



REPORT

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

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

Submitted to:

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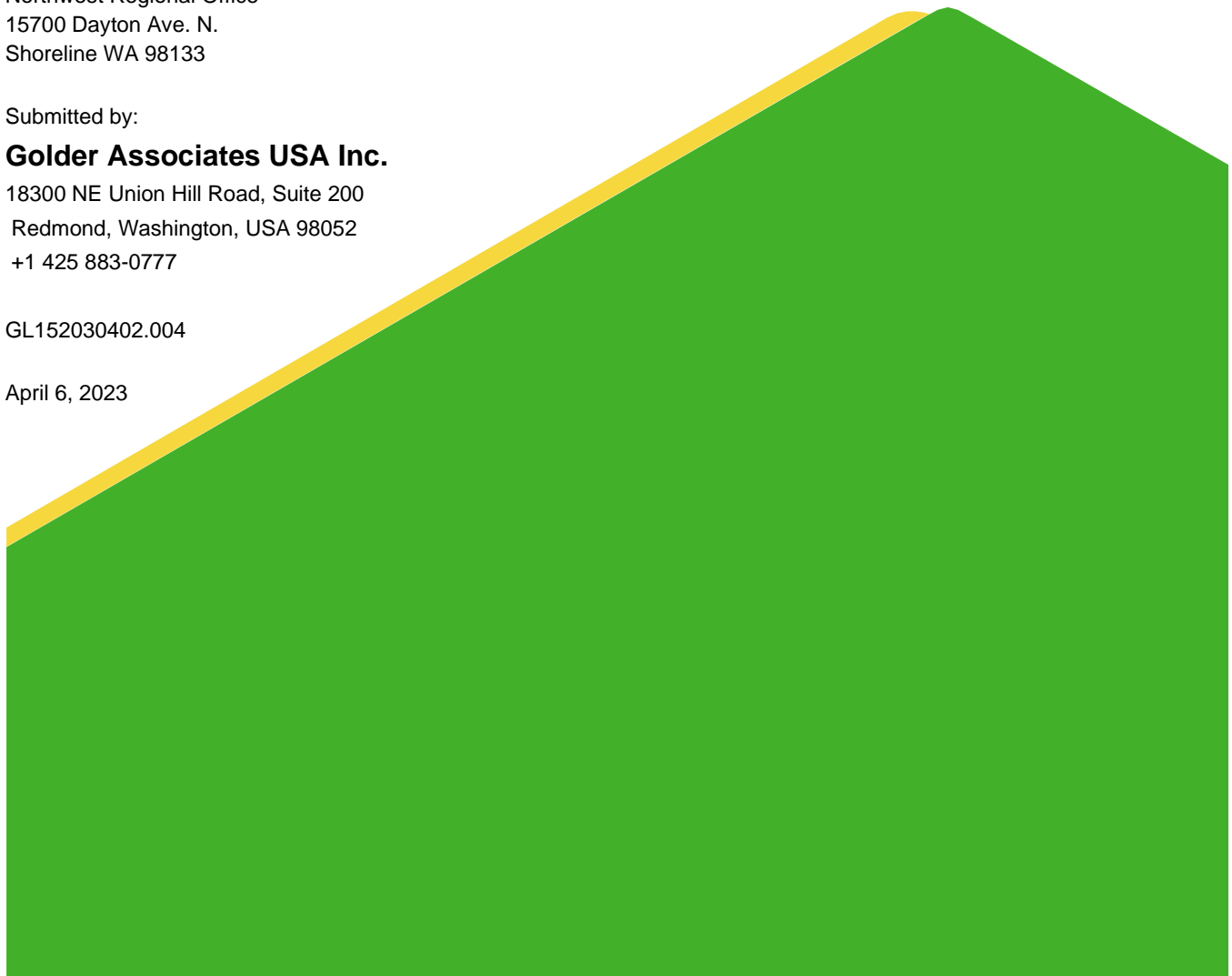
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1.0 INTRODUCTION

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 fourth 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 fourth quarter monitoring event was conducted in December 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. The monitoring well naming convention of assigning either the prefix MW (for monitoring well) or P (for piezometer) differentiates wells that are historically associated with or will likely be associated with the closed landfill permit required monitoring (prefix MW- or MWB- for bedrock wells), from groundwater wells that were installed for site investigation purposes (P- wells). MW and P groundwater wells are constructed similarly, and groundwater sampling of these wells follows the procedures approved in the Work Plan, thus, data collected from MW or P wells are equivalent in representativeness.

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 DSP 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.

3.4 Off-Site Private Well Sampling

The closest private well is the Baja Property private well located approximately 500 feet southwest of the Infiltration Ponds. Figure 3C shows the approximate location of the Baja Property private well. The well was previously inoperable and unavailable for sampling but was available during the December 2022 sampling round. The samples were collected from a faucet located close to the well head, following purging and measurement of field parameters. There is no access at the well head for measurement of water levels.

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 December 12, 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 2100Q Turbidimeter

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

- Interceptor Trench samples are 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

During the period of December 12 to 14, 2022, Golder sampled groundwater from shallow/alluvial groundwater monitoring wells outside of the LDA (MW-1A, MW-2A, MW-3A, MW-4A, MW-5A, MW-6A, MW-7A, MW-8A, MW-9A, MW-10, P-16, P-17), and from two well installed within the LDA (P-14 and P-15).

The following methods and procedures were used to collect 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 100 and 500 milliliters (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, one 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.
- The pH of the water in some of the wells within the LDA (P-14 and P-15) 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 was 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 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 December 13, 2022, Golder monitored surface water from the Still Well, Weir, and South Pond sampling locations. On January 5, 2023, Golder monitored surface water from the Infiltration Ponds. The following methods and procedures were used to collect 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, one 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 LDA Interceptor Trench Sampling

On December 13, 2022, Golder sampled groundwater from the Interceptor Trench outfall. The following methods and procedures were used to collect the 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.

5.0 RESULTS

Analytical results from the December 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 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 7.75. CO₂ sparging continues until the pH reduces to 7.25. 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 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 fourth 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. During the fourth quarter of 2022, the iron-based adsorption media's effectiveness decreased and required replacement, however, due to supply chain issues the media was not replaced until January 27, 2023. The treatment system was sampled on January 5, 2023 before the iron was replaced, in conjunction with the other fourth-quarter sampling work. Another sample was taken on January 28, 2023 after the media was replaced. Results from both samples are provided in Table 4.

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: Fourth 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	12/12/2022	44	28-43	2-26	2	613.44	32.35	581.09
	MW-2A	12/12/2022	40	25-40	2-23	2	607.21	26.24	580.97
	MW-3A	12/12/2022	20	4-20	2-4	2	689.11	5.32	683.79
	MW-4A	12/12/2022	20	5-20	2-4	2	705.45	3.88	701.57
	MW-5A	12/12/2022	40	25-40	2-23	2	611.23	30.22	581.01
	MW-6A	12/12/2022	39	24-39	2-22	2	608.95	27.98	580.97
	MW-7A	12/12/2022	20	10-20	2-7	2	592.69	12.00	580.69
	MW-8A	12/12/2022	26	16-26	2-13	2	601.49	21.16	580.33
	MW-9A	12/12/2022	13	8-13	2-5	2	697.29	2.50	694.79
	MW-10A	12/12/2022	29	9-29	2-6	2	698.02	14.93	683.09
Within LDA - Groundwater	P-16	12/12/2022	10	5-10	1-3	2	702.87	2.86	700.01
	P-17	12/12/2022	13	8-13	2-5	2	720.32	5.47	714.85
LDA - Bedrock Groundwater	P-14	12/12/2022	52	40-50	3-38	2	773.32	32.59	740.73
	P-15	12/12/2022	34	24-34	2-20	2	756.55	21.29	735.26
LDA - Bedrock Groundwater	MWB-1LDA	12/12/2022	135	115-135	2-105	2	704.68	23.51	681.17
	MWB-2LDA	12/12/2022	125	110-125	2-103	2	741.66	36.41	705.25
	MWB-3LDA	12/12/2022	145	125-145	2-115	2	744.19	4.48	739.71
DSP - Bedrock Groundwater	MWB-1SDSP	12/12/2022	160	150-160	138-148	2	936.29	42.96	893.33
	MWB-1DDSP	12/12/2022	265	255-265	243-253	2	935.37	57.68	877.69
	MWB-2DSP	12/12/2022	258	238-258	-	2	934.82	197.99	736.83
	MWB-4SDSP	12/12/2022	43	32-42.8	-	2	932.41	19.02	913.39
	MWB-5DSP	12/12/2022	83	73-83	2-61	2	935.05	24.31	910.74
	MWB-6DSP	12/12/2022	195	120-195	2-108	2	920.65	DAMAGED	-

- 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: Fourth 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 Cleanup Level ^a			-	-	-	-	-	-	-	-	-	6.5-8.5	-	5.6	8	-	2.1	140
LDA - Shallow/Alluvial Groundwater	MW-1A	12/13/2022	613.44	32.35	581.09	9.4	394.6	8.79	99.3	0.31	6.77	234	0.955	1.13	14500	0.1 U	0.791	
	MW-2A	12/13/2022	607.21	26.24	580.97	9.9	557.0	8.35	117.4	4.38	6.81	319	1.17	1.28 J	21800	0.218 J+	1.59	
	MW-2A Duplicate (MW-45A)	12/13/2022	-	-	-	-	-	-	-	-	-	384	1.21	1.79 J	22100	0.203 J+	1.81	
	MW-3A	12/12/2022	689.11	5.32	683.79	7.7	817	4.09	205.2	1.29	7.15	475	9.5	1.72	99800	0.115 J+	1.26	
	MW-4A	12/14/2022	705.45	3.88	701.57	9.1	278	7.03	135.4	0.44	6.35	224	0.2 U	0.188 J	583	0.1 U	1.42	
	MW-5A	12/13/2022	611.23	30.22	581.01	10.4	928	7.08	109.2	2.27	7.04	634	3.54	1.89	173000	0.105 J+	1.25	
	MW-6A	12/13/2022	608.95	27.98	580.97	12.4	1,915	6.1	80.4	3.77	7.98	1350	12.4	5.64	495000	0.865 J+	1.26	
	MW-7A	12/14/2022	592.69	12	580.69	8	514	5.35	170.1	0.41	7.07	335	1.64	1.18	42700	0.1 U	0.798	
	MW-8A	12/13/2022	601.49	21.16	580.33	10.4	1011	6.13	122.1	1.22	7.07	721	4.53	5.37	205000	0.1 U	3.61	
	MW-9A	12/14/2022	697.29	2.5	694.79	8	413.5	7.42	135.6	0.53	6.91	328	0.132 J	0.599	1630	0.1 U	0.867	
	MW-10A	12/13/2022	698.02	14.93	683.09	9.8	396	4.71	179.4	5.19	7.34	200	0.173 J	1.3	2060	0.1 U	1.1	
	Within LDA - Groundwater	P-16	12/13/2022	702.87	2.86	700.01	8.2	4,004	3.49	-393.6	21	11.01	2390	6.52	55.2	820000	12	213
P-17		12/14/2022	720.32	5.47	714.85	9.7	469.3	3.17	-85.9	3.75	6.51	377	1	2.69	7820	0.1 U	1.6	
LDA - Bedrock Groundwater ^b	P-14	12/14/2022	773.32	32.59	740.73	12.1	19,267	3.3	-448.9	0.88	13.06	6730	130	255	2710000	11.1	23	
	P-15	12/14/2022	756.55	21.29	735.26	11.0	10,770	2.85	-322.9	2.33	13.05	3460	1.72	5.07	1070000	173	1.19	
LDA - Bedrock Groundwater ^b	MWB-1LDA	12/12/2022	704.68	23.51	681.17	-	-	-	-	-	-	-	-	-	-	-	-	
	MWB-2LDA	12/12/2022	741.66	36.41	705.25	-	-	-	-	-	-	-	-	-	-	-	-	
	MWB-3LDA	12/12/2022	744.19	4.48	739.71	-	-	-	-	-	-	-	-	-	-	-	-	

Table 2: Fourth 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 Cleanup Level ^a			-	-	-	-	-	-	-	-	-	6.5-8.5	-	5.6	8	-	2.1	140
LDA- Surface Water	South Pond	12/13/2022	-	-	-	4.1	1319	8.1	-51.9	15.8	9.45	1170	17.5	40.5	384000	33.1	79.3	
	Still Well	12/13/2022	-	-	-	7.7	1419	7.42	-92.9	9.97	11.6	967	71	125	309000	9.95	11.1	
	Weir	12/13/2022	-	-	-	5.6	712	6.9	12.5	1.29	7.83	535	10.5	3.27	111000	0.113 J+	1.01	
	Infiltration Ponds	1/5/2023	-	-	-	8.80	1047.00	8.40	191.00	8.47	8.16	1560	18.8	26.7	567000	2.49	4.45	
	Infiltration Ponds Duplicate (MW-35A)	1/5/2023	-	-	-	-	-	-	-	-	-	1490	20.2	27	587000	2.06	4.39	
DSP - Bedrock Groundwater ^b	MWB-1SDSP	12/12/2022	936.29	42.96	893.33	-	-	-	-	-	-	-	-	-	-	-	-	
	MWB-1DDSP	12/12/2022	935.37	57.68	877.69	-	-	-	-	-	-	-	-	-	-	-	-	
	MWB-2DSP	12/12/2022	934.82	197.99	736.83	-	-	-	-	-	-	-	-	-	-	-	-	
	MWB-4SDSP	12/12/2022	932.41	19.02	913.39	-	-	-	-	-	-	-	-	-	-	-	-	
	MWB-5DSP	12/12/2022	935.05	24.31	910.74	-	-	-	-	-	-	-	-	-	-	-	-	
	MWB-6DSP	12/12/2022	Well damaged			-	-	-	-	-	-	-	-	-	-	-	-	-
	MWB-6DSP Duplicate (MW-55A)	12/12/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Portal	12/14/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
"Baja" Private Well	Baja Well	12/14/2022	-	-	-	9.5	521	8.08	56.8	3.49	7.99	301	0.2	0.309	4400	0.272	0.405	

- 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.
- a Preliminary Cleanup Level (PCUL) provided by Ecology 30 Sept 2022
- b LDA and DSP bedrock wells are monitored semi-annually
- 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.

- TOC Top of casing inside PVC well
- °C Degrees Celsius
- feet bmp Feet below measuring point
- feet NAVD88 Feet in NAVD88 datum
- ug/L Micrograms per liter
- mV Millivolts
- NTU Nephelometric Turbidity Unit
- µmhos/cm 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
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

Table 3: Interceptor Trench Discharge Monitoring

Date Sampled	Time Sampled	Flow (gpm)	Field pH (standard units)	Turbidity (NTU)	Total Dissolved Solids (mg/L)
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
22-Jun-22	14:05	2.2	6.94	6.21	415
23-Sep-22	14:46	0.11	7.54	4.77	330
14-Dec-22	9:20	0.79	7.19	2.27	279

- Not measured or not available
 ^ pH values error, due to faulty pH probe.
 gpm Gallons per minute
 NTU Nephelometric Turbidity Unit
 mg/L Milligrams per liter

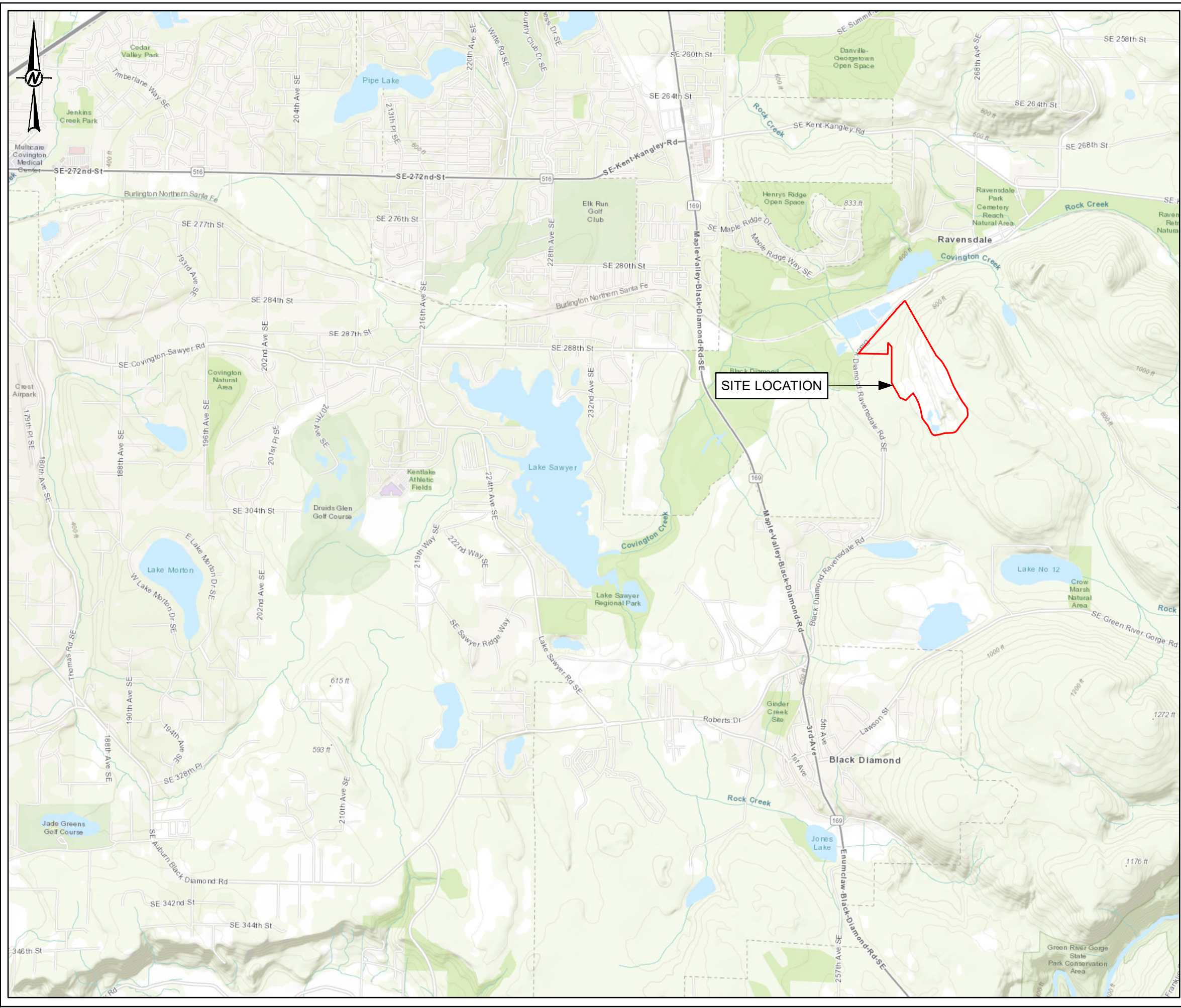
Table 4: Fourth Quarter 2022 Treatment System Metals Monitoring

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	5-Jan-23	20.0	20.6	43.8	26.1	62.3	77.2	6.00	4.94
pH Tank Effluent/Filter Media Influent	Sand-Effluent	5-Jan-23	19.7	-	32.5	-	44.9	-	5.29	-
Filter Media Effluent	As-Effluent	5-Jan-23	17.7	19.7	7.50	19.3	53.4	0.163	5.67	2.17
pH Tank Influent	Tank-Influent	28-Jan-23	17.5	17.7	28.9	13.0	79.6	63.2	5.12	4.20
pH Tank Effluent/Filter Media Influent	Sand-Effluent	28-Jan-23	17.7	17.6	28.2	27.2	65.5	1.52	5.37	4.54
Filter Media Effluent	As-Effluent	28-Jan-23	8.44	7.81	4.43	3.27	42.7	0.538	1.47	0.360

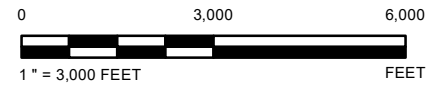
- Not measured or not available
 ug/L Micrograms per liter

Filter media changed on January 27, 2023 and resampled the following day

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**

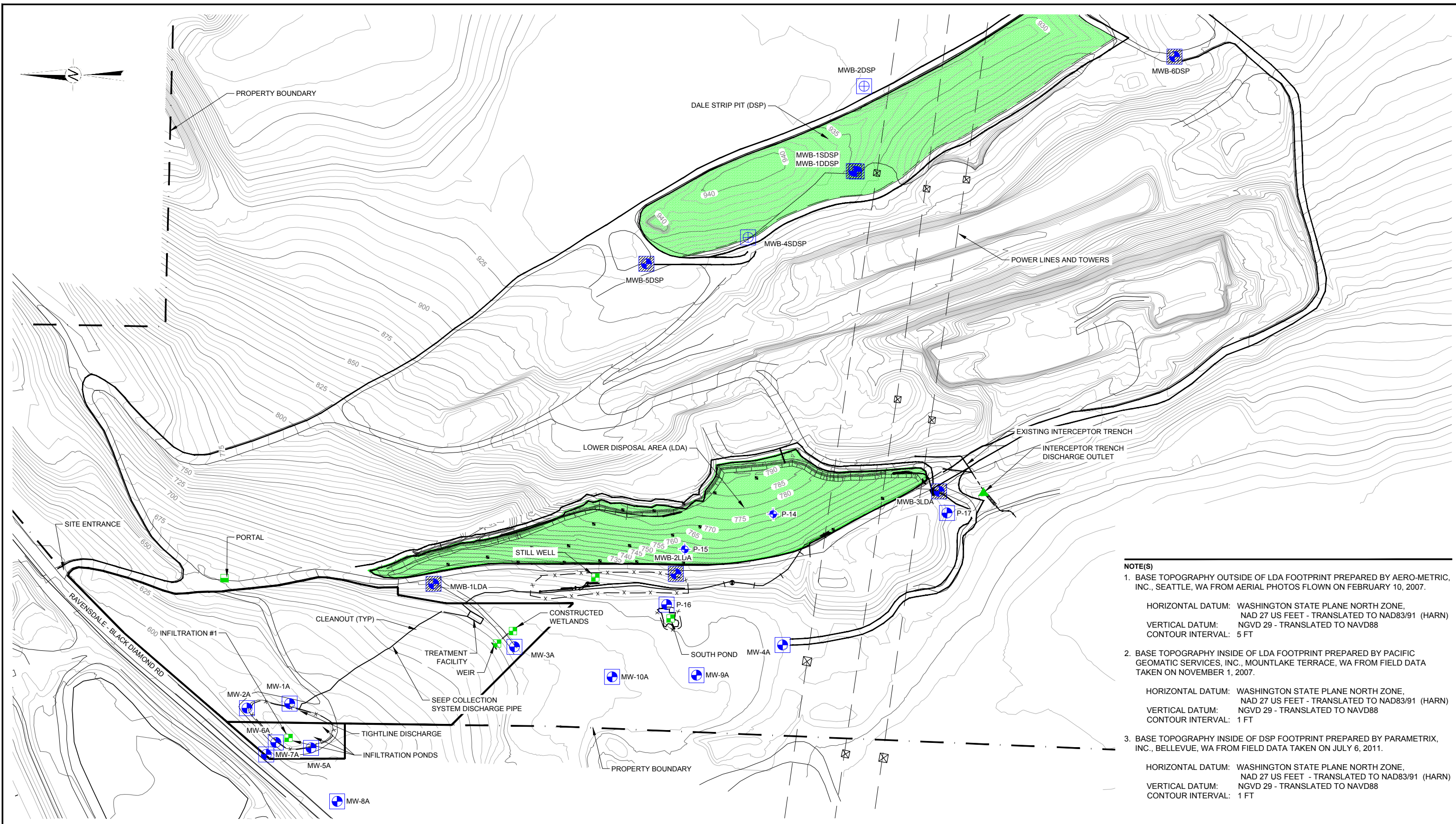
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CONSULTANT	YYYY-MM-DD	2021-02-10
	DESIGNED	TL
	PREPARED	TL
	REVIEWED	JX
	APPROVED	GZ

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



CLIENT
HOLCIM

CONSULTANT



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

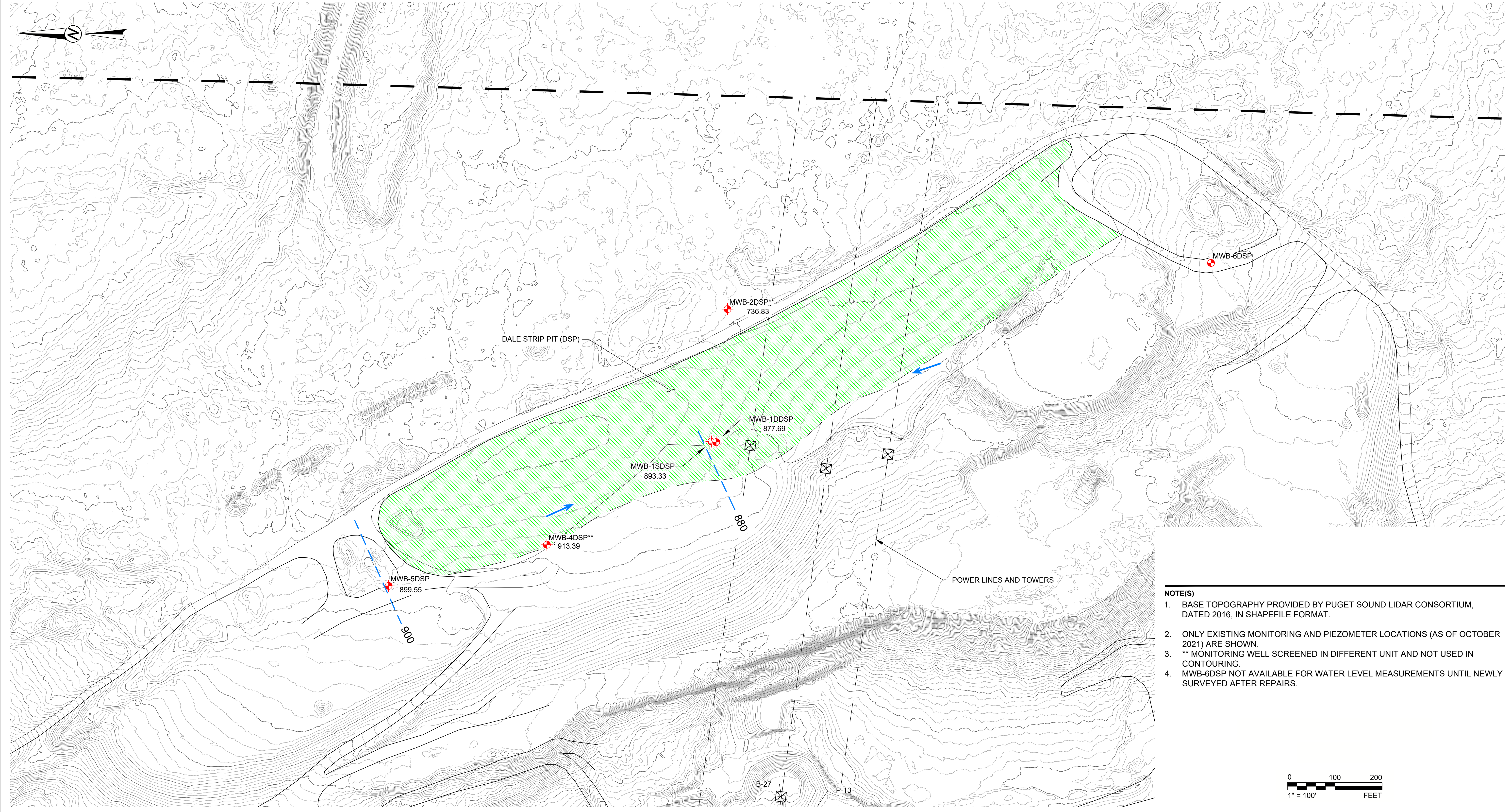
PROJECT
RI WORK PLAN 2020
RAVENSDALE, WA

TITLE
SITE PLAN

PROJECT NO. 152030420	PHASE 004	REV. A	FIGURE 2
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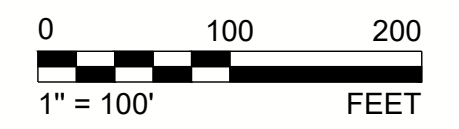
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LEGEND	
	COVER AREA
	MWB-1A ALLUVIAL MONITORING WELL
	MWB-1DDSP BEDROCK MONITORING WELL
	P-14 LDA MONITORING WELL
	AMW-1 PLANT SITE MONITORING WELLS
	P-1 GOLDRER PIEZOMETER
	LDA SURFACE WATER SAMPLING LOCATION
	DSP BEDROCK SAMPLING LOCATION (PORTAL)
	INTERCEPTOR TRENCH SAMPLING LOCATION
	FENCE LINE

- 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. ** MONITORING WELL SCREENED IN DIFFERENT UNIT AND NOT USED IN CONTOURING.
 4. MWB-6DSP NOT AVAILABLE FOR WATER LEVEL MEASUREMENTS UNTIL NEWLY SURVEYED AFTER REPAIRS.



CLIENT
HOLCIM



YYYY-MM-DD	2023-03-24
DESIGNED	AP
PREPARED	REDMOND
REVIEWED	AP
APPROVED	GZ

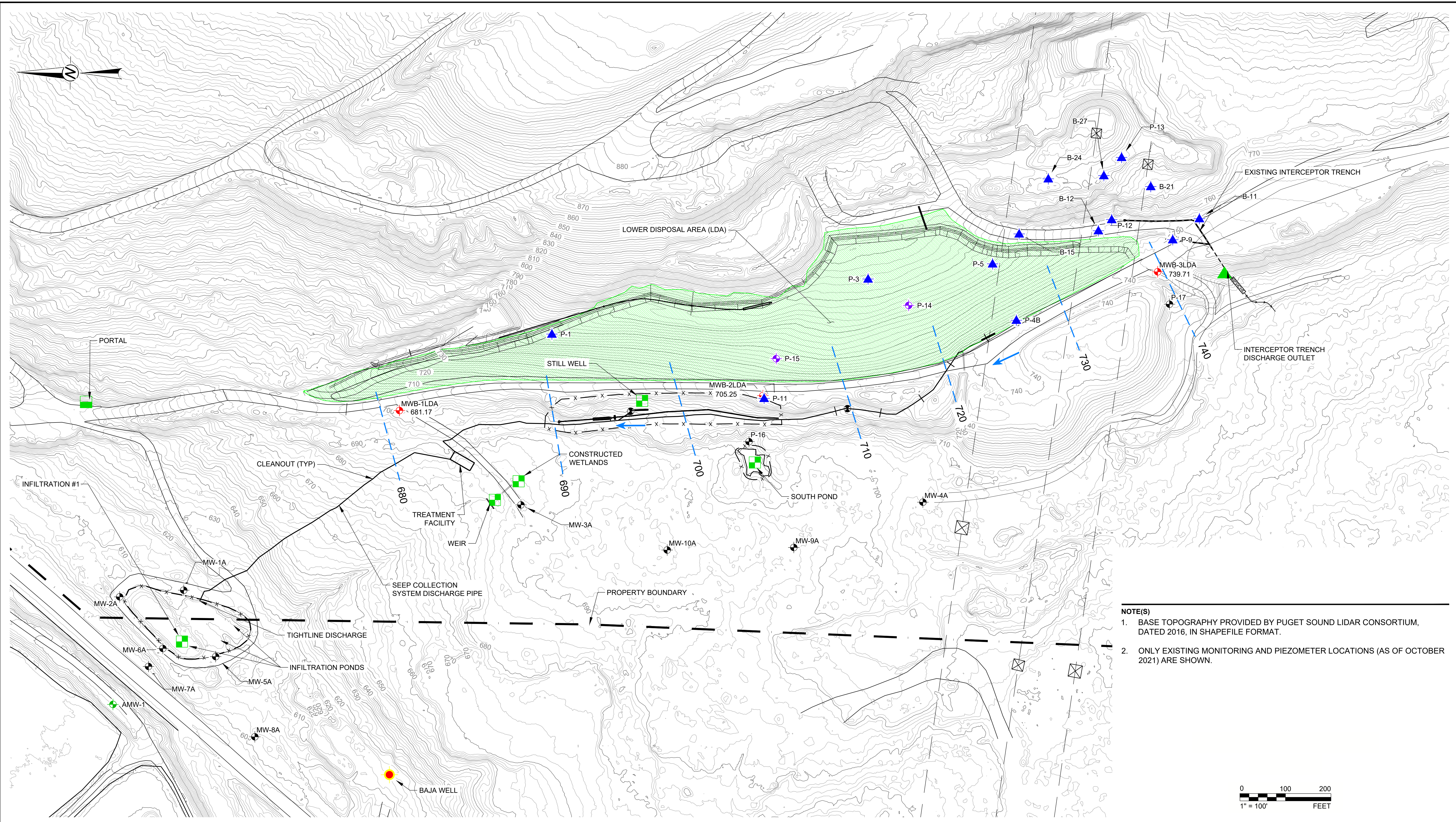
PROJECT
DECEMBER 12, 2022 GROUNDWATER ELEVATIONS
RAVENSDALE, WA

TITLE
DSP BEDROCK GROUNDWATER ELEVATIONS

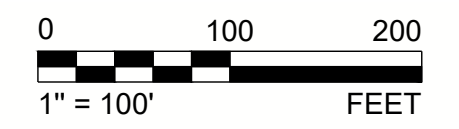
PROJECT NO.	PHASE	REV.	FIGURE
152030402	004	A	3A

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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.



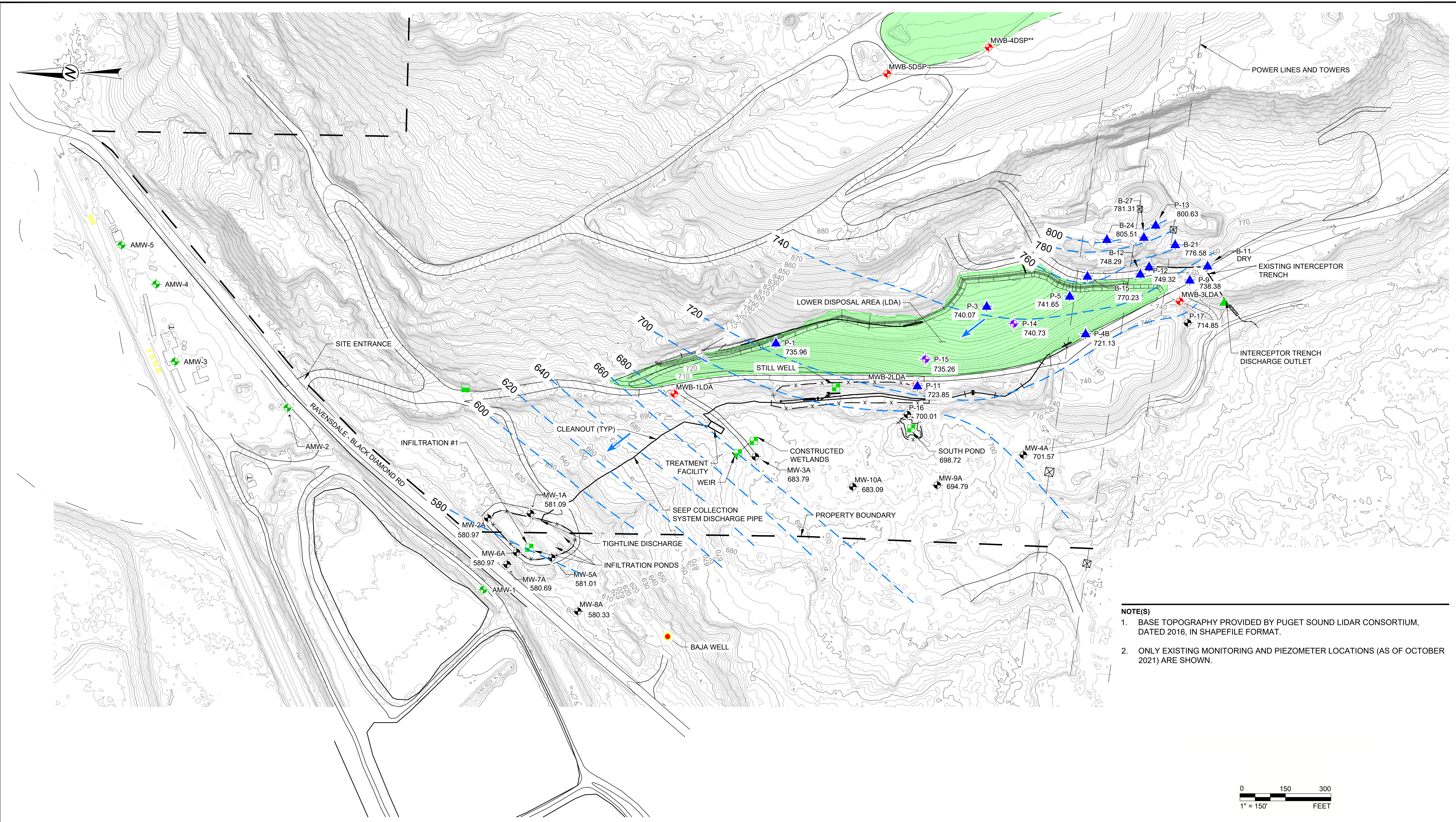
LEGEND						
	COVER AREA		P-1	GOLDER PIEZOMETER		PRIVATE WELL
	MW-1A		LDA SURFACE WATER SAMPLING LOCATION		DSP BEDROCK SAMPLING LOCATION (PORTAL)	
	MWB-1DDSP		INTERCEPTOR TRENCH SAMPLING LOCATION		FENCE LINE	
	P-14					
	AMW-1					

CLIENT	HOLCIM
CONSULTANT	GOLDER MEMBER OF WSP
DESIGNED	AP
PREPARED	REDMOND
REVIEWED	AP
APPROVED	GZ
DATE	2023-03-24

PROJECT	DECEMBER 12, 2022 GROUNDWATER ELEVATIONS RAVENSDALE, WA		
TITLE	LDA BEDROCK GROUNDWATER ELEVATIONS		
PROJECT NO.	152030402	PHASE	004
REV.	A	FIGURE	3B

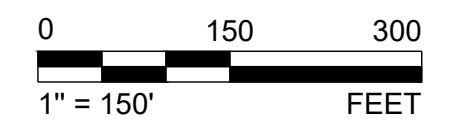
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NOTE(S)

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

CLIENT
HOLCIM



CONSULTANT	YYYY-MM-DD	2023-03-24
DESIGNED	AP	
PREPARED	REDMOND	
REVIEWED	AP	
APPROVED	GZ	

PROJECT
**DECEMBER 12, 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	-	5.6	8	-	2.1	-	-	140
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	-

**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	-	5.6	8	-	2.1	-	-	140
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	-
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
21-Jun-22	15.4	5090	2.53	156.3	3.4	11.96	2180	9.34	51.6	-	3.08	-	465000	3.7
14-Sep-22	16.6	6728	6	68	44.5	12.33	2480	7.82	52.3	-	6.96	-	669000	3.47
13-Dec-22	7.7	1419	7.42	-92.9	9.97	11.6	967	71	125	-	9.95	-	309000	11.1

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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022
- 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-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	-	5.6	8	2.1	-	140
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	-
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	-

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	-	5.6	8	2.1	-	140
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
23-Jun-22	14.90	1982	2.58	156.8	5.3	8.34	1650	8.5	10.2	3.44	549000	0.97
28-Sep-22	16.20	3251.00	7.06	-49.10	3.18	8.75	2730 J	24	5.88	1.11	1040000	0.516
5-Jan-23	8.80	1047.00	8.40	191.00	8.47	8.16	1560	18.8	26.7	2.49	567000	4.45

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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022
- 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 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
Preliminary Screening Level ^a	-	-	-	-	-	6.5-8.5	-	-	5.6	8	2.1	-	140
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	-
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	-

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	-	-	5.6	8	2.1	-	140
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	5.52	4.33	0.698	50500	1
17-Mar-22	7.00	410	9.46	157.2	0.91	7.43	8	394	5.37	3.5	0.055 J	86000	1
21-Jun-22	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
12-Sep-22	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
13-Dec-22	5.60	712	6.9	12.5	1.29	7.83		535	10.5	3.27	0.113 J+	111000	1.01

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 the PSL.
- a Preliminary Cleanup Level (PCUL) provided by Ecology 30 Sept 2022
- 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	-	5.6	8	2.1	-	140
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	-
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	-

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	-	5.6	8	2.1	-	140
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 J+	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	8.80	997	8.53	-66.4	4.54	11.32	912	4.85	22.60	16.70	358000	37.80
21-Jun-22	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
12-Sep-22	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
13-Dec-22	4.1	1319	8.1	-51.9	15.8	9.45	1170	17.5	40.5	33.1	384000	79.3

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.
- + 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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022
- 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-2a: Summary of Lower Disposal Area - Shallow/Alluvial Groundwater Sampling Results - Well MW-1A
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	-	5.6	8	2.1	-	140	
15-Jul-05	35.43	578.01	15.17	883	-	-	358	7.03	664	-	8.47	2 U	-	-	
9-Nov-05	31.83	581.61	10.77	1037	-	-	22.2	6.89	680	-	3.45	1 U	-	-	
15-Feb-06	23.91	589.53	9.14	623	1.53	497.4	6.76	7.26	470 J	-	3.25	1 U	-	-	
17-May-06	31.91	581.53	11.32	1029	1.33	121.6	10.3	7.18	600	-	5.18	1 U	-	-	
23-Aug-06	35.35	578.09	19.21	481	5.97	60.4	6.3	6.67	340	-	1.7	1 U	-	-	
14-Nov-06	20.00	593.44	10.35	635	4.55	95.1	22.2	7.23	550	-	3.07	1 U	-	-	
14-Feb-07	29.29	584.15	11.13	435	3.88	85.6	32.1	6.76	260	-	2	1 U	-	-	
30-May-07	32.90	580.54	10.30	545	6.63	145.7	6.93	6.81	320	-	2.48	1 U	-	-	
27-Aug-07	35.68	577.76	10.49	428	7.13	76.7	8.65	6.95	260 J	-	1.87	1 U	-	-	
29-Nov-07	32.75	580.69	10.10	625	7.14	144.3	12.2	6.96	340 J	-	2.32	1 U	-	-	
27-Feb-08	27.83	585.61	-	-	-	-	19.6	-	320	-	2.58	1 U	-	-	
20-May-08	31.86	581.58	10.22	471	6.38	177.0	109	6.48	290 J	-	2.24	1 U	-	-	
27-Aug-08	36.04	577.40	9.84	427	7.40	118.4	63.6	7.08	260	-	2.05	1 U	23000	-	
26-Sep-08	Test Trench Drain Line Installed														
16-Oct-08	35.65	577.79	9.51	443	9.78	113.9	38	7.38	260 J	-	1.79	1 U	22900	-	
20-Nov-08	25.62	587.82	9.49	563	6.11	231.0	5.48	7.18	430	-	3.68	1 U	106000	-	
30-Dec-08	23.14	590.30	9.84	402	8.40	106.9	8.92	7.25	280 J	-	2.47	1 U	43900	-	
15-Jan-09	20.66	592.78	8.40	336	9.65	229.6	1.07	6.88	290	-	2.25	1 U	35700	-	
12-Feb-09	30.00	583.44	9.05	372	8.46	-	16.7	7.34	320	-	1.93	1 U	27000	-	
12-Mar-09	31.30	582.14	9.13	409	8.60	174.9	15.8	7.03	340	-	1.66	1 U	20600	-	
16-Apr-09	23.88	589.56	8.17	343	10.24	131.8	13.5	6.78	310	-	1.77	1 U	24600	-	
19-May-09	30.50	582.94	8.99	392	8.69	82.6	23.7	7.75	340 J	-	1.56	1 U	19600	-	
23-Jun-09	34.00	579.44	9.21	480	9.56	79.0	22.9	7.89	430	-	2 U	2 U	20000	-	
25-Aug-09	36.95	576.49	13.10	373	6.47	311.9	4.98	6.76	270 J+	-	0.64 J	2 U	17000	-	
23-Sep-09	37.12	576.32	11.30	336	6.90	368.3	21.3	6.73	240	-	2 U	0.18 J	14000	-	
15-Dec-09	28.30	585.14	9.20	643	5.30	567.0	18	6.72	330	-	2 U	2 U	26000	-	
24-Mar-10	30.03	583.41	9.80	562	5.72	545.9	5.04	6.74	370	-	1.9 J	2 U	19000	-	
16-Jun-10	23.55	589.89	9.20	506	5.93	405.4	16.1	6.53	40 U	-	3.6	2 U	20000	-	
21-Sep-10	35.89	577.55	10.40	593	4.82	288.5	117	6.96	370	-	2.6	0.23 J	19000	-	
7-Dec-10	27.39	586.05	10.00	504	1.45	198.4	139	7.15	330	-	2.3	2 U	14000	-	
29-Mar-11	29.76	583.68	8.10	247	2.47	169.0	6.81	7.14	300	-	2.4	2 U	15000	-	
21-Jun-11	30.45	582.99	9.30	606	4.58	332.9	3.56	7.17	400 J	-	5 U	2 U	16000	-	
27-Sep-11	36.65	576.79	9.90	366	7.27	356.2	2.18	6.85	310	-	5 U	2 U	17000	-	
14-Dec-11	31.53	581.91	9.20	407	1.97	234.7	20.4	7.09	370	-	5 U	2 U	16000	-	
20-Mar-12	21.60	591.84	7.70	561	7.06	385.4	4.8	7.18	280	-	2.3	0.4 U	16000	-	
19-Jun-12	21.60	591.84	10.00	575	7.04	378.2	5.6	7.31	330	-	2.5	0.4 U	16000	-	
19-Sep-12	36.42	577.02	11.30	561	8.76	286.0	2.49	7.02	310	-	2.4	0.4 U	17000	-	
19-Dec-12	23.43	590.01	9.30	671	6.67	348.2	0.74	7.26	20 U	-	1.7	0.4 U	17000	-	
25-Feb-13	29.32	584.12	8.00	572	9.51	337.0	26	7.28	300	-	2.5	0.4 U	16000	-	
22-May-13	31.23	582.21	9.00	518	8.59	397.7	4.68	7.40	310	-	1.8	0.4 U	15000	-	
21-Aug-13	37.02	576.42	10.20	534	9.27	152.7	1.46	7.11	227	-	1.2	0.1 U	14100	-	
20-Nov-13	29.69	583.75	9.50	852	7.62	243.5	39.5	6.75	419	-	1.6	0.1 U	19900	-	
1-Apr-14	23.29	590.15	8.90	347	7.60	248.1	2.54	7.30	247	-	2	0.1 U	16500	-	
21-May-14	28.31	585.13	9.50	349	4.02	178.6	-	7.12	280	-	1.8	0.1 U	15100	-	
13-Aug-14	36.52	576.92	12.10	441	9.22	51.9	6.2	7.10	283	-	1.4	0.1 U	15200	-	
13-Nov-14	31.63	581.81	11.50	438	8.80	173.0	14.7	7.10	352	-	1.6	0.1 U	17100	-	
11-Feb-15	23.02	590.42	9.40	498	3.89	98.1	10.5	7.72	319	-	9.1	0.3	42900	-	
4-May-15	31.93	581.51	9.80	578	7.35	416.9	1.05	7.26	413	-	1.7	0.1 U	16000	-	
6-Aug-15	37.65	575.79	10.70	447	0.17	71.6	49	7.21	343	-	3.9	0.1 U	10300	-	
4-Nov-15	32.89	580.55	9.50	657	8.56	240.5	5.7	6.92	554	-	2.3	0.1 U	49300	-	
10-Feb-16	25.39	588.05	9.80	322	7.36	204.8	3.21	7.31	202	-	2	0.1 U	22200	-	
2-May-16	32.32	581.12	10.80	579	5.95	250.2	4.7	7.02	350	-	1.8	0.04 J-	17800	-	
23-Aug-16	37.66	575.78	11.00	488	1.34	459.9	259	7.08	413	-	3.88	0.07 J	14600	-	
2-Nov-16	31.30	582.14	9.70	280	3.94	225.0	6.13	7.18	531	-	2.13	0.12	37700	-	
1-Feb-17	29.01	584.43	8.60	510	5.26	187.7	0.97	7.04	270	-	1.47	0.1 U	19000	-	
30-May-17	28.47	584.97	9.50	483	6.89	4.7	4.85	6.96	290	-	2.09	0.1 U	15700	-	
17-Aug-17	36.30	577.14	10.50	536	3.79	82.5	6.44	6.96	283	-	1.55	0.1 U	15500	-	
9-Nov-17	32.20	581.24	9.20	460	5.89	75.1	2.7	7.01	380	-	1.63	0.1 U	16300	-	
27-Feb-18	25.18	588.26	8.90	215	7.35	121.6	6.04	6.31	186	-	1.72	0.1 U	15500	-	
1-May-18	26.98	586.46	9.50	391	7.82	-	3.06	6.94	214	-	1.65	0.1 UJ	14100	-	
21-Aug-18	37.29	576.15	10.02	266	7.37	75.6	129	6.84	215	-	1.51	0.1 U	13300	-	
6-Nov-18	34.18	579.26	9.60	340	9.13	215.4	1	6.93	327	-	1.67	0.1 U	16600	-	
11-Mar-19	27.75	585.69	8.90	323	5.65	185.3	4.29	6.94	269	-	1.36	0.1 U	14400	-	
8-May-19	30.05	583.39	9.80	448	7.77	97.6	1.11	6.87	320	-	1.25	0.1 U	15100	-	
26-Aug-19	37.02	576.42	9.83	329	1.16	Note 1	7.97	7.11	258	-	0.904	0.1 U	10700	-	
13-Nov-19	35.13	578.31	9.20	376	5.50	144.0	8.26	6.87	320	-	1.23	0.1 U	15800	-	
12-Feb-20	20.38	593.06	9.00	381	2.58	191.6	1.33	7.15	268	-	1.25	0.1 U	26600	-	
12-Aug-20	36.61	576.83	9.50	285	5.01	198.7	0.8	6.96	214	-	1.14	0.1 U	14100	-	

**Table A-2a: Summary of Lower Disposal Area - Shallow/Alluvial Groundwater Sampling Results - Well MW-1A
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	-	5.6	8	2.1	-	140
9-Dec-20	32.05	581.39	9.10	425	7.17	211.0	1.57	6.86	347	-	1.11	0.1 U	17100	-
3-Mar-21	27.01	586.43	8.60	383	5.71	248.0	0.6	6.83	299	-	1.16	0.1 U	17400	-
9-Jun-21	35.32	578.12	9.20	422	8.47	151.0	2.22	6.68	310	-	1.39	0.1 U	16300	-
12-Oct-21	33.84	579.60	9.30	329	9.07	160.8	1.55	6.34	236 J-	0.846	1.13	0.1 U	12500	0.801
5-Jan-22	25.20	588.24	9.20	344	7.96	170.2	0.67	6.54	255	1.06	1.02	0.1 U	18100	0.782
16-Mar-22	23.67	589.77	9.30	386	7.79	155.0	0.96	5.60	350	1.58	1.33	0.1 U	36800	0.887
23-Jun-22	27.91	585.53	9.80	356	7.21	152.8	2.55	6.93	281	1.08	1.04	0.1 U	16500	0.86
23-Sep-22	37.05	576.39	13.2	312.5	6.93	128.4	2.84	6.91	222	0.83	1.2	0.137	14100	0.786
13-Dec-22	32.35	581.09	9.4	394.6	8.79	99.3	0.31	6.77	234	0.955	1.13	0.1 U	14500	0.791

Notes:

Top of casing elevation (feet NAVD88): 613.44

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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022

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-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 broc)	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	-	5.6	8	2.1	-	140
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	<i>Test Trench Drain Line Installed</i>													
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 UJ	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	-
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	-

**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 btrc)	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	-	5.6	8	2.1	-	140
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	291	3.26	1.85	0.218	60900	1.15
23-Jun-22	21.76	585.45	9.5	442.6	6.06	158.8	1.49	7.10	369	1.94	1.5	0.1 U	37500	1.15
23-Sep-22	30.87	576.34	11.2	471.5	8.5	190.3	2.04	6.82	351	0.923	1.17	0.13	23300	1.18
13-Dec-22	26.24	580.97	9.9	557	8.35	117.4	4.38	6.81	319	1.17	1.28 J	0.218 J+	21800	1.59

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 PS

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

a Preliminary Cleanup Level (PCUL) provided by Ecology 30 Sept 2022

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 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	-	5.6	8	2.1	-	140	
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	-	

**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 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	-	5.6	8	2.1	-	140
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	0.88
21-Jun-22	5.21	683.9	11.2	439.4	0.19	181.3	0.66	7.03	368	0.966	3.66	0.075 J	75400	0.39
13-Sep-22	11.25	677.86	15.3	910	4.92	85.7	9.15	6.49	689	0.973	5.42	0.137	91100	0.507
12-Dec-22	5.32	683.79	7.7	817	4.09	205.2	1.29	7.15	475	9.5	1.72	0.115 J+	99800	1.26

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.

a Preliminary Cleanup Level (PCUL) provided by Ecology 30 Sept 2022

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.	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	-	5.6	8	2.1	-	140	
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. 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	-	5.6	8	2.1	-	140
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
22-Jun-22	3.83	701.62	10.1	327.8	1.36	114.5	0.46	6.36	263	0.2 U	0.201	0.1 U	666	1.16
14-Sep-22	8.9	696.55	13.4	389.4	2.46	87.6	2.53	6.02	330	0.2 U	0.385	0.1 U	1080	1.19
14-Dec-22	3.88	701.57	9.1	278	7.03	135.4	0.44	6.35	224	0.2 U	0.188 J	0.1 U	583	1.42

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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022
- 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-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	Vanadium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	5.6	8	2.1	-	140	
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	<i>Test Trench Drain Line Installed</i>														
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	63000 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	-	
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	-	

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	-	5.6	8	2.1	-	140
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
23-Jun-22	25.74	585.49	9.6	969	3.5	173.1	1.13	7.38	881	5.49	3.29	0.093 J	251000	1.82
23-Sep-22	35	576.23	11.5	1640	3.45	223.6	1.35	7.42	1720	4.57	3.21	0.156 J	455000	1.58
13-Dec-22	30.22	581.01	10.4	928	7.08	109.2	2.27	7.04	634	3.54	1.89	0.105 J+	173000	1.25

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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022

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-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	-	5.6	8	2.1	-	140
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	<i>Test Trench Drain Line Installed</i>													
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	-
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	-

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	-	5.6	8	2.1	-	140
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
23-Jun-22	23.49	585.46	11.2	916	3.74	163.1	0.76	7.66	836	7.00	2.09	0.073 J	265000	0.977
23-Sep-22	32.92	576.03	14.8	2281	3.73	199.3	2.05	8.05	2150	7.64	4.97	0.2 U	646000	2.52
13-Dec-22	27.98	580.97	12.4	1915	6.1	80.4	3.77	7.98	1350	12.4	5.64	0.865 J+	495000	1.26

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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022

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-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 (ReI mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	5.6	8	2.1	-	140
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
22-Jun-22	7.45	585.24	12	541	1.88	107.5	0.47	7.21	387	2.91	1.78	0.1 U	65500	1.19
14-Sep-22	16.9	575.79	13.6	548	4.46	141	0.5	6.31	444	1.63	1.49	0.1 U	54000	1.16
14-Dec-22	12	580.69	8	514	5.35	170.1	0.41	7.07	335	1.64	1.18	0.1 U	42700	0.798

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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022
- 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 (ReI mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	5.6	8	2.1	-	140
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
22-Jun-22	16.4	585.09	9.4	773	2.99	96	0.94	7.22	699	5.17	8.13	0.1 U	197000	4.73
12-Sep-22	26	575.49	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
13-Dec-22	21.16	580.33	10.4	1011	6.13	122.1	1.22	7.07	721	4.53	5.37	0.1 U	205000	3.61

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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022

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 (ReI mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	5.6	8	2.1	-	140
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	8.50	423	5.19	138.3	1.17	7.16	403	0.154 J	0.788	0.1 U	2470	0.776
22-Jun-22	2.38	694.91	10.5	485.8	4.42	72.8	0.85	6.89	399	0.244	0.656	0.052 J	2130	0.916
14-Sep-22	8.7	688.59	13.5	509	3.84	130.2	1.09	6.44	441	0.154 J	1.05	0.1 U	2780	1.13
14-Dec-22	2.5	694.79	8	413.5	7.42	135.6	0.53	6.91	328	0.132 J	0.599	0.1 U	1630	0.867

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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022
- 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	Vanadium	
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	5.6	8	2.1	-	140	
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	151	7.12	95.1	6.21	6.50	139	0.2 U	0.91	0.061 J	1880	0.807	
21-Jun-22	5.89	692.13	11.5	114.9	7.92	191.1	4.48	6.80	116	0.2 U	0.764	0.081 J	1150	1.02	
13-Sep-22	14.24	683.78	12	221.3	6.64	189.1	3.74	6.78	195	0.201	1.54	0.082 J	2350	1.56	
13-Dec-22	14.93	683.09	9.8	395.9	4.71	179.4	5.19	7.34	200	0.173 J	1.3	0.1 U	2060	1.1	

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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022

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 (ReI mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	5.6	8	2.1	-	140
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
22-Jun-22	2.71	700.16	11.6	2757	0.04	-105.8	27.4	12.19	2200	9.62	124	17.1	713000	285
13-Sep-22	4.33	698.54	14.9	2609	1.26	-427.3	31.8	11.63	2160	5.92	103	42.7	756000	431
13-Dec-22	2.86	700.01	8.2	4004	3.49	-393.6	21	11.01	2390	6.52	55.2	12	820000	213

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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022

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	Vanadium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	5.6	8	2.1	-	140	
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	
22-Jun-22	6.87	713.45	11.7	586	0.26	-57.6	2.87	6.44	398	0.68	6.73	0.2 U	3560	2.99	
14-Sep-22	13.31	707.01	14.3	706	1.91	-63.2	2.12	6.1	489	1 U	7.67	0.5 U	3570	2.99	
14-Dec-22	5.47	714.85	9.7	469.3	3.17	-85.9	3.75	6.51	377	1	2.69	0.1 U	7820	1.6	

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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022

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	-	8	2.1	-
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	23.51	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			
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

**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	-	8	2.1	-	
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	
21-Jun-22	21.58	683.1	Monitored Semi-Annually ¹								Monitored Annually ¹		
12-Sep-22	23.51	681.17	11.3	263.3	2.86	-7.4	0.37	6.76	Monitored Annually ¹				
12-Dec-22	23.51	681.17	Monitored Semi-Annually ¹								Monitored Annually ¹		

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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022

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. 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	-	8	2.1	-
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			
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

**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. 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	-	8	2.1	-
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
21-Jun-22	34.7	706.96	Monitored Semi-Annually ¹							Monitored Annually ¹		
23-Sep-22	37	704.66	12.1	243.1	3.88	-17.8	0.54	7.47	Monitored Annually ¹			
12-Dec-22	36.41	705.25	Monitored Semi-Annually ¹							Monitored Annually ¹		

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 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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022

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-3c: Summary of Lower Disposal Area - Bedrock Groundwater Sampling Results
- Well MWB-3LDA 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	-	8	2.1	-
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. 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	-	8	2.1	-
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
21-Jun-22	0.54	743.65	Monitored Semi-Annually ¹						Monitored Annually ¹			
23-Sep-22	4	740.19	13.8	178.6	5.66	172	5.55	6.63	Monitored Annually ¹			
12-Dec-22	4.48	739.71	Monitored Semi-Annually ¹						Monitored Annually ¹			

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 Radium were included in the COPCs for several water locations and are not analyzed at the monitoring wells at the

1 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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022

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	Potassium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	8	2.1	-	
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						Monitored Annually 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						Monitored Annually 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						Monitored Annually 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						Monitored Annually 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						Monitored Annually 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
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	8	2.1	-	
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	
21-Jun-22	35.46	900.83	Monitored Semiannually ²						Monitored Annually ²				
13-Sep-22	44.37	891.92	11.8	1122	2.97	6.4	4.73	6.42	Monitored Annually ²				
12-Dec-22	42.96	893.33	Monitored Semiannually ²						Monitored Annually ²				

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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022

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-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	-	8	2.1	-	
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.	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	-	8	2.1	-	
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	
21-Jun-22	49.68	885.69	Monitored Semiannually ²								Monitored Annually ²		
13-Sep-22	57.47	877.9	11.9	778	2.5	-91	0.45	6.84	Monitored Annually ²				
12-Dec-22	57.68	877.69	Monitored Semiannually ²								Monitored Annually ²		

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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022

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	-	8	2.1	-	
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						Monitored Annually 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						Monitored Annually 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						Monitored Annually 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						Monitored Annually 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						Monitored Annually 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						Monitored Annually 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. 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	-	8	2.1	-
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
21-Jun-22	17.25	917.8	Monitored Semiannually ²						Monitored Annually ²			
13-Sep-22	27.19	907.86	12.3	606	2.54	-3.7	1.49	6.74	Monitored Annually ²			
12-Dec-22	24.31	910.74	Monitored Semiannually ²						Monitored Annually ²			

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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022

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	-	8	2.1	-	
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				
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	

**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
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	8	2.1	-
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
21-Jun-22	21.51	899.14	Monitored Semiannually ²						Monitored Annually ²			
13-Sep-22	Well Damaged - Unable to Sample											
12-Dec-22	Well Damaged - Unable to Sample											

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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022

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-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	-	8	2.1	-
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

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	-	8	2.1	-
-	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			
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
21-Jun-22	Monitored Semiannually ²								Monitored Annually ²			
14-Sep-22	-	-	12	521	7.29	39.1	93.8	6.7	Monitored Annually ²			
14-Dec-22	Monitored Semiannually ²								Monitored Annually ²			

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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022
- 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	-	8	2.1	-
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						-	-	-	
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						-	-	-	

**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	-	8	2.1	-
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	-	-	-	-
21-Jun-22	191.33	743.49	Monitored Semiannually ¹						-	-	-	-
13-Sep-22	200.03	734.79	12.6	404.7	8.66	252.7	10.5	6.91	-	-	-	-
12-Dec-22	197.99	736.83	Monitored Semiannually ¹						-	-	-	-

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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022

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. 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	-	8	2.1	-
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	-	-	-	-
21-Jun-22	17.95	914.46	Monitored Semiannually ¹						-	-	-	-
13-Sep-22	21.6	910.81	15.3	531	7.87	90.3	1.45	7.53	-	-	-	-
12-Dec-22	19.02	913.39	Monitored Semiannually ¹						-	-	-	-

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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022

°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

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 btoc)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (ReI mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	5.6	8	2.1	-	140
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
23-Jun-22	28.65	744.67	13.5	18219	0.05	-88.6	2.04	12.93	6160	130	238	6.56	2250000	21.9
14-Sep-22	34.22	739.1	13.2	17395	1.72	-127.9	1.7	13.21	6510	130	235	6.3	2570000	20.5
14-Dec-22	32.59	740.73	12.1	19267	3.3	-448.9	0.88	13.06	6730	130	255	11.1	2710000	23

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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022

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 (ReI mV)	Turbidity (NTU)	pH (standard units)		Total Dissolved Solids (mg/L)	Antimony	Arsenic	Lead	Potassium
Preliminary Screening Level ^a	-	-	-	-	-	-	-	6.5-8.5	-	5.6	8	2.1	-	140
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
22-Jun-22	18.39	738.16	13	10563	0.14	-71	2.19	12.95	3300	2.22	5.37	100	924000	1.14
14-Sep-22	28.82	727.73	13.8	14297	6.41	-17.7	4.71	12.99	5340	4 U	3.68 J	269	1790000	0.624
14-Dec-22	21.29	735.26	11	10770	2.85	-322.9	2.33	13.05	3460	1.72	5.07	173	1070000	1.19

Notes:

Top of casing elevation (feet NAVD88): 756.55

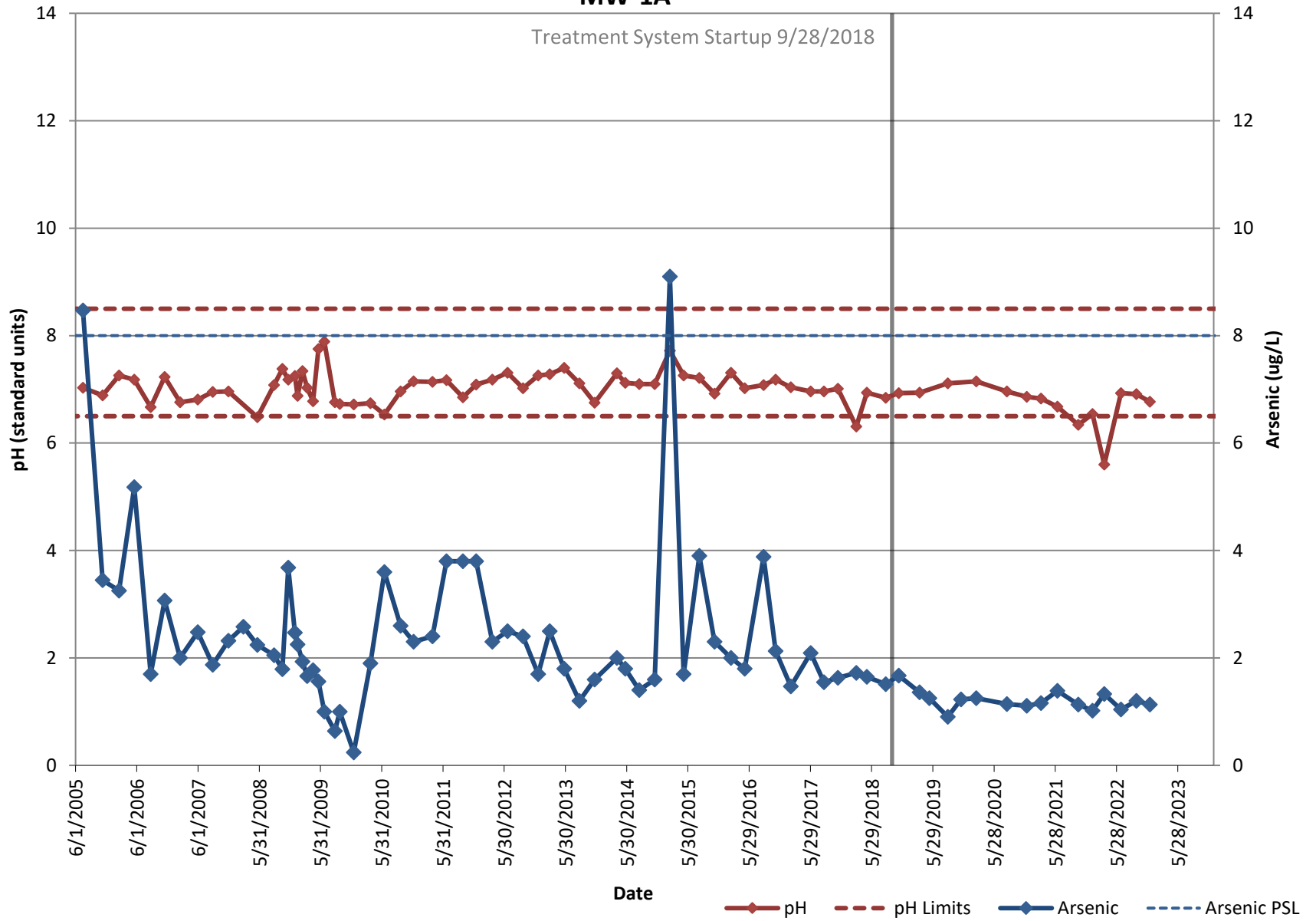
Dissolved metals were analyzed at the Site until December 2020 (Q4 2020). Total metals were analyzed for Q4 2020 and will continue to be analyzed moving forward. Iron and manganese are not included in the COPCs at the Site and are not analyzed beginning in Q2 2021. Antimony and Vanadium were included 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 Cleanup Level (PCUL) provided by Ecology 30 Sept 2022
- 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

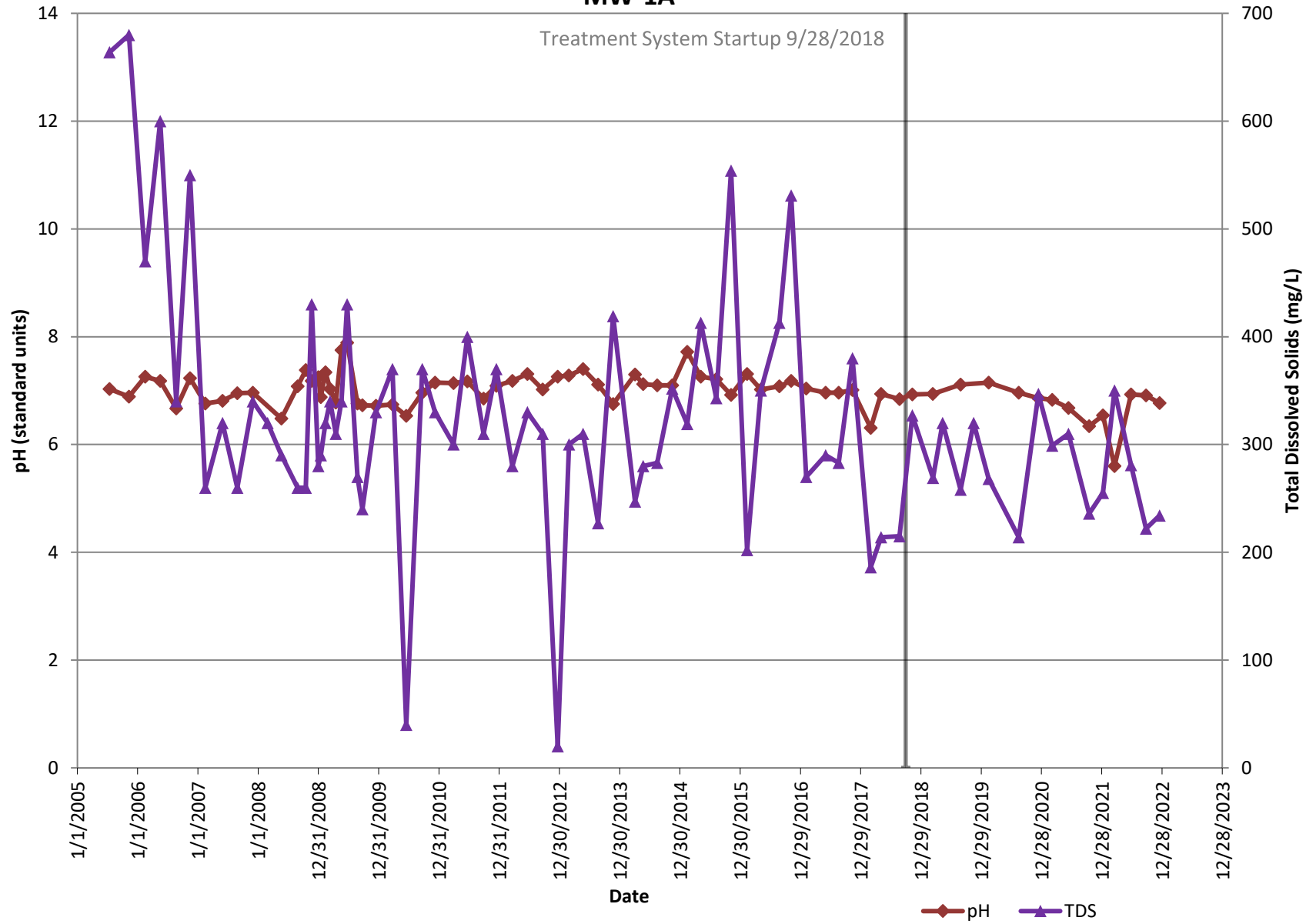
APPENDIX B

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

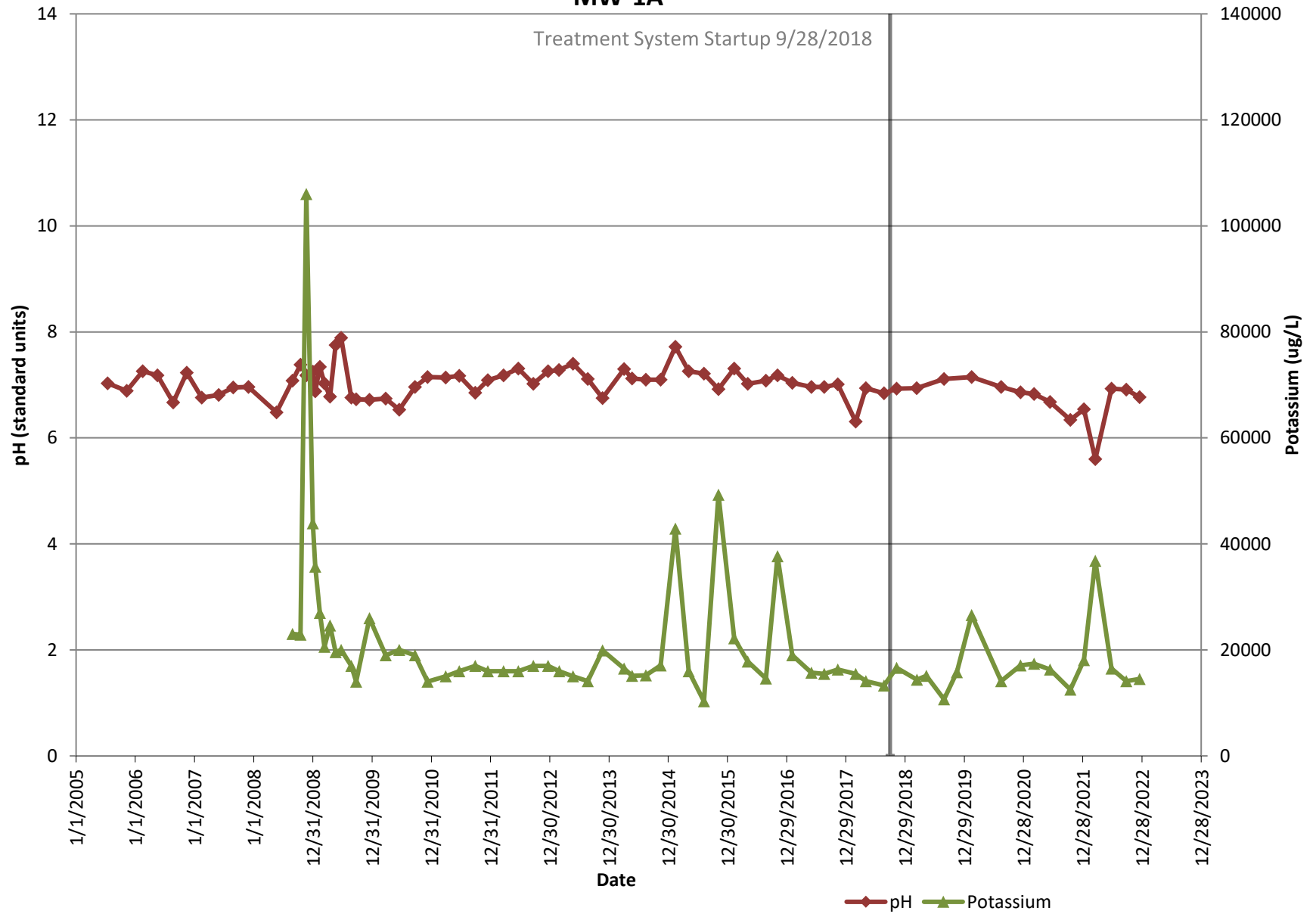
LDA Shallow/Alluvial Monitoring Wells MW-1A



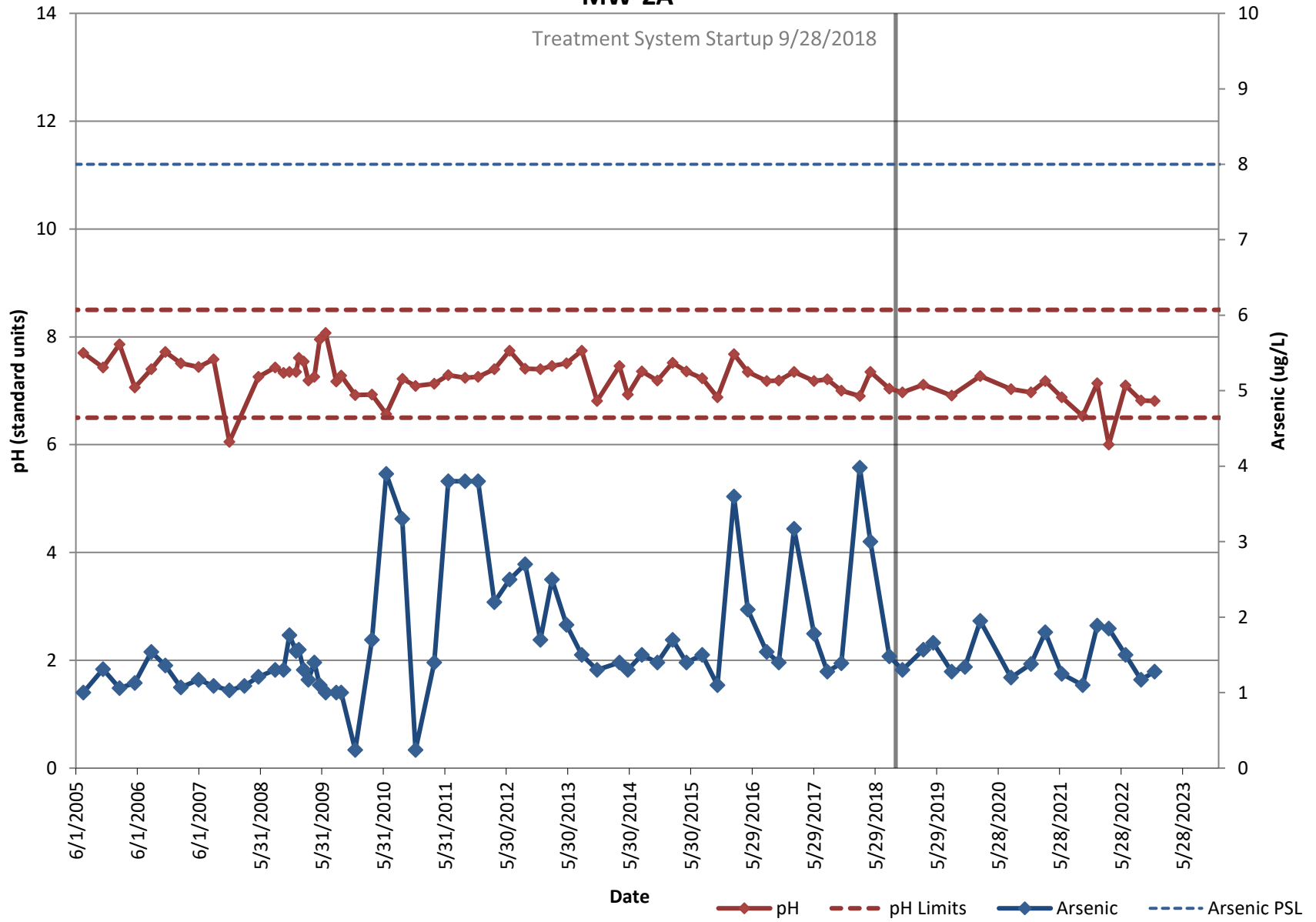
LDA Shallow/Alluvial Monitoring Wells MW-1A



LDA Shallow/Alluvial Monitoring Wells MW-1A

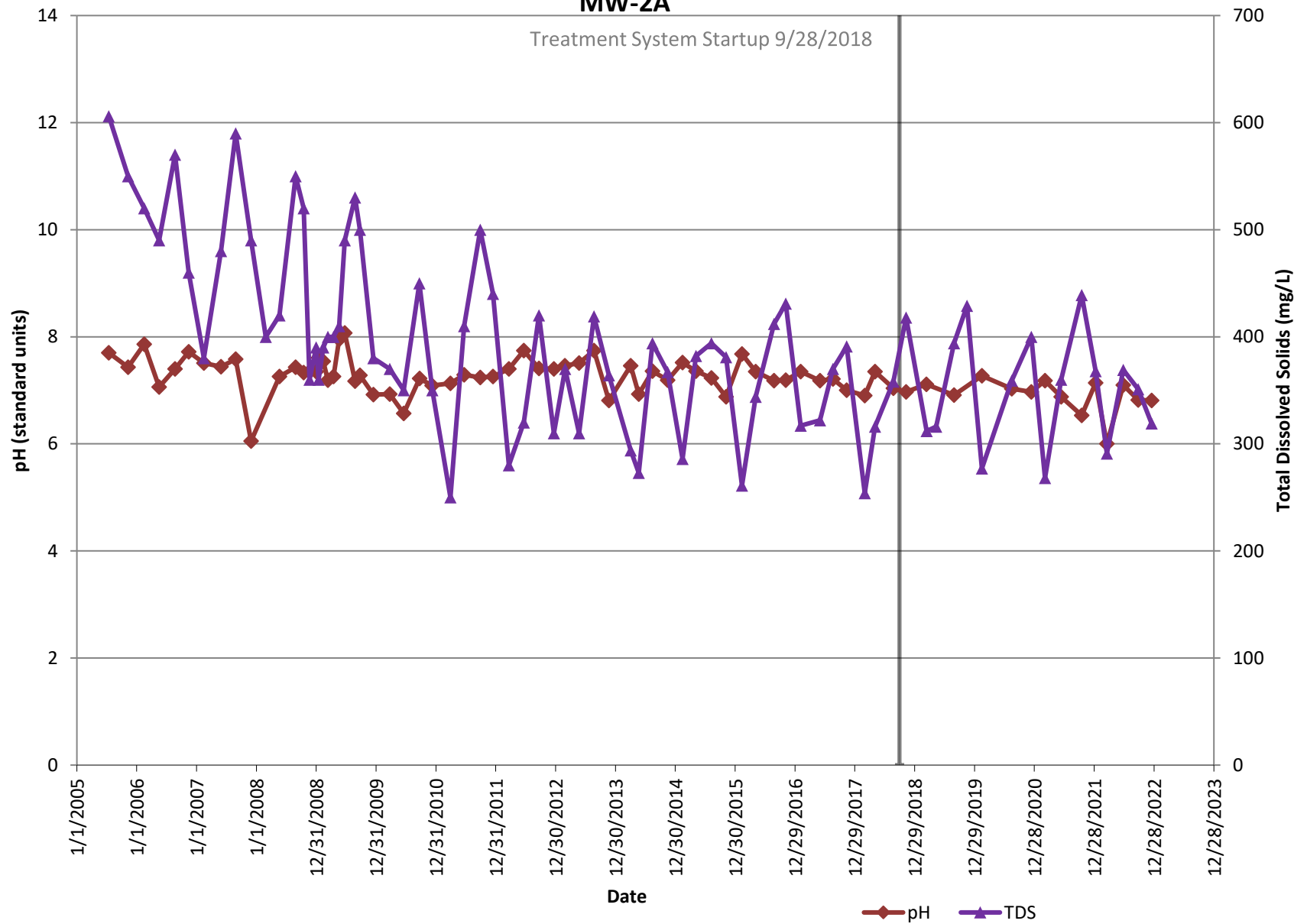


LDA Shallow/Alluvial Monitoring Wells MW-2A



LDA Shallow/Alluvial Monitoring Wells

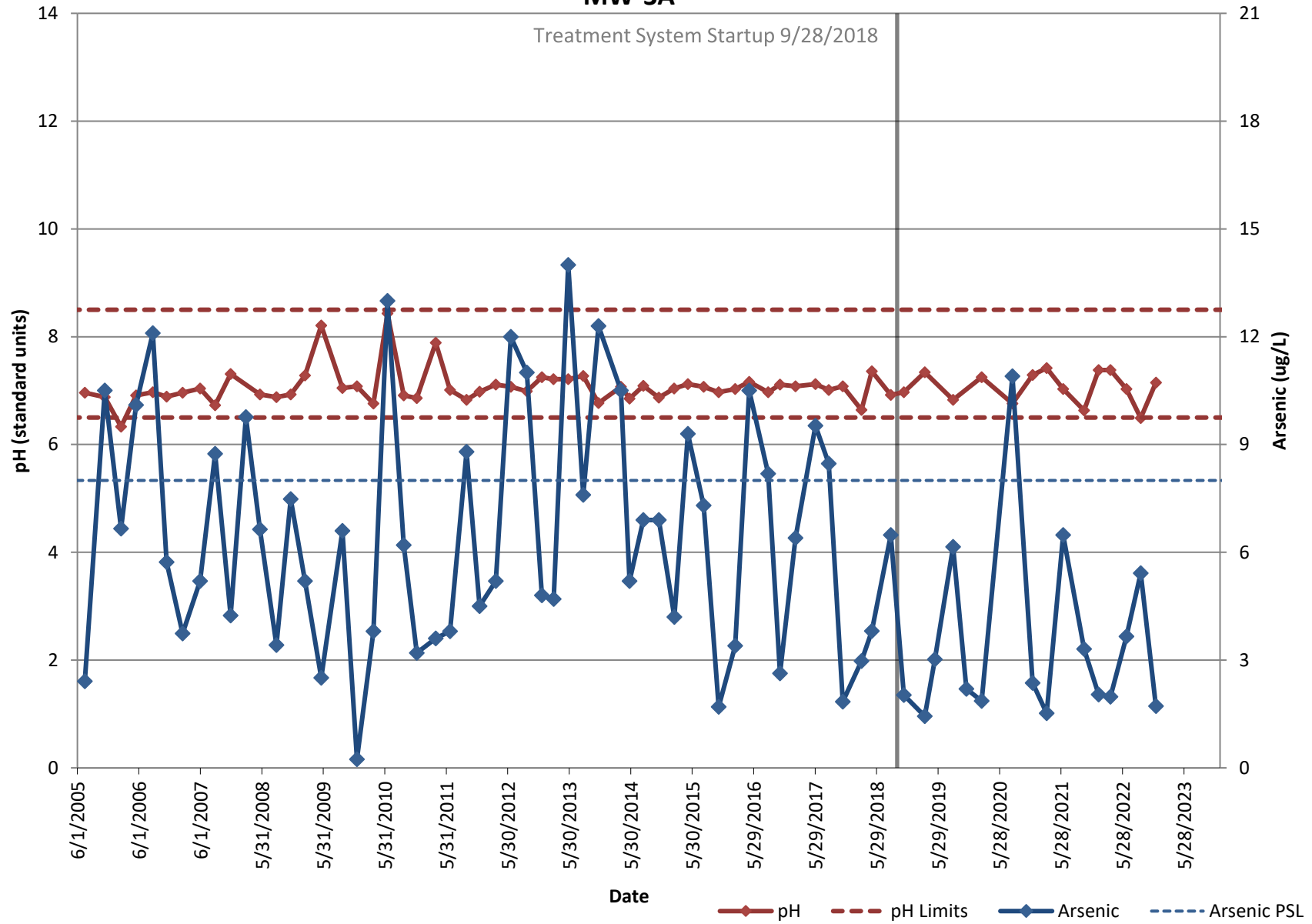
MW-2A



LDA Shallow/Alluvial Monitoring Wells MW-2A

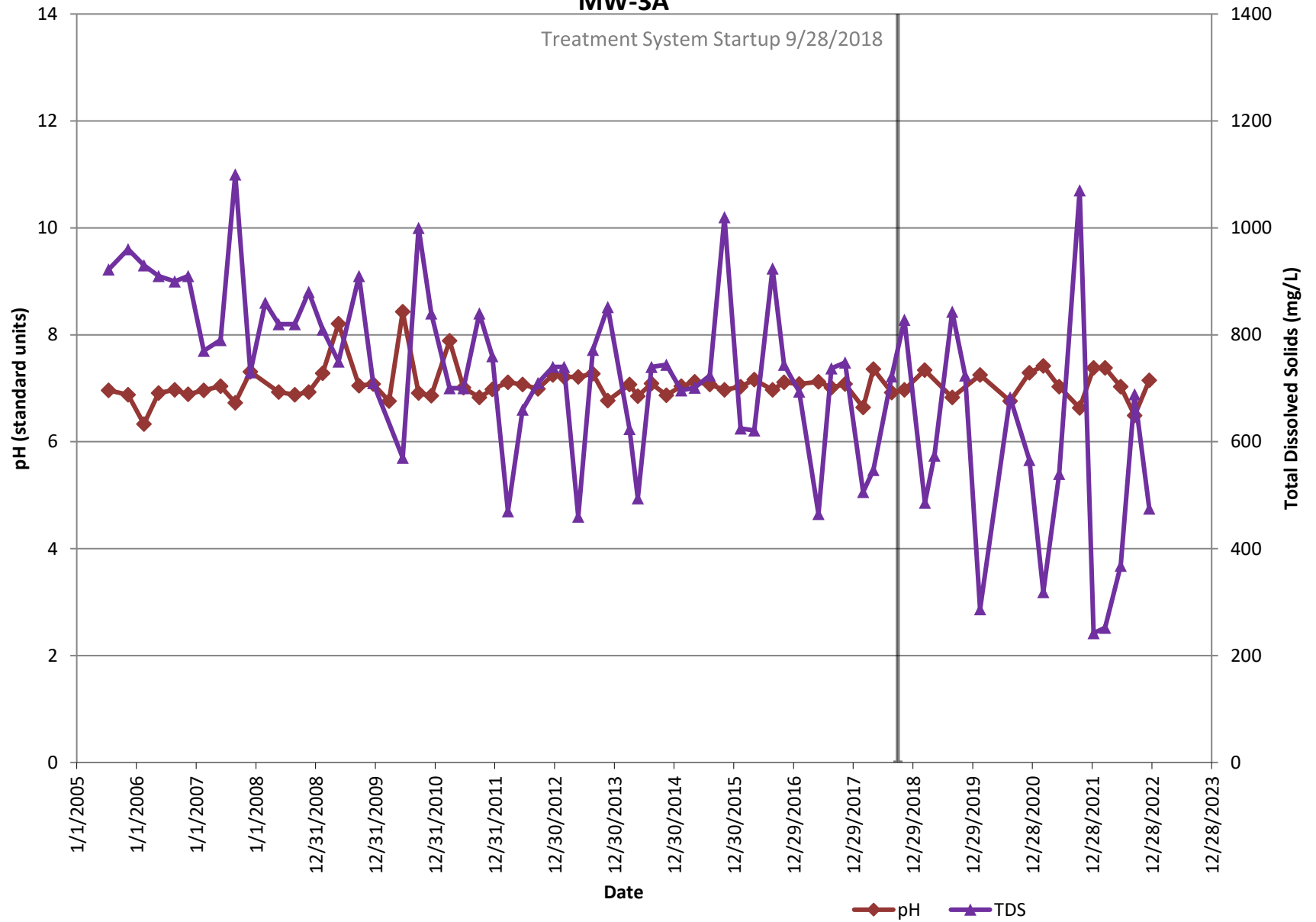


LDA Shallow/Alluvial Monitoring Wells MW-3A

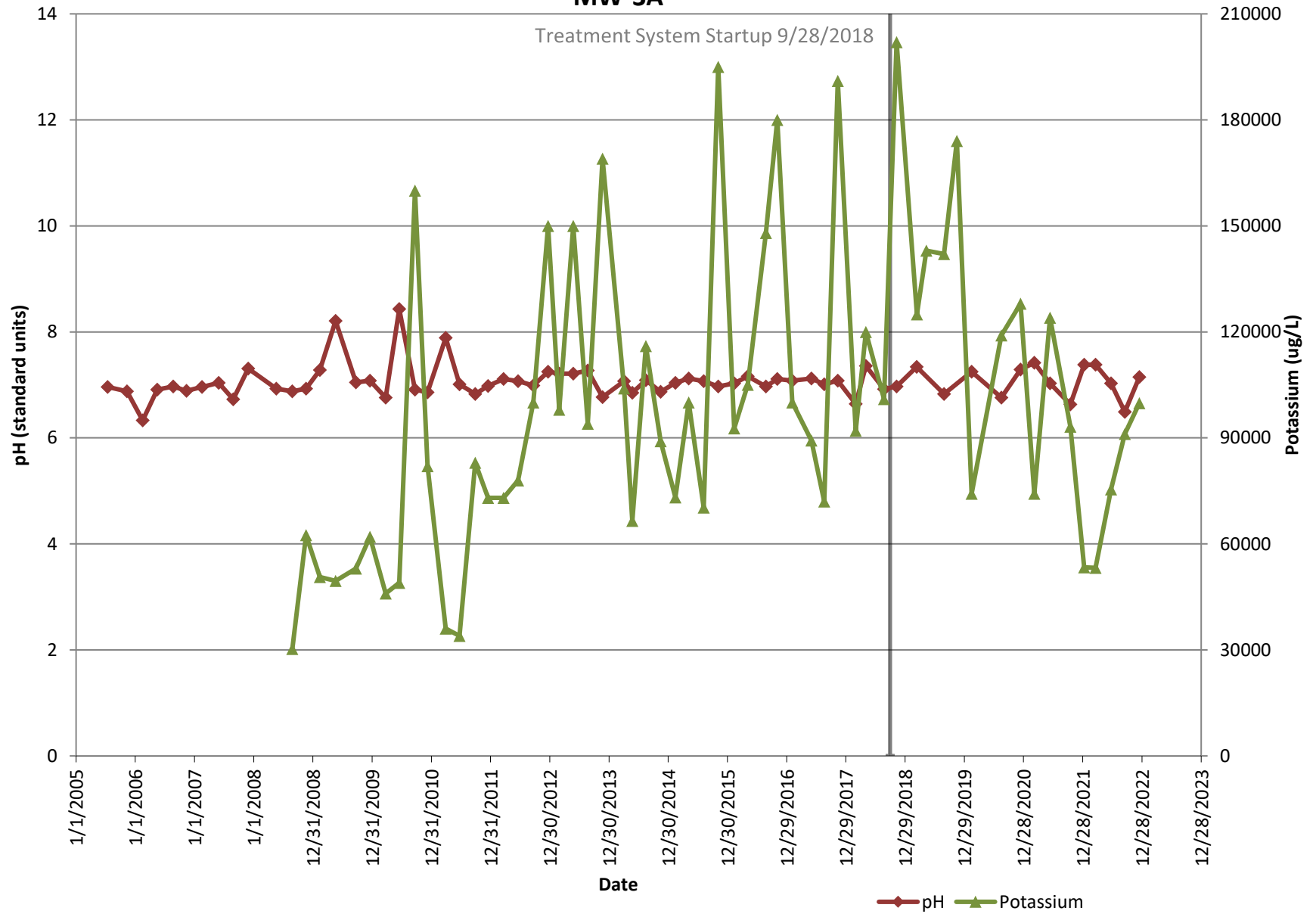


LDA Shallow/Alluvial Monitoring Wells

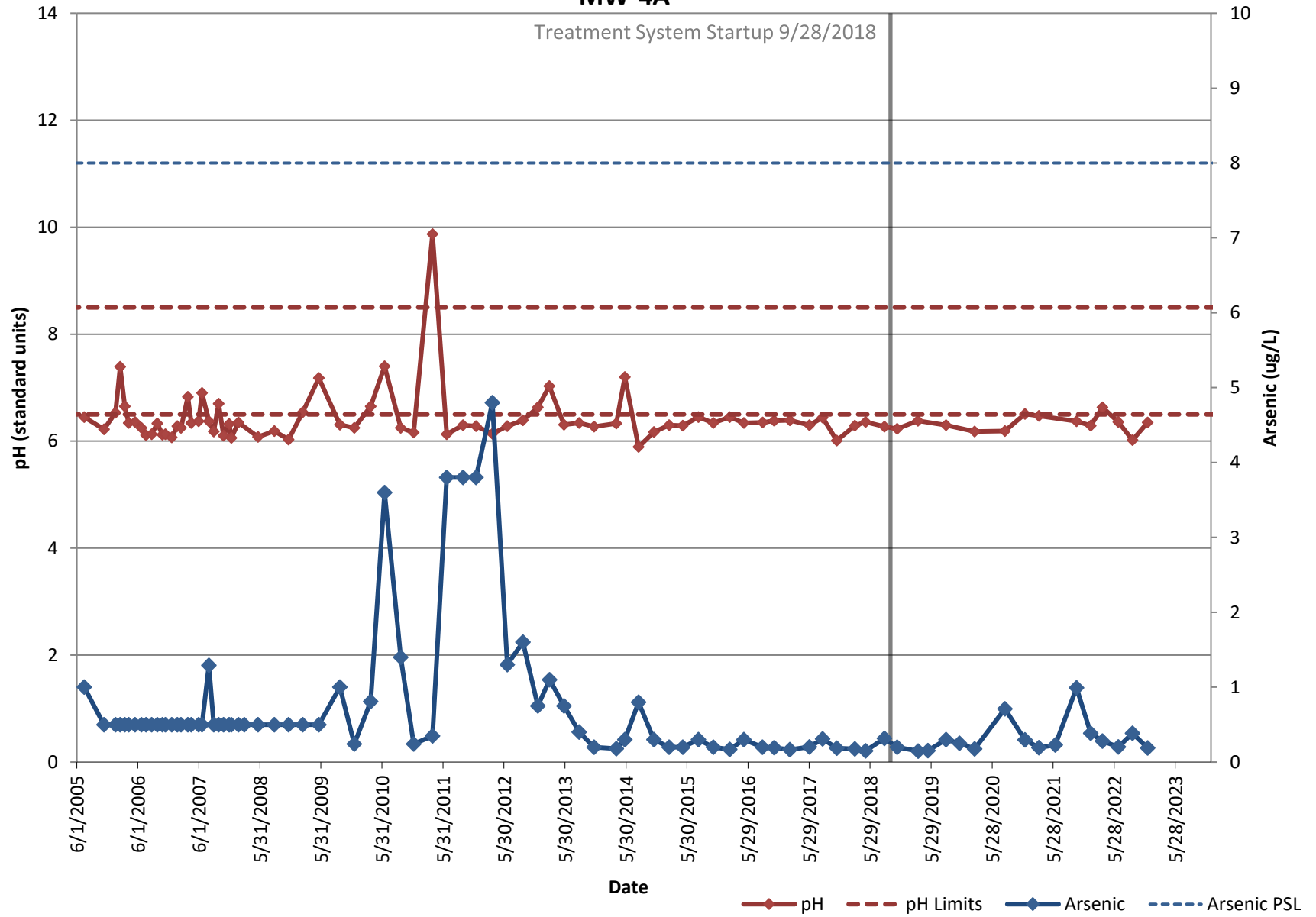
MW-3A



LDA Shallow/Alluvial Monitoring Wells MW-3A

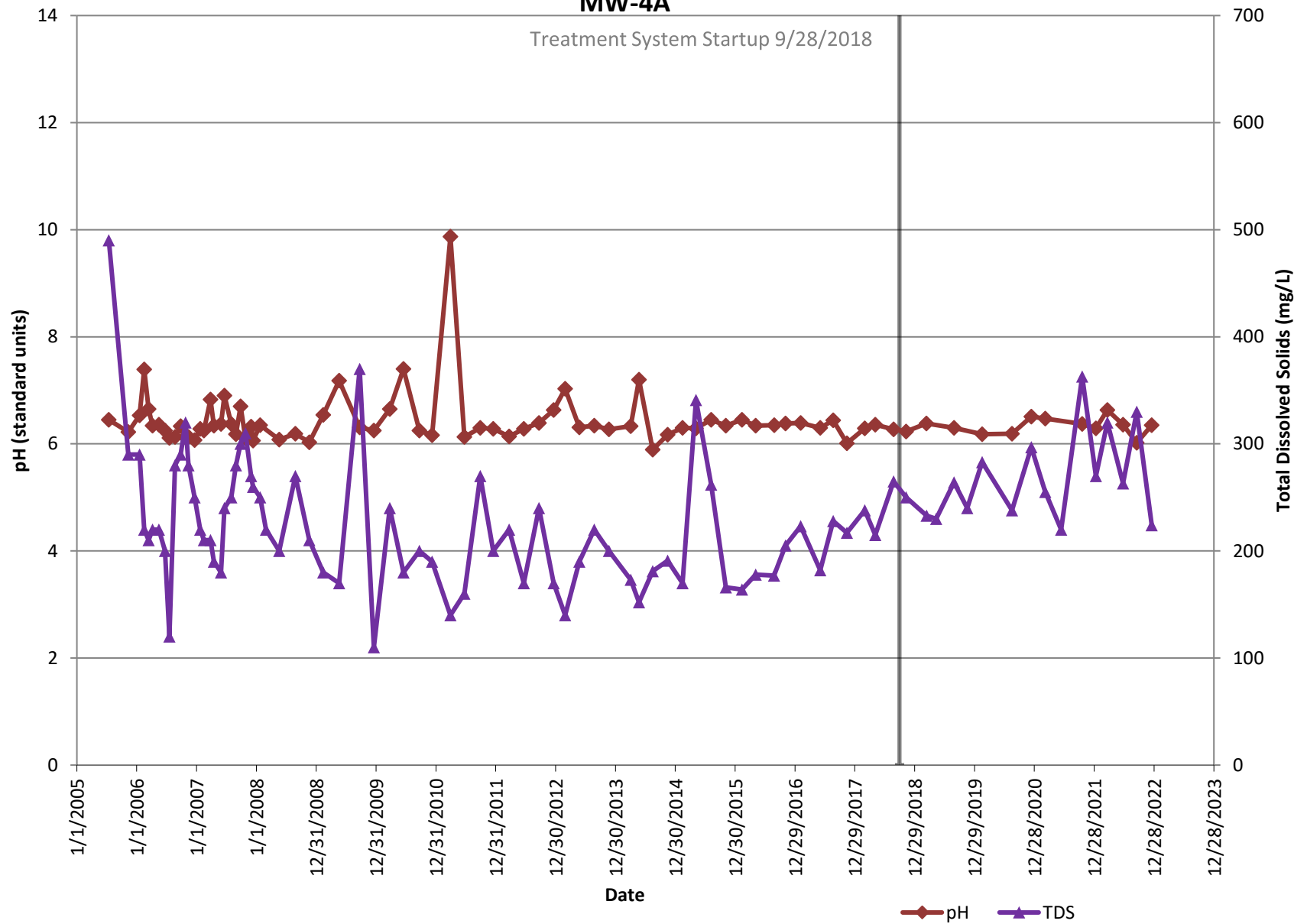


LDA Shallow/Alluvial Monitoring Wells MW-4A

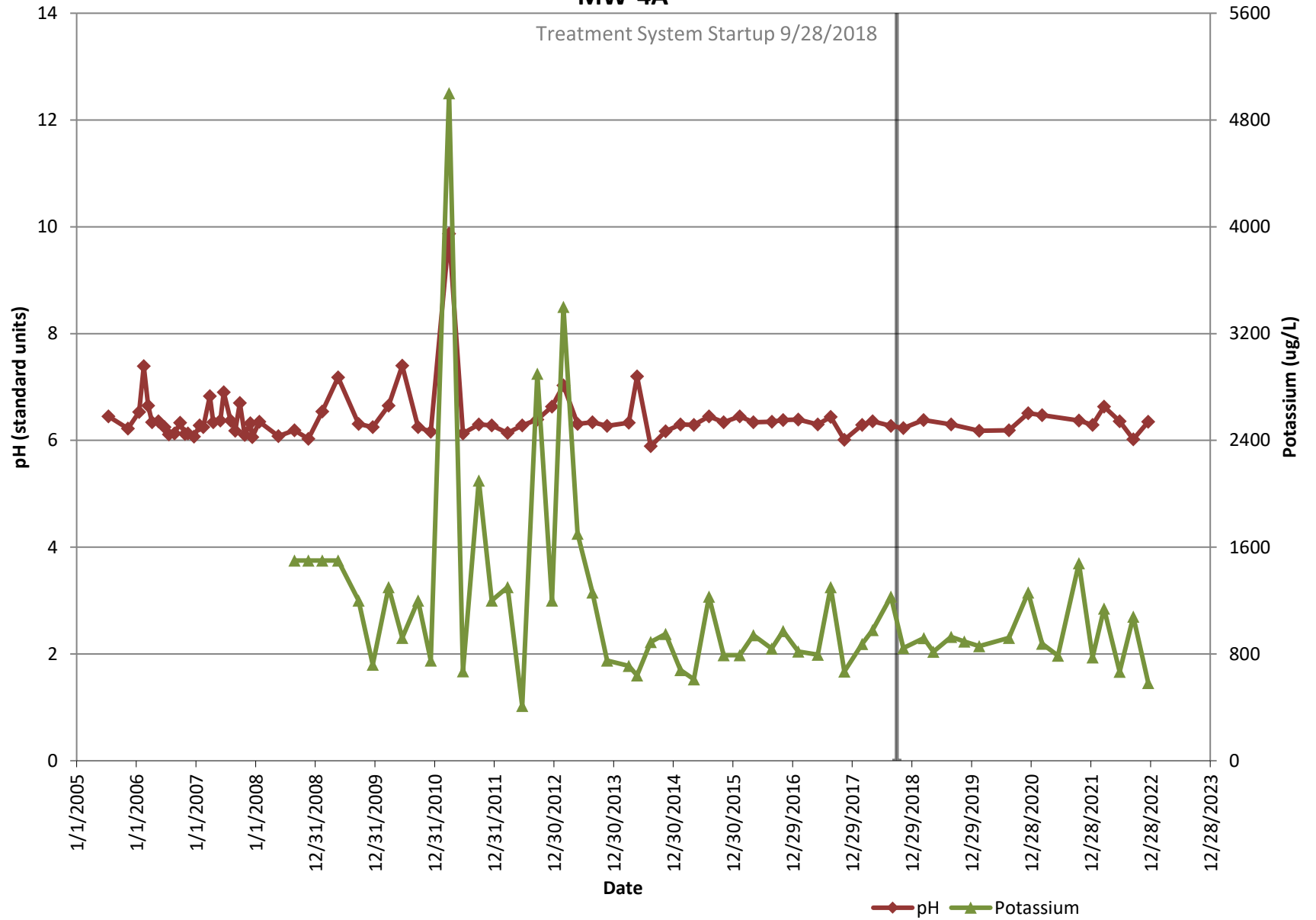


LDA Shallow/Alluvial Monitoring Wells

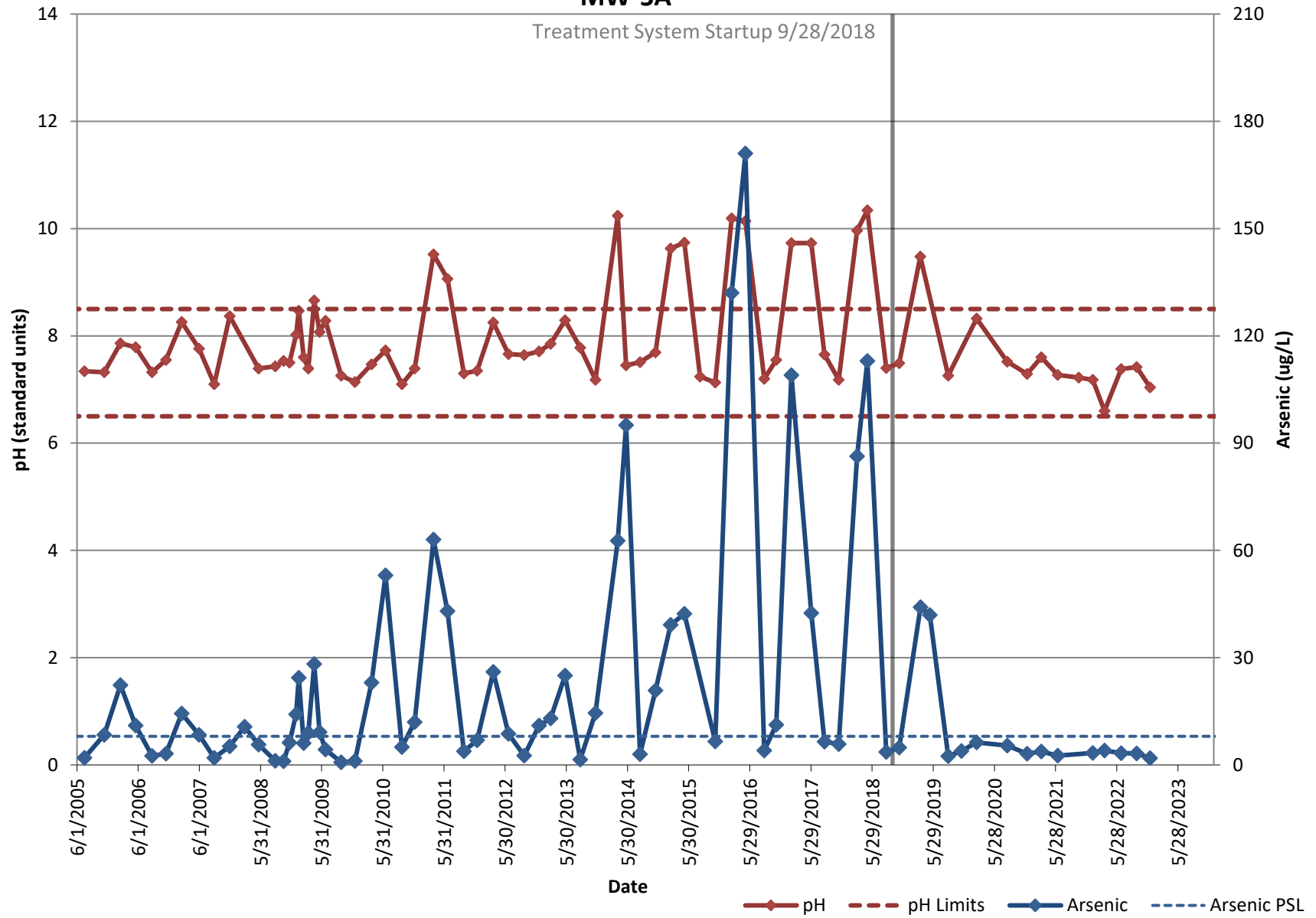
MW-4A



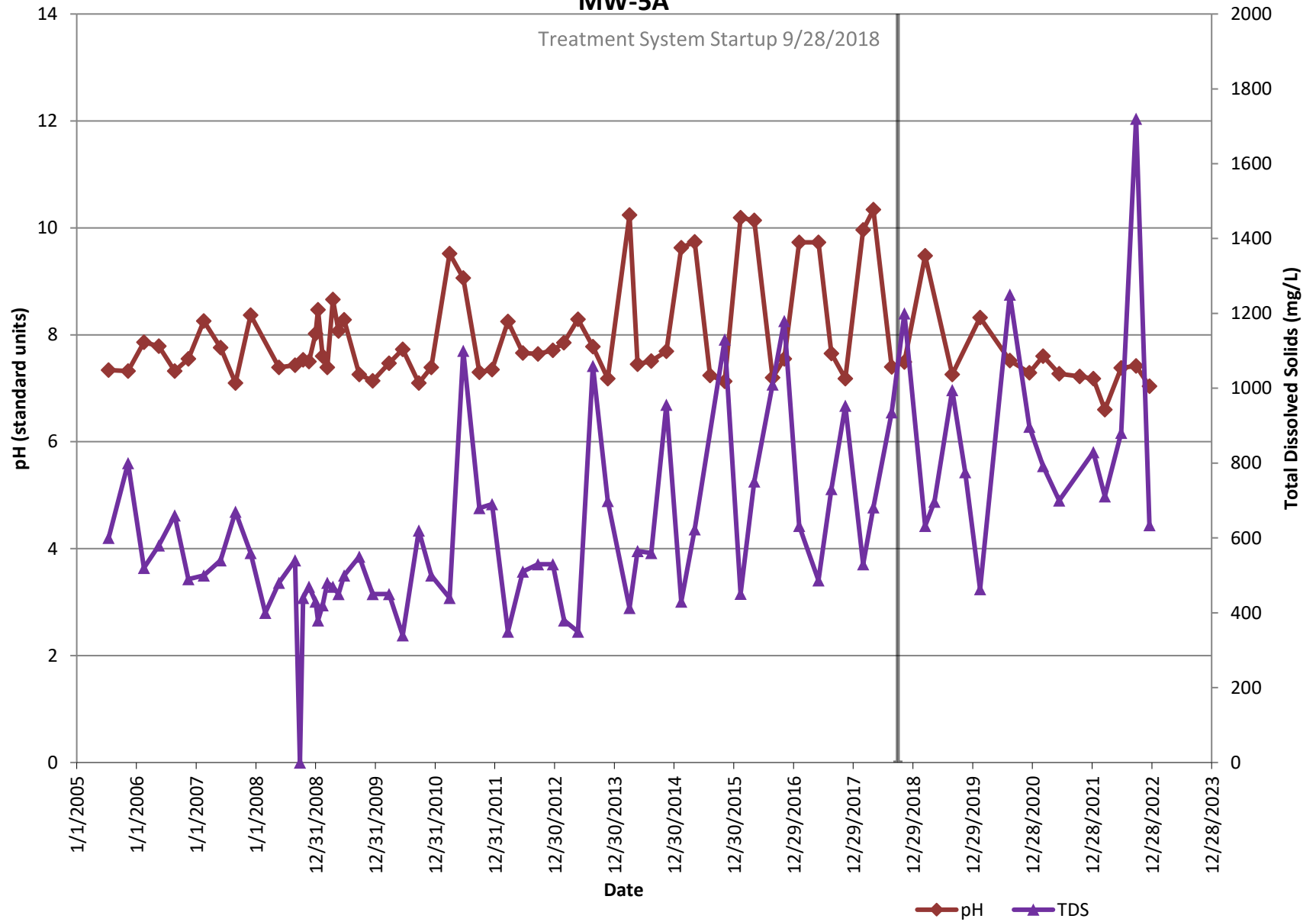
LDA Shallow/Alluvial Monitoring Wells MW-4A



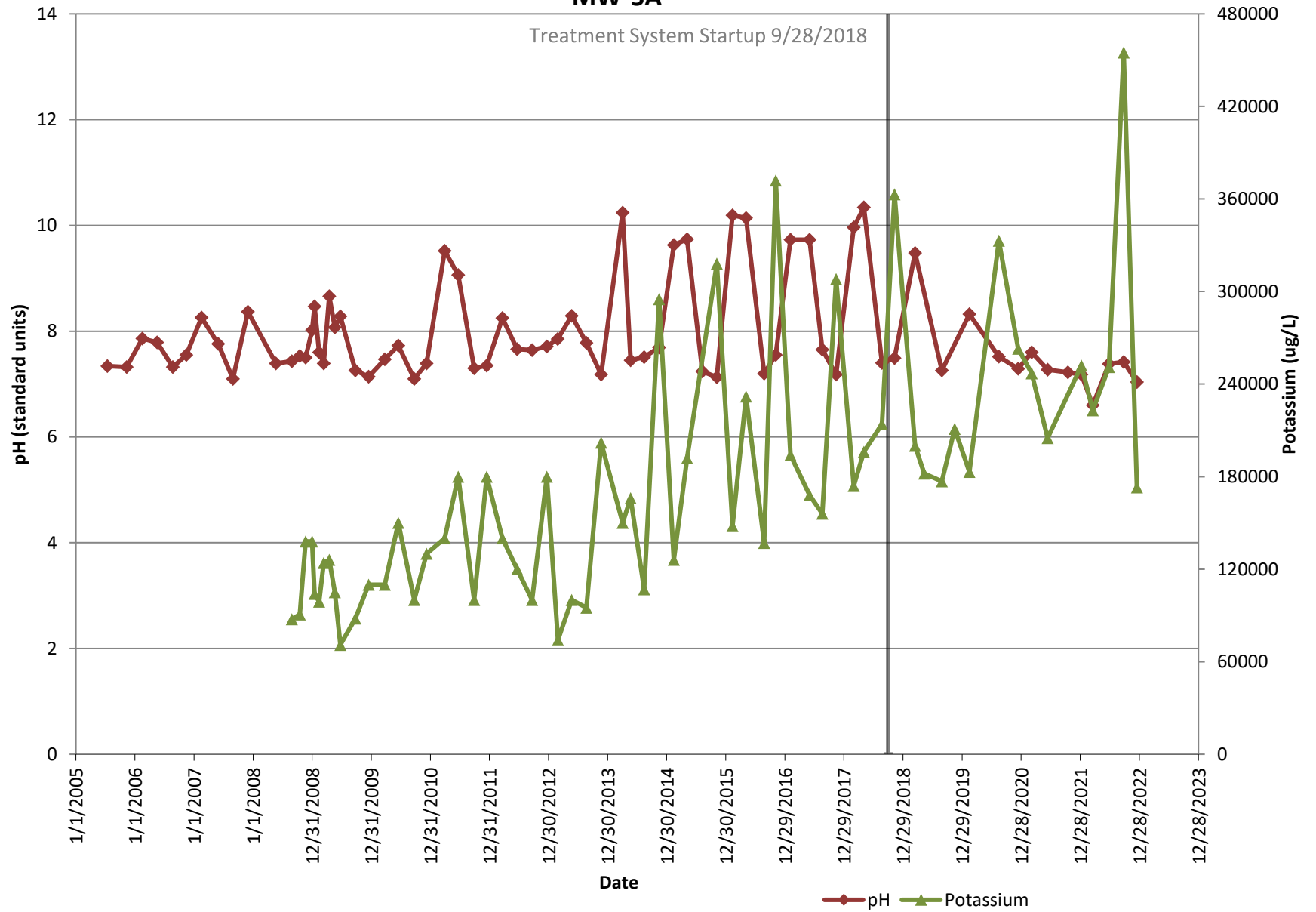
LDA Shallow/Alluvial Monitoring Wells MW-5A



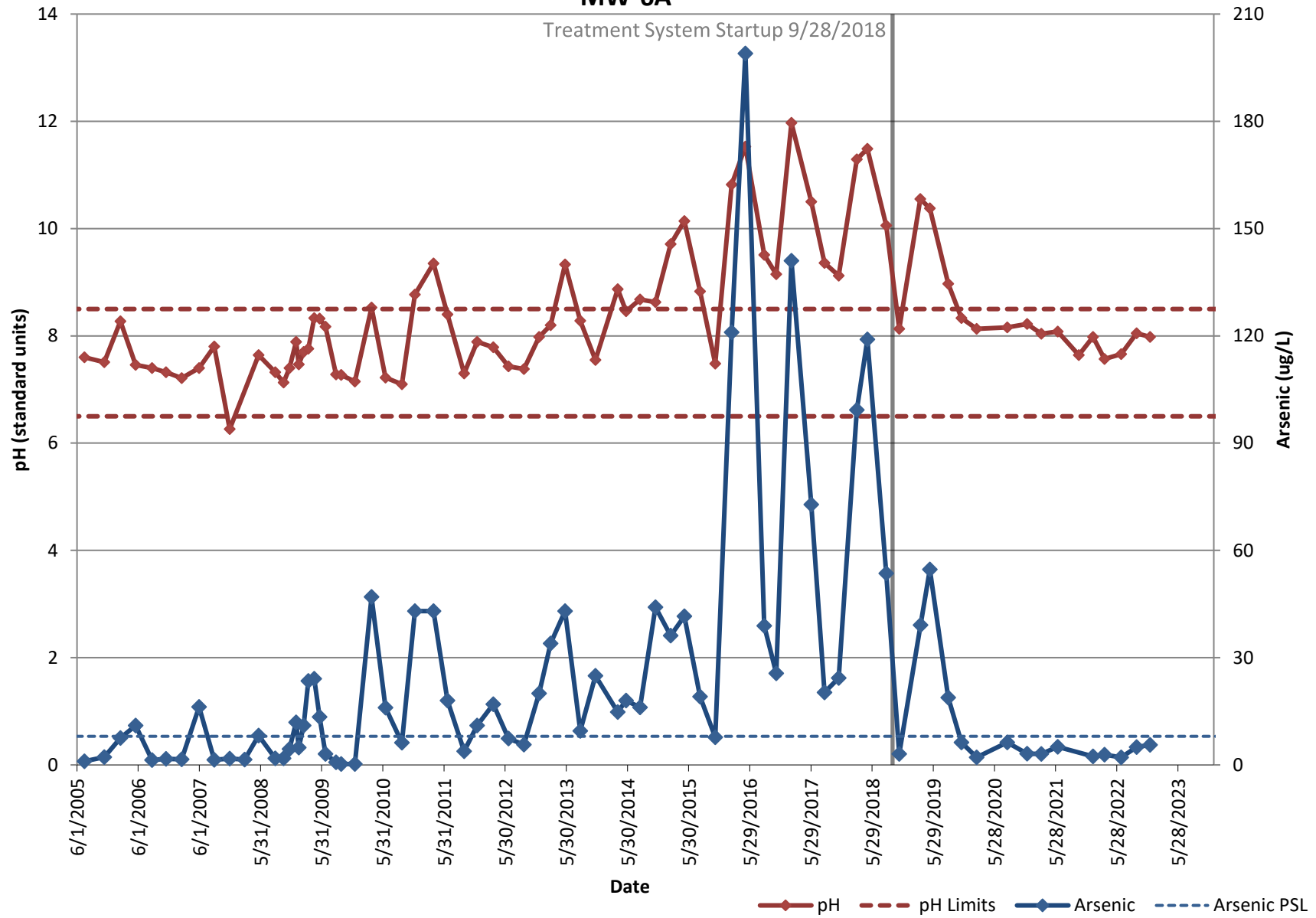
LDA Shallow/Alluvial Monitoring Wells MW-5A



LDA Shallow/Alluvial Monitoring Wells MW-5A

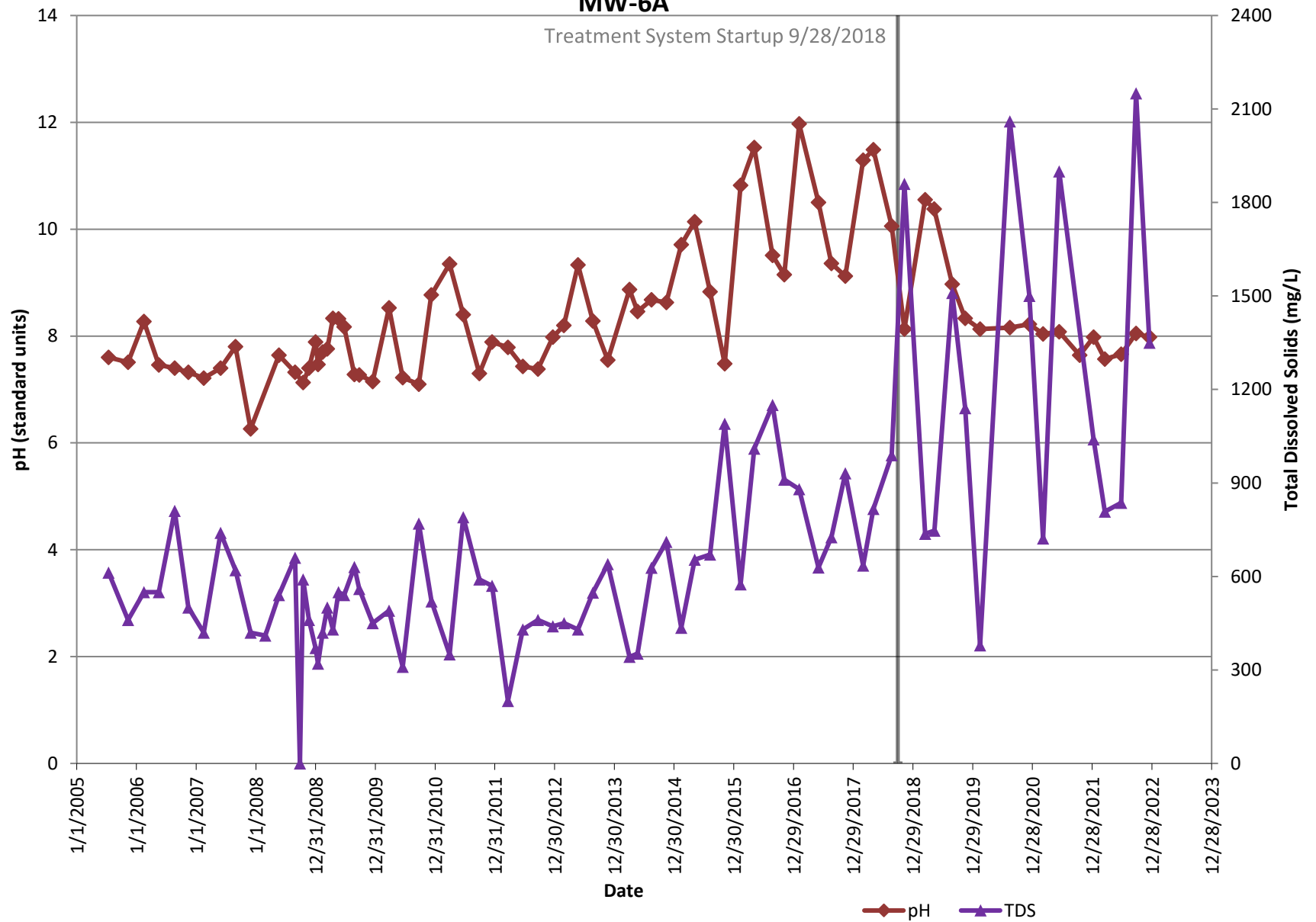


LDA Shallow/Alluvial Monitoring Wells MW-6A

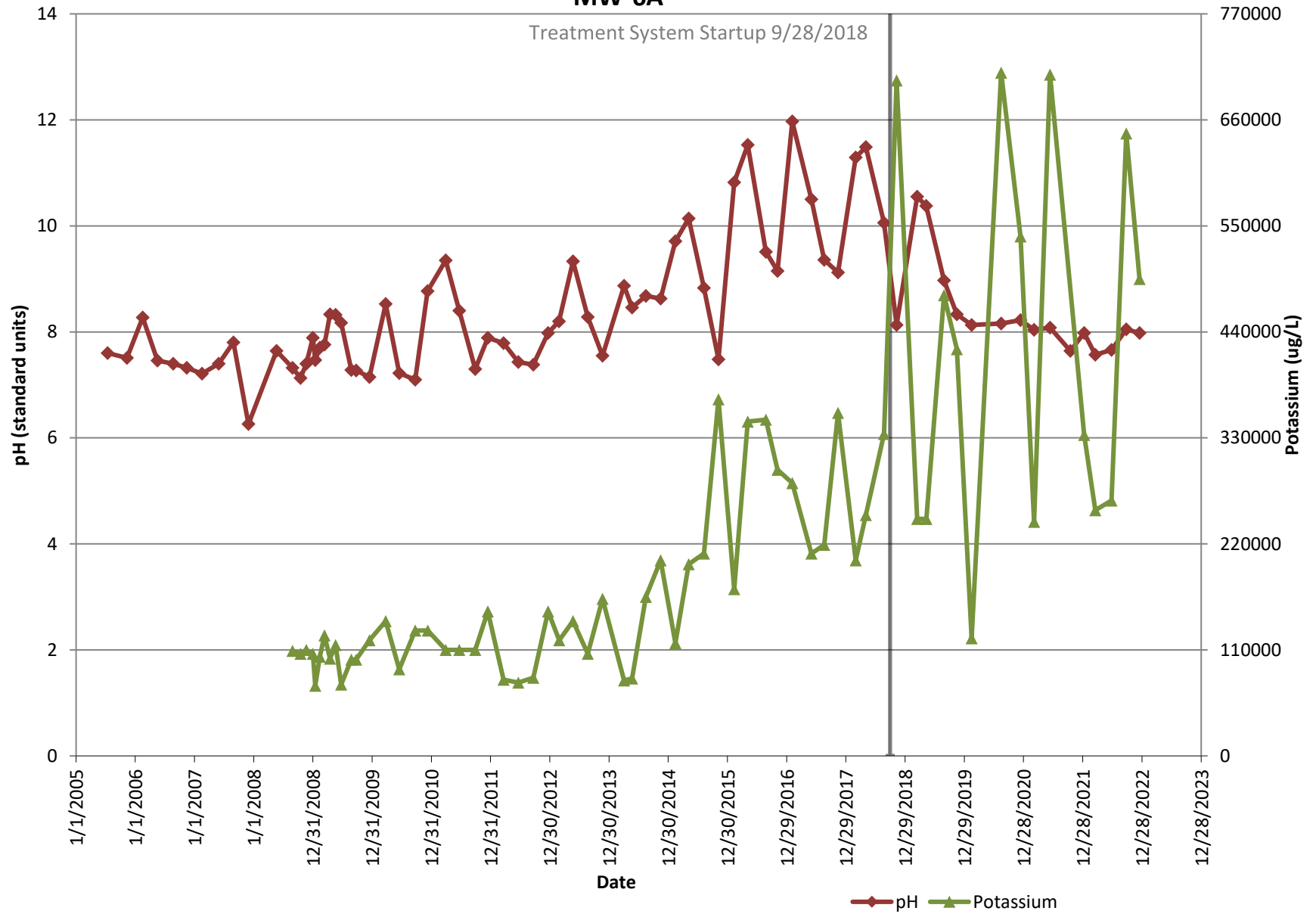


LDA Shallow/Alluvial Monitoring Wells

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:	GL152030402/004.0003
Sample Identification(s):	Weir-1222, South Pond-1222, Still Well-1222, Interceptor Trench-1222, Infiltration Pond-1222, MW-35A-1222, MW-1A-1222, MW-2A-1222, MW-3A-1222, MW-4A-1222, MW-5A-1222, MW-6A-1222, MW-7A-1222, MW-8A-1222, MW-9A-1222, MW-10A-1222, P-14-1222, P-15-1222, P-16-1222, P-17-1222, MW-45A-1222, Baja Well-1222, MW-99-1-1222
Sample Date(s):	12/12/22, 12/13/22, 12/14/22, 1/5/23
Sample Team:	Sean Johnson, Golder Associates/WSP Andrew Waser, Golder Associates/WSP
Sample Matrix:	Aqueous
Analyzing Laboratory:	Analytical Resources, Inc. – Tukwila, WA
Analyses:	TDS (SM2540C); Total Metals K, Pb, Sb, V (SW6010D, E200.8); As (E200.8 UCT-KED)
Laboratory Report No.:	22L0385, 23A0096

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:

In SDG 22L0385, the Cooler Receipt Form indicated that one cooler was received at a temperature of -1.3°C, which is outside the recommended cooler temperature range of 0-6°C. There was no indication that the samples were received partially frozen. There is no other action but 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:

- Field duplicates are as followed: MW-35A-1222 is a duplicate to Infiltration Pond-1222 and MW-45A-1222 is a field duplicate to MW-2A-1222. The field duplicate pair for MW-2A-1222/MW-45A-1222 displayed a relative percent difference (RPD) greater than the control limit for arsenic. The parent and duplicate sample were qualified as estimated (J).

- There was a detection in the field blank for lead at 0.195 µg/L. When the blank concentration was greater than the RL and associated sample results were greater than the RL but less than ten times the blank results the sample results were qualified J+. If the sample results were less than the RL, the sample was qualified U at the reporting limit. If the sample results were ND or greater than ten times the blank result no qualifications were required.

GENERAL WET CHEMISTRY

TDS (SM 2540C)	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				
6. LCS duplicate (LCSD) %R	X				
7. MS duplicate (MSD) %R	X				
8. MS/MSD RPD	X				
9. LCS/LCSD RPD	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:

- Holding times were outside the recommended holding time for sample MW-99-1-1222 (the field blank sample). The sample was initially analyzed within the recommended holding time at a dilution, then reanalyzed at a lesser dilution outside of the holding time. Field QC are not qualified. There is no other action but to note.
- Field duplicates are as followed: MW-35A-1222 is a duplicate to Infiltration Pond-1222 and MW-45A-1222 is a field duplicate to MW-2A-1222.

DATA VALIDATION CHECKLIST

SUMMARY AND DATA QUALIFIER CODES

Project Name:	Ravensdale Project
Project Number:	GL152030402/004.0003
Sample Identification(s):	Weir-1222, South Pond-1222, Still Well-1222, Interceptor Trench-1222, Infiltration Pond-1222, MW-35A-1222, MW-1A-1222, MW-2A-1222, MW-3A-1222, MW-4A-1222, MW-5A-1222, MW-6A-1222, MW-7A-1222, MW-8A-1222, MW-9A-1222, MW-10A-1222, P-14-1222, P-15-1222, P-16-1222, P-17-1222, MW-45A-1222, Baja Well-1222, MW-99-1-1222,
Sample Date(s):	12/12/22, 12/13/22, 12/14/22, 1/5/23
Sample Team:	Sean Johnson, Golder Associates/WSP Andrew Waser, Golder Associates/WSP
Sample Matrix:	Aqueous
Analyzing Laboratory:	Analytical Resources, Inc. – Tukwila, WA
Analyses:	TDS (SM2540C); Total Metals K, Pb, Sb, V (SW6010D, E200.8); As (E200.8 UCT-KED)
Laboratory Report No.:	22L0385, 23A0096

Sample ID	Analyte(s)	Old Result	Old Qualifier	New Result	New Qualifier	Reason(s)
WEIR-1222	Lead	-	-	-	J+	Field blank contamination, sample result greater than RL but less than 10x blank result.
MW-2A-1222	Lead	-	-	-	J+	Field blank contamination, sample result greater than RL but less than 10x blank result.
MW-3A-1222	Lead	-	-	-	J+	Field blank contamination, sample result greater than RL but less than 10x blank result.
MW-5A-1222	Lead	-	-	-	J+	Field blank contamination, sample result greater than RL but less than 10x blank result.
MW-6A-1222	Lead	-	-	-	J+	Field blank contamination, sample result greater than RL but less than 10x blank result.
MW-10A-1222	Lead	0.088	J	0.100	U	Field blank contamination, sample result less than RL.
MW-45A-1222	Lead	-	-	-	J+	Field blank contamination, sample result greater than RL but less than 10x blank result.
BAJA WELL-1222	Lead	-	-	-	J+	Field blank contamination, sample result greater than RL but less than 10x blank result.
MW-2A-1222	Arsenic	-	-	-	J	Field duplicate RPD greater than control limit
MW-45A-1222	Arsenic	-	-	-	J	Field duplicate RPD greater than control limit

VALIDATION PERFORMED BY:	Tunde Komuves-Sandor, WSP
DATE:	February 10, 2023
PEER REVIEW PERFORMED BY:	Michael Shadle, WSP
DATE:	February 24, 2023

RPD Value 30

		Primary Sample Infiltration Ponds-1222 23A0096-01		Duplicate Sample MW-35A-1222 23A0096-02					
SDG	Analyte	Result	RL	Result	RL	Abs Diff	RPD	Criteria	Qualifier
23A0096	Antimony	19	1	20.2	1	1.4	7.2	RPD	OK
23A0096	Lead	2.49	0.2	2.06	0.2	0.43	18.9	RPD	OK
23A0096	Vanadium	4.45	0.4	4.39	0.4	0.06	1.4	RPD	OK
23A0096	Arsenic	26.7	0.2	27	0.2	0.3	1.1	RPD	OK
23A0096	Potassium	567	1	587	1	20	3.5	RPD	OK
23A0096	Total Dissolved Solids	1560	20	1490	20	70	4.6	RPD	OK

RPD Value 30

		Primary Sample MW-2A-1222 22L0385-06		Duplicate Sample MW-45A-1222 22L0385-19					
SDG	Analyte	Result	RL	Result	RL	Abs Diff	RPD	Criteria	Qualifier
22L0385	Antimony	1	0.2	1.21	0.2	0.04	3.4	RPD	OK
22L0385	Lead	0.218	0.1	0.203	0.1	0.015	7.1	Abs Diff	OK
22L0385	Vanadium	1.59	0.2	1.81	0.2	0.22	12.9	RPD	OK
22L0385	Arsenic	1.28	0.2	1.79	0.2	0.51	33.2	RPD	J
22L0385	Potassium	21.8	0.5	22.1	0.5	0.3	1.4	RPD	OK
22L0385	Total Dissolved Solids	319	10	384	10	65	18.5	RPD	OK



Analytical Resources, LLC
Analytical Chemists and Consultants

17 January 2023

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)
22L0385

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

ARI Assigned Number: 27L0385	Turn-around Requested: Standard	Date: 12/14/22
ARI Client Company: Golder	Phone: (425) 883-0777	Page: 1 of 3
Client Contact: Gary Zimmerman	No. of Coolers:	Cooler Temps:

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested							Notes/Comments	
					Total Metals: As, Pb, Sb, V, K	TDS							
WEIR - 1222	12/13/22	10:45	SW	2	X	X							
SOUTH POND - 1222	12/13/22	10:23	SW	2	X	X							
STILL WELL - 1222	12/13/22	11:10	SW	2	X	X							
INTERCEPTOR TRENCH - 1222	12/14/22	9:20	SW	1		X							

Comments/Special Instructions Analyze in accordance with MSA between Golder and ARI. Ecology EIM EDD.	Relinquished by: (Signature) <i>[Signature]</i>	Received by: (Signature) <i>[Signature]</i>	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Andrew Waser	Printed Name: [Signature]	Printed Name:	Printed Name:
	Company: Golder/WSP	Company: ARI LLC	Company:	Company:
	Date & Time: 12/15/22 09:25	Date & Time: 12/15/22 9:25	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: Unless specified by workorder or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.

Chain of Custody Record & Laboratory Analysis Request



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

ARI Assigned Number: <i>220585</i>	Turn-around Requested: Standard	Date: <i>12/14/22</i>
ARI Client Company: Golder	Phone: (425) 883-0777	Page: <i>2</i> of <i>3</i>
Client Contact: Gary Zimmerman	No. of Coolers:	Cooler Temps:

Client Project Name: Ravensdale 2022 Q3 Sampling	Analysis Requested						Notes/Comments
Client Project #: 152030402.004	Samplers: Sean Johnson and Ryan Kober <i>SS</i>	Total Metals: As, Pb, Sb, V, K	TDS				

Sample ID	Date	Time	Matrix	No. Containers	Total Metals: As, Pb, Sb, V, K	TDS											
MW-1A-1222	12/13/22	14:25	GW	2	X	X											
MW-2A-1222	12/13/22	13:35	GW	2	X	X											
MW-3A-1222	12/12/22	14:50	GW	2	X	X											
MW-4A-1222	12/14/22	10:00	GW	2	X	X											
MW-5A-1222	12/13/22	12:10	GW	2	X	X											
MW-6A-1222	12/13/22	12:55	GW	2	X	X											
MW-7A-1222	12/14/22	15:26	GW	6	X	X											MS/MSD
MW-8A-1222	12/13/22	15:25	GW	2	X	X											
MW-9A-1222	12/14/22	10:40	GW	2	X	X											
MW-10A-1222	12/13/22	9:15	GW	2	X	X											

Comments/Special Instructions Analyze in accordance with MSA between Golder and ARI. Ecology EIM EDD.	Relinquished by: (Signature) <i>[Signature]</i>	Received by: (Signature) <i>[Signature]</i>	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Andrew Vaser	Printed Name: Tina Somers	Printed Name:	Printed Name:
	Company: Golder/USP	Company: ARI LLC	Company:	Company:
	Date & Time: 12/15/22 0925	Date & Time: 12/15/22 9:24	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: Unless specified by workorder or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.

Chain of Custody Record & Laboratory Analysis Request



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

ARI Assigned Number: 2220385	Turn-around Requested: Standard	Date:
ARI Client Company: Golder	Phone: (425) 883-0777	Page: 3 of 3
Client Contact: Gary Zimmerman	No. of Coolers:	Cooler Temps:

Client Project Name: Ravensdale 2022 Q4 Sampling	Analysis Requested						Notes/Comments
Client Project #: 152030402.004	Samplers: Sean Johnson and Ryan Keber SS	Total Metals: As, Pb, Sb, V, K	TDS				

Sample ID	Date	Time	Matrix	No. Containers	Total Metals: As, Pb, Sb, V, K	TDS										
P-14-1222	12/14/22	11:50	GW	2	X	X										
P-15-1222	12/14/22	12:45	GW	2	X	X										
P-16-1222	12/13/22	10:05	GW	2	X	X										
P-17-1222	12/14/22	9:10	GW	2	X	X										
MW-45A-1222	12/13/22	13:40	GW	2	X	X										
BASA Well-1222	12/14/22	14:35	GW	2	X	X										
MW-99-1-1222	12/14/22	13:30	D.I	2	X	X										

Comments/Special Instructions Analyze in accordance with MSA between Golder and ARI. Ecology EIM EDD.	Relinquished by: (Signature) <i>[Signature]</i>	Received by: (Signature) <i>[Signature]</i>	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Andrew Luser	Printed Name: Trent Simon	Printed Name:	Printed Name:
	Company: Golder/WSP	Company: ARZ LLC	Company:	Company:
	Date & Time: 12/15/22 0925	Date & Time: 12/15/22 9:24	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, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: Unless specified by workorder or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.



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

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

Reported:
17-Jan-2023 11:08

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WEIR-1222	22L0385-01	Water	13-Dec-2022 10:45	15-Dec-2022 09:24
SOUTH POND-1222	22L0385-02	Water	13-Dec-2022 10:23	15-Dec-2022 09:24
STILL WELL-1222	22L0385-03	Water	13-Dec-2022 11:10	15-Dec-2022 09:24
INTERCEPTOR TRENCH-1222	22L0385-04	Water	14-Dec-2022 09:20	15-Dec-2022 09:24
MW-1A-1222	22L0385-05	Water	13-Dec-2022 14:25	15-Dec-2022 09:24
MW-2A-1222	22L0385-06	Water	13-Dec-2022 13:35	15-Dec-2022 09:24
MW-3A-1222	22L0385-07	Water	12-Dec-2022 14:50	15-Dec-2022 09:24
MW-4A-1222	22L0385-08	Water	14-Dec-2022 10:00	15-Dec-2022 09:24
MW-5A-1222	22L0385-09	Water	13-Dec-2022 12:10	15-Dec-2022 09:24
MW-6A-1222	22L0385-10	Water	13-Dec-2022 12:55	15-Dec-2022 09:24
MW-7A-1222	22L0385-11	Water	14-Dec-2022 15:26	15-Dec-2022 09:24
MW-8A-1222	22L0385-12	Water	13-Dec-2022 15:25	15-Dec-2022 09:24
MW-9A-1222	22L0385-13	Water	14-Dec-2022 10:40	15-Dec-2022 09:24
MW-10A-1222	22L0385-14	Water	13-Dec-2022 09:15	15-Dec-2022 09:24
P-14-1222	22L0385-15	Water	14-Dec-2022 11:50	15-Dec-2022 09:24
P-15-1222	22L0385-16	Water	14-Dec-2022 12:45	15-Dec-2022 09:24
P-16-1222	22L0385-17	Water	13-Dec-2022 10:05	15-Dec-2022 09:24
P-17-1222	22L0385-18	Water	14-Dec-2022 09:10	15-Dec-2022 09:24
MW-45A-1222	22L0385-19	Water	13-Dec-2022 13:40	15-Dec-2022 09:24
BAJA WELL-1222	22L0385-20	Water	14-Dec-2022 14:35	15-Dec-2022 09:24
MW-99-1-1222	22L0385-21	Water	14-Dec-2022 13:30	15-Dec-2022 09:24



Golder Associates

18300 NE Union Hill Road Suite 200

Redmond WA, 98052-3333

Project: Ravensdale

Project Number: Ravensdale

Project Manager: Gary Zimmerman

Reported:

17-Jan-2023 11:08

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 with the exception of sample 22L0385-21 which was originally analyzed at a dilution and re-analyzed at a lesser dilution outside of the holding time. Both runs were reported.

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 duplicate (DUP) relative percent difference (RPD) were within advisory control limits.



WORK ORDER

22L0385

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
22L0385-01 A	HDPE NM, 1000 mL	
22L0385-01 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22L0385-02 A	HDPE NM, 1000 mL	
22L0385-02 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22L0385-03 A	HDPE NM, 1000 mL	
22L0385-03 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22L0385-04 A	HDPE NM, 1000 mL	
22L0385-05 A	HDPE NM, 1000 mL	
22L0385-05 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22L0385-06 A	HDPE NM, 1000 mL	
22L0385-06 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22L0385-07 A	HDPE NM, 1000 mL	
22L0385-07 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22L0385-08 A	HDPE NM, 1000 mL	
22L0385-08 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22L0385-09 A	HDPE NM, 1000 mL	
22L0385-09 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22L0385-10 A	HDPE NM, 1000 mL	
22L0385-10 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22L0385-11 A	HDPE NM, 1000 mL	
22L0385-11 B	HDPE NM, 1000 mL	
22L0385-11 C	HDPE NM, 1000 mL	
22L0385-11 D	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22L0385-11 E	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22L0385-11 F	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22L0385-12 A	HDPE NM, 1000 mL	
22L0385-12 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22L0385-13 A	HDPE NM, 1000 mL	
22L0385-13 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22L0385-14 A	HDPE NM, 1000 mL	
22L0385-14 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22L0385-15 A	HDPE NM, 1000 mL	
22L0385-15 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
22L0385-16 A	HDPE NM, 1000 mL	




WORK ORDER

22L0385

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

22L0385-16 B	HDPE NM, 500 mL, 1:1 HNO3	L2pass
22L0385-17 A	HDPE NM, 1000 mL	
22L0385-17 B	HDPE NM, 500 mL, 1:1 HNO3	L2pass
22L0385-18 A	HDPE NM, 1000 mL	
22L0385-18 B	HDPE NM, 500 mL, 1:1 HNO3	L2pass
22L0385-19 A	HDPE NM, 1000 mL	
22L0385-19 B	HDPE NM, 500 mL, 1:1 HNO3	L2pass
22L0385-20 A	HDPE NM, 1000 mL	
22L0385-20 B	HDPE NM, 500 mL, 1:1 HNO3	L2pass
22L0385-21 A	HDPE NM, 1000 mL	
22L0385-21 B	HDPE NM, 500 mL, 1:1 HNO3	L2pass

Preservation Confirmed By 

Date 12/15/22



Cooler Receipt Form

ARI Client: Bolger

Project Name: Riverside 2022 24 Samples

COC No(s): _____ (NA)

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

Assigned ARI Job No: 22L0385

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 9:27 -1.3 .9

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 2009208

Cooler Accepted by: [Signature] Date: 12/15/22 Time: 9:24

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: [Signature] Date: 12/15/22 Time: 10:32 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: 17-Jan-2023 11:08
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WEIR-1222
22L0385-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 12/13/2022 10:45
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 02:17

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-01 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	10.5	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.113	ug/L	
Vanadium	7440-62-2	1	0.0556	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: 17-Jan-2023 11:08
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WEIR-1222
22L0385-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 12/13/2022 10:45
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 02:17

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-01 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	3.27	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: 17-Jan-2023 11:08
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WEIR-1222
22L0385-01 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 12/13/2022 10:45
Instrument: ICP3 Analyst: SKD Analyzed: 01/09/2023 22:44

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22L0385-01 B 02
Preparation Batch: BLA0071 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	1	0.107	0.500	111	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: 17-Jan-2023 11:08
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WEIR-1222
22L0385-01 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/13/2022 10:45
Instrument: BAL2 Analyst: UW Analyzed: 12/15/2022 15:24

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-01
Preparation Batch: BKL0409 Sample Size: 100 mL
Prepared: 12/15/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	535	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:
17-Jan-2023 11:08

SOUTH POND-1222
22L0385-02 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/13/2022 10:23

Instrument: ICPMS2 Analyst: MCB

Analyzed: 01/11/2023 02:00

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN - EPA 3010A M

Extract ID: 22L0385-02 B 02

Preparation Batch: BLA0070

Sample Size: 25 mL

Prepared: 01/04/2023

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	17.5	ug/L	D		
Lead	7439-92-1	5	0.257	0.500	33.1	ug/L	D		
Vanadium	7440-62-2	5	0.278	1.00	79.3	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: 17-Jan-2023 11:08
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SOUTH POND-1222
22L0385-02 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 12/13/2022 10:23
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 02:00

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-02 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	5	0.187	1.00	40.5	ug/L	D



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SOUTH POND-1222
22L0385-02 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 12/13/2022 10:23
Instrument: ICP3 Analyst: SKD Analyzed: 01/10/2023 19:43

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22L0385-02 B 02
Preparation Batch: BLA0071 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	2	0.214	1.00	384	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: 17-Jan-2023 11:08
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SOUTH POND-1222
22L0385-02 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/13/2022 10:23
Instrument: BAL2 Analyst: UW Analyzed: 12/15/2022 15:24

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-02
Preparation Batch: BKL0409 Sample Size: 75 mL
Prepared: 12/15/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	13	13	1170	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: 17-Jan-2023 11:08
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STILL WELL-1222
22L0385-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 12/13/2022 11:10
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 02:05

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-03 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	2	0.202	0.400	71.0	ug/L	D
Lead	7439-92-1	2	0.103	0.200	9.95	ug/L	D
Vanadium	7440-62-2	2	0.111	0.400	11.1	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: 17-Jan-2023 11:08
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STILL WELL-1222
22L0385-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 12/13/2022 11:10
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 02:05

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-03 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	2	0.0746	0.400	125	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: 17-Jan-2023 11:08
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STILL WELL-1222
22L0385-03 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 12/13/2022 11:10
Instrument: ICP3 Analyst: SKD Analyzed: 01/09/2023 22:50

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22L0385-03 B 02
Preparation Batch: BLA0071 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	1	0.107	0.500	309	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: 17-Jan-2023 11:08
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STILL WELL-1222
22L0385-03 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/13/2022 11:10
Instrument: BAL2 Analyst: UW Analyzed: 12/15/2022 15:24

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-03
Preparation Batch: BKL0409 Sample Size: 75 mL
Prepared: 12/15/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	13	13	967	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: 17-Jan-2023 11:08
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INTERCEPTOR TRENCH-1222
22L0385-04 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/14/2022 09:20
Instrument: BAL2 Analyst: UW Analyzed: 12/15/2022 15:24

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-04
Preparation Batch: BKL0409 Sample Size: 100 mL
Prepared: 12/15/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	279	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: 17-Jan-2023 11:08
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MW-1A-1222
22L0385-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 12/13/2022 14:25
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 02:28

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-05 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	0.955	ug/L	
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	0.791	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: 17-Jan-2023 11:08
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MW-1A-1222
22L0385-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 12/13/2022 14:25
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 02:28

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-05 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	1.13	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: 17-Jan-2023 11:08
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MW-1A-1222
22L0385-05 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 12/13/2022 14:25
Instrument: ICP3 Analyst: SKD Analyzed: 01/09/2023 22:53

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22L0385-05 B 02
Preparation Batch: BLA0071 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	1	0.107	0.500	14.5	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: 17-Jan-2023 11:08
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MW-1A-1222
22L0385-05 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/13/2022 14:25
Instrument: BAL2 Analyst: UW Analyzed: 12/15/2022 15:24

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-05
Preparation Batch: BKL0409 Sample Size: 100 mL
Prepared: 12/15/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	234	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: 17-Jan-2023 11:08
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MW-2A-1222
22L0385-06 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 12/13/2022 13:35
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 02:33

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-06 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	1.17	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.218	ug/L	
Vanadium	7440-62-2	1	0.0556	0.200	1.59	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: 17-Jan-2023 11:08
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MW-2A-1222
22L0385-06 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 12/13/2022 13:35
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 02:33

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-06 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	1.28	ug/L	



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MW-2A-1222
22L0385-06 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 12/13/2022 13:35
Instrument: ICP3 Analyst: SKD Analyzed: 01/10/2023 19:38

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22L0385-06 B 02
Preparation Batch: BLA0071 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	1	0.107	0.500	21.8	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: 17-Jan-2023 11:08
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MW-2A-1222
22L0385-06 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/13/2022 13:35
Instrument: BAL2 Analyst: UW Analyzed: 12/15/2022 16:11

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-06
Preparation Batch: BKL0410 Sample Size: 100 mL
Prepared: 12/15/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	319	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: 17-Jan-2023 11:08
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MW-3A-1222
22L0385-07 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 12/12/2022 14:50
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 02:38

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-07 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	9.50	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.115	ug/L	
Vanadium	7440-62-2	1	0.0556	0.200	1.26	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: 17-Jan-2023 11:08
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MW-3A-1222
22L0385-07 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 12/12/2022 14:50
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 02:38

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-07 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	1.72	ug/L	



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MW-3A-1222
22L0385-07 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 12/12/2022 14:50
Instrument: ICP3 Analyst: SKD Analyzed: 01/10/2023 19:40

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22L0385-07 B 02
Preparation Batch: BLA0071 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	1	0.107	0.500	99.8	mg/L	



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MW-3A-1222
22L0385-07 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/12/2022 14:50
Instrument: BAL2 Analyst: UW Analyzed: 12/15/2022 16:11

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-07
Preparation Batch: BKL0410 Sample Size: 100 mL
Prepared: 12/15/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	475	mg/L	



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MW-4A-1222
22L0385-08 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 12/14/2022 10:00
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 02:45

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-08 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 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	1.42	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: 17-Jan-2023 11:08
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MW-4A-1222
22L0385-08 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 12/14/2022 10:00
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 02:45

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-08 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	0.188	ug/L	J



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MW-4A-1222
22L0385-08 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 12/14/2022 10:00
Instrument: ICP3 Analyst: SKD Analyzed: 01/10/2023 20:17

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22L0385-08 B 02
Preparation Batch: BLA0071 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	1	0.107	0.500	0.583	mg/L	



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MW-4A-1222
22L0385-08 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/14/2022 10:00
Instrument: BAL2 Analyst: UW Analyzed: 12/15/2022 16:11

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-08
Preparation Batch: BKL0410 Sample Size: 200 mL
Prepared: 12/15/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	224	mg/L	



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MW-5A-1222
22L0385-09 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 12/13/2022 12:10
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 03:08

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-09 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	3.54	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.105	ug/L	
Vanadium	7440-62-2	1	0.0556	0.200	1.25	ug/L	



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MW-5A-1222
22L0385-09 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 12/13/2022 12:10
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 03:08

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-09 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	1.89	ug/L	



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MW-5A-1222
22L0385-09 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 12/13/2022 12:10
Instrument: ICP3 Analyst: SKD Analyzed: 01/10/2023 20:20

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22L0385-09 B 02
Preparation Batch: BLA0071 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	1	0.107	0.500	173	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: 17-Jan-2023 11:08
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MW-5A-1222
22L0385-09 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/13/2022 12:10
Instrument: BAL2 Analyst: UW Analyzed: 12/15/2022 16:11

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-09
Preparation Batch: BKL0410 Sample Size: 100 mL
Prepared: 12/15/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	634	mg/L	



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Redmond WA, 98052-3333

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

Reported:
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MW-6A-1222
22L0385-10 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/13/2022 12:55

Instrument: ICPMS2 Analyst: MCB

Analyzed: 01/12/2023 00:54

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN - EPA 3010A M

Extract ID: 22L0385-10 B 01

Preparation Batch: BLA0070

Sample Size: 25 mL

Prepared: 01/04/2023

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	5	0.505	1.00	12.4	ug/L	D
Lead	7439-92-1	1	0.0513	0.100	0.865	ug/L	
Vanadium	7440-62-2	1	0.0556	0.200	1.26	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: 17-Jan-2023 11:08
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MW-6A-1222
22L0385-10 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 12/13/2022 12:55
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 03:13

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-10 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	5.64	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: 17-Jan-2023 11:08
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MW-6A-1222
22L0385-10 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 12/13/2022 12:55
Instrument: ICP3 Analyst: SKD Analyzed: 01/11/2023 18:31

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22L0385-10 B 02
Preparation Batch: BLA0071 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	2	0.214	1.00	495	mg/L	D



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MW-6A-1222
22L0385-10 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/13/2022 12:55
Instrument: BAL2 Analyst: UW Analyzed: 12/15/2022 16:11

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-10
Preparation Batch: BKL0410 Sample Size: 50 mL
Prepared: 12/15/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	20	20	1350	mg/L	



Golder Associates
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Redmond WA, 98052-3333

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

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MW-7A-1222
22L0385-11 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/14/2022 15:26

Instrument: ICPMS2 Analyst: MCB

Analyzed: 01/11/2023 00:36

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN - EPA 3010A M

Extract ID: 22L0385-11 F 02

Preparation Batch: BLA0070

Sample Size: 25 mL

Prepared: 01/04/2023

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	1.64	ug/L	
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Vanadium	7440-62-2	2	0.111	0.400	0.798	ug/L	D



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MW-7A-1222
22L0385-11 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 12/14/2022 15:26
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/12/2023 01:06

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-11 F 01
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	2	0.0746	0.400	1.18	ug/L	D



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MW-7A-1222
22L0385-11 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 12/14/2022 15:26
Instrument: ICP3 Analyst: SKD Analyzed: 01/09/2023 22:56

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22L0385-11 F 02
Preparation Batch: BLA0071 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	1	0.107	0.500	42.7	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: 17-Jan-2023 11:08
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MW-7A-1222
22L0385-11 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/14/2022 15:26
Instrument: BAL2 Analyst: UW Analyzed: 12/15/2022 16:11

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-11
Preparation Batch: BKL0410 Sample Size: 100 mL
Prepared: 12/15/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	335	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: 17-Jan-2023 11:08
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MW-8A-1222
22L0385-12 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 12/13/2022 15:25
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 03:18

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-12 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	4.53	ug/L	
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	3.61	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: 17-Jan-2023 11:08
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MW-8A-1222
22L0385-12 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 12/13/2022 15:25
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 03:18

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-12 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	5.37	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: 17-Jan-2023 11:08
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MW-8A-1222
22L0385-12 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 12/13/2022 15:25
Instrument: ICP3 Analyst: SKD Analyzed: 01/10/2023 20:26

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22L0385-12 B 02
Preparation Batch: BLA0071 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	1	0.107	0.500	205	mg/L	



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MW-8A-1222
22L0385-12 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/13/2022 15:25
Instrument: BAL2 Analyst: UW Analyzed: 12/15/2022 16:11

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-12
Preparation Batch: BKL0410 Sample Size: 75 mL
Prepared: 12/15/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	13	13	721	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: 17-Jan-2023 11:08
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MW-9A-1222
22L0385-13 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 12/14/2022 10:40
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 03:25

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-13 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	0.132	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	0.867	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: 17-Jan-2023 11:08
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MW-9A-1222
22L0385-13 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 12/14/2022 10:40
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 03:25

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-13 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	0.599	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: 17-Jan-2023 11:08
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MW-9A-1222
22L0385-13 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 12/14/2022 10:40
Instrument: ICP3 Analyst: SKD Analyzed: 01/10/2023 20:29

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22L0385-13 B 02
Preparation Batch: BLA0071 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	1	0.107	0.500	1.63	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: 17-Jan-2023 11:08
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MW-9A-1222
22L0385-13 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/14/2022 10:40
Instrument: BAL2 Analyst: UW Analyzed: 12/15/2022 16:11

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-13
Preparation Batch: BKL0410 Sample Size: 100 mL
Prepared: 12/15/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	328	mg/L	



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MW-10A-1222
22L0385-14 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 12/13/2022 09:15
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 03:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-14 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	0.173	ug/L	J
Lead	7439-92-1	1	0.0513	0.100	0.0880	ug/L	J
Vanadium	7440-62-2	1	0.0556	0.200	1.10	ug/L	



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MW-10A-1222
22L0385-14 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 12/13/2022 09:15
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 03:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-14 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	1.30	ug/L	



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MW-10A-1222
22L0385-14 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 12/13/2022 09:15
Instrument: ICP3 Analyst: SKD Analyzed: 01/10/2023 20:32

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22L0385-14 B 02
Preparation Batch: BLA0071 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	1	0.107	0.500	2.06	mg/L	



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MW-10A-1222
22L0385-14 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/13/2022 09:15
Instrument: BAL2 Analyst: UW Analyzed: 12/15/2022 16:11

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-14
Preparation Batch: BKL0410 Sample Size: 200 mL
Prepared: 12/15/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	200	mg/L	



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P-14-1222
22L0385-15 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 12/14/2022 11:50
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/12/2023 00:49

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-15 B 01
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	20	2.02	4.00	130	ug/L	D
Lead	7439-92-1	2	0.103	0.200	11.1	ug/L	D
Vanadium	7440-62-2	2	0.111	0.400	23.0	ug/L	D



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P-14-1222
22L0385-15 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 12/14/2022 11:50
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/12/2023 00:49

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-15 B 01
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	20	0.746	4.00	255	ug/L	D



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P-14-1222
22L0385-15 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 12/14/2022 11:50
Instrument: ICP3 Analyst: SKD Analyzed: 01/11/2023 18:37

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22L0385-15 B 02
Preparation Batch: BLA0071 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	10	1.07	5.00	2710	mg/L	D



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P-14-1222
22L0385-15 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/14/2022 11:50
Instrument: BAL2 Analyst: UW Analyzed: 12/15/2022 16:11

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-15
Preparation Batch: BKL0410 Sample Size: 10 mL
Prepared: 12/15/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	100	100	6730	mg/L	



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P-15-1222
22L0385-16 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 12/14/2022 12:45
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/12/2023 00:58

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-16 B 01
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	5	0.505	1.00	1.72	ug/L	D
Lead	7439-92-1	5	0.257	0.500	173	ug/L	D
Vanadium	7440-62-2	5	0.278	1.00	1.19	ug/L	D



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P-15-1222
22L0385-16 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 12/14/2022 12:45
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/12/2023 00:58

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-16 B 01
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	5	0.187	1.00	5.07	ug/L	D



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P-15-1222
22L0385-16 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 12/14/2022 12:45
Instrument: ICP3 Analyst: SKD Analyzed: 01/11/2023 18:34

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22L0385-16 B 02
Preparation Batch: BLA0071 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	5	0.534	2.50	1070	mg/L	D



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P-15-1222
22L0385-16 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/14/2022 12:45
Instrument: BAL2 Analyst: UW Analyzed: 12/15/2022 16:11

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-16
Preparation Batch: BKL0410 Sample Size: 10 mL
Prepared: 12/15/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	100	100	3460	mg/L	



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P-16-1222
22L0385-17 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 12/13/2022 10:05
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/10/2023 23:31

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-17 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	10	1.01	2.00	6.52	ug/L	D
Lead	7439-92-1	10	0.513	1.00	12.0	ug/L	D
Vanadium	7440-62-2	20	1.11	4.00	213	ug/L	D



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P-16-1222
22L0385-17 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 12/13/2022 10:05
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/12/2023 00:45

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-17 B 01
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	20	0.746	4.00	55.2	ug/L	D



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P-16-1222
22L0385-17 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 12/13/2022 10:05
Instrument: ICP3 Analyst: SKD Analyzed: 01/10/2023 20:40

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22L0385-17 B 02
Preparation Batch: BLA0071 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	5	0.534	2.50	820	mg/L	D



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P-16-1222
22L0385-17 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/13/2022 10:05
Instrument: BAL2 Analyst: UW Analyzed: 12/15/2022 16:11

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-17
Preparation Batch: BKL0410 Sample Size: 50 mL
Prepared: 12/15/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	20	20	2390	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: 17-Jan-2023 11:08
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P-17-1222
22L0385-18 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 12/14/2022 09:10
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 03:46

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-18 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	1.00	ug/L	
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	1.60	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: 17-Jan-2023 11:08
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P-17-1222
22L0385-18 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 12/14/2022 09:10
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/12/2023 01:02

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-18 B 01
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	2	0.0746	0.400	2.69	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: 17-Jan-2023 11:08
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P-17-1222
22L0385-18 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 12/14/2022 09:10
Instrument: ICP3 Analyst: SKD Analyzed: 01/10/2023 22:47

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22L0385-18 B 02
Preparation Batch: BLA0071 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	1	0.107	0.500	7.82	mg/L	



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P-17-1222
22L0385-18 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/14/2022 09:10
Instrument: BAL2 Analyst: UW Analyzed: 12/15/2022 16:11

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-18
Preparation Batch: BKL0410 Sample Size: 100 mL
Prepared: 12/15/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	377	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: 17-Jan-2023 11:08
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MW-45A-1222
22L0385-19 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 12/13/2022 13:40
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 03:52

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-19 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	1.21	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.203	ug/L	
Vanadium	7440-62-2	1	0.0556	0.200	1.81	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: 17-Jan-2023 11:08
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MW-45A-1222
22L0385-19 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 12/13/2022 13:40
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 03:52

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-19 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	1.79	ug/L	



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MW-45A-1222
22L0385-19 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 12/13/2022 13:40
Instrument: ICP3 Analyst: SKD Analyzed: 01/10/2023 22:50

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22L0385-19 B 02
Preparation Batch: BLA0071 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	1	0.107	0.500	22.1	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: 17-Jan-2023 11:08
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MW-45A-1222
22L0385-19 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/13/2022 13:40
Instrument: BAL2 Analyst: UW Analyzed: 12/15/2022 16:11

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-19
Preparation Batch: BKL0410 Sample Size: 100 mL
Prepared: 12/15/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	384	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: 17-Jan-2023 11:08
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BAJA WELL-1222
22L0385-20 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 12/14/2022 14:35
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 04:15

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-20 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 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	0.272	ug/L	
Vanadium	7440-62-2	1	0.0556	0.200	0.405	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: 17-Jan-2023 11:08
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BAJA WELL-1222
22L0385-20 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 12/14/2022 14:35
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 04:15

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-20 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	0.309	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: 17-Jan-2023 11:08
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BAJA WELL-1222
22L0385-20 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 12/14/2022 14:35
Instrument: ICP3 Analyst: SKD Analyzed: 01/10/2023 22:53

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22L0385-20 B 02
Preparation Batch: BLA0071 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	1	0.107	0.500	4.40	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: 17-Jan-2023 11:08
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BAJA WELL-1222
22L0385-20 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/14/2022 14:35
Instrument: BAL2 Analyst: UW Analyzed: 12/15/2022 16:11

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-20
Preparation Batch: BKL0410 Sample Size: 100 mL
Prepared: 12/15/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	301	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: 17-Jan-2023 11:08
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MW-99-1-1222
22L0385-21 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 12/14/2022 13:30
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 04:20

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-21 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 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	0.195	ug/L	
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: 17-Jan-2023 11:08
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MW-99-1-1222
22L0385-21 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 12/14/2022 13:30
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/11/2023 04:20

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 22L0385-21 B 02
Preparation Batch: BLA0070 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
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: 17-Jan-2023 11:08
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MW-99-1-1222
22L0385-21 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 12/14/2022 13:30
Instrument: ICP3 Analyst: SKD Analyzed: 01/10/2023 22:56

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 22L0385-21 B 02
Preparation Batch: BLA0071 Sample Size: 25 mL
Prepared: 01/04/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	1	0.107	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: 17-Jan-2023 11:08
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MW-99-1-1222
22L0385-21 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/14/2022 13:30
Instrument: BAL2 Analyst: UW Analyzed: 12/15/2022 16:11

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-21
Preparation Batch: BKL0410 Sample Size: 10 mL
Prepared: 12/15/2022 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	100	100	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: 17-Jan-2023 11:08
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MW-99-1-1222
22L0385-21RE1 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 12/14/2022 13:30
Instrument: BAL2 Analyst: UW Analyzed: 01/10/2023 15:05

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 22L0385-21RE1
Preparation Batch: BLA0227 Sample Size: 200 mL
Prepared: 01/10/2023 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	ND	mg/L	H, U



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 17-Jan-2023 11:08
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Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BLA0070 - EPA 200.8

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLA0070-BLK1)						Prepared: 04-Jan-2023 Analyzed: 10-Jan-2023 21:00						
Antimony	121	ND	0.101	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
Arsenic	75a	ND	0.0373	0.200	ug/L							U
LCS (BLA0070-BS1)						Prepared: 04-Jan-2023 Analyzed: 10-Jan-2023 21:05						
Antimony	121	25.7	0.101	0.200	ug/L	25.0		103	80-120			
Lead	208	28.1	0.0513	0.100	ug/L	25.0		112	80-120			
Vanadium	51a	25.8	0.0556	0.200	ug/L	25.0		103	80-120			
Arsenic	75a	25.2	0.0373	0.200	ug/L	25.0		101	80-120			
Duplicate (BLA0070-DUP1)						Source: 22L0385-11 Prepared: 04-Jan-2023 Analyzed: 11-Jan-2023 00:42						
Antimony	121	1.69	0.101	0.200	ug/L		1.64			2.89	20	
Lead	208	ND	0.0513	0.100	ug/L		ND					U
Duplicate (BLA0070-DUP2)						Source: 22L0385-11 Prepared: 04-Jan-2023 Analyzed: 12-Jan-2023 01:10						
Vanadium	51a	0.836	0.111	0.400	ug/L		0.798			4.65	20	D
Arsenic	75a	1.26	0.0746	0.400	ug/L		1.18			6.39	20	D
Matrix Spike (BLA0070-MS1)						Source: 22L0385-11 Prepared: 04-Jan-2023 Analyzed: 11-Jan-2023 00:47						
Antimony	121	26.8	0.101	0.200	ug/L	25.0	1.64	101	75-125			
Lead	208	25.0	0.0513	0.100	ug/L	25.0	ND	99.9	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.												
Matrix Spike (BLA0070-MS2)						Source: 22L0385-11 Prepared: 04-Jan-2023 Analyzed: 12-Jan-2023 01:15						
Vanadium	51a	23.7	0.111	0.400	ug/L	25.0	0.798	91.5	75-125			D
Arsenic	75a	27.3	0.0746	0.400	ug/L	25.0	1.18	105	75-125			D
Recovery limits for target analytes in MS/MSD QC samples are advisory only.												
Matrix Spike Dup (BLA0070-MSD1)						Source: 22L0385-11 Prepared: 04-Jan-2023 Analyzed: 11-Jan-2023 00:53						
Antimony	121	28.2	0.101	0.200	ug/L	25.0	1.64	106	75-125	4.99	20	
Lead	208	24.9	0.0513	0.100	ug/L	25.0	ND	99.5	75-125	0.38	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.												
Matrix Spike Dup (BLA0070-MSD2)						Source: 22L0385-11 Prepared: 04-Jan-2023 Analyzed: 12-Jan-2023 01:21						
Vanadium	51a	24.0	0.111	0.400	ug/L	25.0	0.798	92.9	75-125	1.42	20	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 17-Jan-2023 11:08
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Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BLA0070 - EPA 200.8 UCT-KED

Instrument: ICPMS2 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 (BLA0070-MSD2)			Source: 22L0385-11			Prepared: 04-Jan-2023		Analyzed: 12-Jan-2023 01:21				
Arsenic	75a	27.0	0.0746	0.400	ug/L	25.0	1.18	103	75-125	1.21	20	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: 17-Jan-2023 11:08
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Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BLA0071 - EPA 6010D

Instrument: ICP3 Analyst: SKD

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLA0071-BLK1)						Prepared: 04-Jan-2023 Analyzed: 09-Jan-2023 22:39					
Potassium	ND	0.107	0.500	mg/L							U
LCS (BLA0071-BS1)						Prepared: 04-Jan-2023 Analyzed: 09-Jan-2023 22:41					
Potassium	10.8	0.107	0.500	mg/L	10.0		108	80-120			
Duplicate (BLA0071-DUP1)						Source: 22L0385-11 Prepared: 04-Jan-2023 Analyzed: 09-Jan-2023 22:58					
Potassium	42.4	0.107	0.500	mg/L		42.7			0.61	20	
Matrix Spike (BLA0071-MS1)						Source: 22L0385-11 Prepared: 04-Jan-2023 Analyzed: 09-Jan-2023 23:01					
Potassium	52.5	0.107	0.500	mg/L	10.0	42.7	98.6	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BLA0071-MSD1)						Source: 22L0385-11 Prepared: 04-Jan-2023 Analyzed: 09-Jan-2023 23:04					
Potassium	51.8	0.107	0.500	mg/L	10.0	42.7	91.3	75-125	1.39	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: 17-Jan-2023 11:08
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Analysis by: Analytical Resources, LLC

Wet Chemistry - Quality Control

Batch BKL0409 - SM 2540 C-97

Instrument: BAL2 Analyst: UW

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKL0409-BLK1)						Prepared: 15-Dec-2022 Analyzed: 15-Dec-2022 15:24					
Dissolved Solids	ND	5	5	mg/L							U
LCS (BKL0409-BS1)						Prepared: 15-Dec-2022 Analyzed: 15-Dec-2022 15:24					
Dissolved Solids	485	5	5	mg/L	500		97.0	90-110			



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 17-Jan-2023 11:08
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Analysis by: Analytical Resources, LLC

Wet Chemistry - Quality Control

Batch BKL0410 - SM 2540 C-97

Instrument: BAL2 Analyst: UW

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKL0410-BLK1)						Prepared: 15-Dec-2022 Analyzed: 15-Dec-2022 16:11					
Dissolved Solids	ND	5	5	mg/L							U
LCS (BKL0410-BS1)						Prepared: 15-Dec-2022 Analyzed: 15-Dec-2022 16:11					
Dissolved Solids	470	5	5	mg/L	500		94.0	90-110			
Duplicate (BKL0410-DUP1)						Source: 22L0385-11 Prepared: 15-Dec-2022 Analyzed: 15-Dec-2022 16:11					
Dissolved Solids	346	10	10	mg/L		335			3.23	20	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 17-Jan-2023 11:08
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Analysis by: Analytical Resources, LLC

Wet Chemistry - Quality Control

Batch BLA0227 - SM 2540 C-97

Instrument: BAL2 Analyst: UW

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLA0227-BLK1)						Prepared: 10-Jan-2023 Analyzed: 10-Jan-2023 15:05					
Dissolved Solids	ND	5	5	mg/L							U
LCS (BLA0227-BS1)						Prepared: 10-Jan-2023 Analyzed: 10-Jan-2023 15:05					
Dissolved Solids	483	10	10	mg/L	500		96.6	90-110			



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

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

Reported:
17-Jan-2023 11:08

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 6010D in Water	
Potassium	WADOE,NELAP,DoD-ELAP
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
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2023
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2023
WADOE	WA Dept of Ecology	C558	06/30/2023
WA-DW	Ecology - Drinking Water	C558	06/30/2023



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

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

Reported:
17-Jan-2023 11:08

Notes and Definitions

- B This analyte was detected in the method blank.
- D The reported value is from a dilution
- H Hold time violation - Hold time was exceeded.
- J Estimated concentration value detected below the reporting limit.
- L Analyte concentration is ≤ 5 times the reporting limit and the replicate control limit defaults to \pm RL instead of 20% RPD
- 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

31 January 2023

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

RE: Ravensdale (152030402.004)

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)
23A0096

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: 23A0096	Turn-around Requested: STANDARD	Page: 1	of 1
ARI Client Company: GOLDER	Phone: (425)883-0777	Date: 1/5/23	Ice Present? YES
Client Contact: CARY ZIMMERMAN		No. of Coolers: 1	Cooler Temps: 2.9

Client Project Name: RAVENSDALE 2022 Q4 SAMPLING					Analysis Requested								Notes/Comments		
Client Project #: 152030402.004		Samplers: SJ+ AW			TOTAL METALS (As, Pb, Sb, V, H)	TDS									
Sample ID	Date	Time	Matrix	No. Containers											
INFILTRATION POND-1222	1/5/23	12:20	SW	2	X	X									
MW-35A-1222	1/5/23	12:25	SW	2	X	X									
Comments/Special Instructions ANALYZE IN ACCORDANCE W/ MSA BETWEEN GOLDER AND ARI Ecology EIM EDD					Relinquished by: (Signature) Printed Name: SEAN JOHNSON Company: GOLDER Date & Time: 1/5/23 15:20			Received by: (Signature) Printed Name: Roman Miller Company: ARI Date & Time: 1/5/23 1520			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, 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: 152030402.004
Project Manager: Gary Zimmerman

Reported:
31-Jan-2023 09:55

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Infiltration Pond-1222	23A0096-01	Water	05-Jan-2023 12:20	05-Jan-2023 15:20
MW-35A-1222	23A0096-02	Water	05-Jan-2023 12:25	05-Jan-2023 15:20



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

Project: Ravensdale
Project Number: 152030402.004
Project Manager: Gary Zimmerman

Reported:
31-Jan-2023 09:55

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



Cooler Receipt Form

ARI Client: Golder

Project Name: Ravensdale 2022 Q4 Sampling

COC No(s): _____ NA

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

Assigned ARI Job No: 23A0096

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) 2.9°

Time 1520

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 9708

Cooler Accepted by: Rm Date: 1/5/23 Time: 1520

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: Rm Date: 1/5/23 Time: 1534 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: _____



WORK ORDER

23A0096

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: 152030402.004

Preservation Confirmation

Container ID	Container Type	pH
23A0096-01 A	HDPE NM, 1000 mL	
23A0096-01 B	HDPE NM, 500 mL, 1:1 HNO3	6.2 pass
23A0096-02 A	HDPE NM, 1000 mL	
23A0096-02 B	HDPE NM, 500 mL, 1:1 HNO3	6.2 pass

Preservation Confirmed By

Date



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: 152030402.004 Project Manager: Gary Zimmerman	Reported: 31-Jan-2023 09:55
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Infiltration Pond-1222
23A0096-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 01/05/2023 12:20
Instrument: ICPMS1 Analyst: MCB Analyzed: 01/27/2023 05:00

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0096-01 B 01
Preparation Batch: BLA0516 Sample Size: 25 mL
Prepared: 01/20/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Lead	7439-92-1	2	0.103	0.200	2.49	ug/L	D
Vanadium	7440-62-2	2	0.111	0.400	4.45	ug/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: 152030402.004 Project Manager: Gary Zimmerman	Reported: 31-Jan-2023 09:55
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Infiltration Pond-1222
23A0096-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 01/05/2023 12:20
Instrument: ICPMS1 Analyst: MCB Analyzed: 01/23/2023 22:33

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0096-01 B 02
Preparation Batch: BLA0516 Sample Size: 25 mL
Prepared: 01/20/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	26.7	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: 152030402.004 Project Manager: Gary Zimmerman	Reported: 31-Jan-2023 09:55
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Infiltration Pond-1222
23A0096-01 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 01/05/2023 12:20
Instrument: ICP3 Analyst: SKD Analyzed: 01/24/2023 19:19

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 23A0096-01 B 01
Preparation Batch: BLA0484 Sample Size: 25 mL
Prepared: 01/20/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	2	0.214	1.00	567	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: 152030402.004 Project Manager: Gary Zimmerman	Reported: 31-Jan-2023 09:55
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Infiltration Pond-1222
23A0096-01 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 01/05/2023 12:20
Instrument: BAL2 Analyst: UW Analyzed: 01/10/2023 15:05

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 23A0096-01
Preparation Batch: BLA0227 Sample Size: 50 mL
Prepared: 01/10/2023 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	20	20	1560	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: 152030402.004 Project Manager: Gary Zimmerman	Reported: 31-Jan-2023 09:55
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Infiltration Pond-1222
23A0096-01RE1 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 01/05/2023 12:20
Instrument: ICPMS1 Analyst: MCB Analyzed: 01/27/2023 23:27

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0096-01RE1 B 03
Preparation Batch: BLA0651 Sample Size: 25 mL
Prepared: 01/27/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	5	0.505	1.00	18.8	ug/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: 152030402.004 Project Manager: Gary Zimmerman	Reported: 31-Jan-2023 09:55
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MW-35A-1222
23A0096-02 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 01/05/2023 12:25
Instrument: ICPMS1 Analyst: MCB Analyzed: 01/27/2023 04:55

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0096-02 B 01
Preparation Batch: BLA0516 Sample Size: 25 mL
Prepared: 01/20/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Lead	7439-92-1	1	0.0513	0.100	2.06	ug/L	
Vanadium	7440-62-2	1	0.0556	0.200	4.39	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: 152030402.004 Project Manager: Gary Zimmerman	Reported: 31-Jan-2023 09:55
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MW-35A-1222
23A0096-02 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 01/05/2023 12:25
Instrument: ICPMS1 Analyst: MCB Analyzed: 01/27/2023 04:55

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0096-02 B 01
Preparation Batch: BLA0516 Sample Size: 25 mL
Prepared: 01/20/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	27.0	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: 152030402.004 Project Manager: Gary Zimmerman	Reported: 31-Jan-2023 09:55
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MW-35A-1222
23A0096-02 (Water)

Metals and Metallic Compounds

Method: EPA 6010D Sampled: 01/05/2023 12:25
Instrument: ICP3 Analyst: SKD Analyzed: 01/24/2023 19:22

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 23A0096-02 B 01
Preparation Batch: BLA0484 Sample Size: 25 mL
Prepared: 01/20/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Potassium	7440-09-7	2	0.214	1.00	587	mg/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: 152030402.004 Project Manager: Gary Zimmerman	Reported: 31-Jan-2023 09:55
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MW-35A-1222
23A0096-02 (Water)

Wet Chemistry

Method: SM 2540 C-97 Sampled: 01/05/2023 12:25
Instrument: BAL2 Analyst: UW Analyzed: 01/10/2023 15:05

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 23A0096-02
Preparation Batch: BLA0227 Sample Size: 50 mL
Prepared: 01/10/2023 Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	20	20	1490	mg/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: 152030402.004 Project Manager: Gary Zimmerman	Reported: 31-Jan-2023 09:55
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MW-35A-1222
23A0096-02RE1 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 01/05/2023 12:25
Instrument: ICPMS1 Analyst: MCB Analyzed: 01/27/2023 23:31

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0096-02RE1 B 03
Preparation Batch: BLA0651 Sample Size: 25 mL
Prepared: 01/27/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	5	0.505	1.00	20.2	ug/L	D



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: 152030402.004 Project Manager: Gary Zimmerman	Reported: 31-Jan-2023 09:55
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Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BLA0484 - EPA 6010D

Instrument: ICP3 Analyst: SKD

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLA0484-BLK1)						Prepared: 20-Jan-2023 Analyzed: 24-Jan-2023 16:02					
Potassium	ND	0.107	0.500	mg/L							U
LCS (BLA0484-BS1)						Prepared: 20-Jan-2023 Analyzed: 24-Jan-2023 16:04					
Potassium	11.1	0.107	0.500	mg/L	10.0		111	80-120			



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

Project: Ravensdale
Project Number: 152030402.004
Project Manager: Gary Zimmerman

Reported:
31-Jan-2023 09:55

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BLA0516 - EPA 200.8

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 (BLA0516-BLK1)						Prepared: 20-Jan-2023 Analyzed: 23-Jan-2023 19:05						
Lead	208	ND	0.0513	0.100	ug/L							U
Arsenic	75a	ND	0.0373	0.200	ug/L							U
Blank (BLA0516-BLK2)						Prepared: 20-Jan-2023 Analyzed: 26-Jan-2023 18:24						
Vanadium	51a	ND	0.0556	0.200	ug/L							U
LCS (BLA0516-BS1)						Prepared: 20-Jan-2023 Analyzed: 23-Jan-2023 19:10						
Lead	208	25.2	0.0513	0.100	ug/L	25.0		101	80-120			
Arsenic	75a	24.0	0.0373	0.200	ug/L	25.0		95.9	80-120			
LCS (BLA0516-BS2)						Prepared: 20-Jan-2023 Analyzed: 26-Jan-2023 18:29						
Vanadium	51a	24.0	0.0556	0.200	ug/L	25.0		96.0	80-120			
Duplicate (BLA0516-DUP1)			Source: 23A0096-01			Prepared: 20-Jan-2023 Analyzed: 23-Jan-2023 22:37						
Arsenic	75a	26.3	0.0373	0.200	ug/L		26.7			1.25	20	
Duplicate (BLA0516-DUP2)			Source: 23A0096-01			Prepared: 20-Jan-2023 Analyzed: 27-Jan-2023 05:05						
Lead	208	2.49	0.103	0.200	ug/L		2.49			0.08	20	D
Vanadium	51a	4.37	0.111	0.400	ug/L		4.45			1.91	20	D
Matrix Spike (BLA0516-MS1)			Source: 23A0096-01			Prepared: 20-Jan-2023 Analyzed: 23-Jan-2023 22:43						
Arsenic	75a	51.4	0.0373	0.200	ug/L	25.0	26.7	99.1	75-125			

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

Matrix Spike (BLA0516-MS2)			Source: 23A0096-01			Prepared: 20-Jan-2023 Analyzed: 27-Jan-2023 05:11						
Lead	208	23.1	0.103	0.200	ug/L	25.0	2.49	82.3	75-125			D
Vanadium	51a	29.5	0.111	0.400	ug/L	25.0	4.45	100	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: 152030402.004 Project Manager: Gary Zimmerman	Reported: 31-Jan-2023 09:55
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Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BLA0651 - EPA 200.8

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 (BLA0651-BLK1)						Prepared: 27-Jan-2023 Analyzed: 27-Jan-2023 21:28						
Antimony	121	ND	0.101	0.200	ug/L							U
LCS (BLA0651-BS1)						Prepared: 27-Jan-2023 Analyzed: 27-Jan-2023 21:33						
Antimony	121	24.5	0.101	0.200	ug/L	25.0		97.8	80-120			



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: 152030402.004 Project Manager: Gary Zimmerman	Reported: 31-Jan-2023 09:55
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Analysis by: Analytical Resources, LLC

Wet Chemistry - Quality Control

Batch BLA0227 - SM 2540 C-97

Instrument: BAL2 Analyst: UW

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLA0227-BLK1)						Prepared: 10-Jan-2023 Analyzed: 10-Jan-2023 15:05					
Dissolved Solids	ND	5	5	mg/L							U
LCS (BLA0227-BS1)						Prepared: 10-Jan-2023 Analyzed: 10-Jan-2023 15:05					
Dissolved Solids	483	10	10	mg/L	500		96.6	90-110			
Duplicate (BLA0227-DUP1)						Source: 23A0096-01 Prepared: 10-Jan-2023 Analyzed: 10-Jan-2023 15:05					
Dissolved Solids	1550	20	20	mg/L		1560			0.39	20	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: 152030402.004 Project Manager: Gary Zimmerman	Reported: 31-Jan-2023 09:55
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Certified Analyses included in this Report

Analyte	Certifications
<i>EPA 200.8 in Water</i>	
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
<i>EPA 200.8 UCT-KED in Water</i>	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
<i>EPA 6010D in Water</i>	
Potassium	WADOE,NELAP,DoD-ELAP
<i>SM 2540 C-97 in Water</i>	
Dissolved Solids	DoD-ELAP,WADOE,WA-DW,NELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program, PJLA Testing	66169	02/28/2023
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2023
WADOE	WA Dept of Ecology	C558	06/30/2023
WA-DW	Ecology - Drinking Water	C558	06/30/2023



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

Project: Ravensdale
Project Number: 152030402.004
Project Manager: Gary Zimmerman

Reported:
31-Jan-2023 09:55

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

01 February 2023

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)
23A0097

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, Incorporated
 Analytical Chemists and Consultants
 4611 South 134th Place, Suite 100
 Tukwila, WA 98168
 206-695-6200 206-695-6201 (fax)
 www.arilabs.com

ARI Assigned Number: 23A-0097	Turn-around Requested: STANDARD	Page: 1 of 1
ARI Client Company: GOLDER	Phone: (425)883-0777	Date: 1/5/23 Ice Present? Yes
Client Contact: GARY ZIMMERMAN	No. of Coolers: 1	Cooler Temps: 1.6°

Client Project Name: RAVENSDALE	Analysis Requested	Notes/Comments
Client Project #: GLI520304.003	Samplers: SJ+AW	ANALYZE IN ACCORDANCE W/ MSA BETWEEN GOLDER AND ARI

Sample ID	Date	Time	Matrix	No. Containers	TOTAL METALS (As, Pb, Sb, V)	DISSOLVED METALS (As, Pb, Sb, V)												
TANK - INFLUENT	1/5/23	12:55	W	2	X	X												
TANK - EFFLUENT	↓	13:05	↓	1	X													
AS - EFFLUENT	↓	13:15	↓	2	X	X												

Comments/Special Instructions PLEASE FILTER AND PRESERVE DISSOLVED METALS	Relinquished by: (Signature) <i>SM</i>	Received by: (Signature) <i>R Miller</i>	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: SEAN JOHNSON	Printed Name: Roman Miller	Printed Name:	Printed Name:
	Company: GOLDER	Company: ARI	Company:	Company:
	Date & Time: 1/5/23 15:20	Date & Time: 1/5/23 1520	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:
01-Feb-2023 08:47

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TANK-INFLUENT	23A0097-01	Water	05-Jan-2023 12:55	05-Jan-2023 15:20
TANK-INFLUENT	23A0097-02	Water	05-Jan-2023 12:55	05-Jan-2023 15:20
TANK-EFFLUENT	23A0097-03	Water	05-Jan-2023 13:05	05-Jan-2023 15:20
AS-EFFLUENT	23A0097-04	Water	05-Jan-2023 13:15	05-Jan-2023 15:20
AS-EFFLUENT	23A0097-05	Water	05-Jan-2023 13:15	05-Jan-2023 15:20



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

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

Reported:
01-Feb-2023 08:47

Work Order Case Narrative

Total Metals - EPA Method 200.8

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.



WORK ORDER

23A0097

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
23A0097-01 A	HDPE NM, 500 mL, 1:1 HNO3	42 pass
23A0097-02 A	HDPE NM, 1000 mL	72 fail
23A0097-03 A	HDPE NM, 500 mL, 1:1 HNO3	42 pass
23A0097-04 A	HDPE NM, 500 mL, 1:1 HNO3	42 pass
23A0097-05 A	HDPE NM, 1000 mL	72 fail

Preservation Confirmed By

Date

1/05/23



Cooler Receipt Form

ARI Client: Goldner

Project Name: Ravensdale

COC No(s): _____ NA

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

Assigned ARI Job No: 23A0097

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 1520 1.6°

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 4708

Cooler Accepted by: R Date: 1/5/23 Time: 1520

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: 01/05/2023 Time: 15:52 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: 01-Feb-2023 08:47
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TANK-INFLUENT
23A0097-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 01/05/2023 12:55
Instrument: ICPMS1 Analyst: MCB Analyzed: 01/27/2023 04:45

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0097-01 A 01
Preparation Batch: BLA0516 Sample Size: 25 mL
Prepared: 01/20/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Lead	7439-92-1	1	0.0513	0.100	62.3	ug/L	
Vanadium	7440-62-2	1	0.0556	0.200	6.00	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:
01-Feb-2023 08:47

TANK-INFLUENT
23A0097-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED

Sampled: 01/05/2023 12:55

Instrument: ICPMS1 Analyst: MCB

Analyzed: 01/27/2023 23:12

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M
Preparation Batch: BLA0516
Prepared: 01/20/2023

Sample Size: 25 mL
Final Volume: 25 mL

Extract ID: 23A0097-01 A 01

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	5	0.187	1.00	43.8	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: 01-Feb-2023 08:47
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TANK-INFLUENT
23A0097-01RE1 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 01/05/2023 12:55
Instrument: ICPMS1 Analyst: MCB Analyzed: 01/30/2023 22:21

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0097-01RE1 A 02
Preparation Batch: BLA0651 Sample Size: 25 mL
Prepared: 01/27/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	5	0.505	1.00	20.0	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: 01-Feb-2023 08:47
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TANK-INFLUENT
23A0097-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 Sampled: 01/05/2023 12:55
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/12/2023 02:50

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN - EPA 3010A M	Sample Size: 25 mL	Extract ID: 23A0097-02 A 02
	Preparation Batch: BLA0121	Final Volume: 25 mL	Filtration Batch: BLA0119
	Prepared: 01/05/2023		Filtration Date: 01/05/2023 16:33

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony, Dissolved	7440-36-0	5	0.505	1.00	20.6	ug/L	D
Lead, Dissolved	7439-92-1	1	0.0680	0.100	77.2	ug/L	
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	4.94	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: 01-Feb-2023 08:47
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TANK-INFLUENT
23A0097-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED Sampled: 01/05/2023 12:55
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/12/2023 02:50

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0097-02 A 02
Preparation Batch: BLA0121 Filtration Batch: BLA0119
Prepared: 01/05/2023 Final Volume: 25 mL
Filtration Date: 01/05/2023 16:33

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic, Dissolved	7440-38-2	5	0.110	1.00	26.1	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: 01-Feb-2023 08:47
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TANK-EFFLUENT
23A0097-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 01/05/2023 13:05
Instrument: ICPMS1 Analyst: MCB Analyzed: 01/27/2023 04:50

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0097-03 A 01
Preparation Batch: BLA0516 Sample Size: 25 mL
Prepared: 01/20/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Lead	7439-92-1	1	0.0513	0.100	44.9	ug/L	
Vanadium	7440-62-2	1	0.0556	0.200	5.29	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: 01-Feb-2023 08:47
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TANK-EFFLUENT
23A0097-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 01/05/2023 13:05
Instrument: ICPMS1 Analyst: MCB Analyzed: 01/27/2023 04:50

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0097-03 A 01
Preparation Batch: BLA0516 Sample Size: 25 mL
Prepared: 01/20/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	32.5	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: 01-Feb-2023 08:47
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TANK-EFFLUENT
23A0097-03RE1 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 01/05/2023 13:05
Instrument: ICPMS1 Analyst: MCB Analyzed: 01/27/2023 23:19

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0097-03RE1 A 02
Preparation Batch: BLA0651 Sample Size: 25 mL
Prepared: 01/27/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	5	0.505	1.00	19.7	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: 01-Feb-2023 08:47
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AS-EFFLUENT
23A0097-04 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 01/05/2023 13:15
Instrument: ICPMS1 Analyst: MCB Analyzed: 01/27/2023 04:39

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0097-04 A 01
Preparation Batch: BLA0516 Sample Size: 25 mL
Prepared: 01/20/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Lead	7439-92-1	5	0.257	0.500	53.4	ug/L	D
Vanadium	7440-62-2	5	0.278	1.00	5.67	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: 01-Feb-2023 08:47
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AS-EFFLUENT
23A0097-04 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 01/05/2023 13:15
Instrument: ICPMS1 Analyst: MCB Analyzed: 01/27/2023 04:39

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0097-04 A 01
Preparation Batch: BLA0516 Sample Size: 25 mL
Prepared: 01/20/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	5	0.187	1.00	17.5	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: 01-Feb-2023 08:47
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AS-EFFLUENT
23A0097-04RE1 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 01/05/2023 13:15
Instrument: ICPMS1 Analyst: MCB Analyzed: 01/27/2023 23:23

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0097-04RE1 A 02
Preparation Batch: BLA0651 Sample Size: 25 mL
Prepared: 01/27/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	5	0.505	1.00	17.7	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: 01-Feb-2023 08:47
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AS-EFFLUENT
23A0097-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 Sampled: 01/05/2023 13:15
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/12/2023 02:54

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN - EPA 3010A M	Sample Size: 25 mL	Extract ID: 23A0097-05 A 02
	Preparation Batch: BLA0121	Final Volume: 25 mL	Filtration Batch: BLA0119
	Prepared: 01/05/2023		Filtration Date: 01/05/2023 16:33

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony, Dissolved	7440-36-0	5	0.505	1.00	19.7	ug/L	D
Lead, Dissolved	7439-92-1	1	0.0680	0.100	0.163	ug/L	
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	2.17	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: 01-Feb-2023 08:47
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AS-EFFLUENT
23A0097-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED Sampled: 01/05/2023 13:15
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/12/2023 02:54

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN - EPA 3010A M	Sample Size: 25 mL	Extract ID: 23A0097-05 A 02
	Preparation Batch: BLA0121	Final Volume: 25 mL	Filtration Batch: BLA0119
	Prepared: 01/05/2023		Filtration Date: 01/05/2023 16:33

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic, Dissolved	7440-38-2	5	0.110	1.00	19.3	ug/L	D



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

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

Reported:
01-Feb-2023 08:47

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BLA0516 - EPA 200.8

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 (BLA0516-BLK1)						Prepared: 20-Jan-2023 Analyzed: 23-Jan-2023 19:05						
Lead	208	ND	0.0513	0.100	ug/L							U
Arsenic	75a	ND	0.0373	0.200	ug/L							U
Blank (BLA0516-BLK2)						Prepared: 20-Jan-2023 Analyzed: 26-Jan-2023 18:24						
Vanadium	51a	ND	0.0556	0.200	ug/L							U
LCS (BLA0516-BS1)						Prepared: 20-Jan-2023 Analyzed: 23-Jan-2023 19:10						
Lead	208	25.2	0.0513	0.100	ug/L	25.0		101	80-120			
Arsenic	75a	24.0	0.0373	0.200	ug/L	25.0		95.9	80-120			
LCS (BLA0516-BS2)						Prepared: 20-Jan-2023 Analyzed: 26-Jan-2023 18:29						
Vanadium	51a	24.0	0.0556	0.200	ug/L	25.0		96.0	80-120			



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: Ravensdale Project Manager: Gary Zimmerman	Reported: 01-Feb-2023 08:47
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Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BLA0651 - EPA 200.8

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 (BLA0651-BLK1)						Prepared: 27-Jan-2023 Analyzed: 27-Jan-2023 21:28						
Antimony	121	ND	0.101	0.200	ug/L							U
LCS (BLA0651-BS1)						Prepared: 27-Jan-2023 Analyzed: 27-Jan-2023 21:33						
Antimony	121	24.5	0.101	0.200	ug/L	25.0		97.8	80-120			



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

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

Reported:
01-Feb-2023 08:47

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BLA0121 - EPA 200.8

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLA0121-BLK1)						Prepared: 05-Jan-2023 Analyzed: 06-Jan-2023 20:21						
Lead, Dissolved	208	ND	0.0513	0.100	ug/L							U
Arsenic, Dissolved	75a	ND	0.0373	0.200	ug/L							U
Blank (BLA0121-BLK2)						Prepared: 05-Jan-2023 Analyzed: 10-Jan-2023 21:10						
Lead, Dissolved	208	ND	0.0513	0.100	ug/L							U
Vanadium, Dissolved	51a	ND	0.0556	0.200	ug/L							U
LCS (BLA0121-BS1)						Prepared: 05-Jan-2023 Analyzed: 06-Jan-2023 20:26						
Lead, Dissolved	208	27.0	0.0513	0.100	ug/L	25.0		108	80-120			
Arsenic, Dissolved	75a	25.2	0.0373	0.200	ug/L	25.0		101	80-120			
LCS (BLA0121-BS2)						Prepared: 05-Jan-2023 Analyzed: 10-Jan-2023 21:15						
Lead, Dissolved	208	27.6	0.0513	0.100	ug/L	25.0		110	80-120			
Vanadium, Dissolved	51a	26.8	0.0556	0.200	ug/L	25.0		107	80-120			



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

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

Reported:
01-Feb-2023 08:47

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
Lead-208	NELAP,WADOE,WA-DW,DoD-ELAP
Antimony-121	NELAP,WADOE,WA-DW,DoD-ELAP
Antimony-123	NELAP,WADOE,WA-DW,DoD-ELAP
Vanadium-51a	DoD-ELAP,NELAP,WADOE
Vanadium-51b	DoD-ELAP,NELAP,WADOE
EPA 200.8 UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program, PJLA Testing	66169	02/28/2023
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2023
WADOE	WA Dept of Ecology	C558	06/30/2023
WA-DW	Ecology - Drinking Water	C558	06/30/2023



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

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

Reported:
01-Feb-2023 08:47

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.
- L Analyte concentration is ≤ 5 times the reporting limit and the replicate control limit defaults to \pm RL instead of 20% RPD
- 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

15 February 2023

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

RE: Ravensdale (GL1520304.003)

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)
23A0613

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: 23A0613	Turn-around Requested:	Page: 1 of 1
ARI Client Company: Goldor	Phone: (425) 893-0777	Date: 1/29/23
Client Contact: Gary Zimmerman	No. of Coolers: 1	Ice Present? Y
Client Project Name: Ravensdale Treatment facility Sampling	Cooler Temps: -0.9	



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	
					Total Metals	Dissolved metals (Low filter)							
Tank - Influent	1/28/23	1318	water	2	X	X							
Tank - Effluent	1/28/23	1320	water	2	X	X							
AS - Effluent	1/28/23	1322	water	2	X	X							
Comments/Special Instructions	Relinquished by: (Signature) <i>[Signature]</i>		Received by: (Signature) <i>Phillip [Signature]</i>		Relinquished by: (Signature)		Received by: (Signature)						
	Printed Name: Andrew Wuser		Printed Name: Phillip Gates		Printed Name:		Printed Name:						
	Company: Goldor/WSP		Company: AR		Company:		Company:						
	Date & Time: 1/20/23 1035		Date & Time: 1/30/23 10:35		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.



WORK ORDER

23A0613

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: GL1520304.003

Preservation Confirmation

Container ID	Container Type	pH
23A0613-01 A	HDPE NM, 500 mL, 1:1 HNO3	<2 Pass (P)
23A0613-02 A	HDPE NM, 500 mL	>2 Fail (D)
23A0613-03 A	HDPE NM, 500 mL, 1:1 HNO3	<2 P
23A0613-04 A	HDPE NM, 500 mL	>2 Fail (D)
23A0613-05 A	HDPE NM, 500 mL, 1:1 HNO3	<2 P
23A0613-06 A	HDPE NM, 500 mL	>2 Fail (D)

PJB

Preservation Confirmed By

1/30/23

Date

Filtered at 0.45 um and preserved to pH <2.0 with 0.75M conc. HNO₃ (K11506).

M 01/30/23



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

Project: Ravensdale
Project Number: GL1520304.003
Project Manager: Gary Zimmerman

Reported:
15-Feb-2023 19:37

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Tank-Influent	23A0613-01	Water	28-Jan-2023 13:18	30-Jan-2023 10:35
Tank-Influent	23A0613-02	Water	28-Jan-2023 13:18	30-Jan-2023 10:35
Tank-Effluent	23A0613-03	Water	28-Jan-2023 13:20	30-Jan-2023 10:35
Tank-Effluent	23A0613-04	Water	28-Jan-2023 13:20	30-Jan-2023 10:35
AS-Effluent	23A0613-05	Water	28-Jan-2023 13:22	30-Jan-2023 10:35
AS-Effluent	23A0613-06	Water	28-Jan-2023 13:22	30-Jan-2023 10:35



Golder Associates

18300 NE Union Hill Road Suite 200

Redmond WA, 98052-3333

Project: Ravensdale

Project Number: GL1520304.003

Project Manager: Gary Zimmerman

Reported:

15-Feb-2023 19:37

Work Order Case Narrative

Total and Dissolved Metals - EPA Method 200.8

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.



WORK ORDER

23A0613

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: GL1520304.003

Preservation Confirmation

Container ID	Container Type	pH	
23A0613-01 A	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass (P)
23A0613-02 A	HDPE NM, 500 mL	>2	Fail
23A0613-03 A	HDPE NM, 500 mL, 1:1 HNO3	<2	P
23A0613-04 A	HDPE NM, 500 mL	>2	Fail
23A0613-05 A	HDPE NM, 500 mL, 1:1 HNO3	<2	P
23A0613-06 A	HDPE NM, 500 mL	>2	Fail

PIB

1/30/23

Preservation Confirmed By

Date



Cooler Receipt Form

ARI Client: Golden/WSP
 COC No(s): _____ (NA)
 Assigned ARI Job No: 23A0613

Project Name: Ravensdale Treatment Facility
 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) -0.9
 Time 10:35
 If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 7009708

Cooler Accepted by: PIA Date: 11/30/23 Time: 10:35

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: PIA Date: 11/30/23 Time: 11:05 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: GL1520304.003 Project Manager: Gary Zimmerman	Reported: 15-Feb-2023 19:37
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Tank-Influent
23A0613-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 01/28/2023 13:18
Instrument: ICPMS2 Analyst: MCB Analyzed: 02/14/2023 18:14

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0613-01 A 01
Preparation Batch: BLB0249 Sample Size: 25 mL
Prepared: 02/09/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	17.5	ug/L	
Lead	7439-92-1	1	0.0513	0.100	79.6	ug/L	
Vanadium	7440-62-2	1	0.0556	0.200	5.12	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: GL1520304.003 Project Manager: Gary Zimmerman	Reported: 15-Feb-2023 19:37
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Tank-Influent
23A0613-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 01/28/2023 13:18
Instrument: ICPMS2 Analyst: MCB Analyzed: 02/14/2023 18:14

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0613-01 A 01
Preparation Batch: BLB0249 Sample Size: 25 mL
Prepared: 02/09/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	28.9	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: GL1520304.003 Project Manager: Gary Zimmerman	Reported: 15-Feb-2023 19:37
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Tank-Influent
23A0613-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 Sampled: 01/28/2023 13:18
Instrument: ICPMS2 Analyst: MCB Analyzed: 02/14/2023 17:28

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0613-02 A 02
Preparation Batch: BLB0010 Filtration Batch: BLA0703
Prepared: 02/01/2023 Final Volume: 25 mL Filtration Date: 01/30/2023 11:47

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony, Dissolved	7440-36-0	1	0.101	0.200	17.7	ug/L	
Lead, Dissolved	7439-92-1	1	0.0680	0.100	63.2	ug/L	
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	4.20	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: GL1520304.003 Project Manager: Gary Zimmerman	Reported: 15-Feb-2023 19:37
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Tank-Influent
23A0613-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED Sampled: 01/28/2023 13:18
Instrument: ICPMS2 Analyst: MCB Analyzed: 02/14/2023 17:28

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0613-02 A 02
Preparation Batch: BLB0010 Filtration Batch: BLA0703
Prepared: 02/01/2023 Final Volume: 25 mL
Filtration Date: 01/30/2023 11:47

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	13.0	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: GL1520304.003 Project Manager: Gary Zimmerman	Reported: 15-Feb-2023 19:37
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Tank-Effluent
23A0613-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 01/28/2023 13:20
Instrument: ICPMS2 Analyst: MCB Analyzed: 02/14/2023 17:46

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0613-03 A 01
Preparation Batch: BLB0249 Sample Size: 25 mL
Prepared: 02/09/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	17.7	ug/L	
Lead	7439-92-1	1	0.0513	0.100	65.5	ug/L	
Vanadium	7440-62-2	1	0.0556	0.200	5.37	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: GL1520304.003 Project Manager: Gary Zimmerman	Reported: 15-Feb-2023 19:37
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Tank-Effluent
23A0613-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 01/28/2023 13:20
Instrument: ICPMS2 Analyst: MCB Analyzed: 02/14/2023 17:46

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0613-03 A 01
Preparation Batch: BLB0249 Sample Size: 25 mL
Prepared: 02/09/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	28.2	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: GL1520304.003 Project Manager: Gary Zimmerman	Reported: 15-Feb-2023 19:37
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Tank-Effluent
23A0613-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 Sampled: 01/28/2023 13:20
Instrument: ICPMS2 Analyst: MCB Analyzed: 02/14/2023 17:32

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN - EPA 3010A M	Sample Size: 25 mL	Extract ID: 23A0613-04 A 02
	Preparation Batch: BLB0010	Final Volume: 25 mL	Filtration Batch: BLA0703
	Prepared: 02/01/2023		Filtration Date: 01/30/2023 11:47

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony, Dissolved	7440-36-0	1	0.101	0.200	17.6	ug/L	
Lead, Dissolved	7439-92-1	1	0.0680	0.100	1.52	ug/L	
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	4.54	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: GL1520304.003 Project Manager: Gary Zimmerman	Reported: 15-Feb-2023 19:37
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Tank-Effluent
23A0613-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED Sampled: 01/28/2023 13:20
Instrument: ICPMS2 Analyst: MCB Analyzed: 02/14/2023 17:32

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN - EPA 3010A M	Sample Size: 25 mL	Extract ID: 23A0613-04 A 02
	Preparation Batch: BLB0010	Final Volume: 25 mL	Filtration Batch: BLA0703
	Prepared: 02/01/2023		Filtration Date: 01/30/2023 11:47

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	27.2	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: GL1520304.003 Project Manager: Gary Zimmerman	Reported: 15-Feb-2023 19:37
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AS-Effluent
23A0613-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 01/28/2023 13:22
Instrument: ICPMS2 Analyst: MCB Analyzed: 02/14/2023 17:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0613-05 A 01
Preparation Batch: BLB0249 Sample Size: 25 mL
Prepared: 02/09/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony	7440-36-0	1	0.101	0.200	8.44	ug/L	
Lead	7439-92-1	1	0.0513	0.100	42.7	ug/L	
Vanadium	7440-62-2	1	0.0556	0.200	1.47	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: GL1520304.003 Project Manager: Gary Zimmerman	Reported: 15-Feb-2023 19:37
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AS-Effluent
23A0613-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED Sampled: 01/28/2023 13:22
Instrument: ICPMS2 Analyst: MCB Analyzed: 02/14/2023 17:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0613-05 A 01
Preparation Batch: BLB0249 Sample Size: 25 mL
Prepared: 02/09/2023 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	4.43	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: GL1520304.003 Project Manager: Gary Zimmerman	Reported: 15-Feb-2023 19:37
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AS-Effluent
23A0613-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 Sampled: 01/28/2023 13:22
Instrument: ICPMS2 Analyst: MCB Analyzed: 02/14/2023 17:37

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN - EPA 3010A M Extract ID: 23A0613-06 A 02
Preparation Batch: BLB0010 Filtration Batch: BLA0703
Prepared: 02/01/2023 Final Volume: 25 mL
Filtration Date: 01/30/2023 11:47

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Antimony, Dissolved	7440-36-0	1	0.101	0.200	7.81	ug/L	
Lead, Dissolved	7439-92-1	1	0.0680	0.100	0.538	ug/L	
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	0.360	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: GL1520304.003 Project Manager: Gary Zimmerman	Reported: 15-Feb-2023 19:37
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AS-Effluent
23A0613-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED Sampled: 01/28/2023 13:22
Instrument: ICPMS2 Analyst: MCB Analyzed: 02/14/2023 17:37

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN - EPA 3010A M	Sample Size: 25 mL	Extract ID: 23A0613-06 A 02
	Preparation Batch: BLB0010	Final Volume: 25 mL	Filtration Batch: BLA0703
	Prepared: 02/01/2023		Filtration Date: 01/30/2023 11:47

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	3.27	ug/L	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: GL1520304.003 Project Manager: Gary Zimmerman	Reported: 15-Feb-2023 19:37
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Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BLB0249 - EPA 200.8

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLB0249-BLK1)						Prepared: 09-Feb-2023 Analyzed: 09-Feb-2023 16:58						
Lead	208	ND	0.0513	0.100	ug/L							U
Arsenic	75a	ND	0.0373	0.200	ug/L							U
Blank (BLB0249-BLK2)						Prepared: 09-Feb-2023 Analyzed: 14-Feb-2023 17:19						
Antimony	121	ND	0.101	0.200	ug/L							U
Vanadium	51a	ND	0.0556	0.200	ug/L							U
LCS (BLB0249-BS1)						Prepared: 09-Feb-2023 Analyzed: 09-Feb-2023 17:03						
Lead	208	27.2	0.0513	0.100	ug/L	25.0		109	80-120			
Arsenic	75a	25.2	0.0373	0.200	ug/L	25.0		101	80-120			
LCS (BLB0249-BS2)						Prepared: 09-Feb-2023 Analyzed: 14-Feb-2023 17:23						
Antimony	121	25.6	0.101	0.200	ug/L	25.0		102	80-120			
Vanadium	51a	25.2	0.0556	0.200	ug/L	25.0		101	80-120			



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

Project: Ravensdale
Project Number: GL1520304.003
Project Manager: Gary Zimmerman

Reported:
15-Feb-2023 19:37

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BLB0010 - EPA 200.8

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BLB0010-BLK1)						Prepared: 01-Feb-2023 Analyzed: 01-Feb-2023 17:07						
Antimony, Dissolved	121	ND	0.101	0.200	ug/L							U
Lead, Dissolved	208	ND	0.0513	0.100	ug/L							U
Arsenic, Dissolved	75a	ND	0.0373	0.200	ug/L							U
Blank (BLB0010-BLK2)						Prepared: 01-Feb-2023 Analyzed: 14-Feb-2023 17:11						
Vanadium, Dissolved	51a	ND	0.0556	0.200	ug/L							U
LCS (BLB0010-BS1)						Prepared: 01-Feb-2023 Analyzed: 01-Feb-2023 17:12						
Antimony, Dissolved	121	26.3	0.101	0.200	ug/L	25.0		105	80-120			
Lead, Dissolved	208	28.3	0.0513	0.100	ug/L	25.0		113	80-120			
Arsenic, Dissolved	75a	25.9	0.0373	0.200	ug/L	25.0		104	80-120			
LCS (BLB0010-BS2)						Prepared: 01-Feb-2023 Analyzed: 14-Feb-2023 17:15						
Vanadium, Dissolved	51a	26.2	0.0556	0.200	ug/L	25.0		105	80-120			



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Ravensdale Project Number: GL1520304.003 Project Manager: Gary Zimmerman	Reported: 15-Feb-2023 19:37
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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
Lead-208	NELAP,WADOE,WA-DW,DoD-ELAP
Antimony-121	NELAP,WADOE,WA-DW,DoD-ELAP
Antimony-123	NELAP,WADOE,WA-DW,DoD-ELAP
Vanadium-51a	DoD-ELAP,NELAP,WADOE
Vanadium-51b	DoD-ELAP,NELAP,WADOE
EPA 200.8 UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program, PJLA Testing	66169	02/28/2023
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2023
WADOE	WA Dept of Ecology	C558	06/30/2023
WA-DW	Ecology - Drinking Water	C558	06/30/2023



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

Project: Ravensdale
Project Number: GL1520304.003
Project Manager: Gary Zimmerman

Reported:
15-Feb-2023 19:37

Notes and Definitions

- D The reported value is from a dilution
- J Estimated concentration value detected below the reporting limit.
- L Analyte concentration is ≤ 5 times the reporting limit and the replicate control limit defaults to \pm RL instead of 20% RPD
- 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 Infiltration Ponds / MW-35A - 0123

Sampling Location Surface Water Monitoring Point

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2020

Type of Sampler Peristaltic Pump

Date January 5, 2023 Time 12:20

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: Depth to water at ft BTOC (January 5, 2023 12:20 PM); Well total depth at N/A

Screen Interval: N/A

Pump Intake: N/A

Sample Description Clear, no odor

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

SAMPLE INTEGRITY DATA SHEET

Well ID Infiltration Ponds / MW-35A

Date 01/05/2023

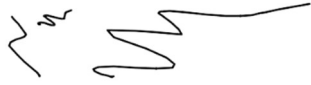
Time Begin Purge 12:20

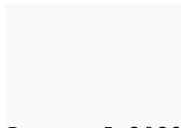
Time Collect Sample 12:20

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
	12:20	8.16	1,047	8.8	8.4	191.0	8.47

Comments:

Flow Rate: _____ mL/min

Sampler  _____

Date  January 5, 2023

Supervisor _____

Date _____

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale Project No. 152030402

Site Location Ravensdale, WA

Sample ID MW-7A - 1222

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2020

Type of Sampler Peristaltic Pump

Date December 14, 2022 Time 15:26

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 12.03 ft BTOC (December 14, 2022 2:54 PM); Well total depth at 20' BGS

Screen Interval: 10' - 20' BGS

Pump Intake: ~ 17' BGS

Sample Description Clear, no odor

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

Plant/Site Ravensdale Project No. 152030402

Site Location Ravensdale, WA

Sample ID Other - 1222

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2020

Type of Sampler Grab

Date December 14, 2022 Time 14:35

Media Groundwater Station Baja 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 ft BTOC (); Well total depth at

Screen Interval:

Pump Intake:

Sample Description

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 _____ Other _____

Date 12/14/2022

Time Begin Purge _____

Time Collect Sample 14:35

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
	14:35	7.99	521	9.5	8.08	56.8	3.49

Comments:

Flow Rate: _____ mL/min

Sampler

Date December 14, 2022

Supervisor _____

Date _____

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale Project No. 152030402

Site Location Ravensdale, WA

Sample ID MW-99-1 - 1222

Sampling Location QA/QC Blank

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2020

Type of Sampler Grab

Date December 14, 2022 Time 13:30

Media Other Station MW-3

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 (); Well total depth at

Screen Interval:

Pump Intake:

Sample Description

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

Plant/Site Ravensdale Project No. 152030402

Site Location Ravensdale, WA

Sample ID P-15 - 1222

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2020

Type of Sampler Peristaltic Pump

Date December 14, 2022 Time 12:45

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 21.81 ft BTOC (December 14, 2022 12:12 PM); Well total depth at 34' BGS

Screen Interval: 24'- 34' BGS

Pump Intake: ~ 30' BGS

Sample Description Clear, no odor

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

Plant/Site Ravensdale Project No. 152030402

Site Location Ravensdale, WA

Sample ID P-14 - 1222

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2020

Type of Sampler Bladder Pump (dedicated)

Date December 14, 2022 Time 11:50

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 32.55 ft BTOC (December 14, 2022 11:15 AM); Well total depth at 50' BGS

Screen Interval: 40'- 50' BGS

Pump Intake: ~ 45' BGS

Sample Description _____

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 P-14

Date 12/14/2022

Time Begin Purge 11:18

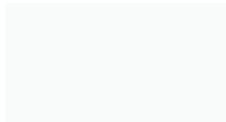
Time Collect Sample 11:50

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
32.7	11:25	12.97	18,998	12.2	5.74	-510.4	7.90
32.7	11:30	13.01	19,201	12.3	4.76	-464.2	2.38
32.7	11:35	13.02	19,334	12.3	4.11	-471.2	0.78
32.7	11:40	13.04	19,285	12.2	3.69	-457.3	1.36
32.7	11:43	13.05	19,288	12.2	3.5	-458	0.75
32.7	11:46	13.06	19,267	12.1	3.3	-448.9	0.88

Comments:

Flow Rate: 300 mL/min


 Sampler _____


 Date December 14, 2022

Supervisor _____

Date _____

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale Project No. 152030402

Site Location Ravensdale, WA

Sample ID MW-9A - 1222

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2020

Type of Sampler Peristaltic Pump

Date December 14, 2022 Time 10:40

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 2.57 ft BTOC (December 14, 2022 10:12 AM); Well total depth at 13' BGS

Screen Interval: 8' - 13' BGS

Pump Intake: ~ 10' BGS

Sample Description _____

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-9A

Date 12/14/2022

Time Begin Purge 10:13

Time Collect Sample 10:40

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
5.17	10:20	7.01	411.3	7.9	8.42	134.6	0.53
6.06	10:25	6.93	412.1	8	7.99	135.6	0.43
6.3	10:30	6.92	413.6	7.9	7.76	135.6	0.48
6.5	10:35	6.92	411.4	7.9	7.54	135.4	0.88
6.6	10:38	6.91	413.5	8	7.42	135.6	0.53

Comments:

Flow Rate: 100 mL/min

Sampler S. G.

Date December 14, 2022

Supervisor _____

Date _____

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale Project No. 152030402

Site Location Ravensdale, WA

Sample ID MW-4A - 1222

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2020

Type of Sampler Peristaltic Pump

Date December 14, 2022 Time 10:00

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 3.85 ft BTOC (December 14, 2022 9:31 AM); Well total depth at 20' BGS

Screen Interval: 5' - 20' BGS

Pump Intake: ~ 12' BGS

Sample Description _____

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

Plant/Site Ravensdale Project No. 152030402

Site Location Ravensdale, WA

Sample ID Interceptor Trench - 1222

Sampling Location Surface Water Monitoring Point

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2020

Type of Sampler Grab

Date December 14, 2022 Time 09:20

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: Depth to water at ft BTOC (); Well total depth at N/A

Screen Interval: N/A

Pump Intake: N/A

Sample Description

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 12/14/2022

Time Begin Purge 09:18

Time Collect Sample 09:20

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
	09:19	7.19	374.1	11	7.47	77.5	2.27

Comments:

Flow Rate: 3000 mL/min



Sampler _____

Date December 14, 2022

Supervisor _____

Date _____

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale Project No. 152030402

Site Location Ravensdale, WA

Sample ID P-17 - 1222

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2020

Type of Sampler Peristaltic Pump

Date December 14, 2022 Time 09:10

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 5.75 ft BTOC (December 14, 2022 8:15 AM); Well total depth at 13' BGS

Screen Interval: 8'- 13' BGS

Pump Intake: ~ 10' BGS

Sample Description Clear, no odor

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 P-17

Date 12/14/2022

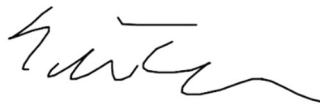
Time Begin Purge 08:20

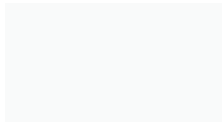
Time Collect Sample 09:10

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
6.51	08:25	6.59	364.9	8.4	6.95	164.2	43.3
6.51	08:30	6.63	365.6	8.6	5.93	126.1	37.3
6.6	08:35	6.65	369.2	8.7	5.07	71.3	28.7
6.65	08:40	6.64	378	8.9	4.57	32	22.2
6.67	08:45	6.61	393.7	9	4.16	-8.9	12.5
6.7	08:50	6.55	428.1	9.3	3.83	-50.6	10.2
6.73	08:55	6.52	452.7	9.5	3.57	-71.5	6.45
6.76	09:00	6.52	458.6	9.6	3.36	-80.7	6.12
6.77	09:03	6.52	465.7	9.7	3.28	-82.6	4.23
6.79	09:06	6.51	469.3	9.7	3.17	-85.9	3.75

Comments:

Flow Rate: 250 mL/min

Sampler  _____


Date December 14, 2022

Supervisor _____

Date _____

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale Project No. 152030402

Site Location Ravensdale, WA

Sample ID MW-8A - 1222

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2020

Type of Sampler Peristaltic Pump

Date December 13, 2022 Time 15:25

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 21.18 ft BTOC (December 13, 2022 2:54 PM); Well total depth at 26' BGS

Screen Interval: 16' - 26' BGS

Pump Intake: ~ 22' BGS

Sample Description Clear, no odor

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-8A

Date 12/13/2022


Time Begin Purge 15:00

Time Collect Sample 15:25

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
21.18	15:05	7.15	1,067	10.2	7.58	95	1.26
21.18	15:10	7.09	1,022	10.4	6.88	106.4	0.83
21.18	15:15	7.08	1,016	10.4	6.48	114.7	0.72
21.18	15:20	7.07	1,013	10.4	6.26	119.4	0.64
21.18	15:23	7.07	1,011	10.4	6.13	122.1	1.22

Comments:

Flow Rate: 200 mL/min


 Sampler _____

Date December 13, 2022

Supervisor _____

Date _____

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale **Project No.** 152030402

Site Location Ravensdale, WA

Sample ID MW-1A - 1222

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2020

Type of Sampler Bladder Pump (dedicated)

Date December 13, 2022 **Time** 14:25

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 32.37 ft BTOC (December 13, 2022 1:47 PM); Well total depth at 44' BGS

Screen Interval: 28' - 43' BGS

Pump Intake: ~ 39' BGS

Sample Description Clear, no odor

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

Plant/Site Ravensdale Project No. 152030402

Site Location Ravensdale, WA

Sample ID MW-2A / MW-45A - 1222

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2020

Type of Sampler Bladder Pump (dedicated)

Date December 13, 2022 Time 13:35

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 26.25 ft BTOC (December 13, 2022 1:11 PM); Well total depth at 40' BGS

Screen Interval: 24'- 40' BGS

Pump Intake: ~ 30' BGS

Sample Description Clear, no odor

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-2A / MW-45A

Date 12/13/2022

Time Begin Purge 13:12

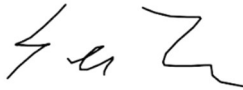
Time Collect Sample 13:35

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
26.27	13:15	6.97	557	9.9	8.94	92.1	10.8
26.27	13:20	6.84	558	9.9	8.63	101.4	8.17
26.27	13:25	6.81	558	9.9	8.44	109.2	4.27
26.27	13:28	6.81	558	9.9	8.4	112.9	3.55
26.27	13:31	6.81	557	9.9	8.35	117.4	4.38

Comments:

Flow Rate: 450 mL/min

Duplicate sample collected at 13:40



Sampler

Date December 13, 2022

Supervisor

Date

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale Project No. 152030402

Site Location Ravensdale, WA

Sample ID MW-6A - 1222

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2020

Type of Sampler Bladder Pump (dedicated)

Date December 13, 2022 Time 12:55

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 27.98 ft BTOC (December 13, 2022 12:24 PM); Well total depth at 39' BGS

Screen Interval: 24'- 39' BGS

Pump Intake: ~ 36' BGS

Sample Description _____

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

Plant/Site Ravensdale Project No. 152030402

Site Location Ravensdale, WA

Sample ID MW-5A - 1222

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2020

Type of Sampler Bladder Pump (dedicated)

Date December 13, 2022 Time 12:10

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 30.22 ft BTOC (December 13, 2022 11:37 AM); Well total depth at 40' BGS

Screen Interval: 25'- 40' BGS

Pump Intake: ~ 38' BGS

Sample Description Clear, no odor

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

Plant/Site Ravensdale Project No. 152030402

Site Location Ravensdale, WA

Sample ID Still Well - 1222

Sampling Location Surface Water Monitoring Point

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2020

Type of Sampler Peristaltic Pump

Date December 13, 2022 Time 11:10

Media Surface Water 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 0.23 ft BTOC (December 13, 2022 11:06 AM); Well total depth at N/A

Screen Interval: N/A

Pump Intake: N/A

Sample Description Cleanish tan, no odor

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 Still Well

Date 12/13/2022

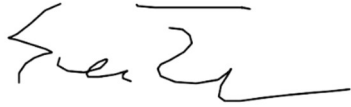
Time Begin Purge 11:07

Time Collect Sample 11:10

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
	11:08	11.6	1,419	7.7	7.42	-92.9	9.97

Comments:

Flow Rate: N/a mL/min



Sampler _____

Date December 13, 2022

Supervisor _____

Date _____

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale Project No. 152030402

Site Location Ravensdale, WA

Sample ID Weir or Constructed Wetlands - 1222

Sampling Location Surface Water Monitoring Point

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2020

Type of Sampler Peristaltic Pump

Date December 13, 2022 Time 10:45

Media Surface Water Station Weir or Constructed Wetlands

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 (December 13, 2022 10:40 AM); Well total depth at N/A

Screen Interval: N/A

Pump Intake: N/A

Sample Description Clear, no odor

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 _____ Weir or Constructed Wetlands _____

Date 12/13/2022

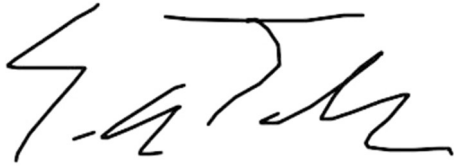
Time Begin Purge 10:43

Time Collect Sample 10:45

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
	10:44	7.83	712	5.6	6.9	12.5	1.29

Comments:

Flow Rate: N/a mL/min



Sampler _____

Date December 13, 2022

Supervisor _____

Date _____

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale Project No. 152030402

Site Location Ravensdale, WA

Sample ID South Pond - 1222

Sampling Location Surface Water Monitoring Point

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2020

Type of Sampler Peristaltic Pump

Date December 13, 2022 Time 10:23

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: Depth to water at 0.41 ft BTOC (December 13, 2022 10:16 AM); Well total depth at N/A

Screen Interval: N/A

Pump Intake: N/A

Sample Description _____

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 South Pond

Date 12/13/2022

Time Begin Purge 10:20

Time Collect Sample 10:23

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
	10:20	9.45	1,319	4.1	8.1	-51.9	15.8

Comments:

Flow Rate: N/a mL/min

Brown, no odor.



Sampler _____

Date December 13, 2022

Supervisor _____

Date _____

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale Project No. 152030402

Site Location Ravensdale, WA

Sample ID P-16 - 1222

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2020

Type of Sampler Peristaltic Pump

Date December 13, 2022 Time 10:05

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 3.01 ft BTOC (December 13, 2022 9:34 AM); Well total depth at 10' BGS

Screen Interval: 5'- 10' BGS

Pump Intake: ~ 8' BGS

Sample Description Brown, sulfur like odor

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 P-16

Date 12/13/2022

Time Begin Purge 09:35

Time Collect Sample 10:05

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
4.27	09:40	10.09	3,578	8.3	6.16	-224	20.4
4.79	09:45	10.21	3,734	8.4	5.08	-313.2	27.9
4.73	09:50	10.29	3,777	8.2	4.46	-349.5	29.2
4.73	09:55	10.63	3,858	8.2	4.01	-370.2	27.5
4.73	09:58	10.71	3,925	8.2	3.78	-375.7	24.9
4.74	10:01	10.75	3,954	8.2	3.62	-381.2	23.7
4.75	10:04	11.01	4,004	8.2	3.49	-393.6	21.0

Comments:

Flow Rate: 200 mL/min

Conductivity measured in specific conductance

Sampler  _____

Date December 13, 2022

Supervisor _____

Date _____

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale Project No. 152030402

Site Location Ravensdale, WA

Sample ID MW-10A - 1222

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2020

Type of Sampler Peristaltic Pump

Date December 13, 2022 Time 09:15

Media Groundwater 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 13.13 ft BTOC (December 13, 2022 8:45 AM); Well total depth at 29' BGS

Screen Interval: 9' - 29' BGS

Pump Intake: ~ 25' BGS

Sample Description Clear, no odor

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

SAMPLE INTEGRITY DATA SHEET

Plant/Site Ravensdale Project No. 152030402

Site Location Ravensdale, WA

Sample ID MW-3A - 1222

Sampling Location Monitoring Well

Technical Procedure Reference(s) Golder, Sampling and Analysis Plan; Quality Assurance Project Plan 2020

Type of Sampler Peristaltic Pump

Date December 12, 2022 Time 14:50

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 5.25 ft BTOC (December 12, 2022 2:02 PM); Well total depth at 20' BGS

Screen Interval: 4' - 20' BGS

Pump Intake: ~ 12' BGS

Sample Description Clear, no odor, no sample

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
2-500 mL	Total Metals	HDPE	HNO3



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