
Alkalinity, Total	125	1.00	1.00	mg/L CaCO3	127		98.3	85.04-114.96			



Golder Associates
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Project: Ravensdale
Project Number: Ravensdale
Project Manager: Gary Zimmerman

Reported:
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Analysis by: Analytical Resources, LLC

Wet Chemistry - Quality Control

Batch BKC0571 - No Prep Wet Chem

Instrument: IC930 Analyst: BF

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKC0571-BLK1)						Prepared: 23-Mar-2022 Analyzed: 23-Mar-2022 23:08					
Chloride	ND	0.100	0.100	mg/L							U
Sulfate	ND	0.100	0.100	mg/L							U
LCS (BKC0571-BS1)						Prepared: 23-Mar-2022 Analyzed: 24-Mar-2022 00:08					
Chloride	4.92	0.100	0.100	mg/L	5.00		98.3	90-110			
Sulfate	5.11	0.100	0.100	mg/L	5.00		102	90-110			
Duplicate (BKC0571-DUP1)						Source: 22C0335-01 Prepared: 23-Mar-2022 Analyzed: 24-Mar-2022 01:09					
Chloride	4.24	0.100	0.100	mg/L		4.24			0.12	20	
Duplicate (BKC0571-DUP3)						Source: 22C0335-01RE2 Prepared: 23-Mar-2022 Analyzed: 31-Mar-2022 03:30					
Sulfate	37.7	1.00	1.00	mg/L		37.6			0.45	20	D
Matrix Spike (BKC0571-MS1)						Source: 22C0335-01 Prepared: 23-Mar-2022 Analyzed: 24-Mar-2022 01:29					
Chloride	6.25	0.100	0.100	mg/L	2.01	4.24	100	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike (BKC0571-MS3)						Source: 22C0335-01RE2 Prepared: 23-Mar-2022 Analyzed: 31-Mar-2022 03:50					
Sulfate	84.9	2.00	2.00	mg/L	50.0	37.6	94.7	75-125			D
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BKC0571-MSD1)						Source: 22C0335-01 Prepared: 23-Mar-2022 Analyzed: 24-Mar-2022 01:49					
Chloride	6.28	0.100	0.100	mg/L	2.01	4.24	102	75-125	0.53	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BKC0571-MSD3)						Source: 22C0335-01RE2 Prepared: 23-Mar-2022 Analyzed: 04-Apr-2022 18:25					
Sulfate	83.3	2.00	2.00	mg/L	50.0	37.6	91.5	75-125	1.92	20	D
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											



Golder Associates
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Redmond WA, 98052-3333

Project: Ravensdale
Project Number: Ravensdale
Project Manager: Gary Zimmerman

Reported:
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Certified Analyses included in this Report

Analyte	Certifications
EPA 200.8 in Water	
Chromium-52	NELAP,WADOE,WA-DW,DoD-ELAP
Chromium-53	NELAP,WADOE,WA-DW,DoD-ELAP
Lead-208	NELAP,WADOE,WA-DW,DoD-ELAP
Antimony-121	NELAP,WADOE,WA-DW,DoD-ELAP
Vanadium-51a	NELAP,DoD-ELAP,WADOE
Vanadium-51b	NELAP,DoD-ELAP,WADOE
EPA 200.8 UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 300.0 in Water	
Chloride	DoD-ELAP,WADOE,WA-DW,NELAP
Sulfate	DoD-ELAP,WADOE,WA-DW,NELAP
EPA 6010D in Water	
Calcium	WADOE,NELAP,DoD-ELAP
Potassium	WADOE,NELAP,DoD-ELAP
Magnesium	WADOE,NELAP,DoD-ELAP
Sodium	DoD-ELAP,WADOE,NELAP
Sodium-1	DoD-ELAP
SM 2320 B-97 in Water	
Alkalinity, Total	DoD-ELAP,WADOE,WA-DW,NELAP
SM 2540 C-97 in Water	
Dissolved Solids	DoD-ELAP,WADOE,WA-DW,NELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2022
WADOE	WA Dept of Ecology	C558	06/30/2022
WA-DW	Ecology - Drinking Water	C558	06/30/2022



Golder Associates
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Project: Ravensdale
Project Number: Ravensdale
Project Manager: Gary Zimmerman

Reported:
19-May-2022 08:11

Notes and Definitions

- * Flagged value is not within established control limits.
- B This analyte was detected in the method blank.
- D The reported value is from a dilution
- HC The natural concentration of the spiked analyte is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- J Estimated concentration value detected below the reporting limit.
- U This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- [2C] Indicates this result was quantified on the second column on a dual column analysis.

APPENDIX D

Sample Integrity Data Sheets

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** MWB-6DSP / MW-55A - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Bladder Pump (dedicated)

Date March 21, 2022 **Time** 09:45

Media Groundwater **Station** MWB-6DSP / MW-55A

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 20.55 ft BTOC (March 21, 2022 9:25 AM); Well total depth at 195' BGS

Screen Interval: 120'- 195' BGS

Pump Intake: ~ 170' BGS

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
2-1000 mL	Total Dissolved Solids	HDPE	N/A
2-500 mL	Dissolved Metals	HDPE	HNO3
2-500 mL	Total Metals	HDPE	HNO3
2-1000 mL	Total Alkalinity	HDPE	N/A
2-500 mL	Anions	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Well ID MWB-6DSP / MW-55A

Date 03/21/2022

Time Begin Purge 09:25

Time Collect Sample 09:45

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
20.55	09:26	7.37	373.9	11.1	5.8	126.3	4.31
22.85	09:30	6.91	361.5	10.9	3.18	109.4	2.98
24.18	09:35	6.51	350.9	10.9	1.84	112.1	2.19
25.06	09:40	6.43	349	10.8	1.53	107.6	1.86
26.21	09:45	6.42	348.2	10.9	1.41	102.1	1.4

Comments:

Flow Rate: 375 mL/min

MW-55A-0322, a duplicate of MWB-6DSP-0322, was obtained at 09:45.



Sampler _____

Date March 21, 2022



Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** MWB-2DSP - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Disposable Bailer

Date March 21, 2022 **Time** 10:15

Media Groundwater **Station** MWB-2DSP

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 194.32 ft BTOC (March 21, 2022 10:15 AM); Well total depth at 258' BGS

Screen Interval: 236'- 256' BGS

Pump Intake: N/A

Sample Description No Sample Collected

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
N/A			

SAMPLE INTEGRITY DATA SHEET

Well ID MWB-2DSP

Date 03/21/2022

Time Begin Purge N/A

Time Collect Sample N/A

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
194.32	10:14	6.63	369	9.6	7.04	125.6	5.95

Comments:

Flow Rate: N/A mL/min



Sampler _____

Date March 21, 2022



Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** MWB-4DSP - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Disposable Bailer

Date March 21, 2022 **Time** 10:45

Media Groundwater **Station** MWB-4DSP

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 16.64 ft BTOC (March 21, 2022 10:45 AM); Well total depth at 42.8' BGS

Screen Interval: 25'- 36' BGS

Pump Intake: N/A

Sample Description No Sample Collected

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
N/A			

SAMPLE INTEGRITY DATA SHEET

Well ID MWB-4DSP

Date 03/21/2022

Time Begin Purge N/A

Time Collect Sample N/A

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
16.64	10:45	7.05	456.3	10.7	9.94	115.5	2.79

Comments:

Flow Rate: N/A mL/min



Sampler _____

Date March 21, 2022



Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** MWB-5DSP - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Bladder Pump (dedicated)

Date March 21, 2022 **Time** 11:15

Media Groundwater **Station** MWB-5DSP

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 16.97 ft BTOC (March 21, 2022 10:54 AM); Well total depth at 83' BGS

Screen Interval: 73'- 83' BGS

Pump Intake: ~ 80' BGS

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Total Metals	HDPE	HNO3
1-1000 mL	Total Alkalinity	HDPE	N/A
1-500 mL	Anions	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Well ID MWB-5DSP

Date 03/21/2022

Time Begin Purge 10:54

Time Collect Sample 11:15

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
16.97	10:54	6.89	558	10.9	5.9	29.2	3.03
18.86	11:00	6.33	605	11.3	2.23	-7.6	1.64
20.38	11:05	6.26	605	11.3	1.6	-33.9	0.75
21.35	11:10	6.25	604	11.3	1.39	-40.9	0.77
22.36	11:15	6.26	601	11.3	1.28	-42.9	0.82

Comments:

Flow Rate: 360 mL/min



Sampler _____

Date March 21, 2022



Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** P-14 - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Bladder Pump (dedicated)

Date March 21, 2022 **Time** 12:35

Media Groundwater **Station** P-14

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 27.21 ft BTOC (March 21, 2022 12:13 PM); Well total depth at 50' BGS

Screen Interval: 40'- 50' BGS

Pump Intake: ~ 45' BGS

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Anions	HDPE	N/A
1-1000 mL	Total Alkalinity	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Well ID P-14

Date 03/21/2022

Time Begin Purge 12:13

Time Collect Sample 12:35

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
27.29	12:15	14.3	9,956	12.2	3.75	18.0	21.1
27.29	12:20	14.48	9,527	12.3	2.05	14.0	4.86
27.47	12:25	14.5	10,503	12.4	1.56	5.7	2.45
27.46	12:30	14.52	11,165	12.4	1.4	7.8	2.18
27.47	12:35	14.52	11,725	12.5	1.27	-25.3	2.18

Comments:

Flow Rate: 300 mL/min

Sampler _____

Date March 21, 2022

Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** MW-8A - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Peristaltic Pump

Date March 21, 2022 **Time** 13:35

Media Groundwater **Station** MW-8A

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 11.99 ft BTOC (March 21, 2022 1:15 PM); Well total depth at 26' BGS

Screen Interval: 16' - 26' BGS

Pump Intake: ~ 22' BGS

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Total Metals	HDPE	HNO3
1-1000 mL	Total Alkalinity	HDPE	N/A
1-500 mL	Anions	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** MW-7A - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Peristaltic Pump

Date March 21, 2022 **Time** 14:25

Media Groundwater **Station** MW-7A

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 3.12 ft BTOC (March 21, 2022 2:05 PM); Well total depth at 20' BGS

Screen Interval: 10' - 20' BGS

Pump Intake: ~ 17' BGS

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Total Metals	HDPE	HNO3
1-1000 mL	Total Alkalinity	HDPE	N/A
1-500 mL	Anions	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Well ID MW-7A

Date 03/21/2022

Time Begin Purge 14:05

Time Collect Sample 14:25

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
3.12	14:05	9.14	504	8	9.69	34.0	5.29
3.12	14:10	7.95	640	7.4	6.51	51.7	2.03
3.12	14:15	7.66	682	7.3	6.39	59.0	3.06
3.12	14:20	7.55	686	7.3	6.38	62.8	1.57
3.12	14:25	7.46	691	7.3	6.38	66.2	1.52

Comments:

Flow Rate: 100 mL/min



Sampler _____

Date March 21, 2022



Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** P-17 - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Peristaltic Pump

Date March 18, 2022 **Time** 09:55

Media Groundwater **Station** P-17

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 4.33 ft BTOC (March 18, 2022 9:31 AM); Well total depth at 13' BGS

Screen Interval: 8'- 13' BGS

Pump Intake: ~ 10' BGS

Sample Description Clear, small white particulates

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Total Metals	HDPE	HNO3
1-1000 mL	Total Alkalinity	HDPE	N/A
1-500 mL	Anions	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Well ID P-17

Date 03/18/2022

Time Begin Purge 09:35

Time Collect Sample 09:55

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
5.49	09:35	10.23	367.6	8.2	5.22	105.2	32.1
4.54	09:40	8.94	362.8	8	2.8	108.5	25.8
4.57	09:45	7.89	374.3	7.9	1.8	63.8	23.2
4.58	09:50	7.45	397.4	8.3	1.53	37.7	9.25
4.58	09:55	7.33	404.4	8.4	1.46	23.7	5.41

Comments:

Flow Rate: 140 mL/min



Sampler _____

Date March 18, 2022



Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** MW-4A - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Peristaltic Pump

Date March 18, 2022 **Time** 11:05

Media Groundwater **Station** MW-4A

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 3.64 ft BTOC (March 18, 2022 10:45 AM); Well total depth at 20' BGS

Screen Interval: 5' - 20' BGS

Pump Intake: ~ 12' BGS

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Anions	HDPE	N/A
1-1000 mL	Total Alkalinity	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Well ID MW-4A

Date 03/18/2022

Time Begin Purge 10:45

Time Collect Sample 11:05

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
3.81	10:45	7.5	344.5	9.1	7.54	98.6	4.44
3.98	10:50	6.88	343.6	9	4.56	109.2	4.90
4.04	10:55	6.71	341.2	9	3.59	116.0	5.21
4.07	11:00	6.65	341	9	3.35	120.9	5.03
4.09	11:05	6.63	340.6	9.1	3.26	123.8	1.85

Comments:

Flow Rate: 220 mL/min



Sampler _____

Date March 18, 2022



Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** MW-9A - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Peristaltic Pump

Date March 18, 2022 **Time** 11:55

Media Groundwater **Station** MW-9A

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 2.36 ft BTOC (March 18, 2022 11:32 AM); Well total depth at 13' BGS

Screen Interval: 8' - 13' BGS

Pump Intake: ~ 10' BGS

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Total Metals	HDPE	HNO3
1-1000 mL	Total Alkalinity	HDPE	N/A
1-500 mL	Anions	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Well ID MW-9A

Date 03/18/2022

Time Begin Purge 11:32

Time Collect Sample 11:55

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
3.18	11:40	7.41	422.9	8.2	6.85	136.5	-
4.35	11:45	7.2	422.2	8.2	5.56	139.5	1.83
4.81	11:50	7.17	421	8.2	5.34	139.1	0.83
5.12	11:55	7.16	423.1	8.5	5.19	138.3	1.17

Comments:

Flow Rate: 175 mL/min



Sampler _____

Date March 18, 2022



Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** MWB-1DDSP - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Bladder Pump (dedicated)

Date March 18, 2022 **Time** 13:25

Media Groundwater **Station** MWB-1DDSP

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 48.41 ft BTOC (March 18, 2022 12:58 PM); Well total depth at 265' BGS

Screen Interval: 255'- 265' BGS

Pump Intake: ~ 260' BGS

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Total Metals	HDPE	HNO3
1-1000 mL	Total Alkalinity	HDPE	N/A
1-500 mL	Anions	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Well ID MWB-1DDSP

Date 03/18/2022

Time Begin Purge 12:58

Time Collect Sample 13:25

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
55.1	13:05	7.81	717	11.7	5.13	-51.3	1.12
54.26	13:10	7.54	745	11.4	1.89	-89.6	2.55
58.49	13:15	7.51	750	11.3	1.4	-86.8	0.69
62.97	13:20	7.51	748	11.3	1.26	-88.1	0.40
67.11	13:25	7.52	741	11.3	1.2	-93.4	0.39

Comments:

Flow Rate: 460 mL/min



Sampler _____

Date March 18, 2022



Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** MWB-1SDSP - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Bladder Pump (dedicated)

Date March 18, 2022 **Time** 13:55

Media Groundwater **Station** MWB-1SDSP

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 34.03 ft BTOC (March 18, 2022 1:36 PM); Well total depth at 160' BGS

Screen Interval: 73'- 83' BGS

Pump Intake: ~ 80' BGS

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Total Metals	HDPE	HNO3
1-1000 mL	Total Alkalinity	HDPE	N/A
1-500 mL	Anions	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Well ID MWB-1SDSP

Date 03/18/2022

Time Begin Purge 13:35

Time Collect Sample 13:55

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
36.74	13:40	7.25	1,086	11.8	3.09	-38.5	2.70
39.26	13:45	7.18	1,107	11.7	1.44	-38.3	3.36
43.02	13:50	7.18	1,101	11.5	1.24	-39.7	0.73
46.05	13:55	7.18	1,096	11.5	1.17	-40.8	0.31

Comments:

Flow Rate: 400 mL/min

Monyu...

Sampler _____

Date March 18, 2022

[Signature]

Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** Still Well - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Peristaltic Pump

Date March 17, 2022 **Time** 08:00

Media Groundwater **Station** Still Well

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 0.2 ft BTOC (March 17, 2022 8:00 AM); Well total depth at N/A

Screen Interval: N/A

Pump Intake: N/A

Sample Description Yellowish-tint, iron-like odor

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-500 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Total Metals	HDPE	HNO3

SAMPLE INTEGRITY DATA SHEET

Well ID Still Well

Date 03/17/2022

Time Begin Purge 08:00

Time Collect Sample 08:00

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
0.2	08:00	13.71	4,955	9	7.43	153.1	1.88

Comments:

Flow Rate: N/A mL/min

High pH— Additional preservatives added to sample container. Tested with pH strip (<2pH)



Sampler _____

Date March 17, 2022



Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** MW-3A - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Peristaltic Pump

Date March 17, 2022 **Time** 08:50

Media Groundwater **Station** MW-3A

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 5.03 ft BTOC (March 17, 2022 8:30 AM); Well total depth at 20' BGS

Screen Interval: 4' - 20' BGS

Pump Intake: ~ 12' BGS

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Anions	HDPE	N/A
1-1000 mL	Total Alkalinity	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Well ID MW-3A

Date 03/17/2022

Time Begin Purge 08:30

Time Collect Sample 08:50

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
5.03	08:30	11.83	442.1	7.8	8.11	155.1	10.6
4.25	08:35	9.1	394.1	7.9	3.4	154.1	8.55
5.27	08:40	8.02	320.1	7.8	2.81	154.3	4.84
5.28	08:45	7.45	288.2	7.6	2.15	151.8	2.18
5.3	08:50	7.1	277.2	7.6	1.77	150.6	1.80

Comments:

Flow Rate: 260 mL/min



Sampler _____

Date March 17, 2022



Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** Weir - 0322

Sampling Location Surface Water Monitoring Point

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Peristaltic Pump, Grab

Date March 17, 2022 **Time** 09:15

Media Surface Water **Station** Weir

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at ft BTOC (March 17, 2022 9:18 AM); Well total depth at N/A

Screen Interval: N/A

Pump Intake: N/A

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
2-1000 mL	Total Dissolved Solids	HDPE	N/A
2-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Dissolved Metals	HDPE	HNO3

SAMPLE INTEGRITY DATA SHEET

Well ID Weir

Date 03/17/2022

Time Begin Purge 09:15

Time Collect Sample 09:15

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
-	09:15	7.43	410	7	9.46	157.2	0.91

Comments:

Flow Rate: 28700 mL/min

MS/MSD collected



Sampler _____

Date March 17, 2022



Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** MW-99-1 - 0322

Sampling Location QA/QC Blank

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Peristaltic Pump

Date March 17, 2022 **Time** 09:42

Media Other **Station** MW-3A

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: N/A

Screen Interval: N/A

Pump Intake: N/A

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Total Metals	HDPE	HNO3

SAMPLE INTEGRITY DATA SHEET

Well ID MW-99-1

Date 03/17/2022

Time Begin Purge 09:42

Time Collect Sample 09:42

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
N/A							

Comments:

Flow Rate: N/A mL/min

MW-99-1-0322 is an equipment blank.

Sampler _____

Date March 17, 2022

Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** P-16 - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Peristaltic Pump

Date March 17, 2022 **Time** 10:35

Media Groundwater **Station** P-16

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 2.43 ft BTOC (March 17, 2022 10:01 AM); Well total depth at 10' BGS

Screen Interval: 5'- 10' BGS

Pump Intake: ~ 8' BGS

Sample Description Brown tint

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Anions	HDPE	N/A
1-1000 mL	Total Alkalinity	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Well ID P-16

Date 03/17/2022

Time Begin Purge 10:10

Time Collect Sample 10:35

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
4.03	10:01	9.94	2,187	8.9	2.64	-115.0	35.3
5.32	10:15	10.48	2,224	8.4	1.57	-275.0	52.6
5.51	10:20	10.98	2,229	8.4	1.31	-323.5	60.8
5.51	10:25	11.38	2,209	8.4	1.27	-341.1	51.9
5.34	10:30	13.02	2,309	8.4	1.21	-401.9	37.0
5.39	10:35	13.71	2,600	8.4	1.16	-421.2	23.5

Comments:

Flow Rate: 250 mL/min



Sampler _____

Date March 17, 2022



Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** South Pond - 0322

Sampling Location Surface Water Monitoring Point

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Peristaltic Pump, Grab

Date March 17, 2022 **Time** 10:55

Media Surface Water **Station** South Pond

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: N/A

Screen Interval: N/A

Pump Intake: N/A

Sample Description Light brown/yellow tint

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Total Metals	HDPE	HNO3

SAMPLE INTEGRITY DATA SHEET

Well ID South Pond

Date 03/17/2022

Time Begin Purge 10:55

Time Collect Sample 10:55

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
-	10:55	11.32	997	8.8	8.53	-66.4	4.54

Comments:

Flow Rate: N/A mL/min



Sampler _____

Date March 17, 2022



Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** MW-10A - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Peristaltic Pump

Date March 17, 2022 **Time** 11:40

Media Surface Water **Station** MW-10A

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 5.36 ft BTOC (March 17, 2022 11:10 AM); Well total depth at 29' BGS

Screen Interval: 9' - 29' BGS

Pump Intake: ~ 25' BGS

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Anions	HDPE	N/A
1-1000 mL	Total Alkalinity	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Well ID MW-10A

Date 03/17/2022

Time Begin Purge 11:10

Time Collect Sample 11:40

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
5.36	11:15	10.32	176.5	9.4	9.39	5.7	-
7.82	11:20	7.95	153.5	9.4	7.54	62.6	6.69
9.05	11:25	7.28	152.1	9.4	7.35	79.2	8.46
10.38	11:30	6.86	150.7	9.3	7.24	88.5	8.96
11.08	11:35	6.62	151	9.3	7.15	93	6.08
11.51	11:40	6.50	150.8	9.4	7.12	95.1	6.21

Comments:

Flow Rate: 200 mL/min



Sampler _____

Date March 17, 2022



Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** MWB-1LDA - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Bladder Pump (dedicated)

Date March 17, 2022 **Time** 12:40

Media Groundwater **Station** MWB-1LDA

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 21.57 ft BTOC (March 17, 2022 12:18 PM); Well total depth at 135' BGS

Screen Interval: 115'- 135' BGS

Pump Intake: ~ 125' BGS

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Anions	HDPE	N/A
1-1000 mL	Total Alkalinity	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Well ID MWB-1LDA

Date 03/17/2022

Time Begin Purge 12:18

Time Collect Sample 12:40

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
22.05	12:20	7.17	260.2	10.9	7.61	106.2	1.54
23.04	12:25	6.66	261.6	10.8	1.94	56.1	0.72
23.16	12:30	6.57	261.1	10.8	1.46	-11.7	0.58
23.67	12:35	6.53	260.3	10.7	1.33	-44.7	0.60
23.78	12:40	6.52	259.6	10.7	1.24	-60.4	0.22

Comments:

Flow Rate: 375 mL/min

Sampler _____

Date March 17, 2022

Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** MWB-2LDA - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Bladder Pump (dedicated)

Date March 17, 2022 **Time** 13:25

Media Groundwater **Station** MWB-2LDA

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 32.57 ft BTOC (March 17, 2022 1:03 PM); Well total depth at 125' BGS

Screen Interval: 110'- 125' BGS

Pump Intake: ~ 120' BGS

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Anions	HDPE	N/A
1-1000 mL	Total Alkalinity	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Well ID MWB-2LDA

Date 03/17/2022

Time Begin Purge 13:03

Time Collect Sample 13:25

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
33.05	13:05	7.17	245.9	11.6	9.45	71.4	2.60
33.05	13:10	6.68	245.2	11.6	2.87	25.9	6.56
33.12	13:15	6.59	244.6	11.5	1.69	-43.3	3.91
33.14	13:20	6.57	244.3	11.6	2.41	-61.6	4.01
33.21	13:25	6.56	244.3	11.6	2.84	-60.6	3.21

Comments:

Flow Rate: 375 mL/min



Sampler _____

Date March 17, 2022



Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** P-11 - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Peristaltic Pump

Date March 21, 2022 **Time** 08:25

Media Groundwater **Station** P-11

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 14.08 ft BTOC (March 21, 2022 8:25 AM); Well total depth at

Screen Interval: 14-19' BGS

Pump Intake: ~18' BGS

Sample Description Brown-tint

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Anions	HDPE	N/A
1-1000 mL	Total Alkalinity	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Well ID P-11
 Date 03/17/2022
 Time Begin Purge 3/17/2022 13:33
 Time Collect Sample 3/21/2022 08:25

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
12.69	13:40	13.36	6,286	11.5	5.48	2.5	7.93
16.05	13:45	14.52	5,514	11.5	1.37	-67.6	7.93
17.79	13:50	14.45	5,129	11.3	1.22	-68	24.9
19.34	13:55	14.43	5,173	11.4	1.2	-63.3	37.3
16.97	08:55	13.77	393.2	11.8	5.16	163.2	-

Comments:

Flow Rate: 230 mL/min

Re-sample full bottles set for P-11 @ 3/21 0825 due to well running dry on 3/17 and 3/18

Sampler _____

Date March 21, 2022

Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** P-15 - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Peristaltic Pump

Date March 17, 2022 **Time** 14:40

Media Groundwater **Station** P-15

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 14.13 ft BTOC (March 17, 2022 2:10 PM); Well total depth at 34' BGS

Screen Interval: 24'- 34' BGS

Pump Intake: ~ 30' BGS

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Anions	HDPE	N/A
1-1000 mL	Total Alkalinity	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Well ID P-15

Date 03/17/2022

Time Begin Purge 14:20

Time Collect Sample 14:40

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
14.43	14:20	14.52	9,227	12	4.01	-30.0	6.64
14.43	14:25	14.6	9,338	11.8	1.68	-49.2	5.53
14.47	14:30	14.6	9,355	11.8	1.33	-58.5	1.75
14.48	14:35	14.6	9,358	11.8	1.17	-65.8	1.8
14.5	14:40	14.6	9,351	11.8	1.11	-70.0	1.88

Comments:

Flow Rate: 200 mL/min



Sampler _____

Date March 17, 2022



Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** Interceptor Trench - 0322

Sampling Location Surface Water Monitoring Point

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Grab

Date March 17, 2022 **Time** 15:25

Media Surface Water **Station** Interceptor Trench

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: N/A

Screen Interval: N/A

Pump Intake: N/A

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Well ID Interceptor Trench

Date 03/17/2022

Time Begin Purge 15:17

Time Collect Sample 15:25

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
-	15:25	11.75	443.4	10.2	10.34	-6.6	3.24

Comments:

Flow Rate: 13200 mL/min

Sampler _____

Date March 17, 2022

Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** MWB-3LDA - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Bladder Pump (dedicated)

Date March 17, 2022 **Time** 15:55

Media Groundwater **Station** MWB-3LDA

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 0.3 ft BTOC (March 17, 2022 3:35 PM); Well total depth at 145' BGS

Screen Interval: 125'- 145' BGS

Pump Intake: ~ 135' BGS

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Anions	HDPE	N/A
1-1000 mL	Total Alkalinity	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** MW-5A - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Bladder Pump (dedicated)

Date March 16, 2022 **Time** 12:40

Media Groundwater **Station** MW-5A

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 20.6 ft BTOC (March 16, 2022 11:55 AM); Well total depth at 40' BGS

Screen Interval: 25'- 40' BGS

Pump Intake: ~ 38' BGS

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Total Metals	HDPE	HNO3
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Anions	HDPE	N/A
1-1000 mL	Total Alkalinity	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Well ID MW-5A

Date 03/16/2022

Time Begin Purge 12:01

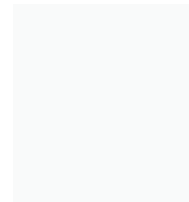
Time Collect Sample 12:40

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
20.59	12:16	6.64	972	8	5.35	198.1	5.54
20.59	12:22	6.53	841	7.8	5.24	194.6	4.11
20.59	12:27	6.56	771	7.8	6.03	191.6	3.11
20.58	12:32	6.59	736	7.8	6.68	188.6	2.44
20.59	12:37	6.60	724	7.8	7.00	187.0	2.65

Comments:

Flow Rate: 250 mL/min

Sampler _____



Date March 16, 2022

Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** Infiltration Ponds /
MW-35A - 0322

Sampling Location Surface Water Monitoring Point

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Peristaltic Pump, Grab

Date March 16, 2022 **Time** 13:00 / 13:05

Media Surface Water **Station** Infiltration Ponds / MW-35A

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: N/A

Screen Interval: N/A

Pump Intake: N/A

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
2-1000 mL	Total Dissolved Solids	HDPE	N/A
2-500 mL	Dissolved Metals	HDPE	HNO3
2-500 mL	Total Metals	HDPE	HNO3

SAMPLE INTEGRITY DATA SHEET

Well ID Infiltration Ponds / MW-35A

Date 03/16/2022

Time Begin Purge 13:00

Time Collect Sample 13:00 / 13:05

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
-	13:00	7.45	786	11.1	10.41	172.1	12.8

Comments:

Flow Rate: N/A mL/min

MW-35A-0322, a duplicate of Infiltration Ponds-0322, was collected at 13:05.



Sampler _____

Date March 16, 2022



Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** MW-6A - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Bladder Pump (dedicated)

Date March 16, 2022 **Time** 13:55

Media Groundwater **Station** MW-6A

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 18.35 ft BTOC (March 16, 2022 1:26 PM); Well total depth at 39' BGS

Screen Interval: 24'- 39' BGS

Pump Intake: ~ 36' BGS

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Dissolved Metals	HDPE	HNO3
1-1000 mL	Total Alkalinity	HDPE	N/A
1-500 mL	Anions	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** MW-2A / MW-45A - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Bladder Pump (dedicated)

Date March 16, 2022 **Time** 14:50 / 14:55

Media Groundwater **Station** MW-2A

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 16.67 ft BTOC (March 16, 2022 2:21 PM); Well total depth at 40' BGS

Screen Interval: 24'- 40' BGS

Pump Intake: ~ 30' BGS

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
2-1000 mL	Total Dissolved Solids	HDPE	N/A
2-500 mL	Total Metals	HDPE	HNO3
2-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Anions	HDPE	N/A
1-1000 mL	Total Alkalinity	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Well ID MW-2A / MW-45A

Date 03/16/2022

Time Begin Purge 14:21

Time Collect Sample 14:50 / 14:55

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
16.68	14:25	7.46	300.1	8.6	10.12	155.5	34.8
16.69	14:30	6.54	296	8.5	10.05	159.6	21.6
16.7	14:35	6.24	299.5	8.5	10.02	154.5	13.4
16.7	14:40	6.11	300.1	8.4	10	153.4	9.76
16.71	14:45	6.04	302.2	8.4	9.99	154.1	7.48
16.7	14:50	6	304.1	8.4	9.88	154.6	6.43

Comments:

Flow Rate: 450 mL/min

MW-45A-0322, a duplicate of MW-2A-0322, was collected at 14:55.



Sampler _____

Date March 16, 2022



Supervisor _____

Date March 25, 2022

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** MW-1A - 0322

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Bladder Pump (dedicated)

Date March 16, 2022 **Time** 15:41

Media Groundwater **Station** MW-1A

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: Depth to water at 22.78 ft BTOC (March 16, 2022 3:16 PM); Well total depth at 44' BGS

Screen Interval: 28' - 43' BGS

Pump Intake: ~ 39' BGS

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Anions	HDPE	N/A
1-1000 mL	Total Alkalinity	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA **Sample ID** Portal - 0322

Sampling Location Surface Water Monitoring Point

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2021

Type of Sampler Peristaltic Pump

Date March 16, 2022 **Time** 16:15

Media Groundwater **Station** Portal

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL: N/A

Screen Interval: N/A

Pump Intake: N/A

Sample Description Clear

Field Measurements on Sample (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation
1-1000 mL	Total Dissolved Solids	HDPE	N/A
1-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Dissolved Metals	HDPE	HNO3
1-500 mL	Anions	HDPE	N/A
1-1000 mL	Total Alkalinity	HDPE	N/A

SAMPLE INTEGRITY DATA SHEET

Well ID Portal

Date 03/16/2022

Time Begin Purge -

Time Collect Sample 16:15

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
-	16:15	5.81	402.9	12	6.78	70.7	19.8

Comments:

Flow Rate: N/A mL/min



Sampler

Date March 16, 2022



Supervisor

Date March 25, 2022



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