REPORT

QUARTERLY MONITORING REPORT
FIRST QUARTER 2018
RAVENSDALE SITE

28131 Ravensdale-Black Diamond Road
Ravensdale, Washington 98051

Submitted to:

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1.0 INTRODUCTION

This report, prepared by Golder Associates Inc. (Golder) for Holcim (US) Inc., presents the results of surface water and groundwater monitoring conducted at the Ravensdale Site during the first quarter of 2018. The quarterly surface and groundwater monitoring events were completed during February 2018.

1.1 Site Description

The Ravensdale Site (Site) is located at 28131 Ravensdale-Black Diamond Road in Ravensdale, Washington. Figure 1 shows the Site location. The Site is comprised of two distinct areas: the Lower Disposal Area (LDA) and the Dale Strip Pit (DSP). The LDA encompasses about 7 acres and is located in the northwestern portion of the Site. The DSP, an area of about 6 acres, is located in the southeastern portion of the Site. The LDA and DSP are shown in Figure 2.

Historically, sand and coal mining operations occurred on the Site. The Site is currently owned and operated by the Reserve Silica Corporation and is in the reclamation phase. Reserve Silica Corporation is backfilling the remaining historical excavation areas. The Site's historical background and previous environmental investigations are discussed further in Section 2.0.

1.2 Purpose and Scope

The purpose of the quarterly monitoring activities is to assess the groundwater and surface water conditions with respect to potential impact from buried cement kiln dust (CKD). Quarterly monitoring and reporting activities are conducted in accordance with the procedures established in the *Sampling and Analysis and Quality Assurance Project Plan* (SAP/QAPP) (ARCADIS 2006). The SAP/QAPP was approved by the Interagency Group (Washington State Department of Ecology, Public Health – Seattle and King County, and King County Department of Development and Environmental Services) in a letter to ARCADIS U.S., Inc. (ARCADIS) dated August 3, 2006 (Ecology 2006). Modifications to the SAP/QAPP related to sampling locations, test parameters, and sampling frequency were agreed upon as documented in the ARCADIS March 3, 2008 letter to the Department of Ecology. Modifications to the sampling frequency were agreed upon as documented in the Golder April 9, 2015 letter to Public Health – Seattle and King County and a subsequent approval letter from Public Health dated April 7, 2016.

The groundwater and surface water monitoring scope of work includes the following:

- Quarterly collection of groundwater samples from six on-site shallow/alluvial groundwater monitoring wells (MW-1A, MW-2A, MW-3A, MW-4A, MW-5A, and MW-6A) as part of the LDA monitoring program.
- Annual collection of groundwater samples from three on-site bedrock groundwater monitoring wells (MWB-1LDA, MWB-2LDA, and MWB-3LDA) as part of the LDA monitoring program.
- Annual collection of groundwater samples from four on-site bedrock groundwater-monitoring wells (MWB-1SDSP, MWB-1DDSP, MWB-5DSP, MWB-6DSP) as part of the DSP monitoring program.
- Semi-annual measurement of water levels and field parameters in monitoring wells MWB-2DSP and MWB-4SDSP.
- Quarterly collection of surface water samples from Infiltration Ponds #1, Weir (or the constructed wetlands located upstream if the Weir is dry), South Pond, and Still Well as part of the LDA surface water sampling program.

- Annual collection of water samples from the culvert that discharges from the former mine Portal (the Portal) as part of the DSP sampling program.
- Measurement of field parameters in water purged from the groundwater monitoring wells, and sampled directly from the surface water areas. Field parameters include: groundwater level readings (in wells only), pH, conductivity, temperature, dissolved oxygen (DO), oxidation-reduction potential (ORP), and turbidity.
- Analysis of the groundwater, surface water, and quality control samples for dissolved arsenic, lead, iron, manganese, potassium, and total dissolved solids (TDS).
- Analysis of duplicate samples for quality control.
- Quarterly Interceptor Trench monitoring for instantaneous flow volume and sampling for pH, TDS, and turbidity.

Figure 2 shows the location of the monitoring wells and surface water collection points. Table 1 presents details of each monitoring well.

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 as provided by ARCADIS (ARCADIS 2009). This section also includes a discussion of the quarterly monitoring program.

2.1.1 LDA Background

The LDA is a former open pit sand mine that was reclaimed by placing 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 has surfaced along the slope west of the LDA. The outbreaks are primarily located along the northern half of the western boundary of the LDA. The leachate drained through low-lying, marshy areas and commingled with stormwater before flowing to the three infiltration ponds (near the Infiltration Ponds #1 sampling point, as shown in Figure 2) near the Ravensdale-Black Diamond Road (ARCADIS 2004).

2.1.2 DSP Background

The DSP was created to mine the Dale No. 4 coal seam from the surface 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 – Seattle and King County. It is estimated that about one-third of the DSP was filled with CKD (ARCADIS 2004).

2.2 Monitoring Locations

2.2.1 LDA

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 upstream with respect to surface water drainage, the high pH seepage area.

Bedrock monitoring wells were installed along the west side of the main access road, west of the LDA, in December 2006 to assess bedrock groundwater conditions in the vicinity 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.

The LDA surface water sampling locations were chosen to evaluate the effects of high pH seepage in the vicinity of the LDA. Infiltration Ponds #1 sampling location is situated in the westernmost infiltration pond. The infiltration ponds are located at the north end of the Site, near Ravensdale-Black Diamond Road. 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 South Pond is a closed depression located west of MWB-2LDA near the southern end of the high pH seepage zone. The Still Well is a 2-inch-diameter flush-mount well located along the high pH seepage zone west of the LDA.

The LDA groundwater and surface water sampling locations are shown in Figure 2.

2.2.2 DSP

The DSP bedrock groundwater monitoring program was required by Public Health – Seattle and King County and Ecology as a condition of the CKD exemption as a dangerous waste on December 13, 1984 (Public Health 1984). The DSP bedrock groundwater monitoring program includes four wells in the DSP area (MWB-1SDSP, MWB-1DDSP, MWB-5DSP, and MWB-6DSP) and the Portal, which is considered to reflect groundwater conditions. There are two additional monitoring wells (MWB-2DSP and MWB-4SDSP) located in the DSP area that are being monitored for water levels and field parameters.

The DSP groundwater monitoring locations are shown in Figure 2.

2.2.3 LDA Interceptor Trench

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

2.3 Mitigation Activities

2.3.1 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).

2.3.2 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 two test trenches and the tightline 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).

2.3.3 LDA Seep Collection Ditch

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 tightline that carries flow from the test trenches to the infiltration pond. 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. Between October 2017 and January 2018, a water treatment system was constructed, and the collection ditch was extended. The treatment pad is currently waiting for electricity to be provided by Puget Sound Energy in order to begin operating. Seepage water collected in the ditch will carry flow to the water treatment system, which will use carbon dioxide sparging to lower the pH of the water, before discharging it through the existing tightline to the infiltration pond.

2.3.4 LDA Interceptor Trench

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

2.3.5 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.

2.4 Groundwater and Surface Water Monitoring Schedule

Various levels of groundwater and surface water monitoring have been conducted at the Site since 2002. ARCADIS performed monthly and quarterly monitoring activities through the second quarter of 2009. Golder assumed responsibility for monitoring activities in August 2009 and conducted groundwater and surface water monitoring until April 2014. GeoEngineers performed groundwater and surface monitoring from May to December 2014. Golder resumed the groundwater and surface monitoring in February 2015.

2.4.1 LDA Groundwater Sampling

Groundwater monitoring of the shallow/alluvial monitoring wells generally occurred on a quarterly schedule from July 2005 to September 2008. After the seep collection test trenches were installed, groundwater monitoring frequency for the four wells around the infiltration ponds was increased to monthly through September 2009. At

the end of the formal test trench monitoring program in October 2009, the sampling frequency for these four wells returned to quarterly.

Groundwater monitoring of the bedrock monitoring wells generally occurred on a quarterly schedule since December 2006. A letter was submitted to the Public Health – Seattle and King County dated April 9, 2015 requesting a variance to the LDA bedrock groundwater monitoring frequency. In a letter to Golder dated April 7, 2016, Public Health – Seattle and King County granted a variance for three years to reduce the monitoring frequency of the Ravensdale LDA bedrock wells to annually (Public Health 2016).

2.4.2 LDA Surface Water Sampling

Surface water monitoring of Infiltration Ponds #1, Weir (or the constructed wetlands located upstream if the Weir was dry), South Pond, and Still Well generally occurred on a monthly schedule from February 2005 to June 2008 and then was reduced to the current quarterly schedule.

2.4.3 DSP Groundwater Sampling

Groundwater monitoring of wells MWB-1SDSP and MWB-1DDSP generally occurred on a quarterly schedule starting in December 2002. Monitoring of well MWB-5DSP generally occurred on a monthly schedule from December 2006 to June 2008 and then monitoring was reduced to quarterly. Groundwater monitoring of well MWB-6DSP generally occurred on a quarterly schedule starting in December 2006. Groundwater levels and field parameters are being measured in wells MWB-2DSP and MWB-4SDSP on a quarterly schedule. Surface water monitoring of the Portal discharge generally occurred on a quarterly schedule starting in March 2002.

In a letter to Golder dated May 16, 2012, Public Health – Seattle and King County granted a variance for three years to reduce the monitoring frequency of the Ravensdale DSP wells and Portal to semi-annually (Public Health 2012). During this variance period, groundwater monitoring of the DSP wells occurred during the first and third quarters each year. During the second and fourth quarters, only water levels were measured in these wells. This variance expired in May 2015. A letter was submitted to the Public Health – Seattle and King County dated April 9, 2015, requesting a variance to the groundwater monitoring frequency. Pending approval, sampling of the DSP and Portal was reverted back to quarterly, starting with the August 2015 sampling quarter. In a letter to Golder dated April 7, 2016, Public Health – Seattle and King County granted a variance for three years to reduce the monitoring frequency of the DSP wells and Portal to annually (Public Health 2016).

2.4.4 LDA Interceptor Trench Sampling

The Interceptor Trench was monitored monthly from October 2013 to December 2014 and data showed that the water being collected and discharged is not impacted. A reduction in monitoring frequency to quarterly was approved by King County Public Health in an email to Joel Bolduc of Holcim dated January 2, 2015 (Public Health 2015). The Interceptor Trench is being monitored for pH, turbidity, and TDS.

3.0 SAMPLING ACTIVITIES

The following section summarizes the activities associated with the first quarter monitoring event conducted in February 2018.

3.1 Common Elements

3.1.1 Field Parameter Measurements

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 pH, Conductivity, ORP, and temperature
- Hach 2100P Turbidimeter

3.1.2 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:

Arsenic (dissolved)	EPA Method 200.8
Lead (dissolved)	EPA Method 200.8
Potassium (dissolved)	EPA Method 6010C
Iron (dissolved)	EPA Method 6010C
Manganese (dissolved)	EPA Method 6010C
Total Dissolved Solids (TDS)	EPA Method 160.1

- Interceptor Trench samples were tested for the following parameters using the method indicated:

pH	Field Measurement
TDS	EPA Method 160.1
Turbidity	Field Measurement

- Summaries of historical analytic data for the various sampling locations are presented in Appendix A. Validated analytical laboratory data packages are provided electronically on a USB in Appendix C.

3.2 Sampling Procedures

3.2.1 LDA Groundwater Sampling

On February 27 and February 28, 2018, Golder sampled groundwater from the LDA shallow/alluvial groundwater monitoring wells (MW-1A, MW-2A, MW-3A, MW-4A, MW-5A, and MW-6A) and bedrock monitoring wells (MWB-1LDA, MWB-2LDA, and MWB-3LDA). The following methods and procedures were used in collecting the groundwater samples:

- Depth to groundwater was measured in the wells prior to purging and sampling. Table 1 presents depth to water measurements and elevations.
- Using dedicated tubing connected to a portable, stainless steel bladder pump or a peristaltic pump (if groundwater elevation allowed), water from wells MW-1A, MW-2A, MW-3A, MW-4A, MW-5A, and MW-6A was purged at a rate between approximately 200 and 400 milliliters (mL) per minute.
- Using the dedicated discharge tubing connected to the dedicated bladder pump, water from wells MWB-1LDA, MWB-2LDA, and MWB-3LDA was purged at a rate between approximately 350 and 370 mL per minute.
- Field parameters of pH, conductivity, temperature, dissolved oxygen, oxidation-reduction potential, and turbidity were measured and recorded during purging at approximately five minute intervals until parameters were stable. Parameters were considered stable when three consecutive readings of pH, temperature, and conductivity were within five percent.
- Once the field parameters stabilized, the purging phase of the process was concluded. Groundwater samples were then collected directly from the dedicated sample tubing. Samples collected for dissolved metals were field-filtered through a 0.45 μm in-line filter.
- For quality control purposes, a duplicate sample was collected from MW-2A (labeled as MW-7A) and at MWB-1LDA (labeled as MWB-7LDA).
- Laboratory-provided containers were used to collect the samples. For each groundwater sample, one 1-Liter (L) bottle preserved with nitric acid and one 1-L un-preserved bottle were collected. The samples were then labeled and placed in a cooler with ice.

All groundwater and quality control samples were analyzed for the parameters listed in Section 3.1.2. Analytical results are discussed in Section 4.0, and the field parameters and analytical data are presented in Table 2.

3.2.2 LDA Surface Water Sampling

On February 27, 2018, Golder sampled surface water from the Still Well, South Pond, Weir, and the Infiltration Ponds #1 sampling locations. The following methods and procedures were used in collecting the surface water samples:

- Field parameters of pH, conductivity, temperature, dissolved oxygen, oxidation-reduction potential, 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. Samples collected for dissolved metals were field-filtered through a 0.45 μm in-line filter.
- For quality control purposes, a duplicate sample was collected from Infiltration Ponds #1 (labeled as Infiltration Ponds #2).
- Laboratory-provided containers were used to collect the surface water samples. For each surface water sample, one 1-L bottle preserved with nitric acid and one unpreserved 1-L bottle were collected. The samples were then labeled and placed in a cooler with ice.
- The pH of the LDA surface water samples can be 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. In order 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, 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 3.1.2. Analytical results are discussed in Section 4.0, and the field parameters and analytical data are presented in Table 2.

3.2.3 DSP Groundwater Sampling

On February 27 and 28, 2018, Golder sampled groundwater from the DSP groundwater monitoring wells (MWB-1SDSP, MWB-1DDSP, MWB-5DSP, and MWB-6DSP) and the Portal. The following methods and procedures were used in collecting the groundwater samples:

- Depth to groundwater was measured in the wells prior to purging and sampling. Table 1 presents depth to water measurements and elevations.
- Using the dedicated discharge tubing connected to the dedicated bladder pump, water from wells MWB-1DDSP, MWB-1SDSP, MWB-5DSP, and MWB-6DSP was purged at a rate between approximately 340 and 400 mL per minute.
- Field parameters of pH, conductivity, temperature, dissolved oxygen, oxidation-reduction potential, and turbidity were measured and recorded during purging at approximately five minute intervals until parameters were stable. Parameters were considered stable when three consecutive readings of pH, temperature, and conductivity were within five percent.
- Once the field parameters stabilized, the purging phase of the process was concluded. Groundwater samples were then collected directly from the dedicated sample tubing. Samples collected for dissolved metals were field-filtered through a 0.45 μm in-line filter.
- Grab water samples were collected from the Portal using dedicated sample tubing connected to a peristaltic pump. The water quality parameters were measured and recorded at the Portal at the time of sample collection.
- For quality control purposes, a duplicate sample was collected from MWB-6DSP (labeled as MWB-9DSP).
- Laboratory-provided containers were used to collect the samples. For each groundwater sample, one 1-L bottle preserved with nitric acid and one 1-L un-preserved bottle were collected. The samples were then labeled and placed in a cooler with ice.

All groundwater and quality control samples were analyzed for the parameters listed in Section 3.1.2. Analytical results are discussed in Section 4.0, and the field parameters and analytical data are presented in Table 2.

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

3.2.4 LDA Interceptor Trench Sampling

On February 28, 2018, Golder sampled groundwater from the Interceptor Trench. The following methods and procedures were used in collecting the groundwater sample:

- Field pH, turbidity, and the flow rate at the Interceptor Trench outfall were measured and recorded.
- Grab water samples were collected from the Interceptor Trench by placing the sample bottles under the flow of water. pH and turbidity were measured and recorded at the Interceptor Trench at the time of sample collection.
- Laboratory-provided containers were used to collect the sample for TDS lab analysis. One 1-L un-preserved 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 3.1.2. Analytical results are discussed in Section 4.0, and the field parameters and analytical data are presented in Table 4.

4.0 RESULTS

4.1 Preliminary Standards

Preliminary standards have been established from the Washington State Administrative Code (WAC) 173-200 and 246-290-310(3)(a) for some of the field parameters and analytes measured as part of the monitoring program. These standards are presented in Table 3.

4.2 Method Detection Limits and Reporting Limits

The Method Detection Limit (MDL) is the minimum concentration of an analyte that the laboratory can detect using the specified analytical method and equipment. The Reporting Limit (RL) is the lowest concentration that the laboratory can report with certainty after adjustments have been made for sample dilution, sample weight, and other factors.

Where the laboratory analytical results indicate non-detection (ND), the concentration of an analyte is below the MDL. On the trend graphs presented in Appendix B, non-detections for sampling events prior to the December 2009 fourth quarter monitoring were plotted as 50 percent of the RL value. Beginning with the December 2009 fourth quarter monitoring event, non-detections are plotted as the MDL value, which is more representative of actual laboratory results. Method Detection Limits are not available for all of the historical data; therefore, non-detect data prior to December 2009 remains plotted as 50 percent of the RL value. For TDS results, non-detect data are plotted at the RL.

4.3 Data Validation

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 2014) and the *Site Sampling and Analysis and Quality Assurance Project Plan* (ARCADIS 2006). Data reporting qualifiers are included with the analytical results in Appendix A. Copies of the data validation checklist are included in Appendix C, along with the raw analytical data packages provided by the laboratory. The data validation review found that, although some of the data were qualified due to minor analytical issues, all of the data were considered to be valid and usable.

4.4 Measurement Results

A summary of the groundwater field parameters and analytical results for the February 2018 first quarter monitoring are included in Table 2. Interceptor Trench results are provided in Table 4. Trend graphs of pH, TDS, and arsenic and potassium concentrations measured in each monitoring well are presented in Appendix B.

5.0 LIMITATIONS

We have 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 Inc. is not responsible for any data that were inaccurately reported by others and reproduced here.

6.0 REFERENCES

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Tables

Table 1: First Quarter 2018 Water Level Measurements, Ravensdale Site, Ravensdale, Washington

Sample Area	Sample Location ID	Date Sampled	Well Data				Water Levels		
			Total Well Depth (feet bgs)	Screened Interval (feet bgs)	Bentonite Seal (feet bgs)	Casing Diameter (inches)	TOC Elevation (feet msl)	Depth to Water (feet btoc)	Groundwater Elevation (feet msl)
LDA - Shallow/Alluvial Groundwater	MW-1A	27-Feb-18	44	28-43	2-26	2	609.83	25.18	584.65
	MW-2A	27-Feb-18	40	25-40	2-23	2	603.61	19.03	584.58
	MW-3A	27-Feb-18	20	4-20	2-4	2	685.51	5.16	680.35
	MW-4A	27-Feb-18	20	5-20	2-4	2	701.85	3.76	698.09
	MW-5A	27-Feb-18	40	25-40	2-23	2	607.61	23.02	584.59
	MW-6A	27-Feb-18	39	24-39	2-22	2	605.35	20.78	584.57
LDA - Bedrock Groundwater	MWB-1LDA	28-Feb-18	135	115-135	-	2	701.08	22.04	679.04
	MWB-2LDA	28-Feb-18	125	110-125	-	2	738.06	34.95	703.11
	MWB-3LDA	28-Feb-18	145	125-145	-	2	740.59	1.13	739.46
DSP - Bedrock Groundwater	MWB-1SDSP	28-Feb-18	165	150-160	138-148	2	932.69	32.04	900.65
	MWB-1DDSP	28-Feb-18	270	255-265	243-253	2	931.77	45.21	886.56
	MWB-2DSP	28-Feb-18	256	236-256	-	2	931.22	185.96	745.26
	MWB-4SDSP	28-Feb-18	36	25-36	-	2	928.81	17.09	911.72
	MWB-5DSP	28-Feb-18	83	73-83	-	2	931.45	16.55	914.90
	MWB-6DSP	28-Feb-18	195	120-195	-	2	902.35	6.50	895.85

Notes:

-	Not measured or not available
feet bgs	Feet below ground surface
feet bmp	Feet below measuring point
feet msl	Feet above mean sea level
TOC	Top of casing inside PVC well

Table 2: First Quarter 2018 Field Parameters and Analytical Data, Ravensdale Site, Ravensdale, Washington

Sample Area	Sample Location ID	Date Sampled	Field Parameters									Gen. Chem.	Dissolved Metals (mg/L)				
			TOC Elevation (feet msl)	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)	Total Dissolved Solids (mg/L)	Arsenic	Iron	Lead	Manganese	Potassium
LDA - Shallow/Alluvial Groundwater	MW-1A	27-Feb-18	609.83	25.18	584.65	8.9	215	7.35	121.6	6.04	6.31	186	0.00172	<0.05	<0.0001	0.0084	15.5
	MW-2A	27-Feb-18	603.61	19.03	584.58	8.8	293	7.43	185.2	15.1	6.90	254	0.00398	<0.05	<0.0001	<0.001	41.9
	MW-2A dupl MW-7A	27-Feb-18	-	-	-	-	-	-	-	-	-	253	0.0042	<0.05	0.000096 J	0.0004 J	40.7
	MW-3A	27-Feb-18	685.51	5.16	680.35	7.6	**791**	0.21	-75.4	9.52	6.64	**506**	0.00297	1.41	<0.0001	**1.38**	92
	MW-4A	27-Feb-18	701.85	3.76	698.09	8.3	302	3.19	221.1	0.55	6.29	238	0.000176 J	<0.05	<0.0001	0.0045	0.875
	MW-5A	27-Feb-18	607.61	23.02	584.59	7.7	584	1.91	120.4	12.6	**9.96**	**530**	0.0863	0.143	0.000642	0.0068	174
	MW-6A	27-Feb-18	605.35	20.78	584.57	7.0	**823**	3.99	59.3	12.0	**11.29**	**635**	0.0993	0.077	0.000561	0.0045	203
LDA - Bedrock Groundwater[2]	MWB-1LDA	28-Feb-18	701.08	22.04	679.04	10.1	276	0.20	-96.4	0.25	7.44	221	0.01080	0.192	<0.0001	0.0412	0.951
	MWB-1LDA dupl MWB-7LDA	28-Feb-18	-	-	-	-	-	-	-	-	-	224	0.01120	0.199	<0.0001	0.0418	0.963
	MWB-2LDA	28-Feb-18	738.06	34.95	703.11	10.9	261	0.21	-115.5	0.80	7.48	205	0.00569	**0.310**	<0.0001	0.0173	0.992
	MWB-3LDA	28-Feb-18	740.59	1.13	739.46	10.8	187	4.11	142	1.83	7.18	159	0.00253	0.02 J	<0.0001	0.0123	0.848
LDA- Surface Water	South Pond	27-Feb-18	-	-	-	6.5	**1379**	4.05	-71.0	6.11	**10.94**	**865**	0.0617	**0.752**	0.0477 J-	0.0267	429
	Still Well	27-Feb-18	-	-	-	6.6	**5312**	3.75	2.3	2.49	**12.11**	**1970**	0.0502	<0.1	0.00753	0.0025	521
	Weir	27-Feb-18	-	-	-	5.5	498	10.68	106.0	5.39	8.60	**503**	0.0097	0.174	0.00123	0.0488	127
	Infiltration #1	27-Feb-18	-	-	-	5.7	**5062**	8.76	42.0	3.74	**12.28**	**1620**	0.015	<0.1	**0.0546**	<0.002	678
	Infiltration #1 dupl Infiltration #2	27-Feb-18	-	-	-	-	-	-	-	-	-	**1880**	0.0157	<0.1	**0.0558**	<0.002	680
DSP - Bedrock Groundwater[2]	MWB-1SDSP	28-Feb-18	932.69	32.04	900.65	10.7	**1278**	0.16	-58.5	0.11	6.82	**1244**	0.02240	-	<0.0001	-	6.53
	MWB-1DDSP	28-Feb-18	931.77	45.21	886.56	10.2	**758**	0.19	-166.6	0.20	7.26	**694**	0.00287	-	<0.0001	-	3.34
	MWB-2DSP	28-Feb-18	931.22	185.96	745.26	10.1	390	5.95	204.7	1.62	7.15	-	-	-	-	-	-
	MWB-4SDSP	28-Feb-18	928.81	17.09	911.72	11.1	509	8.34	29.0	0.72	7.37	-	-	-	-	-	-
	MWB-5DSP	28-Feb-18	931.45	16.55	914.90	10.9	657	0.15	-97.6	0.35	7.02	**528**	0.00539	-	<0.0001	-	2.55
	MWB-6DSP	28-Feb-18	902.35	6.50	895.85	11.0	423	0.19	-61.0	0.18	7.12	138	0.00156	-	<0.0001	-	1.20
	MWB-6DSP dupl MWB-9DSP	28-Feb-18	-	-	-	-	-	-	-	-	-	151	0.00148	-	<0.0001	-	1.16
	Portal	27-Feb-18	-	-	-	9.5	427	9.94	-46.4	16.7	7.72	354	0.00411	-	<0.0001	-	20.4
Preliminary Standard[a]			-	-	-	-	700	-	-	-	6.5-8.5	500	TBD[b]	0.3	0.05	0.05	-

Notes:

-	Not measured or not available.
*	Depth to water (DTW) measurements for all shallow/alluvial wells collected on the same day; date noted is sampling date.
<	Analyte not detected above the reporting limit shown.
a	Preliminary standard is the standard listed or the site-specific (natural) background concentration, whichever is highest.
b	Site background arsenic value to be determined (TBD).
J	Data validation code; estimated value.
J+	Data validation code; estimated value with positive bias
U	Data validation code; not detected at the Reporting Limit (RL).
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.
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 msl	Feet above mean sea level
mg/L	Milligrams per liter
mV	Millivolts
NTU	Nephelometric Turbidity Unit
µmhos/cm	Micromhos per centimeter

Table 3: Preliminary Standards, Ravensdale Site, Ravensdale, Washington

Parameter	Preliminary Standard	Reference
Conductivity	700 µmhos/cm	WAC 246-290-310(3)(a)
pH	6.5 – 8.5	WAC 173-200; WSDOE Permit 2005
Turbidity	None	None
Total Dissolved Solids	500 mg/L	WAC 173-200
Dissolved Iron	0.3 mg/L	WAC 173-200
Dissolved Lead	0.05 mg/L	WAC 173-200
Dissolved Manganese	0.05 mg/L	WAC 173-200
Dissolved Arsenic	TBD	TBD
Dissolved Potassium	None	None

Notes:

µmhos/cm	Micromhos per centimeter
mg/L	Milligrams per liter
WAC	Washington State Administrative Code
WSDOE	Washington State Department of Ecology
TBD	Site background arsenic value to be determined

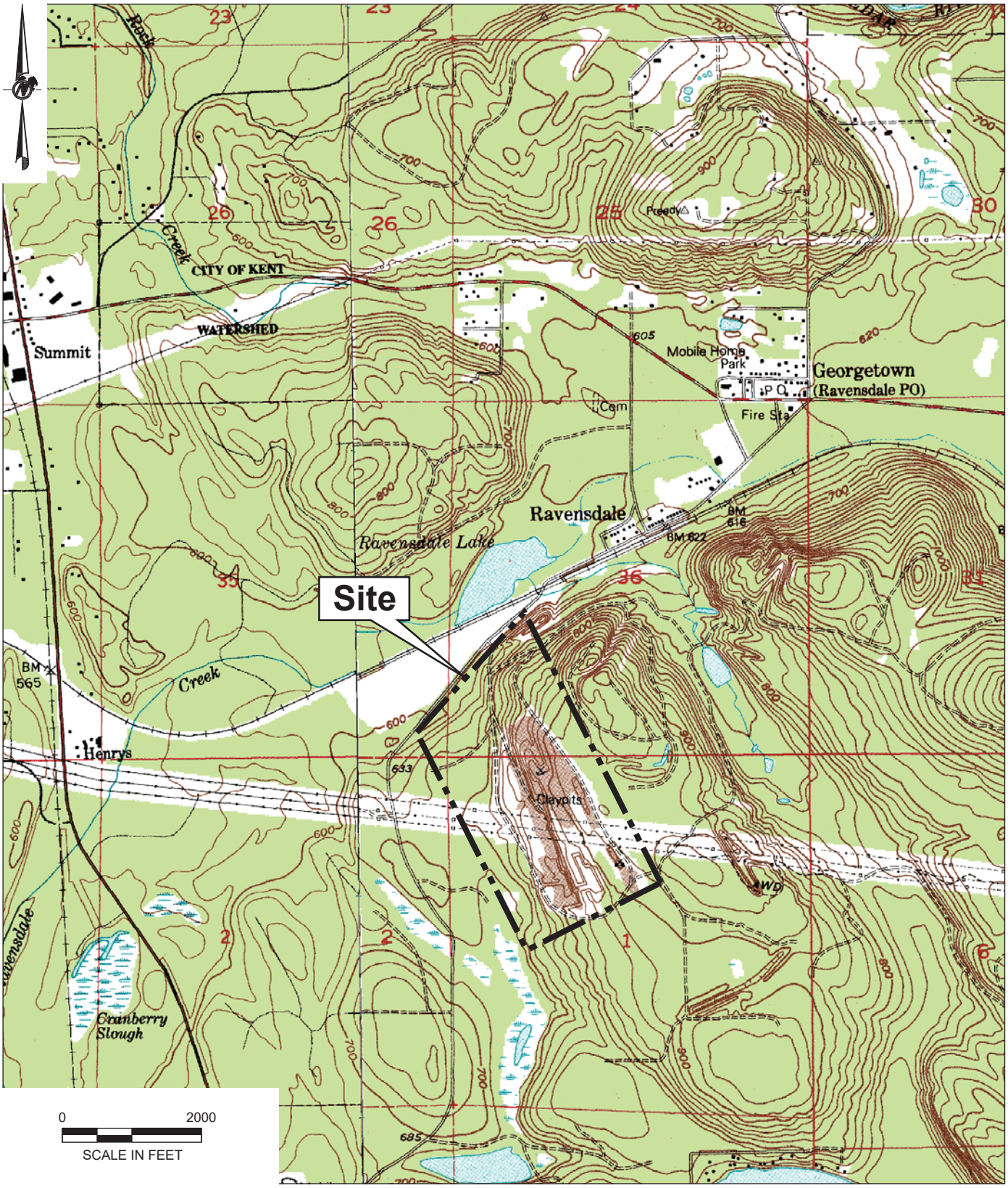
Table 4: Interceptor Trench Discharge Monitoring, Ravensdale Site, Ravensdale, Washington

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	1.0	277
-	-	-	-	-	-
31-Mar-14	11:12	1.0	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	7.20	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	0.3	7.54	2.1	290
4-Aug-15	12:20	0.1	7.61	1.5	268
3-Nov-15	13:15	0.8	7.38	36.9	320
8-Feb-16	10:40	1.9	7.23	9.3	279
2-May-16	16:00	0.5	7.77	22.5	431
22-Aug-16	11:00	0.1	7.78	3.3	302
1-Nov-16	11:40	2.4	8.16	96.3	345
2-Feb-17	9:25	4.5	7.61	0.9	514
30-May-17	15:45	4.5	7.33	4.0	324
18-Aug-17	8:50	0.1	7.57	34.0	300
10-Nov-17	11:20	1.1	6.81	12.9	365
28-Feb-18	10:16	2.2	7.02	37.9	381

Notes:

-	Not measured or not available
gpm	Gallons per minute
NTU	Nephelometric Turbidity Unit
mg/L	Milligrams per liter
1	Reduction in monitoring frequency to quarterly approved by Public Health – Seattle and King County in an email to Holcim dated January 2, 2015.

Figures



CLIENT

HOLCIM (US). INC.

CONSULTANT

GOLDER

YYYY-MM-DD	2018-03-22
PREPARED	REDMOND
DESIGN	
REVIEW	
APPROVED	

PROJECT

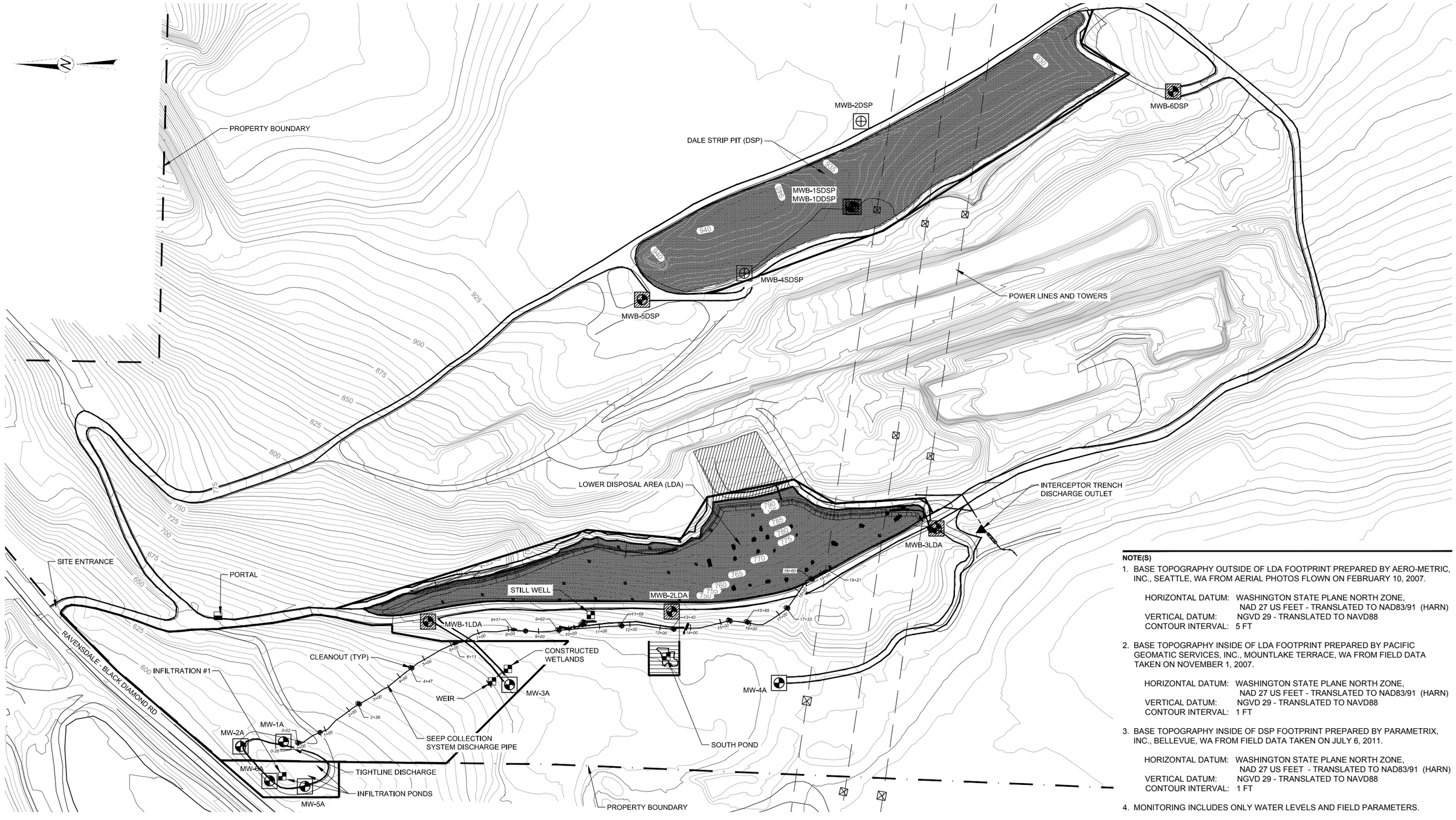
RAVENSDALE

TITLE

VICINITY MAP

PROJECT No.	Phase	Rev.	Figure
1520304	007		1

G:\HOLCIM\Ravensdale\99_PROJECTS\1520304_2015Monitoring\700\02_PRODUCTION\INDD\1520304_700_001.indd



LEGEND

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

0 150 300
1" = 150' FEET

NOTE(S)

1. 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
2. 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
3. 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
4. MONITORING INCLUDES ONLY WATER LEVELS AND FIELD PARAMETERS.

CLIENT
HOLCIM

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-06
DESIGNED	JX
PREPARED	REDMOND
REVIEWED	JX
APPROVED	GZ

PROJECT
RAVENSDALE

TITLE
SITE PLAN

PROJECT NO.	PHASE	REV.	FIGURE
152030401	100	A	2

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

0 1 in

APPENDIX A

Summary Data Tables for Individual Wells and Surface Water Monitoring Locations

APPENDIX A-1

Summary of Lower Disposal Area – Surface Water Sampling Results

Table A-1A Still Well

Table A-1B Infiltration Ponds #1

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						General Chemistry		Dissolved Metals (mg/L)				
	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)	Total Dissolved Solids (mg/L)	pH (standard units)	Arsenic	Iron	Lead	Manganese	Potassium
1-Feb-05	8.10	10658	-	-	6.59	12.87	2860	12.58	0.04990	<0.100	0.00552	<0.0100	-
9-Mar-05	13.23	7393	-	-	7.42	12.51	2860	12.53	0.11500	0.228	0.01470	<0.0100	-
5-Apr-05	9.50	11310	-	-	10.90	12.44	2900	12.32	0.05560	<0.100	0.01160	<0.0200	-
10-May-05	13.99	11871	-	-	3.60	12.53	2810	12.57	0.05540	<0.100	0.01250	<0.0200	-
7-Jun-05	13.83	10888	-	-	22.60	12.54	2490	12.51	<0.00500	<0.100	<0.00500	<0.0200	-
15-Jul-05[a]	18.21	11331	-	-	14.80	12.50	3800	12.6	0.00272	<0.150	0.00607	<0.0100	-
15-Jul-05[b]	-	-	-	-	-	-	2540	12.61	0.03980	<0.100	0.00757	<0.0200	-
9-Aug-05[a]	21.45	12087	-	-	17.90	11.78	3500	12.6	0.12000	0.288	0.01090	0.0101	-
9-Aug-05[b]	-	-	-	-	-	-	2820	12.46	0.09150	<0.100	0.00953	<0.0200	-
14-Sept-05[a]	17.38	9507	-	-	14.00	12.36	3600	12.5	0.11800	<0.750	0.01120	<0.0500	-
14-Sept-05[b]	-	-	-	-	-	-	2830	12.61	0.11500	0.363	0.01440	-	-
5-Oct-05	13.31	11481	-	-	62.70	12.47	3020	12.6	0.08520	<0.100	0.01190	<0.0200	-
9-Nov-05	9.58	14417	-	-	11.00	12.34	3400	12.6	0.07400	<0.150	<0.01000	<0.0100	-
9-Dec-05	6.18	7138	-	-	12.50	12.82	2800	12.6	0.01450	<0.150	0.00107	<0.0100	-
19-Jan-06	8.66	8265	1.74	-	11.80	13.06	1900 J	12.6 J	0.01520 J	<0.150	<0.00100	<0.0100	-
16-Feb-06	8.13	9019	2.81	195.6	6.16	12.27	3200 J	12.6	0.01340 J	<0.150	0.00189	<0.0100	-
15-Mar-06	7.98	9033	0.79	114.8	8.93	12.60	3300 J	12.6	0.00236	<0.150	0.00250 J	<0.0100	-
7-Apr-06	9.98	10450	0.57	34.8	6.08	12.51	3400	12.6	0.01520	<0.150	0.00283	<0.0100	-
16-May-06	12.79	11060	0.14	45.4	9.28	12.40	3500	12.6	0.00404	<0.150	0.00159	<0.0100	-
23-Jun-06	13.29	11680	0.44	-	14.60	12.90	3600	12.6	0.05260	<0.150	0.01650	<0.0100	-
20-Jul-06	16.20	12240	0.14	-217.8	10.40	12.47	4300	12.7	0.01930	<0.150	0.00357	<0.0100	-
22-Aug-06	17.14	10920	1.22	-146.0	13.30	12.66	3800	12.7	0.14400	<0.150	0.00914 J	<0.0100	-
26-Sep-06	15.72	9599	0.42	-263.3	61.40	12.59	3800	12.5	0.12300	0.171	0.00463	0.0154	-
26-Oct-06	10.99	9955	0.88	-207.5	82.30	12.93	3600	12.6	0.16100	<1.500	0.01950	<0.1000	-
15-Nov-06	10.58	12040	1.82	149.2	188.00	12.87	3400	12.5	0.03060 J	<0.150	0.00450	<0.0100	-
20-Dec-06	8.85	10990	0.71	-152.0	32.80	13.02	2600 J	12.8	0.05260	<0.150	0.01300	<0.0100	-
24-Jan-07	8.29	10440	0.97	-139.8	13.70	13.05	2500 J	12.4	0.05860	<0.150	0.01310	<0.0100	-
12-Feb-07	8.88	10590	0.86	-125.8	56.40	13.06	3400	12.5	0.06130	<0.150	0.01400	<0.0100	-
27-Mar-07	9.45	9163	1.25	-42.4	18.40	11.53	2900 J	12.5 J	0.04410	<0.150	0.00181	<0.0100	-
18-Apr-07	8.90	8155	2.63	2.3	37.20	12.77	3300 J	12.4	0.02930	<0.150	0.00198	<0.0100	-
31-May-07	20.12	11050	5.30	-153.9	9.31	11.59	2800 J	12.5	0.04850	<0.150	0.01510 J	<0.0100	-
20-Jun-07	18.28	12000	5.41	-122.5	16.10	12.04	4300 J	12.4 J	0.02680	<0.150	0.00233	<0.0100	-
31-Jul-07	16.53	12200	1.70	-151.6	24.80	12.48	6000	12.6 J	0.08760	<0.150	0.00103	<0.0100	-
29-Aug-07	17.00	9570	1.12	-183.1	268.00	12.78	4600 J	12.6 J	0.10600	<0.150	0.00946	<0.0100	-
27-Sep-07	14.49	8263	52.40	-183.0	211.00	12.42	2800	12.5 J	0.12500	<0.150	0.01540	<0.0100	-

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

Date Sampled	Field Parameters						General Chemistry		Dissolved Metals (mg/L)				
	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)	Total Dissolved Solids (mg/L)	pH (standard units)	Arsenic	Iron	Lead	Manganese	Potassium
26-Oct-07	9.49	6144	4.88	-147.2	92.40	12.85	3300 J	12.3 J	0.12400	0.260	0.02490	0.0101	-
30-Nov-07	5.53	7703	2.13	-122.6	127.00	12.67	2200	12.4 J	0.17400	0.184	0.01410	<0.0100	-
12-Dec-07	5.24	11609	3.43	-144.8	116.00	12.60	4100	12.4 J	0.11000	<0.150	0.01130	<0.0100	-
24-Jan-08	3.73	9649	13.81	-138.0	-	10.74	2500	11.8 J	0.10100	1.530	0.00974	0.0815	-
28-Feb-08	-	-	-	-	51.20	-	2900	12.4 J	0.05850	<0.150	0.01260	<0.0100	-
25-Mar-08	7.06	8623	5.52	-11.2	17.40	11.26	3400	12.5 J	0.07430	<0.150	0.01040	<0.0100	-
29-Apr-08	9.74	11332	4.29	-1.3	27.70	12.82	3000 J	12.5 J	0.07660	<0.150	0.01330	<0.0100	-
20-May-08	14.53	11955	1.74	-35.8	72.70	12.82	3400	12.5 J	0.08730	<0.150	0.01510	<0.0100	-
18-Jun-08	12.77	10267	3.34	-27.0	34.00	12.86	3200 J	12.4 J	0.06320	<0.150	0.01690	<0.0100	-
26-Aug-08	15.86	7703	1.06	-72.8	38.30	12.67	2600 J	12.2 J	0.43000	1.220	0.03500	0.0497	759
20-Nov-08	9.59	8762	0.91	-65.6	74.10	13.32	3500	12.4 J	0.07000	<0.150	0.01680	<0.0100	848
12-Feb-09	3.25	554	14.29	-	108.00	13.03	550	11.8 J	0.04720	<0.150	0.01370	<0.0100	551
19-May-09	11.53	276	8.80	26.0	43.40	9.83	2500 J	12.4 J	0.03780	<0.150	0.01500	<0.0100	689
22-Sep-09	12.47	9760	1.50	159.1	625.00	12.47	3000	-	0.16000	0.200	0.03700	0.0100 J	990
15-Dec-09	5.20	11650	1.90	237.0	26.30	12.85	3000	-	0.08600	0.067 J	0.02100	0.0047 J	900 J
22-Mar-10	9.70	1035	-	182.0	19.40	12.58	3000	-	0.07300	<0.200	0.01700	<0.0200	870
17-Jun-10	11.70	9610	0.08	-	6.59	12.48	2700	-	0.06600	0.095 J	0.01500	0.0020 J	780
21-Sep-10	15.00	6710	1.26	152.6	140.00	12.29	2400	-	0.30000	1.100 J+	0.03900	0.0300 J+	570
8-Dec-10	8.30	10110	1.00	-	5.44	12.63	2600	-	0.06400	<0.200	0.01000	<0.0200	860
30-Mar-11	8.60	4810	0.46	136.3	13.70	14.31	2500 J	-	0.06500	<0.200	0.00960	<0.0200	720
21-Jun-11	16.60	10420	1.63	111.9	3.40	12.36	5200	-	0.06000	<0.200	0.00910	0.0017 J	770
28-Sep-11	14.80	5270	2.34	70.0	66.70	12.17	2200	-	0.22000	0.360	0.01100	0.0072 J	1000
15-Dec-11	6.00	7330	2.47	104.2	18.30	13.09	2800	-	0.08300	<0.200	0.00290	<0.0200	880
21-Mar-12	5.50	11040	3.15	294.2	12.00	12.39	2600	-	0.06700	<0.200	0.00470	<0.0200	760
19-Jun-12	5.50	11040	3.15	294.2	12.00	12.39	2600	-	0.05800	<0.200	0.00670	<0.0200	690
20-Sep-12	16.10	9560	3.27	76.0	10.70	12.35	2900	-	0.08400	<0.200	0.00300	<0.0200	830
19-Dec-12	4.10	1320	10.11	303.1	5.86	9.69	700	-	0.07500	0.690	0.00430	0.0710	250
26-Feb-13	7.30	9950	1.77	161.8	25.50	12.66	2000	-	0.07000	<0.500	0.00029 J	<0.0200	720
23-May-13	11.50	8040	2.23	266.8	22.70	12.47	2500	-	0.05700	<0.500	0.00340	<0.0200	690
22-Aug-13	17.40	8810	2.42	10.8	38.50	12.79	2590	-	0.05780	<0.100	0.00150	0.0020	863
19-Nov-13	9.00	7090	2.47	79.0	62.80	12.54	2720	-	0.05250	<0.100	0.00420	<0.0020	909
1-Apr-14	10.30	6080	0.55	128.2	37.10	6.08	1890	-	0.05460	<0.100	0.00110	<0.0013	687
22-May-14	13.60	7360	1.22	34.4	-	11.75	2330	-	0.06090	<0.100	0.00200	<0.0020	689
13-Aug-14	18.26	7844	0.33	1.2	7.30	12.53	2770	-	0.07000	<0.100	0.00210	<0.0020	849
12-Nov-14	9.00	585	3.17	-47.8	17.50	12.93	2450	-	0.08320	<0.100	0.00390	<0.0020	837

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

Date Sampled	Field Parameters						General Chemistry		Dissolved Metals (mg/L)				
	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)	Total Dissolved Solids (mg/L)	pH (standard units)	Arsenic	Iron	Lead	Manganese	Potassium
12-Feb-15	10.70	7540	2.68	-18.6	9.64	12.71	2150	-	0.05160	<0.100	0.00030	<0.0020	690
4-May-15	12.90	9140	2.73	110.4	26.80	13.02	2520	-	0.05460	<0.100	0.00022 J	<0.0020	734
5-Aug-15	19.50	8060	2.58	-29.8	61.10	12.62	2980	-	0.06390	<0.250	0.00170	0.0047 J	898
3-Nov-15	11.10	5150	0.37	38.6	171.00	8.93	1840	-	0.10900	0.270	0.02170	0.0130	747
9-Feb-16	9.70	7390	0.78	80.8	7.79	13.07	2170	-	0.05360	<0.100	0.00120	0.0060	601
3-May-16	14.70	7530	1.40	358.1	2.65	12.98	2480	-	0.0542	<0.100	0.00170 J-	0.0020	711
22-Aug-16	20.50	8	2.10	-	59.00	12.95	2780	-	0.09130	<0.250	0.00587	0.0023 J	831
1-Nov-16	12.30	2884	2.66	-72.1	19.10	13.17	2620	-	0.04620	<0.100	0.00964	<0.0020	841
31-Jan-17	7.40	8510	2.37	-167.0	7.35	13.17	2050	-	0.05250	0.026 J	0.00119	0.0016 J	582
31-May-17	14.60	7500	2.44	-	4.17	12.89	1900	-	0.04540	0.011 J	0.00068 J+	0.0007 J	615
17-Aug-17	18.30	8460	3.35	-84.0	15.90	12.79	2680	-	0.05680	0.003 J	0.00214	0.0013 J	750
9-Nov-17	8.20	7215	3.48	90.9	18.20	12.65	2360	-	0.0621	<0.1	0.00352	0.0025	822
27-Feb-18	6.60	5312	3.75	2.3	2.49	12.11	1970	-	0.05020	<0.1	0.00753	0.0025	521
Preliminary Standard[c]	-	700	-	-	-	6.5-8.5	500	6.5-8.5	TBD[d]	0.3	0.05	0.05	-

Notes:

-	Not analyzed or not available
<	Analyte not detected above the reporting limit shown
a	North Creek Analytical, Inc.
b	Severn Trent Laboratories
c	Preliminary standard is the standard listed or the site-specific (natural) background concentration, whichever is highest
d	Site background arsenic value to be determined (TBD)
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 msl	Feet above mean sea level
mg/L	Milligrams per liter
mV	Millivolts
NTU	Nephelometric Turbidity Unit

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

Date Sampled	Field Parameters						General Chemistry		Dissolved Metals (mg/L)				
	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)	Total Dissolved Solids (mg/L)	pH (standard units)	Arsenic	Iron	Lead	Manganese	Potassium
1-Feb-05	8.17	1315	-	-	8.13	9.95	874	9.75	0.08490	0.234	0.00499	0.0249	-
9-Mar-05	14.04	1183	-	-	23.00	9.59	960	9.46	0.09620	0.470	0.00392	0.0321	-
5-Apr-05	11.00	1115	-	-	43.70	9.80	800	9.49	0.06230	0.574	0.00321	<0.0200	-
10-May-05	14.91	1275	-	-	564.00	9.83	844	9.79	0.07650	0.790	<0.00500	0.0462	-
7-Jun-05	15.11	1140	-	-	239.00	9.61	804	9.53	0.08430	0.722	<0.00500	0.0327	-
15-Jul-05[a]	23.56	1276	-	-	94.40	9.30	1100	9.54	0.09250	<0.300	0.00414	0.0534	-
15-Jul-05[b]	-	-	-	-	-	-	874	9.45	0.09990	0.533	0.00382	<0.0200	-
9-Aug-05[a]	19.05	1744	-	-	57.20	9.44	1000	9.22	0.12300	0.792	0.00510	0.0499	-
9-Aug-05[b]	-	-	-	-	-	-	1030	9.05	0.14000	0.339	0.00612	0.0308	-
14-Sept-05[a]	13.59	1154	-	-	99.80	8.97	790	9.04	0.11000	<0.750	0.00354	<0.0500	-
14-Sept-05[b]	-	-	-	-	-	-	806	9.03	0.11800	0.877	0.00518	-	-
5-Oct-05	14.82	970	-	-	82.70	8.98	736	8.73	0.08930	0.329	0.00283	0.0263	-
9-Nov-05	8.43	1285	-	-	135.00	8.83	970	9.28	0.04600	0.194	<0.01000	0.0295	-
9-Dec-05	2.12	1361	-	-	14.20	9.71	980	9.54	0.06460	0.179	0.00311	0.0399	-
19-Jan-06	6.66	728	7.96	-	64.70	10.13	470 J	9.77	0.04070	0.181	0.00229	0.0402	-
16-Feb-06	2.63	624	9.75	30.3	25.20	8.54	530 J	8.99	0.01330	<0.150	<0.00100	0.1190	-
15-Mar-06	7.16	639	11.61	236.8	23.10	9.22	530 J	9.19	0.02250	0.167	<0.00100	0.0791	-
7-Apr-06	11.91	1013	10.81	27.8	18.80	9.98	780	9.72	0.06380	0.344	0.00324	0.0483	-
16-May-06	15.58	1160	7.58	50.6	16.50	9.57	950	9.65	0.07790	0.462	0.00249	0.0505	-
23-Jun-06	18.63	1261	7.41	-	126.00	9.85	920	9.35	0.07070	0.228	0.00365	0.0366	-
20-Jul-06	20.65	932	5.36	-35.1	279.00	8.94	980	8.79	0.10800	0.287	0.00348	0.0285	-
22-Aug-06	15.65	860	7.64	86.5	218.00	9.22	760	9.15	0.11600	0.734	0.00384	0.0237	-
26-Sep-06	21.86	903	8.98	-72.8	263.00	8.89	820	8.76	0.07580	0.616	0.00306	0.0558	-
26-Oct-06	11.04	702	9.97	90.4	221.00	8.56	760	8.59	0.06830	<1.500	0.00166	<0.1000	-
15-Nov-06	7.73	715	9.21	149.2	33.60	9.07	500	9.25	0.02080	0.174	0.00229	0.0367	-
20-Dec-06	4.98	1082	9.05	86.3	9.29	9.78	680	9.83	0.05130	0.269	0.00267	0.0549	-
24-Jan-07	2.12	1058	10.71	130.4	20.50	9.97	640 J	9.97	0.06610	<0.150	0.00758	0.0403	-
12-Feb-07	10.10	1218	12.40	-61.8	103.00	9.98	860	9.97	0.09010	0.642	0.00449	0.0451	-
27-Mar-07	7.94	772	9.67	13.3	25.50	8.27	540 J	9.96 J	0.04980	<0.150	0.00274	0.0336	-
18-Apr-07	7.52	2418	9.23	84.4	58.10	11.73	1400	11.4 J	0.07920	0.212	0.01050	0.0296	-
31-May-07	15.45	1879	6.47	-92.2	3.15	9.79	1300	10 J	0.16500	<0.750	0.00811	0.1340	-
20-Jun-07	24.18	1925	10.88	-52.1	251.00	10.24	1300 J	10.1 J	0.14400	<0.150	0.00534	<0.0100	-
31-Jul-07	19.05	1418	5.97	-36.1	128.00	9.81	1200	9.4 J	0.14000	1.070	0.00723	0.0433	-
29-Aug-07	18.00	1193	5.60	-35.4	158.00	9.29	1300 J	9.48 J	0.16400	0.427 J	0.00701	0.0277 J	-
27-Sep-07	14.97	987	5.44	45.9	186.00	8.99	970	9.15 J	0.19600	0.438	0.00549	0.0326	-

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

Date Sampled	Field Parameters						General Chemistry		Dissolved Metals (mg/L)				
	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)	Total Dissolved Solids (mg/L)	pH (standard units)	Arsenic	Iron	Lead	Manganese	Potassium
26-Oct-07	2.66	504	6.02	63.1	282.00	8.64	770 J	8.17 J	0.04290	0.422	0.00225	0.0602	-
30-Nov-07	1.86	955	9.77	190.1	163.00	10.02	570	8.9 J	0.04890	0.205	0.00162	0.0271	-
12-Dec-07	4.22	790	11.11	126.8	56.00	9.40	520	9.05 J	0.03430	0.179	0.00167	0.0175	-
24-Jan-08	2.12	875	19.35	142.0	-	8.68	640	9.24 J	0.04280	0.162	0.00166	0.0155	-
28-Feb-08	-	-	-	-	25.60	-	510	9.18 J	0.04130	<0.150	0.00266	0.0159	-
25-Mar-08	5.27	937	14.46	91.0	86.80	9.60	630	9.55 J	0.05020	0.180	0.00215	0.0213	-
29-Apr-08	9.02	1079	10.56	190.8	61.30	9.87	670 J	9.76 J	0.06600	0.27 J	0.00287	0.0286	-
20-May-08	15.42	1191	7.58	160.0	91.40	9.75	820	9.7 J	0.08590	0.334	0.00485	0.0432	-
18-Jun-08	12.94	1124	9.62	167.3	76.90	9.65	810 J	9.55 J	0.07760	0.486	0.00367	0.0222	-
26-Aug-08	15.95	880	3.75	53.5	490.00	8.00	650 J	7.81 J	0.07690	0.334	0.00164	0.0713	144
20-Nov-08	6.91	897	7.02	183.5	376.00	10.22	960	10.1 J	0.08720	0.196	0.00421	0.0584 J	313
12-Feb-09	1.29	-	13.72	-	10.20	10.52	800	10.1 J	0.11800	0.177	0.00584	0.0561	271
19-May-09	11.90	862	6.52	71.9	133.00	9.59	840 J	9.9 J	0.09130	0.350	0.00399	0.0366	238
18-Nov-09	5.70	852	6.61	185.9	68.00	9.88	490	-	0.04000	0.700	0.00440	0.0350	160
15-Dec-09	2.30	1162	8.22	460.1	63.30	9.97	640	-	0.07100	0.850	0.00720	0.0500	220
24-Mar-10	13.00	1299	5.83	408.2	13.00	10.48	1,000	-	0.14000	0.720	0.00850	0.0370	340
17-Jun-10	12.00	947	4.45	332.1	33.60	10.56	540	-	0.06200	0.660	0.00620	0.0630	220
22-Sep-10	15.60	1736	3.14	342.5	33.00	9.84	1300	-	0.13000	2.900	0.02100	0.1700 J+	360
8-Dec-10	5.40	1382	7.73	371.1	12.10	10.75	870	-	0.10000	0.490	0.01200	0.0370	300
29-Mar-11	9.60	627	5.16	577.6	19.80	11.05	760 J	-	0.07800	0.200 J+	0.00310	0.0210	270
21-Jun-11	21.00	1778	5.46	239.1	11.60	10.44	1700 J	-	0.07800	0.810	0.01100	0.0650	340
27-Sep-11	14.80	1382	3.98	239.8	33.40	9.58	1600	-	0.12000	1.600	0.01300	0.0820	670
14-Dec-11	3.10	1046	5.60	281.7	15.70	9.93	1100	-	0.08700	1.100	0.01400	0.0630	330
20-Mar-12	6.10	986	11.04	271.1	11.70	10.32	500	-	0.07100	0.470	0.00330	0.0590	180
19-Jun-12	14.80	862	7.83	352.2	38.80	9.57	500	-	0.06400	0.560 J+	0.00370	0.0540	180
20-Sep-12	12.40	1961	1.81	419.0	10.30	9.43	4600 J	-	0.13000	0.480	0.00210	0.0470	440
19-Dec-12	4.10	1320	10.11	303.1	5.86	9.69	700	-	0.07500	0.690	0.00430	0.0710	250
25-Feb-13	7.10	1963	9.30	234.7	26.60	11.30	1000	-	0.09000	0.100 J	0.00600	0.0230	370
22-May-13	10.50	4380	7.72	411.7	202.00	12.56	1400	-	0.02500	<0.500	0.01100	0.0064 J	530
21-Aug-13	20.10	12850	1.24	-2.3	18.20	12.18	3430	-	0.10600	0.270	0.04750	0.0210	1180
20-Nov-13	5.70	1198	8.03	131.9	22.20	10.23	704	-	0.04130	0.210	0.00620	0.0400	260
1-Apr-14	9.80	1708	9.77	136.4	8.79	12.26	832	-	0.02410	0.049 J	0.00300	0.0050 J+	317
23-May-14	12.63	6574	8.63	120.8	-	12.61	2120	-	0.00480	<0.100	0.03540	<0.0020	811
13-Aug-14	18.99	3273	6.29	77.7	89.00	12.34	1660	-	0.07140	<0.100	0.00630 J	0.0070	548
11-Nov-14	8.80	578	3.55	179.2	62.50	12.73	2000	-	0.05670	<0.100	0.02040	<0.0020	739

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

Date Sampled	Field Parameters						General Chemistry		Dissolved Metals (mg/L)				
	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)	Total Dissolved Solids (mg/L)	pH (standard units)	Arsenic	Iron	Lead	Manganese	Potassium
11-Feb-15	9.70	487	9.97	66.2	42.00	9.40	337	-	0.00910	0.120	0.00090	0.0120	87.7
4-May-15	14.30	4210	5.60	281.2	7.67	12.53	1670	-	0.03530	0.039 J	0.00740	0.0014 J	589
5-Aug-15	19.90	4890	5.14	18.8	89.80	11.79	3080	-	0.08540	0.390	0.01810	0.0120	1150
3-Nov-15	9.20	760	6.39	129.9	34.60	9.78	707	-	0.02350	0.270	0.00530	0.0150	235
9-Feb-16	10.20	-	10.29	100.3	8.01	12.78	1330	-	0.00530	<0.1000	0.02480	0.0030	530
2-May-16	-	-	-	-	-	-	2490	-	0.02400	0.0754 J	0.0370 J-	0.0041 J	996
23-Aug-16	19.30	4250	3.95	386.5	46.30	11.76	2970	-	0.10500	0.404	0.01430	0.0113	989
1-Nov-16	11.70	229	9.26	185.2	48.90	10.33	508	-	0.01260	0.155	0.00079	0.0067	164
1-Feb-17	2.40	8890	10.78	26.1	3.17	13.36	2220	-	0.01010	<0.250	0.04680	<0.0050	854
30-May-17	14.70	6800	56.90	17.7	1.38	12.73	1720	-	0.00175	0.030 J	0.03160 J+	0.0009 J	759
17-Aug-17	18.10	5410	3.88	-19.5	14.90	11.93	3080	-	0.06260	0.122 J	0.03280	0.0111	1150
10-Nov-17	7.90	2016	7.72	64.4	30.70	12.00	1520	-	0.063	0.156	0.0322	0.0141	578
27-Feb-18	5.70	5062	8.76	42.0	3.74	12.28	1620	-	0.01500	<0.1	0.05460	<0.002	678
Preliminary Standard[c]	-	700	-	-	-	6.5-8.5	500	6.5-8.5	TBD[d]	0.3	0.05	0.05	-

Notes:

-	Not analyzed or not available
<	Analyte not detected above the reporting limit shown
a	North Creek Analytical, Inc.
b	Severn Trent Laboratories
c	Preliminary standard is the standard listed or the site-specific (natural) background concentration, whichever is highest
d	Site background arsenic value to be determined (TBD)
e	Field parameters for Infiltration Ponds #1 were inadvertently not collected during May 2016 sampling
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 msl	Feet above mean sea level
mg/L	Milligrams per liter
mV	Millivolts
NTU	Nephelometric Turbidity Unit

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

Date Sampled	Field Parameters							General Chemistry		Dissolved Metals (mg/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)	pH (standard units)	Arsenic	Iron	Lead	Manganese	Potassium
1-Feb-05	8.47	2205	-	-	6.24	10.23	-	1440	10.37	0.14900	0.323	0.01070	0.0569	-
9-Mar-05	11.38	2054	-	-	7.80	10.15	2.64	1630	10.11	0.20000	0.526	0.01190	0.0938	-
5-Apr-05	7.7	2169	-	-	7.99	10.42	10.00	1420	10.18	0.12900	1.150	0.00861	0.0540	-
10-May-05	14.1	1912	-	-	562.00	9.87	25.00	1210	9.85	0.10500	1.460	0.00763	0.0818	-
7-Jun-05	15.74	2588	-	-	11.60	10.03	6.82	1570	10.18	0.13800	1.470	0.01010	0.1170	-
15-Jul-05[a]	20.38	3184	-	-	8.91	10.36	0.94	3200	10.3	0.19200	0.367	0.00998	0.2060	-
15-Jul-05[b]	-	-	-	-	-	-	-	1990	10.44	0.18900	1.460	0.01080	0.1640	-
9-Aug-05[a]	-	-	-	-	-	-	Dry	-	-	-	-	-	-	-
9-Aug-05[b]	-	-	-	-	-	-	Dry	-	-	-	-	-	-	-
14-Sept-05[a]	15.60	3792	-	-	14.50	9.92	0.07	2800	10	0.20800	1.250	0.05780	0.1000	-
14-Sept-05[b]	-	-	-	-	-	-	-	2730	10.16	0.22300	1.070	0.07330	-	-
5-Oct-05	12.96	3237	-	-	4.99	9.89	0.32	2150	9.97	0.17000	1.430	0.01250	0.2250	-
9-Nov-05	8.40	2545	-	-	13.80	9.64	7.50	1900	9.88	0.07820	0.167	<0.01000	0.0835	-
9-Dec-05	3.34	1377	-	-	8.03	10.43	5.00	1700	10.4	0.13000	0.189	0.00612	0.0857	-
19-Jan-06	7.37	1424	7.92	-	12.20	10.61	7.50	1000 J	10.4	0.08950	0.449	0.00481	0.1040	-
16-Feb-06	3.74	1680	12.19	*	14.60	10.78	7.50	1400 J	10.8	0.10500	0.343	0.00546	0.0817	-
15-Mar-06	7.21	1634	12.61	194.4	7.44	10.63	5.28	1300 J	10.7	0.12800	0.204	0.00638	0.0750	-
7-Apr-06	14.33	2055	8.54	55.3	9.21	10.84	3.17	1500	10.4	0.14300	0.552	0.00663	0.1140	-
16-May-06	21.65	2474	6.09	11.6	9.37	10.69	0.83	2000	10.6	0.15700	0.921	0.00819	0.2000	-
23-Jun-06	24.58	2820	6.66	-	15.40	11.64	0.63	1400	10.6	0.15400	0.210	0.01310	0.1090	-
20-Jul-06	21.17	3291	8.56	-85.5	68.30	10.75	Dry*	2300	10.8	0.13100	0.454	0.00941	0.0406	-
22-Aug-06	-	-	-	-	-	-	Dry	-	-	-	-	-	-	-
26-Sep-06	16.38	2997	3.00	-57.1	31.60	9.92	Dry*	2900	9.94	0.10300	1.070	0.01680	0.1010	-
26-Oct-06	11.00	2650	5.35	59.6	25.80	9.65	0.63	2300	9.45	0.13200	2.220	0.02630	<0.100	-
15-Nov-06	8.51	1708	8.16	-35.7	34.70	10.15	17.14	1200	10.1	0.06740	0.518	0.00807	0.0794	-
20-Dec-06	5.07	1927	8.84	14.8	7.94	10.67	10.91	1200	10.5	0.09970	0.384	0.00478	0.0844	-
24-Jan-07	2.30	1846	10.72	5.9	11.70	10.37	9.00	1100 J	10.6	0.12600	0.359	0.01610	0.0729	-
12-Feb-07	9.26	1777	11.75	-91.3	26.70	10.56	6.00	1100	10.3	0.13900	0.283	0.00712	0.0808	-
27-Mar-07	8.71	1219	9.18	-12.6	13.80	8.70	24.00	840 J	10.2 J	0.08850	0.289	0.00486	0.0821	-
18-Apr-07	7.39	4563	8.65	41.0	16.80	12.12	9.00	2000	11.9 J	0.09750	0.830	0.03250	0.0408	-
31-May-07	-	3916	6.33	-149.5	10.70	10.96	1.36	2100	11.5 J	0.27500	<0.750	0.02290	0.1560	-
20-Jun-07	22.59	3336	8.50	-20.4	42.50	10.46	0.29	2400 J	10.4 J	0.25500	<0.150	0.02740	0.0309	-
31-Jul-07	18.94	3915	7.85	-69.2	41.30	10.92	0.06	3300	10.8 J	0.23600	1.100	0.01260	0.0846	-
29-Aug-07	21.52	2406	5.75	-5.3	24.10	9.72	Dry*	2300 J	9.53 J	0.12900	0.627	0.00845	0.1940	-
27-Sep-07	13.88	2009	5.75	15.5	28.30	9.56	0.06	1600	9.51 J	0.20700	1.150	0.00437	0.4170	-

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

Date Sampled	Field Parameters							General Chemistry		Dissolved Metals (mg/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)	pH (standard units)	Arsenic	Iron	Lead	Manganese	Potassium
26-Oct-07	7.68	1662	9.06	80.5	13.00	9.92	2.04	1800 J	9.74 J	0.13200	0.591	0.00753	0.1960	-
30-Nov-07	4.34	2446	9.63	26.7	11.70	9.86	2.63	1600	9.74 J	0.13500	0.432	0.00827	0.1000	-
12-Dec-07	5.88	2056	10.34	39.3	10.30	10.18	2.63	1500	9.85 J	0.10500	0.324	0.00573	0.0784	-
24-Jan-08	3.05	1601	15.03	42.3	-	9.40	2.63	1000	9.73 J	0.08740	0.451	0.00406	0.1500	-
28-Feb-08	-	-	-	-	9.22	-	4.13	1200	10.1 J	0.11800	0.260	0.00892	0.0714	-
25-Mar-08	6.80	1622	12.37	95.1	16.40	9.98	5.25	1100	9.98 J	0.11000	0.307	0.00386	0.0683	-
29-Apr-08	7.53	1997	9.10	137.4	11.90	10.29	7.50	1100 J	10.4 J	0.12400	0.328	0.00705	0.0789	-
20-May-08	16.35	2504	9.03	77.4	32.90	10.92	7.50	1700	10.8 J	0.14600	0.558	0.01470	0.1580	-
18-Jun-08	11.82	2925	8.32	68.3	25.70	11.14	1.69	1800 J	10.9 J	0.20800	0.351	0.00848	0.1540	-
26-Aug-08	17.69	3376	7.98	62.8	41.10	10.43	0.84	2200 J	10.3 J	0.28700	0.391	0.01320	0.4630	647
20-Nov-08	8.10	1447	9.65	112.0	43.70	11.00	11.25	1400	10.6 J	0.12100	0.386	0.01620	0.0888	485
12-Feb-09	2.99	1214	14.46	-	14.60	10.93	4.06	1200	10.6 J	0.21900	0.410	0.01180	0.0986	434
19-May-09	13.05	1962	7.92	32.6	36.70	10.23	7.50	1800 J	10.8 J	0.21000	0.620	0.01370	0.1430	521
24-Sep-09	16.30	2792	1.59	263.8	13.70	8.82	Dry*	2400	-	0.13000	8.600	0.05300	0.6400	730
15-Dec-09	2.80	1702	7.47	343.0	-	10.18	6.67	1200	-	0.17000	2.300	0.02200	0.1200	330
24-Mar-10	13.80	2629	2.09	270.7	263.00	11.46	6.03	1800	-	0.18000	0.660	0.02000	0.0360	600
17-Jun-10	12.00	1876	0.01	-	157.00	10.76	14.15	1200	-	0.02700	1.600	0.00390	0.1700	410
20-Sep-10	11.40	3100	6.34	198.6	12.20	10.63	2.38	2800	-	0.25000	4.800	0.04000	0.4600	580
7-Dec-10	6.60	2455	4.03	154.0	11.00	11.61	16.69	1600	-	0.24000	1.300	0.02600	0.0710	510
30-Mar-11	8.10	848	0.22	136.1	31.50	13.08	58.61	940 J	-	0.09100	0.720 J+	0.00990	0.0500	330
22-Jun-11	14.40	2286	5.68	164.2	13.20	11.28	5.68	2600 J	-	0.12000	1.200	0.02500	0.1000	490
27-Sep-11	16.20	1911	4.62	253.4	39.10	10.07	13.40	2100	-	0.17000	4.900	0.04500	0.4400	880
15-Dec-11	4.10	1439	7.40	139.4	10.60	10.33	6.65	1400	-	0.18000	2.000	0.02100	0.1100	500
20-Mar-12	5.20	1687	8.50	27.5	9.60	11.17	60.00	410	-	0.13000	0.970	0.00740	0.1700	290
18-Jun-12	14.70	2336	0.11	326.9	15.60	11.25	60.00	410	-	0.13000	1.000 J+	0.00980	0.0540	430
20-Sep-12	15.30	2972	7.81	106.0	12.10	9.55	0.10	1400 J	-	0.13000	0.460	0.00220	0.0480	450
18-Dec-12	4.80	1908	9.34	-14.2	7.41	10.28	18.50	870	-	0.12000	1.100	0.00810	0.3000	390
26-Feb-13	5.80	6470	11.27	161.6	22.00	12.46	9.90	1800	-	0.09900	<0.500	0.06200	0.0200	710
23-May-13	10.50	1625	9.14	291.8	14.40	9.93	4.84	980	-	0.09400	2.100	0.02100	0.1500	310
21-Aug-13	15.70	7260	7.69	51.6	9.00	10.71	0.32	2780	-	0.34200	0.770	0.01830	0.1610	954
19-Nov-13	8.10	2032	10.00	87.4	9.95	11.19	25.40	1270	-	0.07080	0.350	0.01690	0.0800	487
1-Apr-14	13.70	3420	9.11	129.4	59.00	12.57	20.77	1300	-	0.03730	0.120	0.01200	0.0160	572
23-May-14	12.83	986	11.63	105.7	-	9.36	-	822	-	0.04700	0.550	0.01390	0.1950	274
13-Aug-14	18.38	2000	5.52	63.6	8.93	8.02	2.00	1250	-	0.01340	0.050	0.00060	0.4140	326
11-Nov-14	6.70	259	9.77	164.8	4.27	8.09	1.50	955	-	0.01900	0.080	0.00020	0.0780	315

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

Date Sampled	Field Parameters							General Chemistry		Dissolved Metals (mg/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)	pH (standard units)	Arsenic	Iron	Lead	Manganese	Potassium
12-Feb-15	10.00	669	11.13	142.9	2.75	8.62	40.00	1490	-	0.01490	0.310	0.00180	0.2020	155
4-May-15	13.70	1293	8.69	181.7	155.00	9.38	0.09	1100	-	0.04330	0.660	0.01130	0.1700	292
5-Aug-15	Dry	Dry	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	-	0.01140	0.120	0.00080	0.1690	355
9-Feb-16	9.10	838	8.79	181.4	2.17	7.87	0.69	529	-	0.00780	0.110	0.00050 J+	0.0630	145
2-May-16	23.40	1126	6.16	128.1	7.59	7.63	Dry*	688	-	0.00760	0.023 J	0.00006 J-	0.3240	162
23-Aug-16	Dry	Dry	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	-	0.00918	0.097	0.00030	0.0223	207
1-Feb-17	2.30	925	11.55	39.1	2.04	7.71	0.30	567	-	0.00490	<0.050	0.00009 J	0.0397	135
30-May-17	13.30	817	57.50	8.3	22.20	7.40	0.30	516	-	0.01310	0.526	0.00008 J+	3.4700	94
17-Aug-17	Dry	Dry	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	-	0.0366	1.33	0.0107	0.284	236
27-Feb-18	5.50	498	10.68	106.0	5.39	8.60		503	-	0.00970	0.174	0.00123	0.0488	127
Preliminary Standard[c]	-	700	-	-	-	6.5-8.5	-	500	6.5-8.5	TBD[d]	0.3	0.05	0.05	-

Notes:

*	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
<	Analyte not detected above the reporting limit shown
a	North Creek Analytical, Inc.
b	Severn Trent Laboratories
c	Preliminary standard is the standard listed or the site-specific (natural) background concentration, whichever is highest
d	Site background arsenic value to be determined (TBD)
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 msl	Feet above mean sea level
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						General Chemistry		Dissolved Metals (mg/L)				
	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)	Total Dissolved Solids (mg/L)	pH (standard units)	Arsenic	Iron	Lead	Manganese	Potassium
1-Feb-05	7.13	9580	-	-	4.19	13.02	4080	12.61	0.17400	1.140	0.02430	0.0694	-
9-Mar-05	14.28	9979	-	-	6.79	12.52	4640	12.57	0.24000	0.988	0.04210	0.0853	-
5-Apr-05	9.90	10820	-	-	43.50	11.99	3830	12.31	0.13300	2.520	0.00985	0.1280	-
10-May-05	15.10	6091	-	-	45.60	12.14	3270	12.4	0.09290	0.866	0.02550	0.0339	-
7-Jun-05	14.49	8257	-	-	24.20	12.19	3780	12.32	0.13200	1.540	0.02470	0.0526	-
15-Jul-05[a]	18.34	6937	-	-	6.89	11.69	5000	11.6	0.28100	1.260	0.03180	0.0922	-
15-Jul-05[b]	-	-	-	-	-	-	4260	11.8	0.23700	0.286	0.03420	<0.0200	-
9-Aug-05[a]	23.53	7654	-	-	17.l	10.26	6600	10.3	0.32200	8.360	0.04450	0.1480	-
9-Aug-05[b]	-	-	-	-	-	-	5580	10.35	0.34000	0.648	0.03710	0.0828	-
14-Sept-05[a]	18.55	6730	-	-	10.00	10.51	5100	11.1	0.23500	1.860	0.01930	0.1550	-
14-Sept-05[b]	-	-	-	-	-	-	4750	11.78	0.26800	2.270	0.03420	-	-
5-Oct-05	12.14	4323	-	-	17.60	9.80	3090	10.15	0.13000	0.947	0.02650	0.0638	-
9-Nov-05	6.78	3784	-	-	11.80	11.12	2600	11.5	0.12100	0.504	0.02170	0.0802	-
9-Dec-05	3.22	8745	-	-	12.90	12.85	3900	12.3	0.17500	5.720	0.01410	0.1490	-
19-Jan-06	7.73	5215	5.43	-	13.30	12.52	2000 J	12.3 J	0.02030	0.556	0.00324	0.0355	-
16-Feb-06	3.96	9342	8.97	231.2	9.08	12.30	4100 J	12.6	0.04300	1.480	0.02560	0.0548	-
15-Mar-06	8.72	12910	9.59	222.1	7.64	12.60	5100 J	12.7	0.03860	<0.150	0.04180	<0.0100	-
7-Apr-06	14.26	15220	6.90	18.9	3.65	12.92	5700	12.7	0.04850	0.382	0.06560	0.0119	-
16-May-06	19.75	10880	2.61	33.8	15.40	12.46	5100	12.6	0.13000	3.200	0.09210	0.0916	-
23-Jun-06	22.76	7586	2.98	-	14.10	12.65	5100	11.9	0.13000	0.606	0.05790	0.0618	-
20-Jul-06	24.33	7457	0.73	-148.4	16.70	11.33	6400	11.5	0.27200	1.180	0.05130	0.0418	-
22-Aug-06	15.03	7481	3.75	61.0	14.10	10.40	6100	10.3	0.31800	0.824	0.03320	0.0390	-
26-Sep-06	17.30	8409	1.31	-312.4	15.10	12.38	5500	12.2	0.23000	0.966	0.04570	0.0490	-
26-Oct-06	10.95	6075	4.10	-265.6	13.30	12.18	4600	11.7	0.24300	3.980	0.04150	<0.2000	-
15-Nov-06	8.07	5022	7.71	-152.7	21.50	12.24	2600	11.9	0.07620	0.217	0.00368	0.1110	-
20-Dec-06	6.32	9148	5.73	-139.6	12.20	12.85	2900 J	12.6	0.04610	1.630	0.00128	0.0820	-
24-Jan-07	2.15	12690	9.24	-98.4	9.74	13.10	3000 J	12.4	0.01920	<0.150	0.02680	<0.0100	-
12-Feb-07	9.35	14110	8.43	-86.7	32.50	13.13	4700	12.6	0.09620	<0.150	0.08350	0.0233	-
27-Mar-07	9.16	10560	8.41	-46.2	7.42	11.31	2900 J	12.5 J	0.00598	<0.150	0.01450	<0.0100	-
18-Apr-07	8.27	14570	8.32	10.8	10.30	12.79	5200	12.5 J	0.01980	<0.300	0.02210	<0.0200	-
31-May-07	23.66	13410	6.42	-95.0	31.20	11.77	5100	12.5 J	0.07840	<1.500	0.05040	<0.100	-
20-Jun-07	26.35	10050	5.53	-195.7	27.90	12.29	5300 J	12.4 J	0.11200	0.315	0.03820	0.0207	-
31-Jul-07	21.39	6666	4.76	-106.4	72.00	10.86	6300	10.9 J	0.20800	2.540	0.06880	0.1160	-
29-Aug-07	22.61	6950	1.57	-193.4	61.80	12.05	6300 J	11.7 J	0.14900	0.835	0.03060	0.0710	-
27-Sep-07	11.45	5059	2.66	-180.4	78.40	11.43	4800	11.3 J	0.19000	1.430	0.01740	0.1140	-

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

Date Sampled	Field Parameters						General Chemistry		Dissolved Metals (mg/L)				
	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)	Total Dissolved Solids (mg/L)	pH (standard units)	Arsenic	Iron	Lead	Manganese	Potassium
26-Oct-07	6.98	4147	1.44	-204.7	39.50	12.48	3900 J	11.8 J	0.16800	1.510	0.02550	0.0861	-
30-Nov-07	2.86	5030	8.50	-74.9	12.40	12.20	2600	11.7 J	0.12100	0.885	0.01430	0.1120	-
12-Dec-07	4.45	3564	2.03	-141.8	20.70	10.93	2700	11 J	0.07930	1.130	0.00987	0.1640	-
24-Jan-08	1.13	4859	4.10	-186.8	-	11.19	2200	12.4 J	0.08610	<0.150	0.00679	<0.0100	-
28-Feb-08	-	-	-	-	18.10	-	2800	11.2 J	0.18300	0.499	0.07340	0.0279	-
25-Mar-08	7.37	5413	7.88	-58.2	122.00	12.29	2900	11.7 J	0.18200	0.548	0.01300	0.0583	-
29-Apr-08	8.43	3685	9.04	59.3	19.20	11.63	2400 J	11.2 J	0.15200	0.708	0.01600	0.0520	-
20-May-08	18.03	3554	6.69	58.0	156.00	11.01	2100	10.8 J	0.13700	0.406	0.03830	0.0688	-
18-Jun-08	13.01	5680	6.46	57.5	71.80	11.14	4000 J	11 J	0.27900	0.381	0.03440	0.0423	-
26-Aug-08	18.02	2800	5.72	16.9	49.80	10.08	2500 J	9.9 J	0.09170	0.404	0.01860	0.0532	557
20-Nov-08	7.46	2011	9.04	38.3	23.60	10.49	2300	10.1 J	0.07290	1.980	0.00920	0.1710	566
12-Feb-09	1.63	1870	11.74	-	46.10	10.83	2300	10.6 J	0.12900	0.982	0.01720	0.1130	738
19-May-09	12.73	1895	5.37	-16.4	168.00	9.82	1700 J	9.94 J	0.07890	1.320	0.01130	0.0736	515
23-Sep-09	21.50	4190	0.09	175.1	14.40	9.70	4100	-	0.12000	4.500	0.09900	0.0890	1300
14-Dec-09	+	+	+	+	+	+	+	+	+	+	+	+	+
22-Mar-10	13.10	2480	-	342.0	15.60	10.05	1700	-	0.07600	5.700	0.03400	0.1400	520
17-Jun-10	13.40	2429	5.14	-	26.10	10.77	2100	-	0.12000	7.700	0.08900	0.1100	630
21-Sep-10	16.30	2733	1.10	216.8	21.50	9.81	2200	-	0.02500	4.400 J	0.02700	0.2400	510
8-Dec-10	6.00	1994	2.70	-	18.70	10.05	1400	-	0.05300	6.000	0.01800	0.2100	490
30-Mar-11	9.10	509	0.37	179.2	13.80	12.04	730 J	-	0.03600	3.000	0.01400	0.0760	260
21-Jun-11	21.60	2092	1.90	192.2	13.60	10.07	2800 J	-	0.06200	4.300	0.02900	0.0890	380
27-Sep-11	14.60	1516	9.34	220.4	32.50	9.34	1800	-	0.07800	2.800	0.03600	0.0580	780
15-Dec-11	3.00	1449	1.90	94.6	13.80	10.75	2100	-	0.14000	6.200	0.07400	0.0810	630
21-Mar-12	2.60	1088	8.10	285.7	13.10	9.95	780	-	0.03000	2.800	0.00720	0.0580	240
19-Jun-12	17.10	1747	5.54	345.3	10.80	9.93	780	-	0.07000	4.200	0.02900	0.0620	400
20-Sep-12	-	-	-	-	-	-	-	-	-	-	-	-	-
19-Dec-12	4.00	1771	6.37	104.0	6.12	10.71	1300	-	0.04700	4.000	0.01800	0.0960	440
26-Feb-13	6.90	3720	5.40	196.7	10.60	11.86	1100	-	0.14000	4.000	0.03900	0.1000	690
23-May-13	11.50	2335	5.21	323.5	44.10	12.48	1800	-	0.13000	3.100	0.05000	0.0510	530
22-Aug-13	Dry	Dry	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	-	0.03980	0.650	0.02040	0.0590	487
1-Apr-14	15.30	2053	4.42	130.9	772.00	11.27	1800	-	0.11300	1.270	0.04220	0.0520	649
23-May-14	14.15	2187	5.50	77.3	-	10.19	1860	-	0.11200	1.180	0.02360	0.0840	623
13-Aug-14	20.29	1298	5.35	40.1	24.80	9.63	949	-	0.04490	0.560	0.02280	0.0480	306
12-Nov-14	1.30	315	4.55	-0.5	22.10	10.45	2440	-	0.12200	1.160	0.03420	0.0480	804

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

Date Sampled	Field Parameters						General Chemistry		Dissolved Metals (mg/L)				
	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (Rel mV)	Turbidity (NTU)	pH (standard units)	Total Dissolved Solids (mg/L)	pH (standard units)	Arsenic	Iron	Lead	Manganese	Potassium
12-Feb-15	11.10	1267	4.01	-8.2	23.90	10.20	905	-	0.02720	2.500	0.00960	0.0440	320
4-May-15	15.60	3200	4.35	240.5	9.21	10.42	2280	-	0.15400	1.320	0.03080	0.0580	774
5-Aug-15	Dry	Dry	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	-	0.02800	0.660	0.02820	0.0430	364
9-Feb-16	7.30	1672	3.45	95.9	7.79	10.45	1170	-	0.05100 J+	0.880	0.03400	0.0540	410
3-May-16	14.20	3150	3.61	335.2	63.80	10.35	2260	-	0.14800	1.430	0.09790 J-	0.0600	777
24-Aug-16	Dry	Dry	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	-	0.02190	0.423	0.01410	0.0213	356
1-Feb-17	2.10	2064	4.82	5.0	17.80	10.27	1330	-	0.05760	0.963	0.13900	0.0693	455
31-May-17	14.50	2594	5.36	-	22.70	9.93	1920	-	0.10500	0.888	0.05150 J+	0.0472	664
17-Aug-17	Dry	Dry	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	-	0.0588	1.46	0.0534 J+	0.0661	441
27-Feb-18	6.50	1379	4.05	-71.0	6.11	10.94	865	-	0.06170	0.752	0.0477 J-	0.0267	429
Preliminary Standard[c]	-	700	-	-	-	6.5-8.5	500	6.5-8.5	TBD[d]	0.3	0.05	0.05	-

Notes:

-	Not analyzed or not available
<	Analyte not detected above the reporting limit shown
+	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 standard is the standard listed or the site-specific (natural) background concentration, whichever is highest
d	Site background arsenic value to be determined (TBD)
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 msl	Feet above mean sea level
mg/L	Milligrams per liter
mV	Millivolts
NTU	Nephelometric Turbidity Unit

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-2a: Summary of Lower Disposal Area - Shallow/Alluvial Groundwater Sampling Results - Well MW-1A
Ravensdale Site, Ravensdale, Washington

Date Sampled*	Field Parameters								Gen. Chem.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Iron	Lead	Manganese	Potassium
15-Jul-05	35.43	574.40	15.17	883	-	-	358.00	7.03	664	0.00847	<0.100	<0.00200	0.6020	-
9-Nov-05	31.83	578.00	10.77	1037	-	-	22.20	6.89	680	0.00345	<0.150	<0.00100	0.0286	-
15-Feb-06	23.91	585.92	9.14	623	1.53	497.4	6.76	7.26	470 J	0.00325	<0.150	<0.00100	<0.0100	-
17-May-06	31.91	577.92	11.32	1029	1.33	121.6	10.30	7.18	600	0.00518	<0.150	<0.00100	0.3160	-
23-Aug-06	35.35	574.48	19.21	481	5.97	60.4	6.30	6.67	340	0.00170	<0.150	<0.00100	0.0234	-
14-Nov-06	20.00	589.83	10.35	635	4.55	95.1	22.20	7.23	550	0.00307	<0.150	<0.00100	0.0131	-
14-Feb-07	29.29	580.54	11.13	435	3.88	85.6	32.10	6.76	260	0.00200	<0.150	<0.00100	0.0116	-
30-May-07	32.90	576.93	10.30	545	6.63	145.7	6.93	6.81	320	0.00248	<0.150	<0.00100	<0.0100	-
27-Aug-07	35.68	574.15	10.49	428	7.13	76.7	8.65	6.95	260 J	0.00187	<0.150	<0.00100	0.0189	-
29-Nov-07	32.75	577.08	10.10	625	7.14	144.3	12.20	6.96	340 J	0.00232	<0.150	<0.00100	<0.0100	-
27-Feb-08	27.83	582.00	-	-	-	-	19.60	-	320	0.00258	<0.150	<0.00100	<0.0100	-
20-May-08	31.86	577.97	10.22	471	6.38	177.0	109.00	6.48	290 J	0.00224	<0.150	<0.00100	0.0253	-
27-Aug-08	36.04	573.79	9.84	427	7.40	118.4	63.60	7.08	260	0.00205	<0.150	<0.00100	0.0173	23.0
26-Sep-08	*Test Trench Drain Line Installed*													
16-Oct-08	35.65	574.18	9.51	443	9.78	113.9	38.00	7.38	260 J	0.00179	<0.150	<0.00100	0.0136	22.9
20-Nov-08	25.62	584.21	9.49	563	6.11	231.0	5.48	7.18	430	0.00368	<0.150	<0.00100	<0.0100	106.0
30-Dec-08	23.14	586.69	9.84	402	8.40	106.9	8.92	7.25	280 J	0.00247	<0.150	<0.00100	0.0130	43.9
15-Jan-09	20.66	589.17	8.40	336	9.65	229.6	1.07	6.88	290	0.00225	<0.150	<0.00100	<0.0100	35.7
12-Feb-09	30.00	579.83	9.05	372	8.46	-	16.70	7.34	320	0.00193	<0.150	<0.00100	0.0165	27.0
12-Mar-09	31.30	578.53	9.13	409	8.60	174.9	15.80	7.03	340	0.00166	<0.150	<0.00100	<0.0100	20.6
16-Apr-09	23.88	585.95	8.17	343	10.24	131.8	13.50	6.78	310	0.00177	<0.150	<0.00100	<0.0100	24.6
19-May-09	30.50	579.33	8.99	392	8.69	82.6	23.70	7.75	340 J	0.00156	<0.150	<0.00100	<0.0100	19.6
23-Jun-09	34.00	575.83	9.21	480	9.56	79.0	22.90	7.89	430	<0.00200	<0.200	<0.00200	<0.0200	20.0
25-Aug-09	36.95	572.88	13.10	373	6.47	311.9	4.98	6.76	270 J+	0.00064 J	<0.200	<0.00200	0.0042 J	17.0
23-Sep-09	37.12	572.71	11.30	336	6.90	368.3	21.30	6.73	240	<0.00200	0.054 J	0.00018 J	0.0120 J	14.0
15-Dec-09	28.30	581.53	9.20	643	5.30	567.0	18.00	6.72	330	<0.00200	0.033 J	<0.00200	0.0065 J	26.0
24-Mar-10	30.03	579.80	9.80	562	5.72	545.9	5.04	6.74	370	0.00190 J	<0.200	<0.00200	<0.0200 U	19.0
16-Jun-10	23.55	586.28	9.20	506	5.93	405.4	16.10	6.53	<40	0.00360	0.110 J	<0.00200	0.0110 J	20.0
21-Sep-10	35.89	573.94	10.40	593	4.82	288.5	117.00	6.96	370	0.00260	<0.200	0.00023 J	0.0350 J+	19.0
7-Dec-10	27.39	582.44	10.00	504	1.45	198.4	139.00	7.15	330	0.00230	0.650	<0.00200	0.1700	14.0
29-Mar-11	29.76	580.07	8.10	247	2.47	169.0	6.81	7.14	300	0.00240	0.290 J+	<0.00200	0.0540	15.0
21-Jun-11	30.45	579.38	9.30	606	4.58	332.9	3.56	7.17	400 J	<0.00500	<0.200	<0.00200	0.0100 J	16.0
27-Sep-11	36.65	573.18	9.90	366	7.27	356.2	2.18	6.85	310	<0.00500	<0.200	<0.00200	0.0060 J	17.0
14-Dec-11	31.53	578.30	9.20	407	1.97	234.7	20.40	7.09	370	<0.00500	0.330	<0.00200	0.0860	16.0
20-Mar-12	21.60	588.23	7.70	561	7.06	385.4	4.80	7.18	280	0.00230	<0.200	<0.00040	0.0029 J	16.0

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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Iron	Lead	Manganese	Potassium
19-Jun-12	21.60	588.23	10.00	575	7.04	378.2	5.60	7.31	330	0.00250	<0.200	<0.00040	0.0068 J	16.0
19-Sep-12	36.42	573.41	11.30	561	8.76	286.0	2.49	7.02	310	0.00240	<0.200	<0.00040	<0.0200	17.0
19-Dec-12	23.43	586.40	9.30	671	6.67	348.2	0.74	7.26	<20	0.00170	<0.200	<0.00040	<0.0200	17.0
25-Feb-13	29.32	580.51	8.00	572	9.51	337.0	26.00	7.28	300	0.00250	<0.500	<0.00040	<0.0200	16.0
22-May-13	31.23	578.60	9.00	518	8.59	397.7	4.68	7.40	310	0.00180	<0.500	<0.00040	<0.0200	15.0
21-Aug-13	37.02	572.81	10.20	534	9.27	152.7	1.46	7.11	227	0.00120	<0.050	<0.00010	0.0030	14.1
20-Nov-13	29.69	580.14	9.50	852	7.62	243.5	39.50	6.75	419	0.00160	<0.050	<0.00010	0.0020	19.9
1-Apr-14	23.29	586.54	8.90	347	7.60	248.1	2.54	7.30	247	0.00200	<0.050	<0.00010	<0.0007	16.5
21-May-14	28.31	581.52	9.50	349	4.02	178.6	-	7.12	280	0.00180	<0.050	<0.00010	0.0150	15.1
13-Aug-14	36.52	573.31	12.10	441	9.22	51.9	6.20	7.10	283	0.00140	<0.050	<0.00010	0.0030	15.2
13-Nov-14	31.63	578.20	11.50	438	8.80	173.0	14.70	7.10	352	0.00160	<0.050	<0.00010	0.0020	17.1
11-Feb-15	23.02	586.81	9.40	498	3.89	98.1	10.50	7.72	319	0.00910	0.180	0.00030	0.0040	42.9
4-May-15	31.93	577.90	9.80	578	7.35	416.9	1.05	7.26	413	0.00170	0.008 J	<0.00010	0.0100	16.0
6-Aug-15	37.65	572.18	10.70	447	0.17	71.6	49.00	7.21	343	0.00390	0.110	<0.00010	0.2140	10.3
4-Nov-15	32.89	576.94	9.50	657	8.56	240.5	5.70	6.92	554	0.00230	0.013 J	<0.00010	<0.0010	49.3
10-Feb-16	25.39	584.44	9.80	322	7.36	204.8	3.21	7.31	202	0.00200	0.0076 J	<0.00010	0.0070	22.2
2-May-16	32.32	577.51	10.80	579	5.95	250.2	4.70	7.02	350	0.00180	<0.050	0.00004 J-	0.0040	17.8
23-Aug-16	37.66	572.17	11.00	488	1.34	459.9	259.00	7.08	413	0.00388	0.130	0.00007 J	0.6220	14.6
2-Nov-16	31.30	578.53	9.70	280	3.94	225.0	6.13	7.18	531	0.00213	<0.050	0.00012	0.0020	37.7
1-Feb-17	29.01	580.82	8.60	510	5.26	187.7	0.97	7.04	270	0.00147	<0.050	<0.00010	0.0035	19.0
30-May-17	28.47	581.36	9.50	483	6.89	4.7	4.85	6.96	290	0.00209	0.005 J	<0.00010	0.0034	15.7
17-Aug-17	36.30	573.53	10.50	536	3.79	82.5	6.44	6.96	283	0.00155	0.061	<0.00010	0.0524	15.5
9-Nov-17	32.20	577.63	9.20	460	5.89	75.1	2.70	7.01	380	0.00163	<0.05	<0.0001	0.0019	16.3
27-Feb-18	25.18	584.65	8.90	215	7.35	121.6	6.04	6.31	186	0.00172	<0.05	<0.0001	0.0084	15.5
Preliminary Standard[a]	-	-	-	700	-	-	-	6.5-8.5	500	TBD[b]	0.3	0.05	0.05	-

Notes:
Top of casing elevation (feet msl): 609.83

-	Not measured or not available
<	Analyte not detected above the reporting limit shown
*	Depth to water (DTW) measurements for all shallow/alluvial wells collected on the same day; date noted is sampling date
a	Preliminary standard is the standard listed or the site-specific (natural) background concentration, whichever is highest
b	Site background arsenic value to be determined (TBD)
J	Data validation code; estimated value
J+	Data validation code; estimated value with positive bias
°C	Degrees Celsius
U	Data validation code; not detected at the Reporting Limit (RL)
µmhos/cm	Micromhos per centimeter
feet bmp	Feet below measuring point
feet msl	Feet above mean sea level
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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Iron	Lead	Manganese	Potassium
15-Jul-05	29.18	574.43	13.78	853	-	-	28.30	7.70	606	<0.00200	<0.100	<0.00200	0.2090	-
9-Nov-05	25.64	577.97	10.95	860	-	-	3.82	7.43	550	0.00131	<0.150	<0.00100	0.4490	-
15-Feb-06	17.64	585.97	7.81	709	0.82	467.7	3.96	7.86	520 J	0.00106	<0.150	<0.00100	0.1340	-
17-May-06	25.76	577.85	9.67	810	2.17	246.1	3.01	7.06	490	0.00113	<0.150	<0.00100	0.0596	-
23-Aug-06	29.13	574.48	12.86	759	2.60	12.0	9.82	7.40	570	0.00154	<0.150	<0.00100	0.2300	-
14-Nov-06	13.74	589.87	10.44	649	3.72	63.6	9.78	7.72	460	0.00136	<0.150	<0.00100	0.0553	-
14-Feb-07	22.09	581.52	10.77	648	1.69	11.5	52.40	7.51	380	0.00107	<0.150	<0.00100	0.1650	-
30-May-07	26.72	576.89	11.46	732	2.05	72.2	12.80	7.44	480	0.00117	<0.150	<0.00100	0.1870	-
27-Aug-07	29.45	574.16	10.80	829	7.41	62.8	117.00	7.58	590 J	0.00109	<0.150	<0.00100	0.1160	-
29-Nov-07	26.57	577.04	10.74	899	2.00	81.1	392.00	6.05	490	0.00103	<0.150	<0.00100	0.1260	-
27-Feb-08	21.45	582.16	-	-	-	-	446.00	-	400	0.00109	<0.150	<0.00100	0.1230	-
20-May-08	25.73	577.88	9.48	706	3.07	110.2	419.00	7.26	420 J	0.00121	<0.150	<0.00100	0.0835	-
27-Aug-08	29.84	573.77	9.87	824	4.74	91.5	571.00	7.43	550 J	0.00130	<0.150	<0.00100	0.0929	65.1
26-Sep-08	*Test Trench Drain Line Installed*													
16-Oct-08	29.13	574.48	9.76	820	4.56	53.6	227.00	7.33	520 J	0.00130	<0.150	<0.00100	0.0496	76.3
20-Nov-08	19.48	584.13	9.31	462	5.24	240.1	6.16	7.35	360	0.00176	<0.150	<0.00100	0.0149	67.0
30-Dec-08	16.93	586.68	9.85	480	6.18	66.8	56.10	7.35	390 J	0.00155	<0.150	<0.00100	0.0157	61.5
15-Jan-09	14.46	589.15	7.71	402	7.47	177.8	1.61	7.61	360	0.00157	<0.150	<0.00100	<0.0100	58.5
12-Feb-09	23.84	579.77	9.63	-	8.72	-	74.90	7.54	390	0.00130	<0.150	<0.00100	0.0371 J	48.1
12-Mar-09	25.15	578.46	9.11	454	7.22	163.7	573.00	7.19	400	0.00117	<0.150	<0.00100	0.0135	43.1
16-Apr-09	17.72	585.89	8.40	417	8.27	126.4	128.00	7.26	400	0.00140	<0.150	<0.00100	0.0107	48.8
19-May-09	24.38	579.23	8.80	448	6.88	72.0	178.00	7.95	410 J	0.00110	<0.150	<0.00100	<0.0100	44.0
23-Jun-09	27.85	575.76	8.95	507	7.76	61.9	256.00	8.07	490	<0.00200	<0.200	<0.00200	<0.0200	39.0
25-Aug-09	30.68	572.93	10.50	707	6.94**	307.4	4.38	7.17	530 J+	<0.00200	0.091 J	0.00018 J	0.0300	49.0
23-Sep-09	30.84	572.77	11.20	661	5.41	374.7	15.00	7.28	500	<0.00200	<0.200	<0.00200	0.0041 J	51.0
15-Dec-09	22.10	581.51	9.50	720	5.10	579.0	39.00	6.92	380	<0.00200	<0.200	<0.00200	<0.0200	42.0
24-Mar-10	23.82	579.79	10.00	602	4.10	535.3	43.30	6.93	370	0.00170 J	0.062 J	<0.00200	<0.0200 U	39.0
17-Jun-10	17.45	586.16	9.30	547	4.06	-	157.00	6.57	350	0.00390	0.063 J	<0.00200	0.0030 J	39.0
22-Sep-10	29.66	573.95	10.20	722	5.77	360.2	7.20	7.22	450	0.00330	<0.200	<0.00200	<0.0200	55.0
8-Dec-10	22.10	581.51	9.90	566	6.69	-	64.60	7.09	350	<0.00200	<0.200	<0.00200	0.0018 J	35.0
29-Mar-11	19.94	583.67	8.40	251	6.95	620.0	28.00	7.13	250 J	0.00140 J	<0.200	<0.00200	0.0030 J	30.0
21-Jun-11	24.25	579.36	9.90	628	5.23	344.3	37.00	7.29	410 J	<0.00500	<0.200	<0.00200	0.0056 J	28.0
28-Sep-11	30.41	573.20	9.50	58	6.54	481.7	13.80	7.24	500	<0.00500	<0.200	<0.00200	<0.0200	54.0
14-Dec-11	25.35	578.26	9.30	441	3.86	346.5	386.00	7.26	440	<0.00500	<0.200	<0.00200	0.0037 J	29.0
20-Mar-12	15.45	588.16	7.70	580	1.53	382.0	32.30	7.40	280	0.00220	0.200	<0.00040	<0.0200	26.0

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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Iron	Lead	Manganese	Potassium
19-Jun-12	23.88	579.73	9.00	590	1.85	388.1	55.70	7.74	320	0.00250	<0.200	<0.00040	<0.0200	23.0
19-Sep-12	30.18	573.43	11.10	695	7.03	297.0	9.31	7.41	420	0.00270	<0.200	<0.00040	<0.0200	42.0
19-Dec-12	17.24	586.37	9.40	704	6.33	317.0	55.20	7.40	310	0.00170	<0.200	<0.00040	<0.0200	25.0
25-Feb-13	23.12	580.49	9.10	585	6.04	339.0	110.00	7.46	370	0.00250	<0.500	<0.00040	<0.0200	24.0
22-May-13	25.05	578.56	8.60	537	8.41	391.5	12.30	7.51	310	0.00190	<0.500	<0.00040	<0.0200	22.0
21-Aug-13	30.75	572.86	10.60	684	8.42	150.2	5.85	7.74	419	0.00150	<0.050	0.00020	0.0020	27.7
20-Nov-13	23.51	580.10	9.60	513	6.19	230.4	32.10	6.81	364	0.00130	<0.050	<0.00010	0.0010	27.5
1-Apr-14	17.11	586.50	8.50	386	7.32	243.1	14.60	7.46	294	0.00140	0.009 J	<0.00010	<0.0005	31.7
21-May-14	22.07	581.54	9.10	365	6.02	212.7	-	6.93	273	0.00130	<0.050	<0.00010	<0.0010	24.7
12-Aug-14	31.32	572.29	13.16	552	6.56	76.7	6.80	7.36	394	0.00150	<0.050	<0.00010	<0.0010	25.3
13-Nov-14	25.48	578.13	12.30	460	7.22	189.8	7.20	7.19	367	0.00140	<0.050	<0.00010	0.0010	25.5
11-Feb-15	16.83	586.78	9.30	447	6.76	134.4	36.60	7.52	286	0.00170	0.026 J	<0.00010	0.0007 J	30.4
4-May-15	25.78	577.83	10.20	619	6.27	407.1	7.70	7.36	382	0.00140	<0.050	<0.00010	0.0004 J	25.2
6-Aug-15	31.87	571.74	11.30	500	9.18	207.1	28.10	7.23	394	0.00150	<0.050	<0.00010	0.0030	22.0
4-Nov-15	26.74	576.87	9.90	481	8.76	222.6	16.80	6.88	381	0.00110	<0.050	<0.00010	0.0190	21.8
10-Feb-16	19.19	584.42	9.00	376	7.35	206.0	40.20	7.68	261	0.00360	0.0140 J	<0.00010	0.0040	37.1
2-May-16	26.14	577.47	11.30	552	3.19	194.5	87.80	7.35	344	0.00210	0.0045 J	0.00001 J-	0.0020	31.2
23-Aug-16	31.64	571.97	10.50	545	7.62	486.5	10.80	7.18	412	0.00154	<0.050	<0.00010	0.0011	32.6
2-Nov-16	25.12	578.49	10.20	220	4.01	238.9	245.00	7.19	431	0.00140	<0.050	<0.00010	0.0015	30.6
1-Feb-17	22.84	580.77	9.10	580	5.06	186.3	13.60	7.35	317	0.00317	0.010 J	<0.00010	<0.0010	51.1
30-May-17	22.31	581.30	9.40	520	7.01	5.0	40.20	7.18	322	0.00178	0.010 J	<0.00010	<0.0010	34.1
17-Aug-17	30.08	573.53	10.60	626	5.63	134.2	32.30	7.21	370	0.00128	0.014 J	<0.00010	0.0009 J	28.9
9-Nov-17	26.04	577.57	9.80	480	5.79	74.4	68.80	7.00	391	0.00139	<0.05	<0.0001	0.0005 J	25.4
27-Feb-18	19.03	584.58	8.80	293	7.43	185.2	15.10	6.90	254	0.00398	<0.05	<0.0001	<0.001	41.9
Preliminary Standard[a]	-	-	-	700	-	-	-	6.5-8.5	500	TBD[b]	0.3	0.05	0.05	-

Notes:
Top of casing elevation (feet msl): 603.61

-	Not measured or not available
<	Analyte not detected above the reporting limit shown
*	Depth to water (DTW) measurements for all shallow/alluvial wells collected on the same day; date noted is sampling date
**	Dissolved Oxygen meter working incorrectly at the time of sample collection
a	Preliminary standard is the standard listed or the site-specific (natural) background concentration, whichever is highest
b	Site background arsenic value to be determined (TBD)
J	Data validation code; estimated value
J+	Data validation code; estimated value with positive bias
°C	Degrees Celsius
U	Data validation code; not detected at the Reporting Limit (RL)
µmhos/cm	Micromhos per centimeter
feet bmp	Feet below measuring point
feet msl	Feet above mean sea level
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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Iron	Lead	Manganese	Potassium
15-Jul-05	6.09	679.42	13.80	1124	-	-	30.30	6.96	922	0.00241	<0.100	<0.00200	0.6280	-
10-Nov-05	5.50	680.01	10.80	1518	-	-	2.32	6.88	960	0.01050	4.800	<0.00100	3.6000	-
15-Feb-06	5.31	680.20	9.52	1357	0.46	217.4	58.20	6.33	930 J	0.00666	4.290	<0.00100	2.8500	-
16-May-06	6.25	679.26	10.40	1296	0.96	91.0	11.40	6.91	910	0.01010	6.560	<0.00100	3.3800	-
22-Aug-06	8.85	676.66	12.84	1362	1.28	-64.8	56.00	6.97	900	0.01210	7.060	<0.00100	2.8500	-
13-Nov-06	5.03	680.48	11.24	1392	2.12	-74.4	234.00	6.89	910	0.00573	4.750	<0.00100	2.6900	-
16-Feb-07	5.55	679.96	8.99	1155	0.75	-71.3	12.30	6.96	770	0.00374	3.770 J	<0.00100	2.6100 J	-
30-May-07	6.72	678.79	11.86	1297	0.75	-25.2	12.50	7.04	790	0.00520	5.840	<0.00100	2.2200	-
27-Aug-07	8.38	677.13	12.65	1483	0.71	-96.3	15.30	6.73	1100 J	0.00874	9.160	<0.00100	2.3200	-
28-Nov-07	5.66	679.85	10.47	1363	1.05	-72.9	26.90	7.31	730	0.00424	5.460	<0.00100	2.2700	-
27-Feb-08	5.57	679.94	-	-	-	-	121.00	-	860	0.00976	5.990	<0.00100	2.4900	-
19-May-08	5.94	679.57	9.39	1346	0.66	-52.6	20.00	6.93	820 J	0.00664	8.740	<0.00100	2.3300	-
26-Aug-08	6.44	679.07	12.15	1495	0.85	-53.6	5.85	6.88	820	0.00342	2.610	<0.00100	1.5300	30.3
18-Nov-08	5.50	680.01	10.50	975	1.87	-67.4	225.00	6.93	880 J	0.00748	10.100	<0.00100	2.2900	62.5
11-Feb-09	5.62	679.89	7.67	877	0.98	-	68.00	7.28	810	0.00520	5.710	<0.00100	2.2700	50.6
19-May-09	5.60	679.91	8.52	847	0.91	-63.4	52.00	8.21	750 J	0.00251	<0.150	<0.00100	2.2000	49.5
22-Sep-09	8.36	677.15	15.70	1149	0.10	132.1	75.10	7.05	910	0.00660	5.200	<0.00200	1.8000	53.0
17-Dec-09	4.59	680.92	8.90	1300	0.40	194.0	401.00	7.08	710	<0.00200	0.740	<0.00200	2.2000	62.0
24-Mar-10	5.40	680.11	11.20	1010	0.12	-	226.00	6.76	800	0.00380	4.400	<0.00200	2.1000	46.0
16-Jun-10	5.27	680.24	10.10	1123	0.20	188.0	6.19	8.43	570	0.01300	6.400	<0.00200	1.9000	49.0
21-Sep-10	6.01	679.50	12.70	1314	0.19	177.7	2.97	6.91	1,000	0.00620	2.800	0.00019 J	1.3000	160.0
7-Dec-10	5.23	680.28	9.70	1183	0.23	182.7	25.30	6.86	840	0.00320	4.100	<0.00200	1.9000	82.0
30-Mar-11	5.04	680.47	8.30	498	0.28	174.0	4.93	7.89	700	0.00360	3.700	<0.00200	1.4000	36.0
22-Jun-11	6.77	678.74	9.70	895	0.43	172.2	9.18	7.01	700 J	<0.00500	5.100	<0.00200	1.5000	34.0
28-Sep-11	7.83	677.68	12.60	99	0.18	141.8	6.07	6.83	840	0.00880	7.700	<0.00200	2.7000	83.0
15-Dec-11	5.40	680.11	9.00	785	0.60	179.8	24.40	6.98	760	0.00450 J	2.400	<0.0020	1.9000	73.0
20-Mar-12	4.96	680.55	7.10	1092	0.16	22.6	12.10	7.11	470	0.00520	2.300	<0.0020	1.6000	73.0
19-Jun-12	6.76	678.75	10.30	1077	0.11	198.6	11.30	7.07	660	0.01200	8.500	<0.0004	1.8000	78.0
20-Sep-12	8.67	676.84	12.30	1235	0.15	111.0	1.96	6.99	710	0.01100	7.500	0.00005 J	2.1000	100.0
18-Dec-12	4.98	680.53	8.70	1450	0.30	-40.6	18.70	7.25	740	0.00480	1.800	<0.00040	1.6000	150.0
26-Feb-13	5.25	680.26	7.80	1211	0.15	186.6	27.80	7.21	740	0.00470	3.100	<0.00040	2.0000	98.0
23-May-13	6.56	678.95	9.90	1000	0.18	242.3	16.90	7.21	460	0.01400	5.100	0.00280	0.9100	150.0
21-Aug-13	9.01	676.50	12.10	917	0.12	-14.2	1.24	7.27	772	0.00760	5.210	0.00005 J	1.8100	94.0
19-Nov-13	6.09	679.42	9.90	697	0.07	61.8	2.93	6.77	852	0.01230	9.660	0.00020	1.5300	169.0
1-Apr-14	5.75	679.76	9.00	722	0.10	131.3	4.47	7.07	624	0.01050	11.100	0.00006 J	1.7600	104.0

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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Iron	Lead	Manganese	Potassium
22-May-14	5.80	679.71	9.80	580	1.08	185.3	-	6.85	494	0.00520	4.170	0.00010	1.4300	66.5
13-Aug-14	8.54	676.97	11.48	915	2.85	-67.6	8.16	7.09	740	0.00690	5.140	<0.00010	1.5100	116.0
12-Nov-14	5.97	679.54	11.10	314	2.79	-85.1	15.30	6.87	744	0.00690	3.400	<0.00010	2.0000	89.1
12-Feb-15	5.50	680.01	9.80	980	0.52	-54.5	1.28	7.04	696	0.00420	3.570	<0.00010	2.1900	73.2
4-May-15	5.80	679.71	10.80	994	0.17	143.4	15.40	7.12	701	0.00930	7.970	<0.00010	1.8800	100.0
5-Aug-15	10.12	675.39	12.60	881	0.13	-90.4	0.89	7.07	724	0.00730	5.000	<0.00010	2.0000	70.3
3-Nov-15	5.30	680.21	12.00	865	1.23	105.5	5.06	6.97	1020	0.00170	0.180	0.00020	0.6750	195.0
9-Feb-16	5.14	680.37	9.10	954	0.55	154.6	4.82	7.03	625	0.00340	3.000	<0.00010	1.8700	92.7
2-May-16	4.74	680.77	11.30	844	0.19	96.8	2.21	7.16	621	0.01050	7.310	0.00004 J-	1.7200	105.0
23-Aug-16	9.04	676.47	13.20	946	0.03	156.2	3.48	6.97	924	0.00819	6.780	0.00009 J	1.7000	148.0
1-Nov-16	6.18	679.33	11.90	349	0.15	18.5	2.43	7.11	744	0.00263	0.730	<0.00010	0.8630	180.0
1-Feb-17	5.91	679.60	7.50	1114	0.17	-67.4	6.05	7.08	694	0.00640	4.810	<0.00010	1.9200	100.0
30-May-17	7.40	678.11	10.40	753	2.20	8.6	3.28	7.12	465	0.00952	5.240	<0.00010	1.3800	89.3
17-Aug-17	9.71	675.80	12.40	1101	0.25	-60.2	3.39	7.01	737	0.00847	5.730	<0.00010	2.1700	72.0
9-Nov-17	6.06	679.45	9.60	833	0.64	75.3	2.01	7.08	748	0.00184	<0.05	<0.0001	0.5540	191.0
27-Feb-18	5.16	680.35	7.60	791	0.21	-75.4	9.52	6.64	506	0.00297	1.410	<0.0001	1.3800	92.0
Preliminary Standard[a]	-	-	-	700	-	-	-	6.5-8.5	500	TBD[b]	0.3	0.05	0.05	-

Notes:
Top of casing elevation (feet msl): 685.51

-	Not measured or not available
<	Analyte not detected above the reporting limit shown
*	Depth to water (DTW) measurements for all shallow/alluvial wells collected on the same day; date noted is sampling date
a	Preliminary standard is the standard listed or the site-specific (natural) background concentration, whichever is highest
b	Site background arsenic value to be determined (TBD)
J	Data validation code; estimated value
°C	Degrees Celsius
µmhos/cm	Micromhos per centimeter
feet bmp	Feet below measuring point
feet msl	Feet above mean sea level
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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Iron	Lead	Manganese	Potassium
15-Jul-05	4.60	697.25	12.43	629	-	-	6.07	6.45	490	<0.00200	<0.100	<0.00200	0.4260	-
10-Nov-05	3.70	698.15	11.98	441	-	-	7.40	6.22	290	<0.00100	<0.150	<0.00100	0.0991	-
19-Jan-06	3.56	698.29	8.29	319	0.42	-	1.46	6.53	290 J	<0.00100	<0.150	<0.00100	0.0908	-
15-Feb-06	3.82	698.03	8.32	326	0.62	99.7	3.50	7.39	220 J	<0.00100	<0.150	<0.00100	0.0341	-
15-Mar-06	3.79	698.06	7.58	254	0.87	201.9	0.82	6.65	210 J	<0.00100	<0.150	<0.00100	0.0650	-
7-Apr-06	3.87	697.98	9.36	295	0.55	157.4	0.24	6.34	220	<0.00100	<0.150	<0.00100	0.0724	-
16-May-06	4.92	696.93	10.80	321	0.45	142.1	0.99	6.36	220	<0.00100	<0.150	<0.00100	0.0376	-
23-Jun-06	4.41	697.44	12.62	316	0.57	-	2.05	6.25	200	<0.00100	<0.150	0.00264	0.0638	-
20-Jul-06	6.90	694.95	13.43	347	0.23	-20.9	0.32	6.11	120	<0.00100	<0.150	<0.00100	0.1040	-
22-Aug-06	8.46	693.39	13.68	406	0.90	153.5	2.20	6.13	280	<0.00100	<0.150	<0.00100	0.1510	-
26-Sep-06	6.50	695.35	14.59	417	2.47	-35.2	2.42	6.33	290	<0.00100	<0.150	<0.00100	0.0835	-
26-Oct-06	5.98	695.87	12.82	434	3.30	124.1	0.82	6.12	320	<0.00100	<0.150	<0.00100	0.2160	-
13-Nov-06	3.02	698.83	11.70	386	5.06	187.8	2.47	6.13	280	<0.00100	<0.150	<0.00100	0.0442	-
20-Dec-06	3.60	698.25	9.64	379	4.30	150.5	1.03	6.07	250	<0.00100	<0.150	<0.00100	0.0568	-
23-Jan-07	3.68	698.17	8.37	239	3.96	58.9	0.66	6.28	220	<0.00100	<0.150	<0.00100	0.1800	-
14-Feb-07	3.74	698.11	8.18	325	2.85	110.8	0.53	6.25	210	<0.00100	<0.150	<0.00100	0.0398	-
27-Mar-07	3.32	698.53	8.27	289	2.07	61.5	0.88	6.83	210 J	<0.00100	<0.150	<0.00100	0.2290	-
17-Apr-07	3.89	697.96	9.59	306	1.80	102.3	2.31	6.34	190	<0.00100	<0.150	<0.00100	0.2220	-
30-May-07	4.70	697.15	11.27	285	1.78	101.7	1.37	6.37	180	<0.00100	<0.150	<0.00100	0.0246	-
20-Jun-07	4.69	697.16	12.37	350	1.67	9.3	1.25	6.90	240 J	<0.00100	<0.150	<0.00100	0.0321	-
31-Jul-07	6.38	695.47	14.57	402	1.15	5.5	0.60	6.37	250	0.00129	<0.150	<0.00100	0.0307	-
29-Aug-07	7.44	694.41	13.78	353	1.11	128.3	1.87	6.18	280 J	<0.00100	<0.150	<0.00100	0.0490	-
27-Sep-07	8.25	693.60	13.60	375	0.96	142.6	0.70	6.70	300	<0.00100	<0.150	<0.00100	0.1170	-
26-Oct-07	4.09	697.76	12.16	343	2.27	75.9	3.93	6.10	310 J	<0.00100	<0.150	<0.00100	0.0117	-
29-Nov-07	3.93	697.92	10.13	428	3.17	197.3	1.63	6.32	270	<0.00100	<0.150	<0.00100	0.0164	-
12-Dec-07	5.82	696.03	9.51	384	3.37	185.0	0.80	6.06	260	<0.00100	<0.150	<0.00100	0.0392	-
24-Jan-08	3.86	697.99	7.74	354	3.09	109.0	-	6.35	250	<0.00100	<0.150	<0.00100	0.0376	-
28-Feb-08	4.04	697.81	-	-	-	-	1.06	-	220	<0.00100	<0.150	<0.00100	0.0275	-
19-May-08	4.35	697.50	9.79	329	1.38	209.2	1.20	6.08	200 J	<0.00100	<0.150	<0.00100	0.0191	-
26-Aug-08	7.83	694.02	12.66	431	1.38	210.5	0.28	6.19	270	<0.00100	<0.150	<0.00100	0.0493	<3.0
18-Nov-08	3.64	698.21	10.43	235	3.95	217.5	0.66	6.03	210	<0.00100	<0.150	<0.00100	0.0208	<3.0
11-Feb-09	4.09	697.76	7.24	188	2.13	-	0.12	6.54	180	<0.00100	<0.150	<0.00100	0.0180	<3.0
19-May-09	3.79	698.06	8.19	173	1.28	111.9	1.78	7.18	170 J	<0.00100	<0.150	<0.00100	0.0163	<3.0
22-Sep-09	9.70	692.15	16.50	440	0.82	383.3	12.50	6.31	370 J	<0.00200	<0.200	<0.00200	0.0700	1.2 J
17-Dec-09	3.47	698.38	9.20	311	4.37	470.0	16.00	6.25	110	<0.00200	<0.200	<0.00200	0.0200 J	0.7 J
24-Mar-10	3.87	697.98	9.40	410	0.34	204.8	30.70	6.65	240	0.00081 J	<0.200	<0.00200	0.1700	1.3 J
16-Jun-10	3.77	698.08	10.30	298	0.99	397.8	1.11	7.40	180	0.00360	0.049 J	<0.00200	0.0320	0.9 J
21-Sep-10	5.82	696.03	13.70	350	1.01	302.5	1.04	6.25	200	0.00140 J	<0.200	0.0002 J	<0.0200	1.2 J

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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Iron	Lead	Manganese	Potassium
7-Dec-10	3.83	698.02	9.60	283	0.72	405.6	0.42	6.16	190	<0.00200	<0.200	<0.00200	0.0090 J	0.8 J
30-Mar-11	3.91	697.94	8.20	133	0.51	248.2	0.29	9.87	140 J	0.00035 J	<0.200	<0.00200	0.0091 J	5.0
22-Jun-11	3.99	697.86	11.00	219	0.16	222.5	0.22	6.13	160	<0.00500	0.180 J	<0.00200	0.1900	0.7 J
28-Sep-11	8.54	693.31	14.30	35	0.26	333.9	2.45	6.30	270	<0.00500	0.110 J	<0.00200	0.1300	2.1 J
15-Dec-11	4.12	697.73	9.40	217	1.15	414.3	2.74	6.28	200	<0.00500	<0.200	<0.00200	0.0170 J	1.2 J
21-Mar-12	3.35	698.50	8.40	346	0.42	438.4	0.48	6.14	220	0.00480	<0.200	<0.00040	0.0280	1.3 J
19-Jun-12	3.78	698.07	11.30	290	0.09	314.0	0.46	6.28	170 J+	0.00130	<0.200	<0.00040	0.0710	<3.3
20-Sep-12	8.53	693.32	14.40	419	0.26	309.0	1.07	6.39	240	0.00160	0.085 J	<0.00040	0.1300	2.9 J
18-Dec-12	3.49	698.36	9.10	491	2.56	264.4	1.38	6.63	170	<0.00100	<0.200	<0.00040	0.0480	1.2 J
26-Feb-13	3.91	697.94	8.40	324	2.59	404.2	1.01	7.03	140	0.00110	<0.500	<0.00040	0.0079 J	3.4
23-May-13	3.76	698.09	10.60	338	1.15	465.9	0.57	6.31	190	<0.00100	<0.500	<0.00040	0.0060 J	<3.3
22-Aug-13	8.28	693.57	13.10	284	0.33	32.2	0.89	6.34	220	0.00040	<0.050	<0.00010	0.0320	1.3
19-Nov-13	3.33	698.52	10.30	323	1.70	109.2	0.64	6.27	200	0.00020	<0.050	<0.00010	0.0070	0.8
1-Apr-14	3.69	698.16	8.20	244	0.45	180.7	0.28	6.33	173	0.00018 J	<0.050	<0.00010	0.0050 J+	0.7
22-May-14	4.52	697.33	10.80	195	0.65	75.0	-	7.20	152	0.00030	<0.050	0.00010	0.0240	0.6
13-Aug-14	7.56	694.29	12.62	269	0.44	37.7	1.12	5.89	181	0.00080	0.200	<0.00010	0.0930	0.9
12-Nov-14	3.73	698.12	11.70	231	1.29	108.2	1.32	6.17	191	0.00030	<0.050	<0.00010	0.0450	1.0
11-Feb-15	3.50	698.35	9.20	270	0.53	-34.2	0.73	6.30	170	0.00020	0.021 J	<0.00010	0.0160	0.7
4-May-15	4.69	697.16	10.90	250	0.28	378.1	0.57	6.29	341	0.00020	0.012 J	<0.00010	0.0790	0.6
5-Aug-15	9.44	692.41	13.90	316	0.72	-38.1	1.16	6.45	262	0.00030	<0.050	<0.00010	0.0150	1.2
3-Nov-15	4.21	697.64	11.80	192	8.59	205.6	5.39	6.34	166	0.00020 J	<0.050	<0.00010	0.0008 J	0.8
9-Feb-16	3.82	698.03	9.20	292	4.61	230.7	0.49	6.45	164	0.00017 J	<0.050	<0.00010	0.0050	0.8
3-May-16	4.61	697.24	10.90	310	2.39	253.0	1.01	6.34	178	0.00030	<0.050	0.00001 J-	0.0020	0.9
24-Aug-16	8.76	693.09	13.20	287	1.24	490.4	1.01	6.35	177	0.00020 J	<0.050	<0.00010	0.0093	0.8
1-Nov-16	3.34	698.51	12.20	100	3.69	177.2	0.40	6.38	205	0.00019 J	<0.050	<0.00010	0.0062	1.0
2-Feb-17	3.94	697.91	7.80	363	3.11	190.0	0.10	6.39	223	0.00017 J	<0.050	<0.00010	0.0080	0.8
31-May-17	4.68	697.17	10.30	300	4.50	-	2.48	6.30	182	0.00020	<0.050	<0.00010	0.0145	0.8
18-Aug-17	8.61	693.24	12.70	393	0.51	120.2	0.87	6.44	228	0.00031	0.096	<0.00010	0.0516	1.3
10-Nov-17	3.58	698.27	11.00	264	3.88	56.5	0.76	6.01	217	0.000186 J	<0.05	<0.0001	0.0054	0.7
27-Feb-18	3.76	698.09	8.30	302	3.19	221.1	0.55	6.29	238	0.000176 J	<0.05	<0.0001	0.0045	0.9
Preliminary Standard[a]	-	-	-	700	-	-	-	6.5-8.5	500	TBD[b]	0.3	0.05	0.05	-

Notes:
Top of casing elevation (feet msl): 701.85

-	Not measured or not available
<	Analyte not detected above the reporting limit shown
*	Depth to water (DTW) measurements for all shallow/alluvial wells collected on the same day; date noted is sampling date
a	Preliminary standard is the standard listed or the site-specific (natural) background concentration, whichever is highest
b	Site background arsenic value to be determined (TBD)
J	Data validation code; estimated value
°C	Degrees Celsius
µmhos/cm	Micromhos per centimeter
feet bmp	Feet below measuring point
feet msl	Feet above mean sea level
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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Iron	Lead	Manganese	Potassium
15-Jul-05	33.33	574.28	12.02	956	-	-	496.00	7.34	600	0.00201	<0.100	<0.00200	1.1300	-
10-Nov-05	29.62	577.99	11.24	1,212	-	-	27.60	7.32	800	0.00840	<0.150	<0.00100	0.0183	-
15-Feb-06	21.70	585.91	6.45	665	2.59	280.3	11.10	7.86	520 J	0.02230	0.256	<0.00100	0.0169	-
17-May-06	29.80	577.81	7.74	831	0.88	101.9	8.67	7.79	580	0.01100	<0.150	<0.00100	0.0207	-
23-Aug-06	33.25	574.36	15.19	737	1.76	33.5	19.60	7.32	660	0.00253	<0.150	<0.00100	0.5820	-
14-Nov-06	17.79	589.82	10.86	699	4.50	76.3	38.70	7.55	490	0.00315	<0.150	<0.00100	0.0134	-
16-Feb-07	27.08	580.53	8.08	630	6.07	2.3	57.60	8.26	500	0.01440	<0.150 UJ	<0.00100	0.016 J	-
30-May-07	30.75	576.86	9.60	894	2.59	13.3	13.40	7.76	540	0.00843	<0.150	<0.00100	<0.0100	-
29-Aug-07	33.60	574.01	9.56	684	7.64	67.0	-	7.10	670 J	0.00197	<0.150	<0.00100	0.4540	-
29-Nov-07	30.60	577.01	11.00	1075	3.53	151.5	23.50	8.37	560	0.00517	<0.150	<0.00100	<0.0100	-
27-Feb-08	25.68	581.93	-	-	-	-	29.90	-	400	0.01070	<0.150	<0.00100	<0.0100	-
20-May-08	29.73	577.88	7.93	768	4.27	180.7	77.80	7.39	480 J	0.00567	<0.150	<0.00100	0.0124	-
27-Aug-08	33.97	573.64	10.17	862	4.07	81.2	-	7.43	540 J	0.00117	<0.150	<0.00100	0.0644	87.5
26-Sep-08	*Test Trench Drain Line Installed*													
16-Oct-08	33.55	574.06	8.89	845	5.39	86.3	852.00	7.53	440 J	0.00103	<0.150	<0.00100	0.0578	90.7
20-Nov-08	23.48	584.13	9.34	577	5.27	234.3	9.48	7.50	470	0.00624	<0.150	<0.00200	0.0121	138.0
30-Dec-08	20.88	586.73	8.39	510	8.89	99.0	44.80	8.02	430 J	0.01420	0.202	0.00111	0.0251	138.0
15-Jan-09	18.50	589.11	4.97	347	8.90	154.8	17.20	8.47	380	0.02440	0.172	<0.00100	0.0238 J	104.0
12-Feb-09	27.90	579.71	8.47	-	10.21	-	22.00	7.60	420 J	0.00611	<0.150	<0.00100	<0.0100	99.0
12-Mar-09	29.19	578.42	7.47	521	6.15	171.7	26.80	7.39	480	0.00897	<0.150	<0.00100	<0.0100	124.0
16-Apr-09	21.70	585.91	6.99	456	7.60	151.6	72.70	8.66	470	0.02820	0.162	0.00101	0.0135	126.0
19-May-09	28.37	579.24	8.08	509	6.38	64.4	31.30	8.07	450 J	0.00919	<0.150	<0.00100	<0.0100	105.0
23-Jun-09	31.95	575.66	8.84	551	5.97	69.1	74.30	8.28	500	0.00430	<0.200	<0.00200	<0.0200	71.0
25-Aug-09	35.08	572.53	-	-	-	-	-	-	-	-	-	-	-	-
24-Sep-09	35.29	572.32	11.70	714	2.28	371.9	258.00	7.26	550 J	0.00076 J	0.180 J	0.00017 J	0.1200	88.0
15-Dec-09	26.11	581.50	8.60	928	2.89	544.0	89.00	7.14	450	0.00110 J	<0.200	<0.00200	0.0024 J	110.0
24-Mar-10	27.86	579.75	8.30	697	3.52	505.1	18.10	7.47	450	0.02300	0.160 J	0.00046 J	0.0280	110.0
16-Jun-10	21.35	586.26	10.70	783	2.07	379.0	41.40	7.73	340	0.05300	0.760	0.00210	0.0300	150.0
22-Sep-10	33.88	573.73	10.40	938	4.30	467.1	7.93	7.10	620	0.00500	<0.200	<0.00200	0.0770 J+	100.0
7-Dec-10	25.22	582.39	10.20	781	3.86	353.7	11.10	7.39	500	0.01200	0.094 J	0.00053 J	0.011 J	130.0
29-Mar-11	23.59	584.02	7.00	354	3.47	708.0	22.22	9.52	440 J	0.06300	0.650 J+	0.00140 J	0.0250	140.0
21-Jun-11	28.33	579.28	11.60	1000	2.22	285.3	10.60	9.06	1100 J	0.04300	0.420	0.00120 J	0.0230	180.0
27-Sep-11	34.70	572.91	12.70	641	1.46	307.2	12.80	7.30	680	<0.00500	0.063 J	0.00023 J	0.2800	100.0
14-Dec-11	29.46	578.15	9.50	691	1.95	757.1	9.69	7.35	690	0.00690	<0.200	0.00018 J	0.0019 J	180.0
20-Mar-12	19.50	588.11	6.20	841	3.98	320.2	8.52	8.25	350	0.02600	0.470	0.00100 J	0.0300	140.0

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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Iron	Lead	Manganese	Potassium
19-Jun-12	27.91	579.70	10.20	800	3.22	365.9	2.76	7.66	510	0.00870	<0.200	<0.00040	0.0290	120.0
20-Sep-12	34.53	573.08	11.00	859	0.73	387.0	46.80	7.64	530	0.00260	<0.200	<0.00040	0.6300	100.0
19-Dec-12	21.26	586.35	8.90	983	1.73	279.0	778.00	7.71	530	0.01100	0.110 J	0.00062	0.0670	180.0
25-Feb-13	27.19	580.42	7.50	682	7.61	330.5	4.36	7.85	380	0.01300	<0.500	0.00015 J	0.0110 J	74.0
22-May-13	29.09	578.52	8.80	828	3.88	411.4	8.11	8.29	350	0.02500	0.085 J	0.00053	0.0220	100.0
21-Aug-13	35.15	572.46	17.10	1248	3.41	114.2	144.00	7.78	1060	0.00150	0.060	0.00005 J	0.4870	95.0
20-Nov-13	27.45	580.16	10.00	1032	4.13	196.5	31.70	7.18	699	0.01450	0.100	0.00140	0.0080	202.0
1-Apr-14	21.08	586.53	8.40	567	3.04	168.2	15.70	10.24	413	0.06270	0.210	0.00150	0.0140	150.0
21-May-14	26.11	581.50	10.30	670	0.49	198.4	-	7.45	565	0.09500	0.200	0.00160	0.0480	166.0
12-Aug-14	34.56	573.05	14.07	812	3.64	87.7	1519.00	7.51	560	0.00300	0.070	<0.00010	0.1370	107.0
13-Nov-14	29.48	578.13	12.90	1135	3.50	241.7	10.46	7.69	956	0.02080	<0.050	0.00010	0.0020	295.0
11-Feb-15	20.81	586.80	7.70	619	6.17	81.4	18.00	9.63	430	0.03920	0.380	0.00130	0.0110	126.0
4-May-15	29.80	577.81	10.50	924	2.54	361.3	8.70	9.74	623	0.04230	0.110	0.00050	0.0130	192.0
6-Aug-15	36.08	571.53	12.80	781	2.40	129.6	261.00	7.24	Dry	Dry	Dry	Dry	Dry	Dry
4-Nov-15	30.80	576.81	10.70	1234	4.98	205.6	11.80	7.13	1130	0.00660	0.048 J	0.00030	0.0020	318.0
10-Feb-16	23.56	584.05	6.40	602	1.62	197.7	11.90	10.19	451	0.13200	0.190	0.00140	0.0190	148.0
2-May-16	30.19	577.42	11.50	1008	0.80	110.6	9.76	10.14	751	0.17100	0.250	0.00270 J-	0.0480	232.0
23-Aug-16	35.79	571.82	13.10	729	2.00	436.2	51.40	7.20	1010	0.00401	<0.050	<0.00010	0.1820	137.0
2-Nov-16	29.06	578.55	10.90	570	4.98	103.1	32.10	7.55	1180	0.01120	0.185	0.00056	0.0050	372.0
1-Feb-17	26.86	580.75	8.10	992	2.21	99.7	7.19	9.73	632	0.10900	0.089	0.00097	0.0179	194.0
30-May-17	26.86	580.75	10.50	814	6.12	5.8	5.74	9.73	487	0.04250	0.084	0.00036 J+	0.0044	168.0
17-Aug-17	34.23	573.38	11.70	1054	5.43	125.1	5.68	7.65	731	0.00652	0.029 J	<0.00010	0.0604	156.0
10-Nov-17	29.96	577.65	10.00	1077	4.65	85.2	10.50	7.18	953	0.00582	0.069	0.00034	0.0042	308.0
27-Feb-18	23.02	584.59	7.70	584	1.91	120.4	12.60	9.96	530	0.08630	0.143	0.00064	0.0068	174.0
Preliminary Standard[a]	-	-	-	700	-	-	-	6.5-8.5	500	TBD[b]	0.3	0.05	0.05	-

Notes:
Top of casing elevation (feet msl): 607.61

-	Not measured or not available
<	Analyte not detected above the reporting limit shown
*	Depth to water (DTW) measurements for all shallow/alluvial wells collected on the same day; date noted is sampling date
Dry	Well went dry during sampling. Unable to collect sample.
a	Preliminary standard is the standard listed or the site-specific (natural) background concentration, whichever is highest
b	Site background arsenic value to be determined (TBD)
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 msl	Feet above mean sea level
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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Iron	Lead	Manganese	Potassium
15-Jul-05	30.89	574.46	15.26	735	-	-	303.00	7.60	612	<0.00200	<0.100	<0.00200	0.3490	-
10-Nov-05	27.25	578.10	11.79	700	-	-	13.70	7.51	460	0.00216	<0.150	<0.00100	0.4510	-
15-Feb-06	19.42	585.93	6.17	759	2.00	162.9	9.42	8.27	550 J	0.00754	<0.150	<0.00100	0.6160	-
17-May-06	27.55	577.80	11.99	835	1.31	248.3	4.16	7.46	550	0.01100	<0.150	<0.00100	0.1060	-
23-Aug-06	30.99	574.36	15.92	862	1.60	-26.4	15.50	7.40	810	0.00134	<0.150	<0.00100	0.6820	-
14-Nov-06	15.30	590.05	10.56	712	4.59	84.1	14.50	7.32	500	0.00171	<0.150	<0.00100	0.0163	-
16-Feb-07	24.22	581.13	8.49	581	3.64	38.6	139.00	7.21	420	0.00160	<0.150 UJ	<0.00100	0.1710 J	-
30-May-07	28.50	576.85	13.93	1092	2.72	180.7	210.00	7.40	740	0.01620	<0.150	<0.00100	0.1570	-
29-Aug-07	31.34	574.01	10.15	701	4.48	84.8	662.00	7.80	620 J	0.00141	<0.150	<0.00100	0.3520	-
29-Nov-07	28.32	577.03	11.30	731	6.23	154.0	-	6.26	420	0.00178	<0.150	<0.00100	0.1760	-
27-Feb-08	23.42	581.93	-	-	-	-	-	-	410	0.00147	<0.150	<0.00100	0.0220	-
20-May-08	27.49	577.86	8.14	791	3.93	176.5	-	7.64	540 J	0.00818	0.170	<0.00100	0.0410	-
27-Aug-08	31.72	573.63	9.33	776	4.83	142.0	-	7.32	660 J	0.00186	<0.150	<0.00100	0.2660	109.0
26-Sep-08	*Test Trench Drain Line Installed*													
16-Oct-08	31.29	574.06	9.17	923	4.60	115.4	-	7.13	590 J	0.00185	<0.150	<0.00100	0.0910	106.0
20-Nov-08	21.18	584.17	9.70	578	5.22	249.4	11.70	7.40	460	0.00442	<0.150	<0.00200	0.0202	110.0
30-Dec-08	18.64	586.71	8.45	448	9.27	137.9	75.80	7.89	370 J	0.01190	0.209	0.00114	0.0267	106.0
15-Jan-09	16.23	589.12	6.84	344	9.25	181.9	2.77	7.47	320	0.00488	<0.150	<0.00100	<0.0100	72.9
12-Feb-09	25.64	579.71	7.89	-	10.82	-	71.70	7.70	420	0.01100	0.177	<0.00100	<0.0100	103.0
12-Mar-09	26.92	578.43	7.27	524	8.31	166.7	116.00	7.76	500	0.02350	0.244	<0.00100	0.0167	125.0
16-Apr-09	19.46	585.89	7.33	406	7.57	182.8	91.80	8.33	430	0.02410	0.154	0.00109	0.0244	101.0
19-May-09	26.10	579.25	9.07	554	6.39	65.6	161.00	8.32	550 J	0.01340	<0.150	<0.00100	<0.0100	115.0
23-Jun-09	29.67	575.68	9.51	522	6.05	71.4	-	8.17	540	0.00310	<0.200	<0.00200	0.0630	74.0
25-Aug-09	32.72	572.63	14.80	795	3.25	282.7	22.00	7.28	630 J	0.00075 J	<0.200	<0.00200	0.0330	100.0
24-Sep-09	32.93	572.42	10.60	745	4.02	361.3	29.80	7.27	560 J	0.00028 J	<0.200	<0.00200	0.0068 J	100.0
15-Dec-09	23.87	581.48	9.50	815	4.20	556.0	20.00	7.15	450	<0.00200	<0.200	<0.00200	0.0030 J	120.0
24-Mar-10	25.61	579.74	8.50	704	4.93	205.6	20.50	8.53	490	0.04700	0.370	0.00090 J	<0.0200 U	140.0
16-Jun-10	19.11	586.24	10.40	553	4.79	399.8	13.40	7.22	310	0.01600	0.100 J	<0.00200	0.0036 J	90.0
22-Sep-10	31.61	573.74	11.30	1019	3.89	413.8	20.30	7.10	770	0.00620	<0.200	0.00024 J	<0.0200	130.0
8-Dec-10	23.10	582.25	87.90	751	6.24	437.1	9.55	8.77	520	0.04300	0.220	0.00130 J	0.0100 J	130.0
29-Mar-11	21.32	584.03	7.10	303	4.76	809.4	13.40	9.35	350 J	0.04300	0.400 J+	0.00055 J	0.0110 J	110.0
21-Jun-11	26.04	579.31	11.20	840	3.24	300.2	8.50	8.40	790	0.01800	0.160 J	0.00058 J	0.0092 J	110.0
28-Sep-11	32.43	572.92	10.90	67	3.92	415.6	8.32	7.30	590	<0.00500	0.040 J	0.00019 J	0.0025 J	110.0
14-Dec-11	27.19	578.16	9.00	605	1.56	329.9	21.90	7.89	570	0.01100	0.280	0.00079 J	0.0085 J	150.0
20-Mar-12	17.23	588.12	6.70	639	5.03	362.5	59.90	7.79	200	0.01700	0.091 J	<0.00200	<0.0200	79.0

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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Iron	Lead	Manganese	Potassium
19-Jun-12	25.63	579.72	9.60	681	5.24	373.2	5.94	7.43	430	0.00740	<0.200	<0.00040	<0.0200	76.0
19-Sep-12	32.12	573.23	11.70	786	3.49	290.0	7.36	7.38	460	0.00570	<0.200	<0.00040	<0.0200	81.0
19-Dec-12	19.00	586.35	8.90	977	4.55	308.0	26.90	7.98	440	0.02000	0.490	0.00130	0.0120 J	150.0
25-Feb-13	24.93	580.42	7.10	766	7.59	306.9	6.18	8.20	450	0.03400	0.190 J	0.00073	0.0120 J	120.0
22-May-13	26.84	578.51	9.10	705	3.94	412.9	5.97	9.33	430	0.04300	0.150 J	0.00052	0.0054 J	140.0
21-Aug-13	32.84	572.51	11.20	879	4.54	110.2	8.28	8.28	548	0.00950	<0.050	<0.00010	0.0040	106.0
20-Nov-13	25.21	580.14	11.10	1264	4.69	201.4	30.80	7.55	640	0.02490	0.140	0.00190	0.0130	163.0
1-Apr-14	18.81	586.54	8.40	448	3.50	194.9	14.70	8.87	342	0.01480	0.060	0.00030	0.0040 J+	78.4
21-May-14	23.84	581.51	10.60	122	1.32	199.3	-	8.46	352	0.01800	<0.050	0.00020	0.0330	80.4
13-Aug-14	32.25	573.10	12.46	796	5.77	54.0	8.01	8.68	628	0.01610	<0.050	<0.00010	0.0040	165.0
13-Nov-14	27.21	578.14	13.30	837	4.02	234.3	11.40	8.63	711	0.04410	0.090	0.00040	0.0030	203.0
11-Feb-15	18.54	586.81	8.40	609	1.75	16.0	87.40	9.71	435	0.03620	0.420	0.00100	0.0120	117.0
4-May-15	27.52	577.83	9.90	974	3.27	356.5	12.30	10.14	654	0.04160	0.100	0.00050	0.0070	199.0
6-Aug-15	33.98	571.37	11.70	822	1.77	113.7	4.02	8.83	670	0.01910	<0.050	<0.00010	0.0020	210.0
4-Nov-15	28.51	576.84	11.70	1207	4.85	206.3	21.20	7.48	1090	0.00770	0.100	0.00100	0.0060	370.0
10-Feb-16	20.96	584.39	6.90	712	2.30	145.8	20.10	10.82	575	0.12100	0.190	0.00110	0.0290	173.0
2-May-16	28.91	576.44	10.60	1856	0.19	111.2	15.60	11.53	1010	0.19900	0.220	0.00250 J-	0.0250	347.0
23-Aug-16	33.58	571.77	11.40	1241	0.43	462.0	8.89	9.51	1150	0.03890	0.084	0.00034	0.0049	349.0
2-Nov-16	26.92	578.43	11.60	409	5.05	14.4	40.60	9.15	911	0.02560	0.448	0.00149	0.0133	297.0
1-Feb-17	24.61	580.74	6.20	1757	2.34	72.1	11.70	11.97	880	0.14100	0.037 J	0.00034	0.0026	283.0
30-May-17	24.56	580.79	10.80	1026	2.45	5.7	16.90	10.50	629	0.07280	0.081	0.00052 J+	0.0064	210.0
17-Aug-17	32.04	573.31	13.10	1019	3.94	87.3	42.70	9.36	726	0.02030	0.048 J	0.00015	0.0083	219.0
10-Nov-17	27.72	577.63	11.60	1090	4.17	109.6	38.20	9.12	931	0.02430	0.251	0.00277	0.0161	356.0
27-Feb-18	20.78	584.57	7.00	823	3.99	59.3	12.00	11.29	635	0.09930	0.077	0.00056	0.0045	203.0
Preliminary Standard[a]	-	-	-	700	-	-	-	6.5-8.5	500	TBD[b]	0.3	0.05	0.05	-

Notes:
Top of casing elevation (feet msl): 605.35

-	Not measured or not available		
<	Analyte not detected above the reporting limit shown		
*	Depth to water (DTW) measurements for all shallow/alluvial wells collected on the same day; date noted is sampling date		
a	Preliminary standard is the standard listed or the site-specific (natural) background concentration, whichever is highest		
b	Site background arsenic value to be determined (TBD)		
J	Data validation code; estimated value		
J+	Data validation code; estimated value with positive bias		
°C	Degrees Celsius	feet msl	Feet above mean sea level
U	Data validation code; not detected at the Reporting Limit (RL)	mg/L	Milligrams per liter
µmhos/cm	Micromhos per centimeter	mV	Millivolts
feet bmp	Feet below measuring point	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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Iron	Lead	Manganese	Potassium
19-Dec-06	26.51	674.57	10.96	546	0.43	-115.4	1.05	7.70	310	0.15100	<0.150	<0.00100	0.0377	-
14-Feb-07	26.08	675.00	10.62	397	1.02	-90.8	3.07	7.53	240	0.16000	0.208	<0.00100	0.0463	-
31-May-07	25.96	675.12	10.83	386	0.36	-172.8	4.20	8.20	220	0.12200	0.183	<0.00100	0.0442	-
27-Aug-07	25.66	675.42	10.97	372	0.76	-128.2	1.08	7.51	240	0.08990	0.166	<0.00100	0.0466	-
28-Nov-07	26.81	674.27	10.56	371	0.42	-121.2	1.29	8.03	220	0.08830	<0.150	<0.00100	0.0547	-
27-Feb-08	25.80	675.28	10.62	371	2.01	-	1.07	-	230	0.08090	0.159	<0.00100	0.0553	<3.0
20-May-08	25.62	675.46	10.61	391	0.36	-53.0	1.11	7.28	230	0.06430	0.162	<0.00100	0.0521	-
27-Aug-08	26.14	674.94	10.58	394	0.50	-63.9	1.02	7.35	230 J	0.06400	0.170	<0.00100	0.0482	<3.0
19-Nov-08	25.16	675.92	10.33	269	0.45	-88.6	0.48	7.51	230	0.05960	0.166	<0.00100	0.0536	<3.0
11-Feb-09	25.08	676.00	10.04	268	0.48	-	0.97	7.89	230	0.05600	0.182	<0.00100	0.0519	<3.0
18-May-09	24.83	676.25	10.10	271	0.42	-50.5	1.81	8.05	230 J	0.04660	<0.150	<0.00100	0.0500	<3.0
24-Sep-09	26.32	674.76	11.80	323	0.24	202.0	3.59	7.57	260	0.02700	0.080 J	<0.00200	0.0650	1.1 J
17-Dec-09	25.06	676.02	10.10	370	0.94	179.0	4.16	7.77	<40	0.03400	0.052 J	<0.00200	0.0700	1.2 J
23-Mar-10	24.83	676.25	10.90	344	0.21	397.4	3.17	7.57	240	0.02500	0.058 J	<0.00200	0.0660	1.3 J
15-Jun-10	24.38	676.70	10.50	355	0.08	195.5	0.42	7.66	150	0.02700	0.083 J	<0.00200	0.0590	1.1 J
20-Sep-10	25.74	675.34	10.50	354	0.06	192.9	0.20	7.65	200	0.02200	<0.200	<0.00200	0.0660 J+	1.1 J
6-Dec-10	24.59	676.49	10.00	347	0.09	99.3	0.17	7.86	230	0.02200	<0.200	<0.00200	0.0510	1.0 J
28-Mar-11	24.01	677.07	10.00	173	0.16	90.6	0.88	7.58	200	0.02200	<0.200	<0.00200	0.0500	1.0 J
20-Jun-11	24.11	676.97	10.30	330	0.07	121.5	0.17	7.65	250	0.02200	0.110 J	<0.00200	0.0510	0.9 J
26-Sep-11	25.39	675.69	10.40	2906	0.06	123.6	0.43	7.65	280	0.01500	0.130 J	<0.00200	0.0560	1.1 J
14-Dec-11	24.61	676.47	9.90	245	0.10	193.8	1.76	7.57	230	0.02100	0.110 J	<0.00200	0.0540	1.2 J
21-Mar-12	23.70	677.38	10.10	392	0.07	392.0	0.22	7.47	240	0.02300	0.110 J	<0.00200	0.0480	1.1 J
18-Jun-12	23.90	677.18	10.50	383	0.02	342.8	0.30	7.67	230	0.02000	<0.200	<0.00040	0.0510	<3.3
19-Sep-12	25.38	675.70	10.30	402	0.01	151.0	0.44	7.63	220	0.01900	0.110 J	<0.00040	0.0550	1.0 J
18-Dec-12	23.59	677.49	10.10	492	0.00	-45.7	0.16	7.70	92	0.01700	0.120 J	<0.00040	0.0490	1.2 J
25-Feb-13	23.73	677.35	9.90	377	0.00	177.1	0.37	7.53	270 J	0.01900	0.140 J	<0.00040	0.0450	1.0 J
22-May-13	23.85	677.23	9.90	398	0.00	430.4	0.44	7.73	290	0.01700	0.130 J	<0.00040	0.0460	<3.3
21-Aug-13	25.34	675.74	10.40	467	0.01	-31.7	0.55	7.68	238	0.01680	0.140	0.00008 J	0.0480	1.1
19-Nov-13	24.25	676.83	10.10	361	0.00	70.3	0.32	7.30	232	0.01570	0.160	<0.00010	0.0500	1.0
31-Mar-14	22.36	678.72	10.70	286	0.01	107.4	0.21	7.79	211	0.01380	0.160	<0.00010	0.0490	1.0
21-May-14	23.29	677.79	8.54	271	1.35	54.3	-	7.14	198	0.01310	0.160	<0.00010	0.0460	1.0
12-Aug-14	24.87	676.21	14.79	335	0.41	-16.0	2.02	7.05	216	0.01190	0.140	<0.00010	0.0450	1.0
11-Nov-14	24.96	676.12	10.10	262	0.79	11.1	1.51	7.49	221	0.01360	0.160	<0.00010	0.0450	1.1
10-Feb-15	23.23	677.85	10.40	319	0.25	-114.0	0.36	7.70	240	0.01330	0.160	<0.00010	0.0450	1.0
4-May-15	23.62	677.46	10.20	370	0.05	175.1	0.16	7.70	224	0.01170	0.180	<0.00010	0.0480	1.0

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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Iron	Lead	Manganese	Potassium
4-Aug-15	25.30	675.78	11.00	279	0.06	-30.5	0.72	7.72	234	0.01440	0.180	<0.00010	0.0460	1.0
4-Nov-15	25.35	675.73	10.60	263	0.00	51.2	0.46	7.46	233	0.01100	0.170	<0.00010	0.0450	1.2
8-Feb-16	23.03	678.05	10.20	319	0.03	206.5	0.20	7.77	210	0.01210	0.190	<0.00010	0.0480	1.1
2-May-16	23.49	677.59	Monitored Semi-Annually[1]						Monitored Annually[1]					
22-Aug-16	25.00	676.08	11.10	323	0.02	-55.2	1.10	7.64	Monitored Annually[1]					
1-Nov-16	24.29	676.79	Monitored Semi-Annually[1]						Monitored Annually[1]					
31-Jan-17	23.06	678.02	10.20	391	0.05	169.3	0.13	7.66	223	0.01190	0.177	<0.00010	0.0418	1.0
30-May-17	22.45	678.63	Monitored Semi-Annually[1]						Monitored Annually[1]					
16-Aug-17	24.27	676.81	10.70	385	0.15	123.4	0.40	7.64	Monitored Annually[1]					
9-Nov-17	22.04	679.04	Monitored Semi-Annually[1]						Monitored Annually[1]					
28-Feb-18	22.04	679.04	10.10	276	0.20	-96.4	0.25	7.44	221	0.01080	0.192	<0.0001	0.0412	1.0
Preliminary Standard[a]	-	-	-	700	-	-	-	6.5-8.5	500	TBD[b]	0.3	0.05	0.05	-

Note:

Top of casing elevation (feet msl): 701.08

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.
-	Not available
<	Analyte not detected above the reporting limit shown
*	Depth to water (DTW) measurements for all bedrock LDA wells collected on the same day; date noted is sampling date
a	Preliminary standard is the standard listed or the site-specific (natural) background concentration, whichever is highest
b	Site background arsenic value to be determined (TBD)
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 msl	Feet above mean sea level
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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Iron	Lead	Manganese	Potassium
19-Dec-06	36.82	701.24	12.15	394	0.57	114.6	1.84	7.58	230	0.00849	<0.150	<0.00100	0.0242	-
14-Feb-07	36.30	701.76	11.69	339	1.40	-85.7	2.72	7.39	200	0.00609	0.232	<0.00100	0.0266	-
31-May-07	36.93	701.13	12.13	346	0.20	-223.7	3.04	8.28	210	0.00695	0.255	<0.00100	0.0297	-
27-Aug-07	37.99	700.07	12.18	336	0.49	-169.7	0.84	7.54	210	0.00749	0.262	<0.00100	0.0313	-
28-Nov-07	37.89	700.17	11.82	338	0.28	-146.6	1.32	7.93	250	0.00691	0.259	<0.00100	0.0320	-
27-Feb-08	37.24	700.82	11.87	340	0.23	-	0.87	7.41	210	0.00746	0.254	<0.00100	0.0309	<3.0
20-May-08	37.31	700.75	11.91	359	0.23	-86.6	0.67	7.27	200	0.00631	0.315	<0.00100	0.0267	-
27-Aug-08	38.37	699.69	11.84	362	0.35	-77.6	0.70	7.21	210 J	0.00636	0.279	<0.00100	0.0231	<3.0
19-Nov-08	37.50	700.56	11.53	254	0.44	-105.9	2.08	7.45	200	0.00586	0.279	<0.00100	0.0231	<3.0
11-Feb-09	37.10	700.96	11.25	254	0.48	-	0.63	7.91	220	0.00561	0.290	<0.00100	0.0238	<3.0
18-May-09	37.00	701.06	11.42	258	0.42	-71.9	1.11	8.00	210 J	0.00517	<0.150	<0.00100	0.0208	<3.0
25-Sep-09	38.88	699.18	13.10	297	0.14	140.7	3.09	7.54	230	0.00650	0.250	<0.00200	0.0290	1.2 J
17-Dec-09	37.19	700.87	10.80	341	0.51	129.0	4.85	7.71	74	0.00430	0.250	<0.00200	0.0290	1.1 J
23-Mar-10	36.60	701.46	12.60	323	0.27	355.0	5.28	7.54	110	0.00760	0.220	<0.00200	0.0290	1.2 J
15-Jun-10	36.25	701.81	11.40	326	0.08	171.1	-	7.62	98	0.00880	0.310	<0.00200	0.0230	1.1 J
20-Sep-10	37.85	700.21	11.60	324	0.08	144.0	0.16	7.61	160	0.00650	0.310 J+	<0.00200	0.0280 J+	1.2 J
6-Dec-10	36.60	701.46	11.00	319	0.21	78.3	0.20	7.81	210	0.00290	0.180 J	<0.00200	0.0200	0.9 J
29-Mar-11	35.98	702.08	11.20	156	0.15	215.0	0.75	7.48	200	0.00560	0.320 J+	<0.00200	0.0200	1.5 J
21-Jun-11	36.34	701.72	11.80	352	0.06	101.5	0.24	7.59	220	<0.00500	0.270	<0.00200	0.0280	1.0 J
27-Sep-11	38.14	699.92	11.50	2484	0.06	114.4	0.45	7.60	220	<0.00500	0.290	<0.00200	0.0220	1.0 J
14-Dec-11	36.91	701.15	11.00	228	0.05	127.2	4.04	7.54	190	0.00670	0.280	<0.00200	0.0210	1.2 J
21-Mar-12	35.68	702.38	11.00	359	0.05	93.9	0.30	7.43	210	0.00690	0.270	<0.00200	0.0170 J	1.1 J
18-Jun-12	36.06	702.00	11.70	350	0.02	211.9	0.23	7.62	220	0.00620	0.350 J+	<0.00040	0.0170 J	<3.3
19-Sep-12	38.07	699.99	11.60	367	0.00	102.0	0.34	7.59	200	0.00650	0.290	<0.00040	0.0220	1.0 J
18-Dec-12	34.88	703.18	10.90	463	0.00	-97.8	0.17	7.81	68	0.00600	0.280	<0.00040	0.0170 J	1.2 J
25-Feb-13	35.70	702.36	10.90	347	0.09	112.6	0.27	7.56	190	0.00660	0.270 J	<0.00040	0.0180 J	1.1 J
22-May-13	36.24	701.82	11.00	412	0.00	412.5	0.43	7.71	190	0.00600	0.280 J	<0.00040	0.0170 J	<3.3
20-Aug-13	38.13	699.93	12.20	406	0.02	-41.5	0.64	7.48	211	0.00550	0.290	<0.00010	0.0220	1.0
19-Nov-13	36.56	701.50	11.10	344	0.01	43.6	0.32	7.35	206	0.00520	0.310	<0.00010	0.0190	1.1
31-Mar-14	35.36	702.70	11.50	285	0.00	93.1	0.31	7.71	207	0.00510	0.320	<0.00010	0.0200	1.1
22-May-14	35.80	702.26	10.05	260	0.24	17.5	-	7.22	186	0.00500	0.310	<0.00010	0.0190	1.0
13-Aug-14	37.50	700.56	13.10	294	0.57	-37.5	3.28	7.19	190	0.00540	0.400	0.00210 J	0.0280	1.1
11-Nov-14	37.06	701.00	10.10	241	0.68	-39.7	2.10	7.48	206	0.00540	0.320	<0.00010	0.0180	1.1
10-Feb-15	35.70	702.36	11.40	295	0.11	-123.2	2.11	7.69	206	0.00510	0.310	<0.00010	0.0190	1.0
4-May-15	36.34	701.72	11.70	336	0.05	340.2	0.72	7.73	204	0.00480	0.310	<0.00010	0.0200	1.0

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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Iron	Lead	Manganese	Potassium
4-Aug-15	38.42	699.64	12.70	263	0.04	-81.8	0.77	7.72	204	0.00580	0.330	<0.00010	0.0200	1.0
4-Nov-15	37.81	700.25	11.60	244	0.04	26.9	2.13	7.45	201	0.00470	0.320	<0.00010	0.0180	1.1
8-Feb-16	35.68	702.38	11.60	307	0.00	208.4	0.74	7.68	186	0.00550	0.330	<0.00010	0.0220	1.1
2-May-16	36.03	702.03	Monitored Semi-Annually[1]						Monitored Annually[1]					
22-Aug-16	37.92	700.14	12.20	306	0.02	-137.6	1.58	7.67	Monitored Annually[1]					
1-Nov-16	37.07	700.99	Monitored Semi-Annually[1]						Monitored Annually[1]					
31-Jan-17	36.00	702.06	10.90	348	0.10	120.5	0.86	7.67	195	0.00566	0.306	<0.00010	0.0168	1.1
30-May-17	35.44	702.62	Monitored Semi-Annually[1]						Monitored Annually[1]					
16-Aug-17	37.69	700.37	12.30	356	0.14	-77.2	3.27	7.67	Monitored Annually[1]					
9-Nov-17	37.11	700.95	Monitored Semi-Annually[1]						Monitored Annually[1]					
28-Feb-18	34.95	703.11	10.90	261	0.21	-115.5	0.80	7.48	205	0.00569	0.310	<0.0001	0.0173	1.0
Preliminary Standard[a]	-	-	-	700	-	-	-	6.5-8.5	500	TBD[b]	0.3	0.05	0.05	-

Note:
Top of casing elevation (feet msl): 738.06

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.
-	Not available
<	Analyte not detected above the reporting limit shown
*	Depth to water (DTW) measurements for all bedrock LDA wells collected on the same day; date noted is sampling date
a	Preliminary standard is the standard listed or the site-specific (natural) background concentration, whichever is highest
b	Site background arsenic value to be determined (TBD)
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 msl	Feet above mean sea level
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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Iron	Lead	Manganese	Potassium
19-Dec-06	7.08	733.51	11.37	670	0.42	-171.2	1.20	9.23	500	0.02570	0.173	<0.00100	0.0476	-
23-Jan-07	5.62	734.97	13.07	383	0.51	-275.0	1.53	8.63	270	0.01840	0.450	<0.00100	0.0787	-
14-Feb-07	5.81	734.78	12.57	328	1.09	-158.2	115.00	7.86	310	0.01510	<0.150	<0.00100	0.0718	-
29-Mar-07	4.78	735.81	12.44	458	0.57	-140.8	4.25	7.78	260 J	0.03790	0.261	<0.00100	0.0601	-
17-Apr-07	4.86	735.73	12.79	389	0.27	-102.4	1.22	7.46	240	0.02300	0.451	<0.00100	0.0900	-
31-May-07	6.39	734.20	12.98	394	0.29	-223.8	3.32	8.14	240	0.02120	0.443	<0.00100	0.0998	-
20-Jun-07	6.86	733.73	13.41	412	6.10	-128.5	1.35	8.02	230 J	0.02380	0.274	<0.00100	0.0898	-
31-Jul-07	7.96	732.63	13.47	417	0.77	-174.1	0.92	7.64	250	0.01890	0.609	<0.00100	0.1190	-
27-Aug-07	8.50	732.09	12.84	395	0.46	-132.4	1.97	7.43	250	0.01760	0.315	<0.00100	0.1040	-
27-Sep-07	9.58	731.01	12.68	294	0.51	-133.8	0.53	7.87	250	0.01930	0.451	<0.00100	0.1170	-
26-Oct-07	9.65	730.94	12.49	288	0.84	-111.9	9.83	7.60	240 J	0.01100	0.949	<0.00100	0.1970	-
28-Nov-07	10.23	730.36	11.95	362	0.64	-86.1	1.58	7.87	200	0.01780	0.315	<0.00100	0.0819	-
12-Dec-07	9.66	730.93	11.83	334	0.26	-93.2	0.63	7.63	280 J	0.01740	0.458	<0.00100	0.0953	-
24-Jan-08	8.20	732.39	11.09	335	0.44	-108.3	-	7.46	220	0.01920	0.456	<0.00100	0.0861	-
26-Feb-08	7.61	732.98	12.26	337	0.48	-	2.40	7.45	210	0.02200	0.448	<0.00100	0.0916	<3.0
25-Mar-08	7.22	733.37	11.94	337	1.01	-48.6	2.80	7.51	210	0.01780	0.296	<0.00100	0.0789	-
29-Apr-08	6.75	733.84	12.53	332	0.77	-50.3	1.95	7.41	200 J	0.01820	0.449	<0.00100	0.0826	-
19-May-08	7.17	733.42	12.37	336	0.57	-57.2	2.19	7.34	200 J	0.01870	0.373	<0.00100	0.0758	-
18-Jun-08	7.26	733.33	12.11	323	0.48	-64.1	0.83	7.13	190 J	0.01950	0.461	<0.00100	0.0896	-
26-Aug-08	8.78	731.81	12.31	329	1.16	-36.5	2.89	7.30	200 J	0.01770	0.298	<0.00100	0.0532	<3.0
19-Nov-08	9.03	731.56	11.91	243	0.52	-93.1	1.69	7.40	190	0.01820	0.394	<0.00100	0.0690	<3.0
11-Feb-09	7.07	733.52	11.74	227	0.65	-	1.03	7.76	180	0.01770	0.582	<0.00100	0.1020	<3.0
18-May-09	6.50	734.09	12.11	225	0.67	-63.9	1.51	7.83	190 J	0.01290	<0.150	<0.00100	0.0886	<3.0
25-Sep-09	10.47	730.12	13.50	260.1	0.36	215.3	4.14	7.61	220	0.01700	0.260	0.00094 J	0.0440	12.0
17-Dec-09	8.39	732.20	11.50	301.0	0.44	110.0	3.10	7.71	270	0.02300	0.610	<0.00200	0.0970	1.3 J
23-Mar-10	6.46	734.13	12.20	294.8	0.43	332.5	3.52	7.57	150 J	0.02700	0.380	<0.00200	0.0760	1.3 J
16-Jun-10	5.34	735.25	11.10	281.7	0.05	117.0	-	7.71	160	0.02700	0.490	<0.00200	0.0760	1.3 J
21-Sep-10	7.72	732.87	11.80	276.3	0.06	169.5	0.36	7.54	140	0.02300	0.600 J+	<0.00200	0.0910 J+	1.3 J
7-Dec-10	6.48	734.11	11.00	263.0	0.15	77.2	0.38	7.58	180	0.02000	0.360	<0.00200	0.0680	1.2 J
28-Mar-11	4.42	736.17	10.80	134.0	0.44	75.6	1.06	7.46	160 J	0.02100	0.610 J+	<0.00200	0.0720	1.7 J
20-Jun-11	4.76	735.83	12.10	252.7	0.07	68.4	0.13	7.48	200 J	0.01600	0.650	<0.00200	0.08900	1.0 J
27-Sep-11	7.86	732.73	11.90	2064.0	0.04	102.6	0.37	7.48	170	0.01800	0.620	<0.00200	0.08300	1.1 J
14-Dec-11	7.17	733.42	11.00	188.2	0.03	140.8	1.87	7.50	770	0.02200	0.310	<0.00200	0.05600	1.3 J
21-Mar-12	4.68	735.91	10.70	297.8	0.07	130.6	0.41	7.39	170	0.02100	0.360	<0.00200	0.04600	1.1 J
18-Jun-12	4.75	735.84	11.60	289.0	0.16	271.3	0.55	7.54	150 J+	0.01900	0.440 J+	<0.00040	0.05300	<3.3

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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Iron	Lead	Manganese	Potassium
19-Sep-12	7.65	732.94	12.60	299.9	0.10	121.0	0.42	7.50	160	0.01800	0.370	<0.00040	0.05500	1.1 J
18-Dec-12	5.58	735.01	10.90	384.0	0.03	15.6	1.39	7.50	200	0.01900	0.150 J	<0.00040	0.04100	1.3 J
25-Feb-13	4.80	735.79	10.60	284.2	0.03	140.4	0.30	7.53	150	0.02200	0.390 J	<0.00040	0.05400	1.2 J
22-May-13	4.81	735.78	11.00	294.9	0.14	387.7	0.52	7.61	160	0.01800	0.420 J	<0.00040	0.05800	<3.3
20-Aug-13	7.63	732.96	12.60	383.0	0.81	-8.4	0.80	7.26	164	0.01670	0.350	<0.00010	0.05200	1.1
19-Nov-13	7.11	733.48	11.30	218.1	0.14	54.3	0.73	7.20	169	0.01660	0.290	<0.00010	0.05200	1.1
1-Apr-14	4.08	736.51	10.70	222.6	0.15	158.5	1.12	7.50	168	0.01330	0.480	<0.00010	0.07300	1.1
22-May-14	4.21	736.38	9.98	206.0	1.59	27.1	-	7.17	158	0.01120	0.150	<0.00010	0.06500	1.0
13-Aug-14	6.95	733.64	13.50	237.0	1.14	9.8	4.70	6.92	154	0.01050	0.160	<0.00010	0.07900	1.0
12-Nov-14	6.04	734.55	8.40	185.1	0.28	-10.1	3.42	7.36	162	0.01610	0.440	<0.00010	0.09300	1.1
11-Feb-15	4.62	735.97	11.50	205.1	1.20	68.1	1.32	7.41	169	0.00900	<0.050	<0.00010	0.07900	1.1
4-May-15	4.93	735.66	12.20	262.0	1.64	190.2	0.84	7.43	168	0.01090	0.640	<0.00010	0.12400	1.0
4-Aug-15	7.44	733.15	13.20	211.3	1.62	81.9	2.02	7.39	173	0.00680	0.043 J	<0.00010	0.05100	1.0
5-Nov-15	8.14	732.45	12.50	186.0	1.49	166.9	1.87	7.10	162	0.00350	0.017 J	<0.00010	0.08600	1.0
8-Feb-16	3.20	737.39	11.70	240.5	2.13	196.9	0.88	7.23	150	0.01120	1.060	<0.00010	0.13300	1.0
2-May-16	3.77	736.82	Monitored Semi-Annually[1]						Monitored Annually[1]					
22-Aug-16	6.81	733.78	13.10	238.0	2.40	168.5	2.39	7.41	Monitored Annually[1]					
1-Nov-16	6.59	734.00	Monitored Semi-Annually[1]						Monitored Annually[1]					
31-Jan-17	4.02	736.57	11.30	265.8	2.79	218.2	1.39	7.34	154	0.00323	0.008 J	<0.00010	0.02720	1.0
30-May-17	2.32	738.27	Monitored Semi-Annually[1]						Monitored Annually[1]					
16-Aug-17	5.48	735.11	13.20	258.4	3.54	92.2	2.50	7.41	Monitored Annually[1]					
9-Nov-17	6.00	734.59	Monitored Semi-Annually[1]						Monitored Annually[1]					
28-Feb-18	1.13	739.46	10.80	186.9	4.11	142.0	1.83	7.18	159	0.00253	0.02 J	<0.0001	0.01230	0.8
Preliminary Standard[a]	-	-	-	700	-	-	-	6.5-8.5	500	TBD[b]	0.3	0.05	0.05	-

Note:
Top of casing elevation (feet msl): 740.59

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.
-	Not available
<	Analyte not detected above the reporting limit shown
*	Depth to water (DTW) measurements for all bedrock LDA wells collected on the same day; date noted is sampling date
a	Preliminary standard is the standard listed or the site-specific (natural) background concentration, whichever is highest
b	Site background arsenic value to be determined (TBD)
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 msl	Feet above mean sea level
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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
2-Dec-02	69.87	862.82	9.5	1690	-	-	-	7.29	910	0.04660	0.00268	-
3-Mar-03	36.83	895.86	11.5	1260	-	-	24.10	7.15	860	0.00973	-	-
3-May-03	34.88	897.81	12.8	1520	-	-	38.00	7.09	950	-	-	-
3-Aug-03	52.02	880.67	19.19	1460	-	-	11.40	7.01	990	-	-	-
1-Nov-03	53.61	879.08	11.60	915	-	-	8.97	7.19	1010	0.00858	0.00070	-
1-Feb-04	32.75	899.94	11.52	1033	-	-	7.36	6.78	1060	-	-	-
1-May-04	42.50	890.19	14.87	1126	-	-	7.53	7.23	1020	-	-	-
1-Aug-04	49.26	883.43	13.72	1234	-	-	8.07	6.98	981	-	-	-
1-Nov-04	42.81	889.88	11.88	1429	-	-	9.06	6.92	1060	0.01000	<0.00100	-
1-Feb-05	33.62	899.07	13.06	1615	-	-	7.11	7.01	1020	-	-	-
1-May-05	34.88	897.81	12.91	1459	-	-	6.54	6.85	1000	-	-	-
1-Aug-05	43.80	888.89	10.40	1472	-	-	10.40	6.80	1090	-	-	-
1-Nov-05	52.80	879.89	10.40	1458	-	-	6.02	6.64	1100	0.01030	<0.00100	-
1-Feb-06	42.70	889.99	10.40	1343	1.10	48.3	11.10	7.08	1100 J	-	-	-
1-May-06	37.81	894.88	11.52	1686	1.64	49.2	10.50	6.83	1100	-	-	-
1-Aug-06	46.11	886.58	14.10	1357	2.33	43.0	10.70	7.11	1100	-	-	-
1-Nov-06	46.47	886.22	-	-	-	-	-	-	-	-	-	-
28-Dec-06	33.20	899.49	-	-	-	-	-	-	-	-	-	-
7-Feb-07	34.50	898.19	-	-	-	-	-	-	-	-	-	-
7-May-07	36.48	896.21	15.19	1484	0.52	-83.4	6.78	7.60	1100	-	-	-
7-Aug-07	47.57	885.12	11.21	1488	8.80	107.4	9.53	6.51	1200	-	-	-
27-Nov-07	51.25	881.44	13.60	1483	1.82	-129.5	434.00	7.11	1000 J	0.00572	<0.00100	-
8-Feb-08	35.12	897.57	14.71	1489	3.11	-	10.20	6.97	1100	-	-	-
8-May-08	37.60	895.09	14.50	1594	3.99	112.5	4.71	6.90	1200 J	-	-	-
8-Aug-08	46.98	885.71	13.27	1617	2.49	105.3	5.32	6.96	1200 J	0.00782	<0.00100	5.6
1-Nov-08	43.35	889.34	11.17	1096	7.29	127.1	47.30	7.70	1100	0.00980	<0.00100	5.6
11-Feb-09	37.00	895.69	10.28	1112	4.15	-	7.68	7.25	1100	0.00752	<0.00100	5.6
9-May-09	36.53	896.16	13.87	1209	2.93	89.0	5.45	7.41	990 J	0.00757	<0.00100	5.6
24-Sep-09	53.61	879.08	12.10	1328	1.98	331.0	3.26	6.92	1200	0.00790	<0.00200	5.7
14-Dec-09	33.72	898.97	10.20	1519	0.55	393.0	2.82	6.99	1100	0.00340	<0.00200	5.7
22-Mar-10	35.11	897.58	10.90	1463	-	508.0	3.95	6.94	1200	0.01000	<0.00200	5.6
15-Jun-10	33.26	899.43	11.00	1485	0.20	210.3	1.50	7.02	1100	0.01100	<0.00200	5.9
20-Sep-10	45.81	886.88	11.30	1484	0.06	159.7	0.91	6.98	1100	0.00910	0.00048 J	6.0
6-Dec-10	36.20	896.49	10.70	1494	0.08	35.4	0.24	7.21	1200	0.00680	0.00034 J	5.2

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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
28-Mar-11	35.07	897.62	10.70	749	0.08	136.8	0.16	6.88	1100	0.00680	<0.00200	5.5
20-Jun-11	38.53	894.16	11.40	1439	0.08	-19.2	0.21	6.99	1400	0.00460 J	<0.00200	5.5
26-Sep-11	50.43	882.26	11.20	1249	0.07	38.5	0.41	7.01	1200	0.00450 J	<0.00200	5.7
13-Dec-11	51.30	881.39	10.40	1308	0.06	50.3	2.03	7.07	530	0.00760	<0.00200	6.1
22-Mar-12	43.75	888.94	10.60	1695	0.08	125.1	0.28	6.99	1200	0.01200	<0.00200	5.7
18-Jun-12	44.86	887.83	*Monitored Semiannually* [1]									
18-Sep-12	55.74	876.95	12.90	1506	0.05	99.5	0.36	7.08	1300	0.01000	<0.00040	5.8
18-Dec-12	41.94	890.75	*Monitored Semiannually* [1]									
21-Feb-13	37.86	894.83	10.40	1730	0.02	131.5	0.41	7.27	1200	0.01300	<0.00040	6.3
22-May-13	39.34	893.35	*Monitored Semiannually* [1]									
20-Aug-13	49.40	883.29	11.90	1707	0.05	-37.6	0.69	7.00	1240	0.01020	<0.00010	6.0
19-Nov-13	44.94	887.75	*Monitored Semiannually* [1]									
31-Mar-14	33.31	899.38	11.20	1256	0.01	103.5	0.27	7.00	1200	0.01310	<0.00010	6.6
21-May-14	33.37	899.32	*Monitored Semiannually* [1]									
15-Aug-14	45.31	887.38	13.43	1467	0.71	-1.1	2.32	6.79	1150	0.01340	<0.00010	6.1
14-Nov-14	44.83	887.86	*Monitored Semiannually* [1]									
10-Feb-15	35.97	896.72	11.00	1423	0.04	-109.4	2.16	7.00	1200	0.01300	<0.00010	6.3
4-May-15	38.67	894.02	*Monitored Semiannually* [1]									
4-Aug-15	49.21	883.48	12.50	1253	0.04	-100.7	0.26	7.07	1230	0.01390	<0.00010	6.1
5-Nov-15	56.85	875.84	11.20	1159	0.02	57.4	0.91	6.75	1190	0.01490	<0.00010	7.0
8-Feb-16	33.02	899.67	11.60	1429	0.00	167.6	0.10	7.05	1190	0.01940	<0.00010	6.7
2-May-16	37.48	895.21	*Monitored Semiannually* [2]						*Monitored Annually* [2]			
22-Aug-16	49.78	882.91	12.10	1232	0.06	-143.8	0.77	7.00	*Monitored Annually* [2]			
1-Nov-16	47.49	885.20	*Monitored Semiannually* [2]						*Monitored Annually* [2]			
31-Jan-17	35.57	897.12	11.10	1620	0.05	-241.6	0.24	6.99	1260	0.02180	<0.00010	6.7
30-May-17	34.70	897.99	*Monitored Semiannually* [2]						*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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
16-Aug-17	44.32	888.37	11.90	1621	0.12	-144.5	0.47	6.97	*Monitored Annually*[2]			
9-Nov-17	44.71	887.98	*Monitored Semiannually*[2]						*Monitored Annually*[2]			
28-Feb-18	32.04	900.65	10.70	1278	0.16	-58.5	0.11	6.82	1244	0.02240	<0.0001	6.5
Preliminary Standard[a]	-	-	-	700	-	-	-	6.5-8.5	500	TBD[b]	0.05	-

Notes:
Top of casing elevation (feet msl): 932.69

-	Not measured or not available		
<	Analyte not detected above the reporting limit 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.		
a	Preliminary standard is the standard listed or the site-specific (natural) background concentration, whichever is highest		
b	Site background arsenic value to be determined (TBD)		
J	Data validation code; estimated value	feet msl	Feet above mean sea level
°C	Degrees Celsius	mg/L	Milligrams per liter
µmhos/cm	Micromhos per centimeter	mV	Millivolts
feet bmp	Feet below measuring point	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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
2-Dec-02	87.28	844.49	11.1	557	-	-	-	7.72	540	0.03270	<0.00050	-
3-Mar-03	48.63	883.14	12.0	623	-	-	24.00	7.48	370	0.00708	-	-
3-May-03	47.12	884.65	12.1	548	-	-	264.00	7.54	440	-	-	-
3-Aug-03	64.60	867.17	23.23	675	-	-	195.00	7.36	450	-	-	-
1-Nov-03	66.14	865.63	11.0	400	-	-	15.50	8.10	437	0.00603	<0.00050	-
1-Feb-04	46.55	885.22	10.68	455	-	-	8.70	7.15	440	-	-	-
1-May-04	55.82	875.95	13.61	508	-	-	12.40	7.58	429	-	-	-
1-Aug-04	61.89	869.88	13.15	585	-	-	15.70	7.47	399	-	-	-
1-Nov-04	56.83	874.94	10.94	655	-	-	9.40	7.22	477	0.00308	<0.00100	-
1-Feb-05	47.31	884.46	12.80	778	-	-	8.39	7.35	451	-	-	-
1-May-05	48.60	883.17	12.86	743	-	-	4.22	7.25	432	-	-	-
1-Aug-05	56.80	874.97	14.17	746	-	-	3.10	6.99	518	-	-	-
1-Nov-05	66.85	864.92	10.20	702	-	-	5.36	7.11	470	0.00360	<0.00100	-
1-Feb-06	47.88	883.89	10.11	648	0.71	109.4	2.72	7.53	450 J	-	-	-
1-May-06	52.23	879.54	12.22	686	1.82	43.7	3.68	7.43	450	-	-	-
1-Aug-06	59.41	872.36	12.28	665	1.06	-74.0	14.20	7.36	480	-	-	-
1-Nov-06	61.84	869.93	-	-	-	-	-	-	-	-	-	-
28-Dec-06	48.26	883.51	-	-	-	-	-	-				
7-Feb-07	49.64	882.13	-	-	-	-	-	-	-	-	-	-
7-May-07	53.24	878.53	12.44	722	0.74	-150.8	6.06	7.94	470	-	-	-
7-Aug-07	60.45	871.32	13.76	712	0.79	-50.0	4.53	7.28	500	-	-	-
27-Nov-07	63.40	868.37	14.41	711	0.45	-194.4	7.07	7.34	470 J	0.00289	<0.00100	-
8-Feb-08	49.23	882.54	14.07	737	0.62	-	6.28	7.46	500	-	-	-
8-May-08	51.31	880.46	13.52	793	0.55	27.9	4.42	7.40	520 J	-	-	-
8-Aug-08	59.69	872.08	13.73	812	0.67	-24.7	9.33	7.37	560 J	0.00226	<0.00100	<3.0
1-Nov-08	57.38	874.39	14.75	619	0.89	-42.5	4.40	7.45	480	0.00222	<0.00100	<3.0
10-Feb-09	50.92	880.85	6.50	618	10.51	-	655.00	7.69 J	530	0.00219	<0.00100	3.0
9-May-09	51.25	880.52	13.95	637	2.21	39.3	5.87	7.74	540 J	0.00242	<0.00100	<3.0
25-Sep-09	65.46	866.31	13.20	678	2.25	331.8	2.29	7.15	570	0.00180 J	<0.00200	3.3
17-Dec-09	49.40	882.37	10.60	794	0.99	224.0	3.97	7.58	440	0.00070 J	<0.00200	3.2 J
22-Mar-10	49.18	882.59	10.40	762	-	245.0	0.74	7.39	580	0.00450	<0.00200	3.2 J
15-Jun-10	46.88	884.89	12.10	762	0.05	142.1	0.47	7.50	420	0.00550	<0.00200	3.3
20-Sep-10	58.97	872.80	11.40	765	0.07	89.6	0.47	7.47	520	0.00470	0.00027 J	3.4
6-Dec-10	50.66	881.11	10.20	763	0.19	58.9	0.32	7.72	550	0.00130 J	<0.00200	3.2 J

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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
28-Mar-11	48.89	882.88	10.50	376	0.55	165.0	0.73	7.53	470	0.00370	<0.00200	3.0 J
20-Jun-11	52.13	879.64	13.40	718	0.45	-65.1	0.75	7.53	600 J	<0.00500	<0.00200	3.5
26-Sep-11	63.02	868.75	11.80	633	1.73	-6.0	1.72	7.61	560	<0.00500	<0.00200	3.5
13-Dec-11	63.88	867.89	8.60	678	0.69	-24.7	1.95	7.56	530	0.00570	<0.00200	4.1
22-Mar-12	56.96	874.81	5.60	877	1.89	-26.6	0.84	7.69	540	0.00340	<0.00040	3.0 J
18-Jun-12	58.01	873.76	*Monitored Semiannually* [1]									
18-Sep-12	67.78	863.99	26.30	838	3.62	12.4	1.27	7.70	540	0.00310	<0.00040	3.1 J
18-Dec-12	56.10	875.67	*Monitored Semiannually* [1]									
21-Feb-13	51.62	880.15	4.30	895	7.54	31.3	0.83	8.04	510	0.00360	<0.00040	3.6
22-May-13	53.14	878.63	*Monitored Semiannually* [1]									
20-Aug-13	62.35	869.42	12.30	526	0.08	-60.4	2.91	7.47	585	0.00320	<0.00010	3.2
19-Nov-13	58.70	873.07	*Monitored Semiannually* [1]									
31-Mar-14	46.60	885.17	11.10	622	0.04	48.4	0.45	7.52	561	0.00180	<0.00010	3.3
21-May-14	46.96	884.81	*Monitored Semiannually* [1]									
15-Aug-14	58.62	873.15	12.48	732	0.90	-62.4	2.04	7.16	564	0.00200	0.00020	3.1
14-Nov-14	59.59	872.18	*Monitored Semiannually* [1]									
10-Feb-15	49.61	882.16	10.90	717	0.03	-114.4	1.82	7.48	551	0.00290	<0.00010	3.3
4-May-15	52.25	879.52	*Monitored Semiannually* [1]									
4-Aug-15	61.71	870.06	12.00	618	0.04	-115.0	0.35	7.56	552	0.00300	<0.00010	3.4
5-Nov-15	68.72	863.05	11.10	625	0.05	27.5	1.26	7.21	603	0.00160	<0.00010	3.6
8-Feb-16	46.93	884.84	11.40	794	0.00	155.1	0.17	7.57	599	0.00210	<0.00010	3.8
2-May-16	50.77	881.00	*Monitored Semiannually* [2]						*Monitored Annually* [2]			
22-Aug-16	62.11	869.66	11.60	770	0.04	-251.0	0.86	7.50	*Monitored Annually* [2]			
1-Nov-16	61.71	870.06	*Monitored Semiannually* [2]						*Monitored Annually* [2]			
31-Jan-17	49.02	882.75	10.60	916	0.13	-310.4	0.35	7.47	676	0.00187	<0.00010	3.4
30-May-17	48.11	883.66	*Monitored Semiannually* [2]						*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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
16-Aug-17	57.17	874.60	11.80	898	0.12	-210.9	0.22	7.42	*Monitored Annually*[2]			
9-Nov-17	58.71	873.06	*Monitored Semiannually*[2]						*Monitored Annually*[2]			
28-Feb-18	45.21	886.56	10.20	758	0.19	-166.6	0.20	7.26	694	0.00287	<0.0001	3.3
Preliminary Standard[a]	-	-	-	700	-	-	-	6.5-8.5	500	TBD[b]	0.05	-

Notes:
Top of casing elevation (feet msl): 931.77

-	Not measured or not available		
<	Analyte not detected above the reporting limit 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.		
a	Preliminary standard is the standard listed or the site-specific (natural) background concentration, whichever is highest		
b	Site background arsenic value to be determined (TBD)		
J	Data validation code; estimated value	feet msl	Feet above mean sea level
°C	Degrees Celsius	mg/L	Milligrams per liter
µmhos/cm	Micromhos per centimeter	mV	Millivolts
feet bmp	Feet below measuring point	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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
18-Dec-06	20.56	910.89	11.30	1054	0.59	-10.5	6.76	7.01	630	0.00446	<0.00100	-
7-Jan-07	18.48	912.97	12.53	700	0.61	-70.6	33.50	7.11	540	0.00519	<0.00100	-
7-Feb-07	21.53	909.92	11.59	557	0.57	-59.1	33.50	6.88	530	0.00519	<0.00100	-
7-Mar-07	15.34	916.11	11.71	817	0.45	-2.4	91.20	6.52	550 J	0.00491	<0.00100	-
7-Apr-07	17.97	913.48	11.96	909	0.25	0.2	121.00	6.91	560	0.00475	<0.00100	-
1-May-07	26.92	904.53	12.55	880	4.20	-14.3	63.70	7.13	540	0.00490	<0.00100	-
7-Jun-07	29.94	901.51	13.12	1016	3.20	-5.6	3.58	7.52	600 J	0.00437	<0.00100	-
7-Jul-07	35.27	896.18	13.00	910	1.74	-27.4	9.97	7.24	550	0.00491	<0.00100	-
7-Aug-07	39.55	891.90	12.40	1065	0.92	-14.6	4.62	6.99	590	0.00446	<0.00100	-
7-Sep-07	44.69	886.76	12.36	696	0.68	-33.3	3.22	7.29	590	0.00492	<0.00100	-
26-Oct-07	38.90	892.55	11.46	667	0.56	-18.3	22.60	6.98	620 J	0.00443	<0.00100	-
27-Nov-07	38.79	892.66	11.71	914	0.56	-46.7	3.32	6.91	560 J	0.00490	<0.00100	-
12-Dec-07	35.33	896.12	12.61	909	0.53	-27.3	4.28	6.87	820	0.00409	<0.00100	-
24-Jan-08	28.97	902.48	10.72	872	0.78	-49.1	-	7.14	550	0.00472	<0.00100	-
8-Feb-08	26.00	905.45	11.25	888	0.44	-	4.18	6.85	550	0.00450	<0.00100	-
8-Mar-08	26.03	905.42	10.94	915	0.59	-95.6	3.19	6.89	550	0.00521	<0.00100	-
8-Apr-08	25.03	906.42	11.27	931	0.61	-20.1	3.44	6.89	550 J	0.00488	<0.00100	-
8-May-08	27.33	904.12	11.68	949	0.68	-6.7	5.37	6.62	580 J	0.00534	<0.00100	-
8-Jun-08	28.38	903.07	11.40	948	0.75	-50.4	1.59	6.68	580 J	0.00445	<0.00100	-
8-Aug-08	39.80	891.65	11.80	970	0.68	-78.6	1.72	6.84	610 J	0.00464	<0.00100	<3.0
1-Nov-08	33.96	897.49	11.20	682	0.63	-115.4	0.95	6.82	540	0.00480	<0.00100	<3.0
10-Feb-09	25.56	905.89	10.54	671	0.71	-71.7	0.98	7.05	610	0.00473	<0.00100	<3.0
9-May-09	25.79	905.66	11.23	682	0.55	-5.8	0.86	7.68	560 J	0.00340	<0.00100	<3.0
22-Sep-09	46.68	884.77	18.70	737	0.64	214.5	0.99	6.91	580 J	0.00390	<0.00200	2.7 J
14-Dec-09	30.45	901.00	9.80	901	0.18	200.0	0.70	6.96	450	0.00170 J	<0.00200	2.5 J
23-Mar-10	19.92	911.53	11.30	773	0.25	148.0	4.40	6.86	510	0.00560	<0.00200	2.6 J
15-Jun-10	16.74	914.71	11.00	838	0.10	202.3	2.89	7.01	860 J	0.00820	<0.00200	2.8 J
20-Sep-10	33.31	898.14	11.20	852	0.09	174.7	0.60	6.97	540	0.00620	<0.00200	2.7 J
6-Dec-10	19.81	911.64	10.80	838	0.10	30.5	0.47	7.17	530	0.00380	<0.00200	2.3 J
28-Mar-11	17.16	914.29	10.80	403	0.15	48.4	1.13	6.89	500 J	0.00230	<0.00200	2.3 J
20-Jun-11	18.95	912.50	11.10	775	0.05	-29.1	0.37	7.01	610 J	<0.00500	<0.00200	2.4 J
26-Sep-11	33.71	897.74	11.20	690	0.03	-8.7	0.54	7.00	560	0.00410 J	<0.00200	2.8 J
13-Dec-11	24.48	906.97	10.50	730	0.05	93.6	1.92	7.07	520	0.00610	<0.00200	2.8 J

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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
21-Mar-12	15.54	915.91	10.70	883	0.06	106.9	0.34	6.90	500	0.00650	<0.00200	2.4 J
19-Jun-12	17.01	914.44	*Monitored Semiannually* [1]									
19-Sep-12	29.82	901.63	11.90	877	0.00	122.0	0.47	7.08	490	0.00690	<0.00040	2.6 J
18-Dec-12	17.39	914.06	*Monitored Semiannually* [1]									
21-Feb-13	18.84	912.61	10.60	875	0.05	103.3	0.40	7.32	510	0.00590	<0.00040	2.6 J
22-May-13	20.25	911.20	*Monitored Semiannually* [1]									
20-Aug-13	30.15	901.30	12.10	530	0.06	-50.3	0.75	6.98	510	0.00560	<0.00010	2.5
19-Nov-13	22.73	908.72	*Monitored Semiannually* [1]									
31-Mar-14	15.50	915.95	11.30	574	0.06	95.7	0.53	7.15	447	0.00560	<0.00010	2.7
21-May-14	14.83	916.62	*Monitored Semiannually* [1]									
15-Aug-14	25.16	906.29	14.49	741	0.48	-24.0	2.92	6.87	477	0.00590	<0.00010	2.6
14-Nov-14	22.25	909.20	*Monitored Semiannually* [1]									
10-Feb-15	15.98	915.47	11.40	693	0.04	-117.5	0.80	7.13	503	0.00590	<0.00010	2.6
4-May-15	20.05	911.40	*Monitored Semiannually* [1]									
4-Aug-15	31.90	899.55	11.90	620	0.16	-71.1	0.47	7.13	517	0.00640	<0.00010	2.7
5-Nov-15	32.00	899.45	11.40	605	0.00	37.5	1.16	6.84	511	0.00530	<0.00010	3.1
8-Feb-16	17.13	914.32	11.80	720	0.00	160.4	0.08	7.34	480	0.00600	<0.00010	3.0
2-May-16	23.31	908.14	*Monitored Semiannually* [2]						*Monitored Annually* [2]			
22-Aug-16	34.07	897.38	12.50	571	0.00	-	0.66	7.11	*Monitored Annually* [2]			
1-Nov-16	26.04	905.41	*Monitored Semiannually* [2]						*Monitored Annually2*			
31-Jan-17	19.36	912.09	12.20	808	0.07	-219.2	0.30	7.21	509	0.00676	<0.00010	2.8
30-May-17	17.31	914.14	*Monitored Semiannually* [2]						*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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
16-Aug-17	28.13	903.32	12.40	826	0.12	-71.9	0.66	7.10	*Monitored Annually*[2]			
9-Nov-17	27.17	904.28	*Monitored Semiannually*[2]						*Monitored Annually*[2]			
28-Feb-18	16.55	914.90	10.90	657	0.15	-97.6	0.35	7.02	528	0.00539	<0.0001	2.6
Preliminary Standard[a]	-	-	-	700	-	-	-	6.5-8.5	500	TBD[b]	0.05	-

Notes:

Top of casing elevation (feet msl): 931.45

-	Not measured or not available		
<	Analyte not detected above the reporting limit 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.		
a	Preliminary standard is the standard listed or the site-specific (natural) background concentration, whichever is highest		
b	Site background arsenic value to be determined (TBD)		
J	Data validation code; estimated value	feet msl	Feet above mean sea level
°C	Degrees Celsius	mg/L	Milligrams per liter
µmhos/cm	Micromhos per centimeter	mV	Millivolts
feet bmp	Feet below measuring point	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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
18-Dec-06	8.13	894.22	9.93	525	0.54	-54.5	0.61	7.78	300	0.00537	<0.00100	-
7-Feb-07	9.40	892.95	11.79	479	1.19	-30.0	7.40	7.41	330	0.00601	<0.00100	-
7-May-07	10.73	891.62	12.26	729	2.83	-103.6	16.40	7.63	480	0.01010	<0.00100	-
7-Aug-07	15.14	887.21	11.42	882	0.75	-11.5	1.82	7.10	470	0.00325	<0.00100	-
27-Nov-07	16.16	886.19	10.98	748	0.37	-47.9	0.83	6.99	440 J	0.00282	<0.00100	-
8-Feb-08	9.66	892.69	11.01	645	0.31	-	0.90	7.05	380	0.00268	<0.00100	-
8-May-08	10.34	892.01	11.27	665	0.64	13.4	1.52	6.93	380 J	0.00240	<0.00100	-
8-Aug-08	14.17	888.18	11.23	683	0.72	-8.2	2.49	7.05	390 J	0.00218	<0.00100	<3.0
1-Nov-08	12.98	889.37	10.61	488	0.60	-45.6	1.35	6.80	380	0.00204	<0.00100	<3.0
10-Feb-09	9.64	892.71	10.32	398	0.52	-57.0	1.20	7.31	350	0.00200	<0.00100	<3.0
9-May-09	9.91	892.44	10.50	405	0.73	-4.0	1.26	7.77	320 J	0.00169	<0.00100	<3.0
23-Sep-09	17.16	885.19	12.50	541	0.25	216.2	5.38	7.14	400 J	0.00091 J	<0.00200	1.3 J
14-Dec-09	12.73	889.62	9.10	580	0.47	231.0	2.70	7.23	270	<0.00200	<0.00200	1.3 J
22-Mar-10	9.62	892.73	10.90	504	-	321.7	3.50	7.22	320	0.00200	<0.00200	1.2 J
15-Jun-10	8.30	894.05	11.00	495	0.11	205.1	1.41	7.29	320	0.00420	<0.00200	1.3 J
20-Sep-10	14.90	887.45	10.90	560	0.10	187.2	0.28	7.29	270	0.00300	<0.00200	1.4 J
6-Dec-10	10.47	891.88	10.50	515	0.12	87.8	0.14	7.47	300	<0.00200	<0.00200	1.1 J
28-Mar-11	8.71	893.64	10.30	241	0.19	58.9	1.86	7.19	300	<0.00200	<0.00200	1.1 J
20-Jun-11	9.87	892.48	10.80	477	0.06	141.2	0.20	7.27	340	<0.00500	<0.00200	1.1 J
26-Sep-11	14.82	887.53	10.80	467	0.05	114.8	0.92	7.26	380	<0.00500	<0.00200	1.5 J
13-Dec-11	13.02	889.33	10.20	491	0.06	131.3	1.69	7.29	340	<0.00500	<0.00200	1.6 J
21-Mar-12	8.13	894.22	10.20	550	0.09	160.0	0.07	7.14	310	0.00250	<0.00040	1.2 J
18-Jun-12	0.00	10.20	*Monitored Semiannually* [1]									
18-Sep-12	14.76	887.59	12.50	587	0.00	122.0	0.35	7.31	370	0.00280	<0.00040	1.3 J
18-Dec-12	8.16	894.19	*Monitored Semiannually* [1]									
21-Feb-13	8.45	893.90	10.10	594	0.02	152.7	0.28	7.49	300	0.00190	<0.00040	1.3 J
22-May-13	9.36	892.99	*Monitored Semiannually* [1]									
20-Aug-13	13.28	889.07	11.70	478	0.01	-43.8	0.54	7.22	349 J	0.00160	<0.00010	1.3
19-Nov-13	9.71	892.64	*Monitored Semiannually* [1]									
31-Mar-14	8.42	893.93	10.70	455	0.06	166.1	0.27	7.35	315	0.00140	<0.00010	1.3
21-May-14	5.99	896.36	*Monitored Semiannually* [1]									
14-Aug-14	12.03	890.32	13.45	512	0.56	-21.4	1.99	6.95	317	0.00170	<0.00010	1.3
14-Nov-14	10.68	891.67	*Monitored Semiannually* [1]									

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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
10-Feb-15	7.39	894.96	10.90	482	0.03	-86.2	0.59	7.32	337	0.00140	<0.00010	1.2
4-May-15	9.17	893.18	*Monitored Semiannually* [1]									
4-Aug-15	13.64	888.71	12.40	449	0.18	-81.7	0.27	7.33	385	0.00170	<0.00010	1.3
5-Nov-15	13.98	888.37	11.50	435	2.23	85.2	1.09	7.04	354	0.00130	<0.00010	1.5
8-Feb-16	6.74	895.61	11.50	495	0.03	187.2	0.25	7.39	297	0.00140	<0.00010	1.4
2-May-16	8.64	893.71	*Monitored Semiannually* [2]						*Monitored Annually* [2]			
22-Aug-16	13.27	889.08	12.20	559	0.03	-52.7	0.80	7.28	*Monitored Annually* [2]			
1-Nov-16	11.36	890.99	*Monitored Semiannually* [2]						*Monitored Annually* [2]			
31-Jan-17	7.91	894.44	10.90	539	0.08	124.4	0.18	7.31	321	0.00148	<0.00010	1.3
30-May-17	2.65	899.70	*Monitored Semiannually* [2]						*Monitored Annually* [2]			
16-Aug-17	12.08	890.27	12.10	573	0.12	-46.9	1.39	7.26	*Monitored Annually* [2]			
9-Nov-17	11.70	890.65	*Monitored Semiannually* [2]						*Monitored Annually* [2]			
28-Feb-18	6.50	895.85	11.00	423	0.19	-61.0	0.18	7.12	138	0.00156	<0.0001	1.2
Preliminary Standard[a]	-	-	-	700	-	-	-	6.5-8.5	500	TBD[b]	0.05	-

Notes:

Top of casing elevation (feet msl): 902.35

-	Not measured or not available
<	Analyte not detected above the reporting limit 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.
a	Preliminary standard is the standard listed or the site-specific (natural) background concentration, whichever is highest
b	Site background arsenic value to be determined (TBD)
J	Data validation code; estimated value
°C	Degrees Celsius
µmhos/cm	Micromhos per centimeter
feet bmp	Feet below measuring point
feet msl	Feet above mean sea level
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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
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	0.00444	<0.00050	-
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	0.00333	<0.00050	-
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	0.00341	<0.00100	-
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	0.00315	<0.00100	-
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	0.00245	<0.00100	-
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	0.00317	<0.00100	-
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	0.00369	<0.00100	41.6
1-Nov-08	-	-	9.79	553	10.70	-21.1	16.90	7.40	460	0.00320	<0.00100	35.5
11-Feb-09	-	-	9.16	488	6.99	-	15.40	7.52	430	0.00297	<0.00100	34.2
9-May-09	-	-	9.64	522	10.56	13.4	9.77	7.39	440 J	0.00201	<0.00100	32.4
23-Sep-09	-	-	10.70	745	8.95	271.7	14.70	6.88	570	<0.00200	<0.00200	40.0
15-Dec-09	-	-	8.60	713	5.20	279.0	12.50	6.67	350	<0.00200	<0.00200	30.0
24-Mar-10	-	-	9.90	681	6.14	370.7	-	6.57	470	0.00420	<0.00200	39.0
17-Jun-10	-	-	10.00	623	9.58	-	26.30	7.50	380	0.00590	<0.00200	28.0

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

Date Sampled	Field Parameters								Gen. Chem.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
22-Sep-10	-	-	10.00	783	9.02	225.9	17.40	7.00	510	0.00520	<0.00200	42.0
7-Dec-10	-	-	9.90	662	9.15	186.0	13.60	6.95	450	<0.00200	<0.00200	32.0
29-Mar-11	-	-	9.90	292	5.90	370.8	4.44	6.73	360 J	0.00410	<0.00200	25.0
20-Jun-11	-	-	10.50	591	6.42	219.1	4.44	7.01	420	<0.00500	<0.00200	26.0
26-Sep-11	-	-	10.70	623	5.76	240.5	11.90	6.83	520	<0.00500	<0.00200	39.0
15-Dec-11	-	-	8.80	472	4.92	310.4	7.32	6.78	430	0.00470 J	<0.00200	32.0
21-Mar-12			8.90	611	5.24	313.3	9.16	6.49	330	0.00480	<0.00040	20.0
18-Jun-12	*Monitored Semiannually* [1]											
18-Sep-12	-	-	14.20	652	9.70	148.0	20.80	7.48	450	0.00500	<0.00040	29.0
18-Dec-12	*Monitored Semiannually* [1]											
25-Feb-13	-	-	9.20	648	10.10	209.6	4.12	7.58	300	0.00500	<0.00040	25.0
25-Feb-13	*Monitored Semiannually* [1]											
21-Feb-13	-	-	9.20	648	10.10	209.6	4.12	7.58	300	0.00500	<0.00040	25.0
22-May-13	*Monitored Semiannually* [1]											
20-Aug-13	-	-	10.80	635	9.31	170.1	8.46	7.11	458	0.00390	<0.00010	32.3
19-Nov-13	*Monitored Semiannually* [1]											
31-Mar-14	-	-	10.60	448	9.29	213.5	87.20	7.30	321	0.00370	0.00018 J	21.1
21-May-14	*Monitored Semiannually* [1]											
15-Aug-14	-	-	10.01	595	10.01	-35.2	6.43	6.99	427	0.00350	<0.00010	31.5
14-Nov-14	*Monitored Semiannually* [1]											
10-Feb-15	-	-	10.60	515	9.88	183.5	6.84	7.26	363	0.00280	0.00007 J	27.2
4-May-15	*Monitored Semiannually* [1]											
4-Aug-15	-	-	10.90	554	9.98	95.8	8.68	7.48	438	0.00260	<0.00010	34.7
5-Nov-15	-	-	10.30	503	10.24	177.6	13.40	7.46	449	0.00280	<0.00010	31.8
8-Feb-16	-	-	9.30	541	11.30	215.0	5.12	7.30	293	0.00320	<0.00010	23.1
-	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	0.00397	<0.00010	29.2
-	Monitored Semiannually [2]								*Monitored Annually* [2]			

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

Date Sampled	Field Parameters								Gen. Chem.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
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	0.00411	<0.0001	20.4
Preliminary Standard[a]	-	-	-	700	-	-	-	6.5-8.5	500	TBD[b]	0.05	-

Notes:

-	Not measured or not available
<	Analyte not detected above the reporting limit shown
*	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.
a	Preliminary standard is the standard listed or the site-specific (natural) background concentration, whichever is highest
b	Site background arsenic value to be determined (TBD)
J	Data validation code; estimated value
°C	Degrees Celsius
µmhos/cm	Micromhos per centimeter
feet bmp	Feet below measuring point
feet msl	Feet above mean sea level
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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
1-Mar-02	-	-	-	542	-	-	-	7.22	467	-	-	-
1-Jun-02	197.34	731.88	12.00	750	-	-	-	7.10	459	-	-	-
1-Sep-02	199.29	729.93	14.00	660	-	-	-	6.90	499	-	-	-
2-Dec-02	200.09	729.13	10.80	675	-	-	-	6.89	440	<0.00100	<0.00050	-
3-Mar-03	190.21	739.01	11.90	763	-	-	-	6.98	450	-	-	-
3-May-03	191.78	737.44	12.30	730	-	-	233.00	6.98	550	-	-	-
3-Aug-03	199.82	729.40	16.50	848	-	-	17.00	6.92	520	-	-	-
1-Nov-03	199.97	729.25	11.60	559	-	-	9.20	7.04	522	0.00098	<0.00050	-
1-Feb-04	188.78	740.44	11.96	608	-	-	4.86	6.68	560	-	-	-
1-May-04	198.45	730.77	13.69	614	-	-	6.17	6.80	478	-	-	-
1-Aug-04	199.17	730.05	14.38	731	-	-	5.48	6.71	460	-	-	-
1-Nov-04	197.92	731.30	11.62	785	-	-	12.30	6.75	512	<0.00100	<0.00100	-
1-Feb-05	186.36	742.86	11.64	806	-	-	1.47	6.94	487	-	-	-
1-May-05	-	-	12.87	790	-	-	15.80	6.89	338	-	-	-
1-Aug-05	196.10	733.12	15.01	603	-	-	45.70	6.44	388	-	-	-
1-Nov-05	196.78	732.44	9.91	549	-	-	13.30	6.66	350	<0.00100	<0.00100	-
1-Feb-06	193.93	735.29	8.10	641	2.11	269.2	35.70	6.82	400 J	-	-	-
1-May-06	197.90	731.32	10.88	798	1.67	27.3	5.38	6.50	380	-	-	-
1-Aug-06	198.80	730.42	11.44	534	2.52	205.7	8.74	6.67	360	-	-	-
1-Nov-06	187.36	741.86	10.77	680	2.12	-19.9	18.90	7.06	430	<0.00100	<0.00100	-
28-Dec-06	192.37	736.85	-	-	-	-	-	-	-	-	-	-
7-Feb-07	197.46	731.76	10.24	621	0.64	-16.7	27.80	6.89	420	-	-	-
7-May-07	198.49	730.73	-	-	-	-	-	-	-	-	-	-
1-Aug-07	198.45	730.77	-	-	-	-	-	-	-	-	-	-
27-Nov-07	196.48	732.74	-	-	-	-	-	-	-	-	-	-
8-Feb-08	191.30	737.92	-	-	-	-	-	-	-	-	-	-
8-May-08	193.95	735.27	-	-	-	-	-	-	-	-	-	-
27-Sep-11	197.32	731.90	-	-	-	-	-	-	-	-	-	-
13-Dec-11	192.15	737.07	9.60	421	2.10	313.0	16.10	7.49	-	-	-	-
22-Mar-12	183.35	747.87	8.90	546	12.83	166.3	0.56	7.47	-	-	-	-
18-Jun-12	192.54	738.68	-	-	-	-	-	-	-	-	-	-
18-Sep-12	199.51	731.71	16.20	508	2.21	120.0	1.27	7.58	-	-	-	-
18-Dec-12	184.52	746.70	-	-	-	-	-	-	-	-	-	-

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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
21-Feb-13	190.65	740.57	7.60	678	5.33	342.6	6.61	8.02	-	-	-	-
22-May-13	198.05	733.17	-	-	-	-	-	-	-	-	-	-
20-Aug-13	200.47	730.75	13.00	488	3.26	90.2	8.47	7.42	-	-	-	-
19-Nov-13	196.59	734.63	-	-	-	-	-	-	-	-	-	-
31-Mar-14	186.78	744.44	11.40	421	7.28	195.1	1.70	7.47	-	-	-	-
21-May-14	192.27	738.95	-	-	-	-	-	-	-	-	-	-
15-Aug-14	199.97	731.25	18.90	492	0.97	1.4	52.50	7.01	-	-	-	-
14-Nov-14	196.60	734.62	-	-	-	-	-	-	-	-	-	-
10-Feb-15	183.97	747.25	10.20	450	7.65	121.4	1.02	7.34	-	-	-	-
4-May-15	194.19	737.03	-	-	-	-	-	-	-	-	-	-
4-Aug-15	198.35	732.87	13.60	432	3.07	18.6	0.27	7.47	-	-	-	-
3-Nov-15	198.25	732.97	10.30	405	2.57	106.2	7.07	7.35	-	-	-	-
8-Feb-16	188.43	742.79	12.50	536	2.77	189.8	0.25	7.78	-	-	-	-
2-May-16	195.72	735.50	Monitored Semiannually[1]						-	-	-	-
22-Aug-16	197.89	733.33	14.00	418	1.27	-123.1	4.36	7.32	-	-	-	-
1-Nov-16	195.49	735.73	Monitored Semiannually[1]						-	-	-	-
31-Jan-17	186.94	744.28	9.20	506	5.26	-45.4	0.38	7.45	-	-	-	-
30-May-17	190.62	740.60	Monitored Semiannually[1]						-	-	-	-
16-Aug-17	197.55	733.67	13.30	540	2.31	37.3	3.42	7.37	-	-	-	-
9-Nov-17	197.11	734.11	Monitored Semiannually[1]						-	-	-	-
28-Feb-18	185.96	745.26	10.10	390	5.95	204.7	1.62	7.15	-	-	-	-
Preliminary Standard[a]	-	-	-	700	-	-	-	6.5-8.5	500	TBD[b]	0.05	-

Notes:

Top of casing elevation (feet msl) prior to raising casing: 929.22

Top of casing elevation (feet msl) after raising casing (December 14, 2011): 931.22

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.

\- Not measured or not available

< Analyte not detected above the reporting limit shown

a Preliminary standard is the standard listed or the site-specific (natural) background concentration, whichever is highest

b Site background arsenic value to be determined (TBD)

J Data validation code; estimated value

°C Degrees Celsius

µmhos/cm Micromhos per centimeter

feet bmp Feet below measuring point

feet msl Feet above mean sea level

mg/L Milligrams per liter

mV Millivolts

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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
26-Sep-11	25.77	903.04	11.40	553	0.86	197.2	-	7.21	-	-	-	-
13-Dec-11	24.94	903.87	9.70	625	1.73	658.0	22.70	7.68	-	-	-	-
22-Mar-12	23.80	905.01	9.60	785	3.71	242.6	8.14	7.30	-	-	-	-
19-Jun-12	24.09	904.72	-	-	-	-	-	-	-	-	-	-
18-Sep-12	25.68	903.13	16.50	664	2.37	150.0	19.20	7.34	-	-	-	-
18-Dec-12	23.02	905.79	-	-	-	-	-	-	-	-	-	-
21-Feb-13	23.50	905.31	10.00	840	6.55	352.4	3.42	7.42	-	-	-	-
22-May-13	23.84	904.97	-	-	-	-	-	-	-	-	-	-
20-Aug-13	25.08	903.73	13.50	539	2.91	45.1	1.87	7.22	-	-	-	-
19-Nov-13	22.76	906.05	-	-	-	-	-	-	-	-	-	-
31-Mar-14	21.39	907.42	12.20	511	6.31	197.3	1.38	7.58	-	-	-	-
21-May-14	19.82	908.99	-	-	-	-	-	-	-	-	-	-
15-Aug-14	24.00	904.81	12.81	647	0.82	7.5	5.42	6.62	-	-	-	-
14-Nov-14	22.28	906.53	-	-	-	-	-	-	-	-	-	-
10-Feb-15	21.10	907.71	12.30	636	2.56	-71.9	1.11	7.11	-	-	-	-
4-May-15	22.65	906.16	-	-	-	-	-	-	-	-	-	-
5-Aug-15	24.65	904.16	13.50	563	3.21	116.4	55.20	7.42	-	-	-	-
3-Nov-15	23.87	904.94	12.20	493	4.65	114.4	5.78	7.52	-	-	-	-
8-Feb-16	19.39	909.42	15.80	670	3.92	163.5	5.06	7.59	-	-	-	-
2-May-16	20.99	907.82	Monitored Semiannually[1]						-	-	-	-
22-Aug-16	24.42	904.39	17.60	527	5.01	106.0	1.39	7.44	-	-	-	-
1-Nov-16	21.31	907.50	Monitored Semiannually[1]						-	-	-	-
31-Jan-17	21.11	907.70	12.10	680	2.75	-146.1	1.48	7.35	-	-	-	-
30-May-17	18.49	910.32	Monitored Semiannually[1]						-	-	-	-

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.	Dissolved Metals (mg/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)	Total Dissolved Solids (mg/L)	Arsenic	Lead	Potassium
17-Aug-17	22.58	906.23	12.60	673	5.22	177.8	1.97	7.15		-	-	-
9-Nov-17	20.72	908.09	Monitored Semiannually[1]						-	-	-	-
28-Feb-18	17.09	911.72	11.10	509	8.34	29.0	0.72	7.37	-	-	-	-
Preliminary Standard[a]	-	-	-	700	-	-	-	6.5-8.5	500	TBD[b]	0.05	-

Notes:

Top of casing elevation (feet msl) prior to DSP Cover Upgrade: 935.82

Top of casing elevation (feet msl) after DSP Cover Upgrade (completed July 2011): 928.81

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.

\- Not measured or not available

a Preliminary standard is the standard listed or the site-specific (natural) background concentration, whichever is highest

b Site background arsenic value to be determined (TBD)

J Data validation code; estimated value

°C Degrees Celsius

µmhos/cm Micromhos per centimeter

feet bmp Feet below measuring point

feet msl Feet above mean sea level

mg/L Milligrams per liter

mV Millivolts

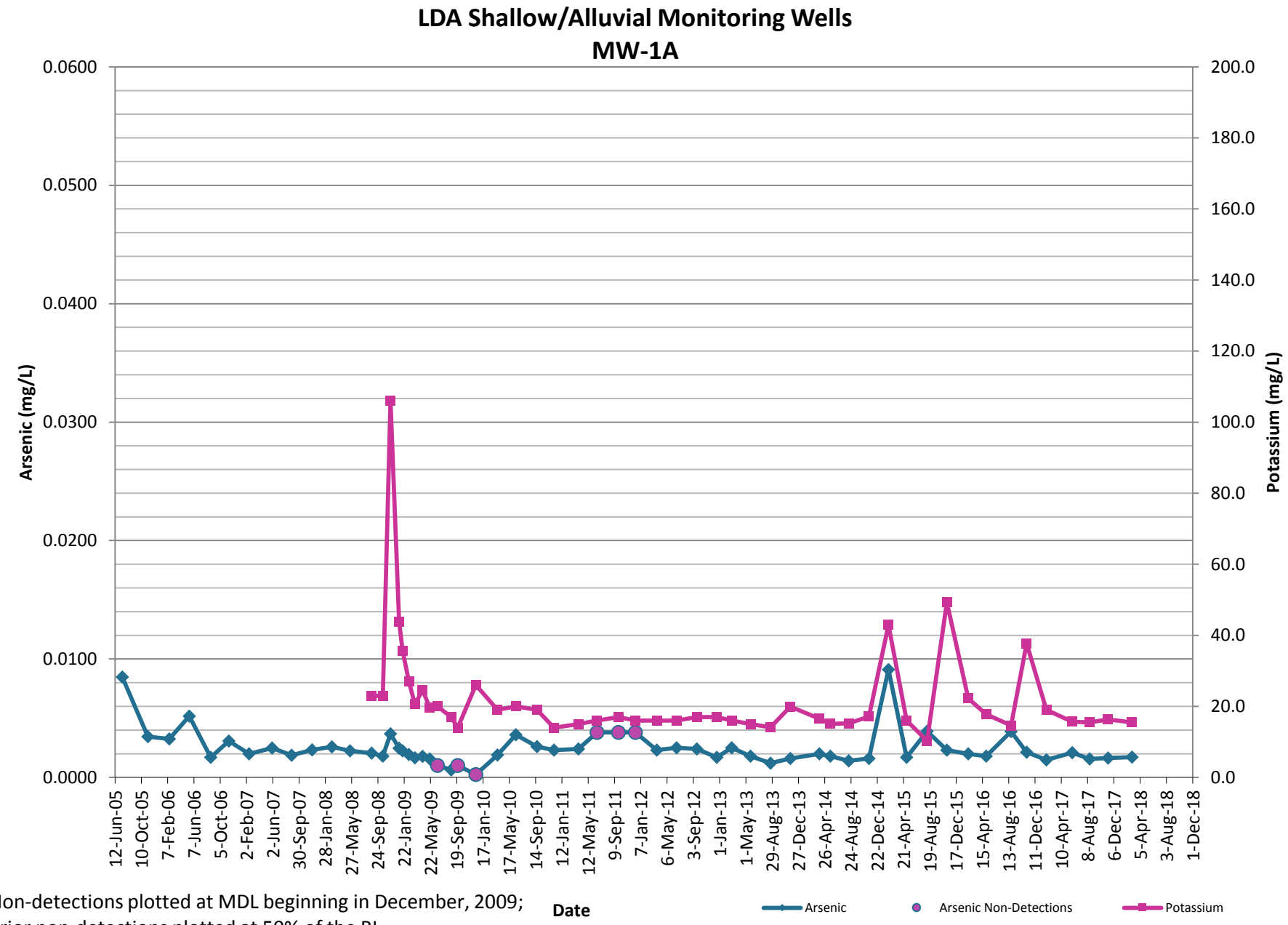
NTU Nephelometric Turbidity Unit

APPENDIX B

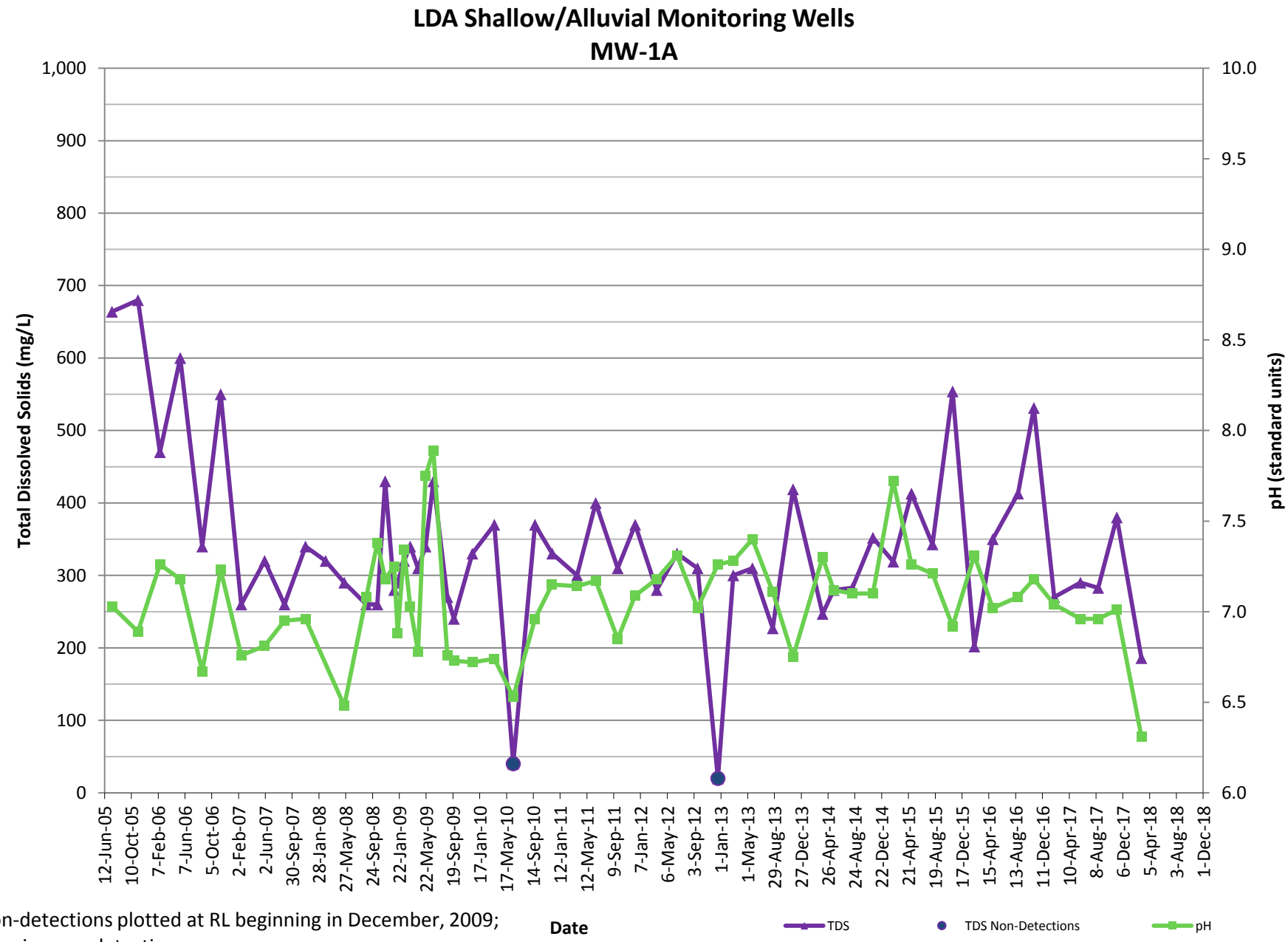
Data Graphs

APPENDIX B-1

LDA Shallow/Alluvial Monitoring Wells Data Graphs

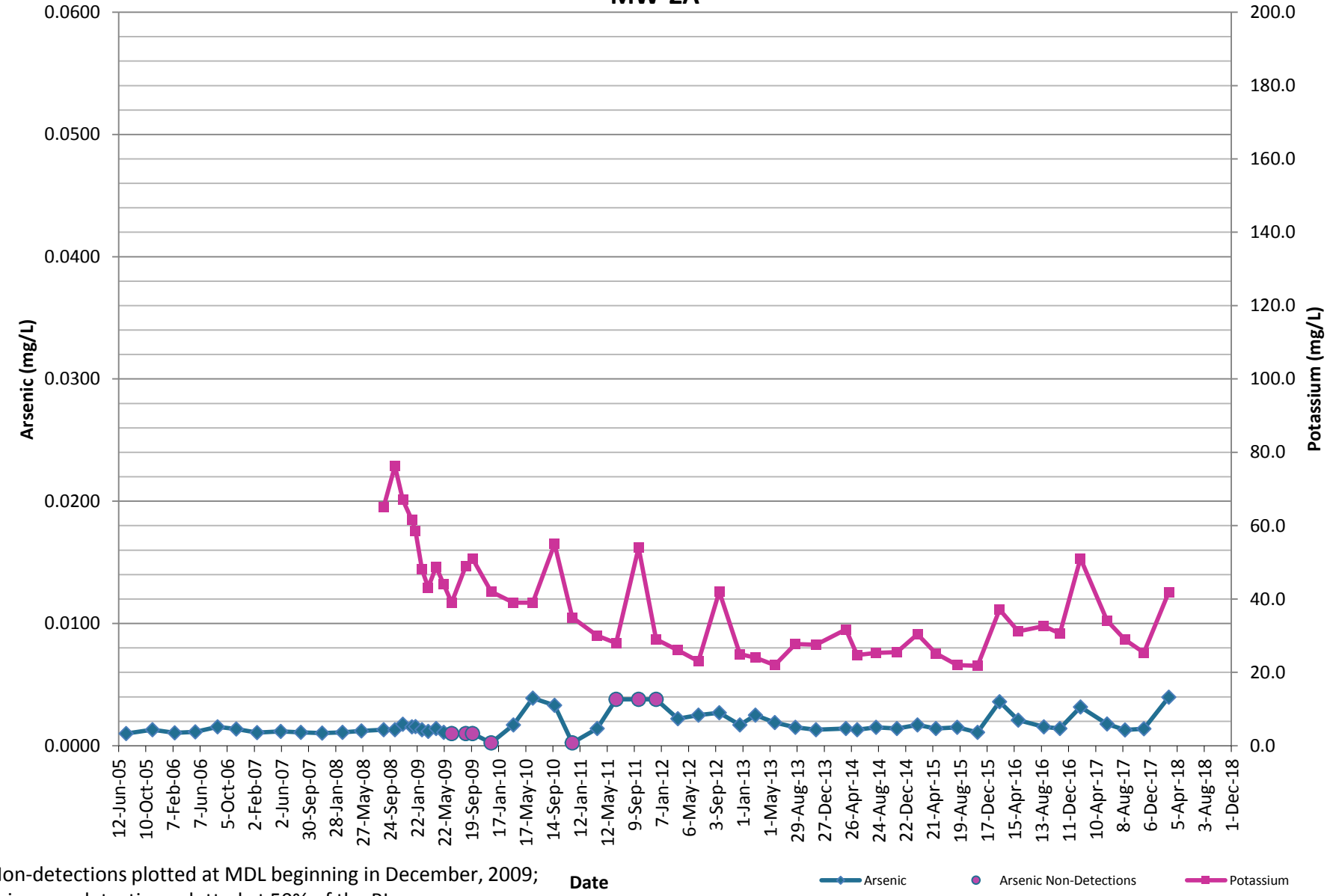


Non-detections plotted at MDL beginning in December, 2009; prior non-detections plotted at 50% of the RL

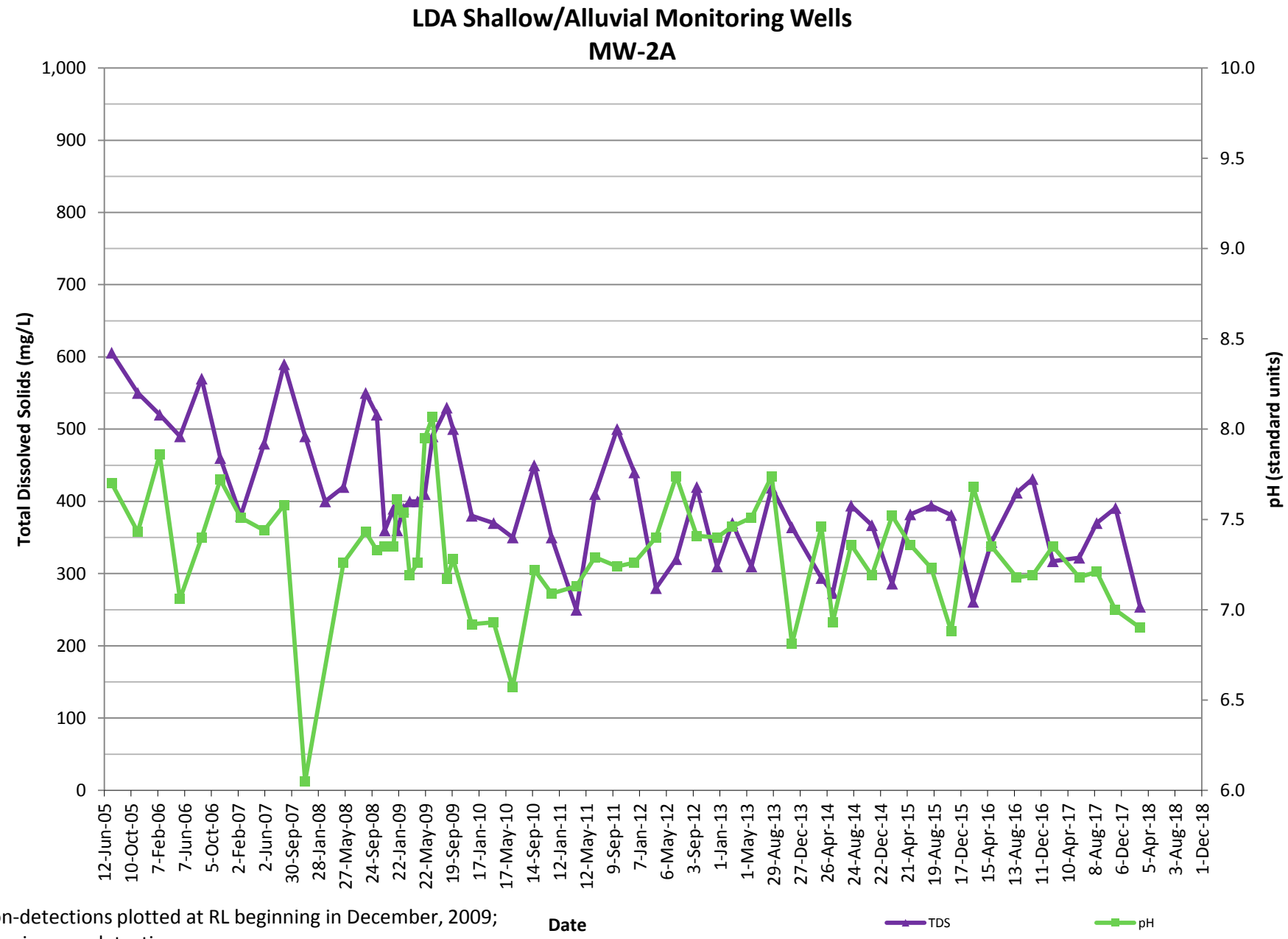


Non-detections plotted at RL beginning in December, 2009; no prior non-detections.

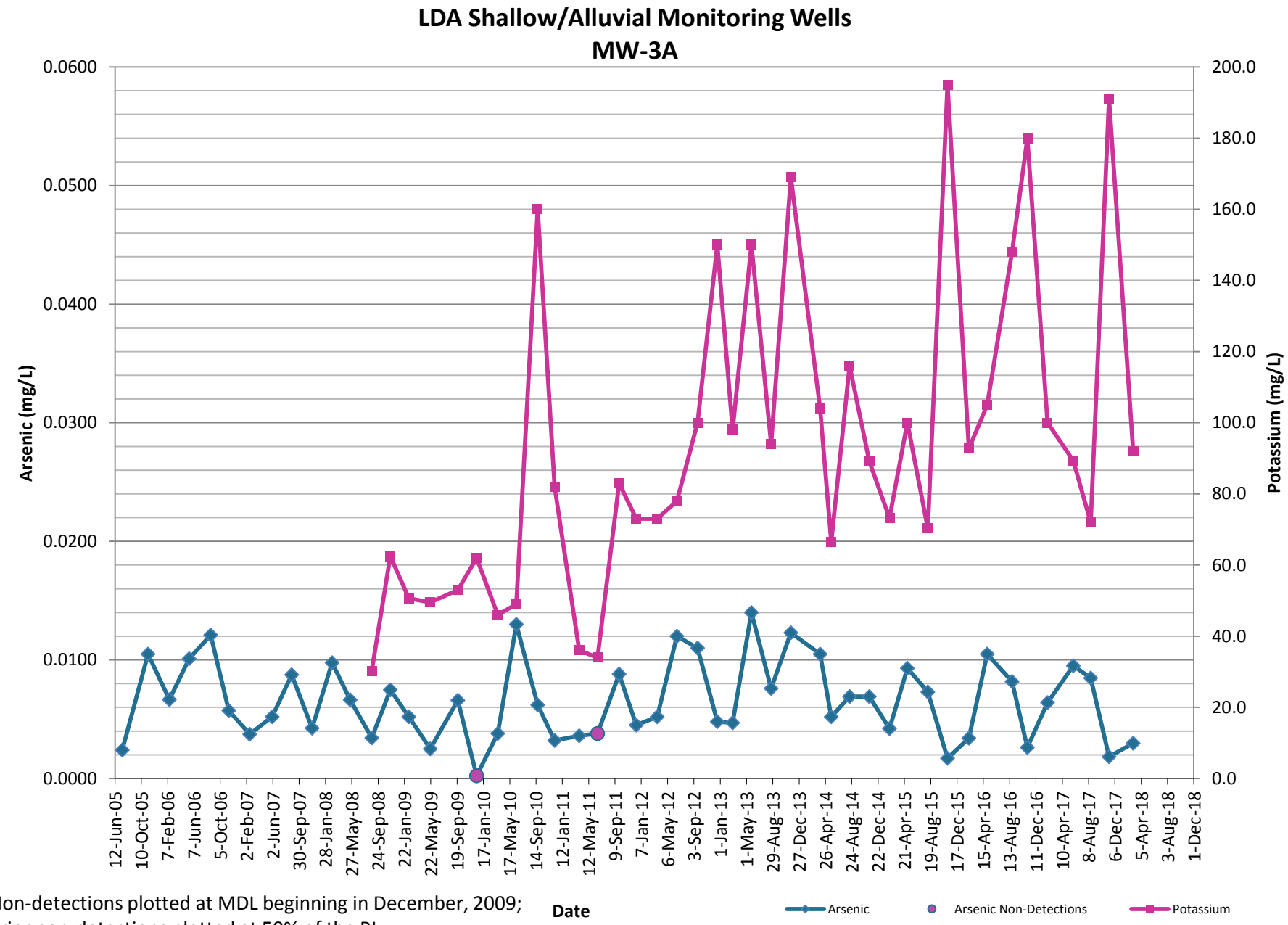
LDA Shallow/Alluvial Monitoring Wells
MW-2A



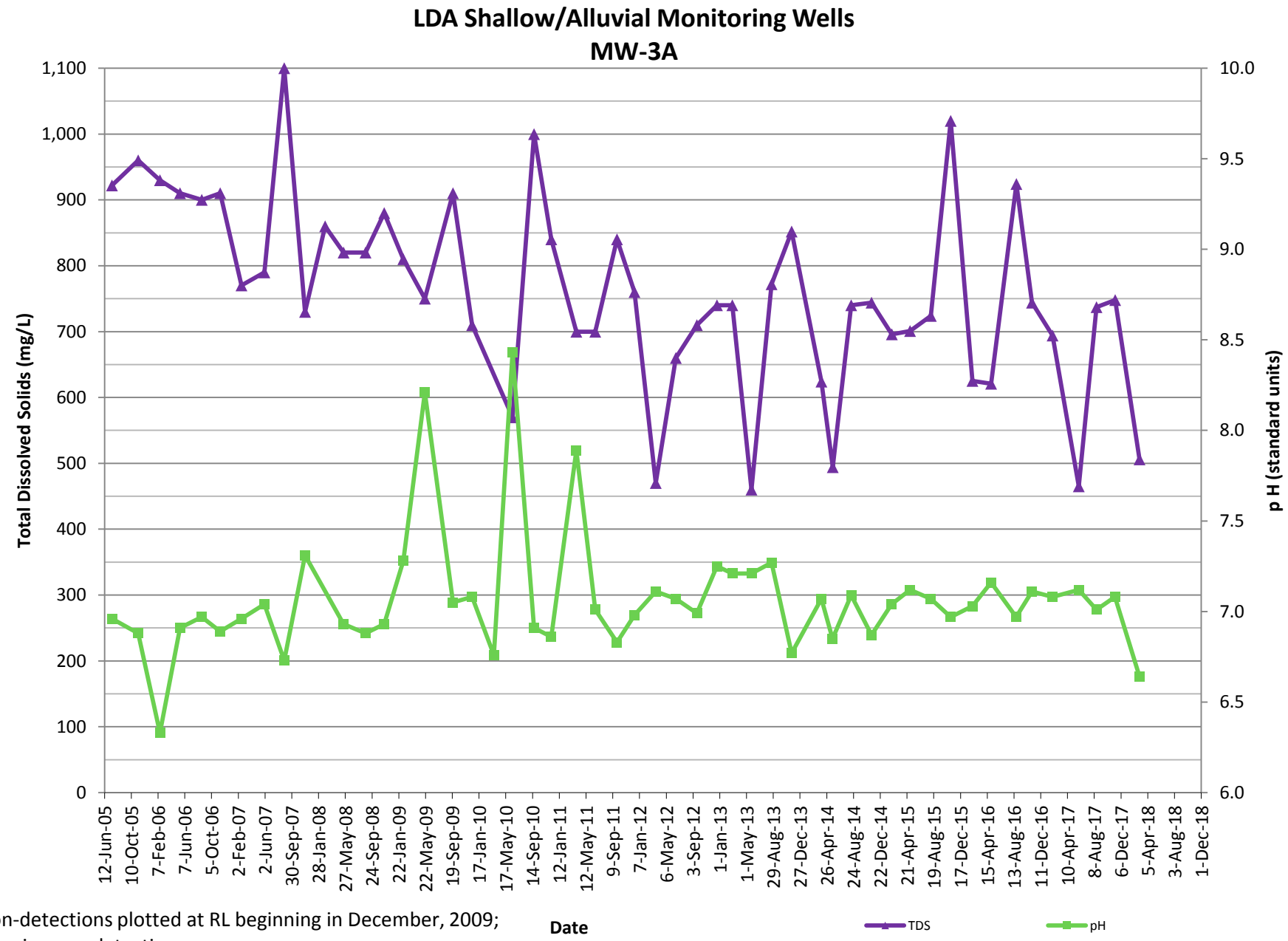
Non-detections plotted at MDL beginning in December, 2009; prior non-detections plotted at 50% of the RL



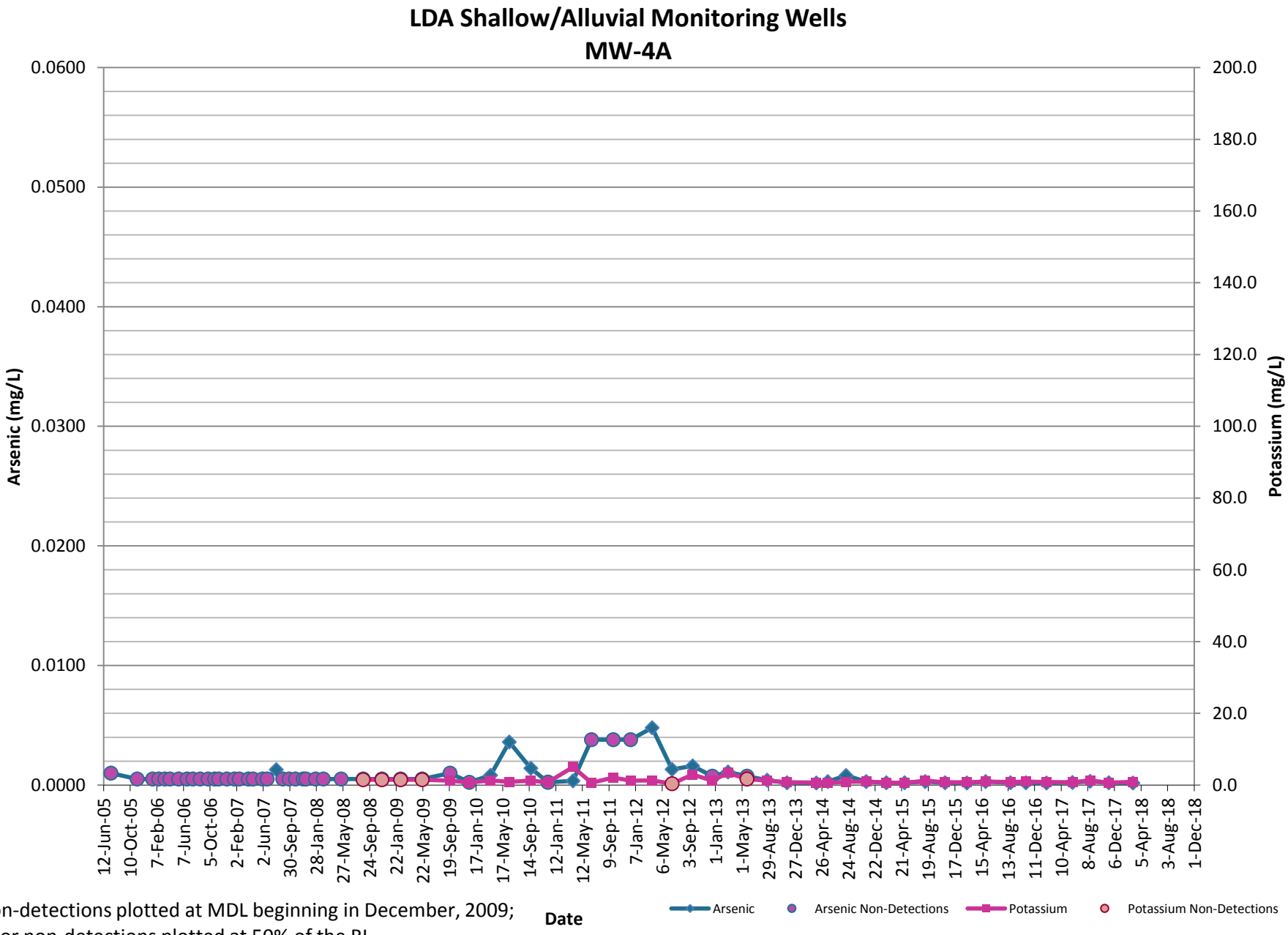
Non-detections plotted at RL beginning in December, 2009; no prior non-detections.



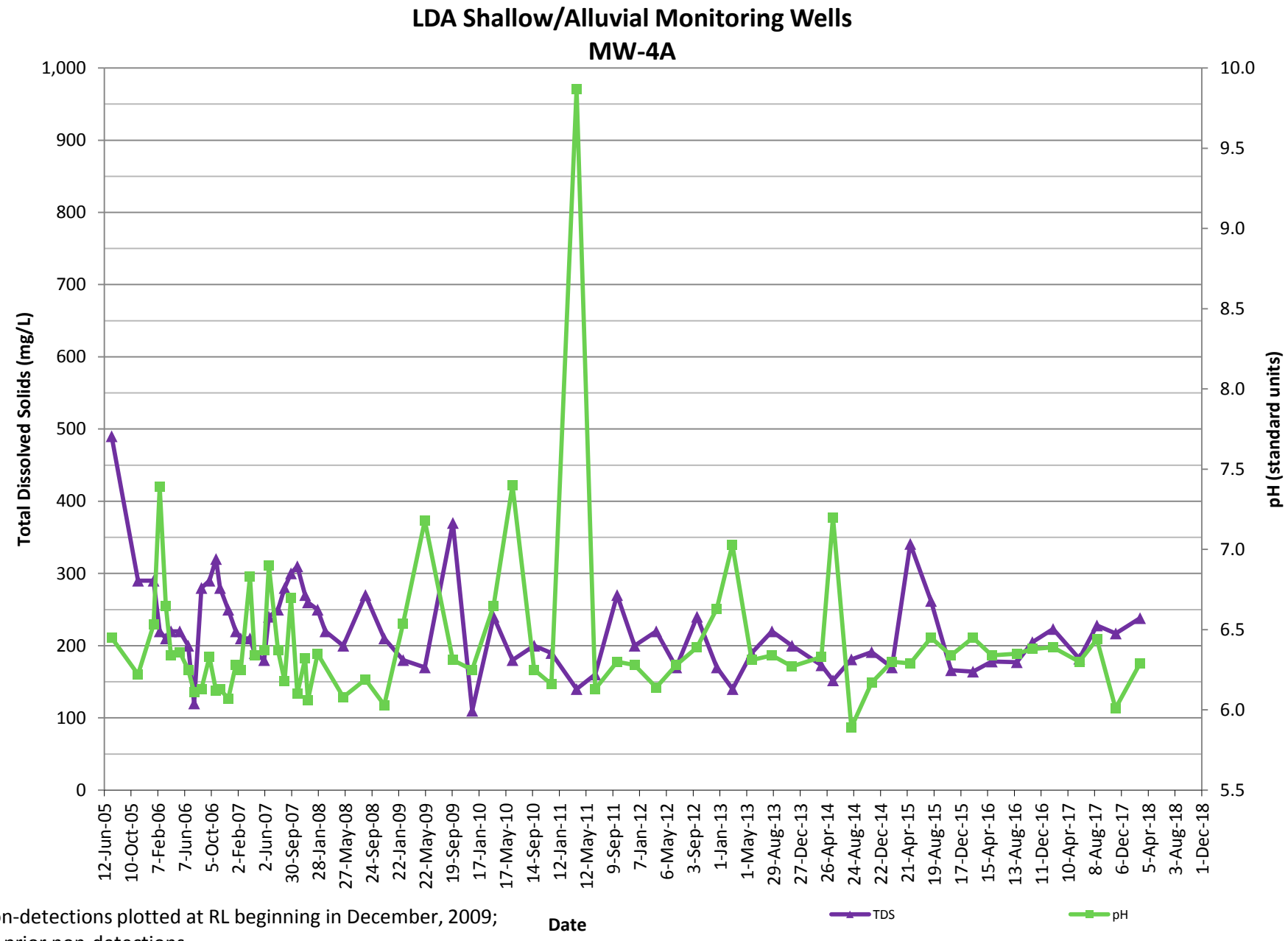
Non-detections plotted at MDL beginning in December, 2009; prior non-detections plotted at 50% of the RL



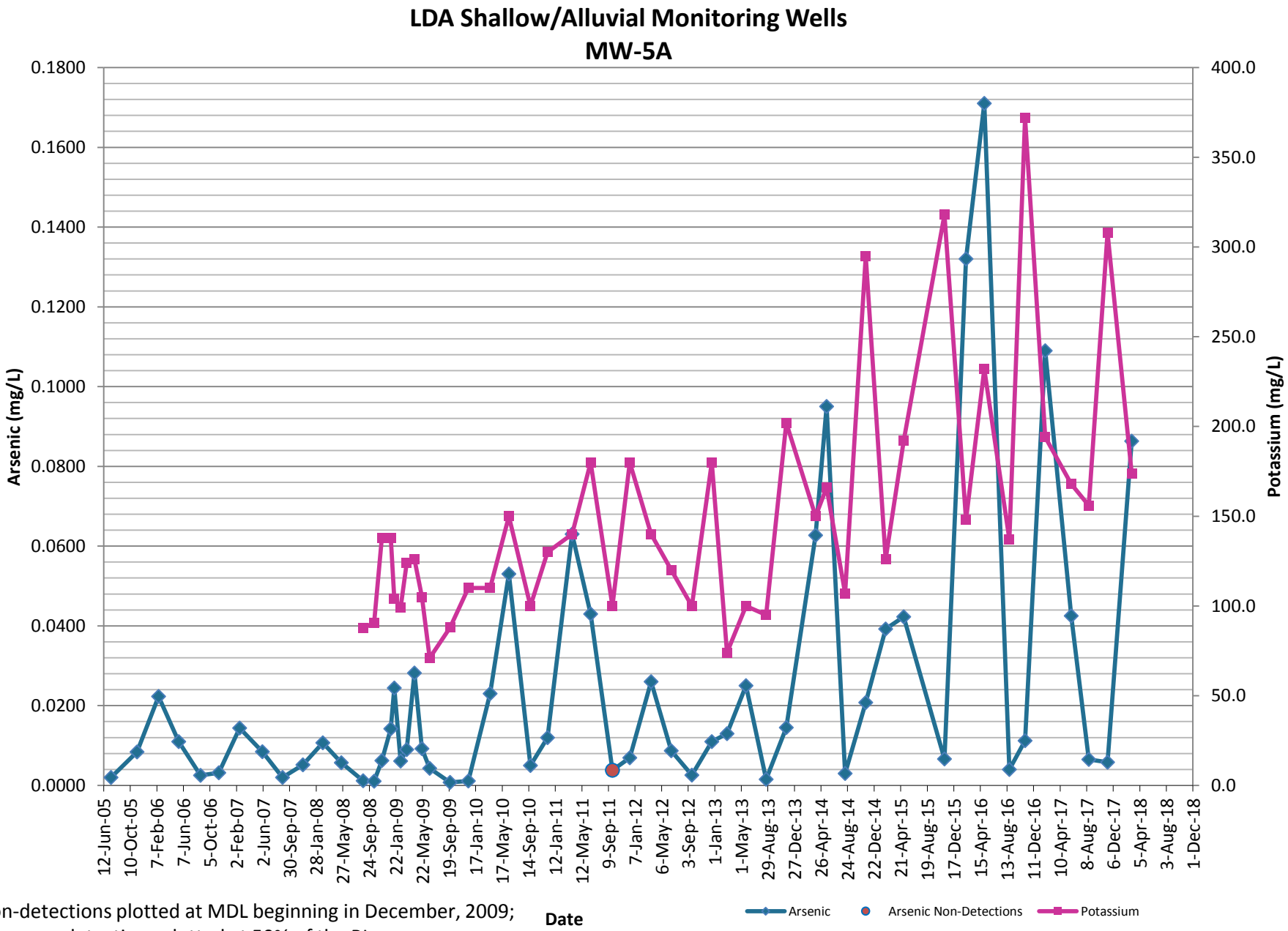
Non-detections plotted at RL beginning in December, 2009; no prior non-detections.



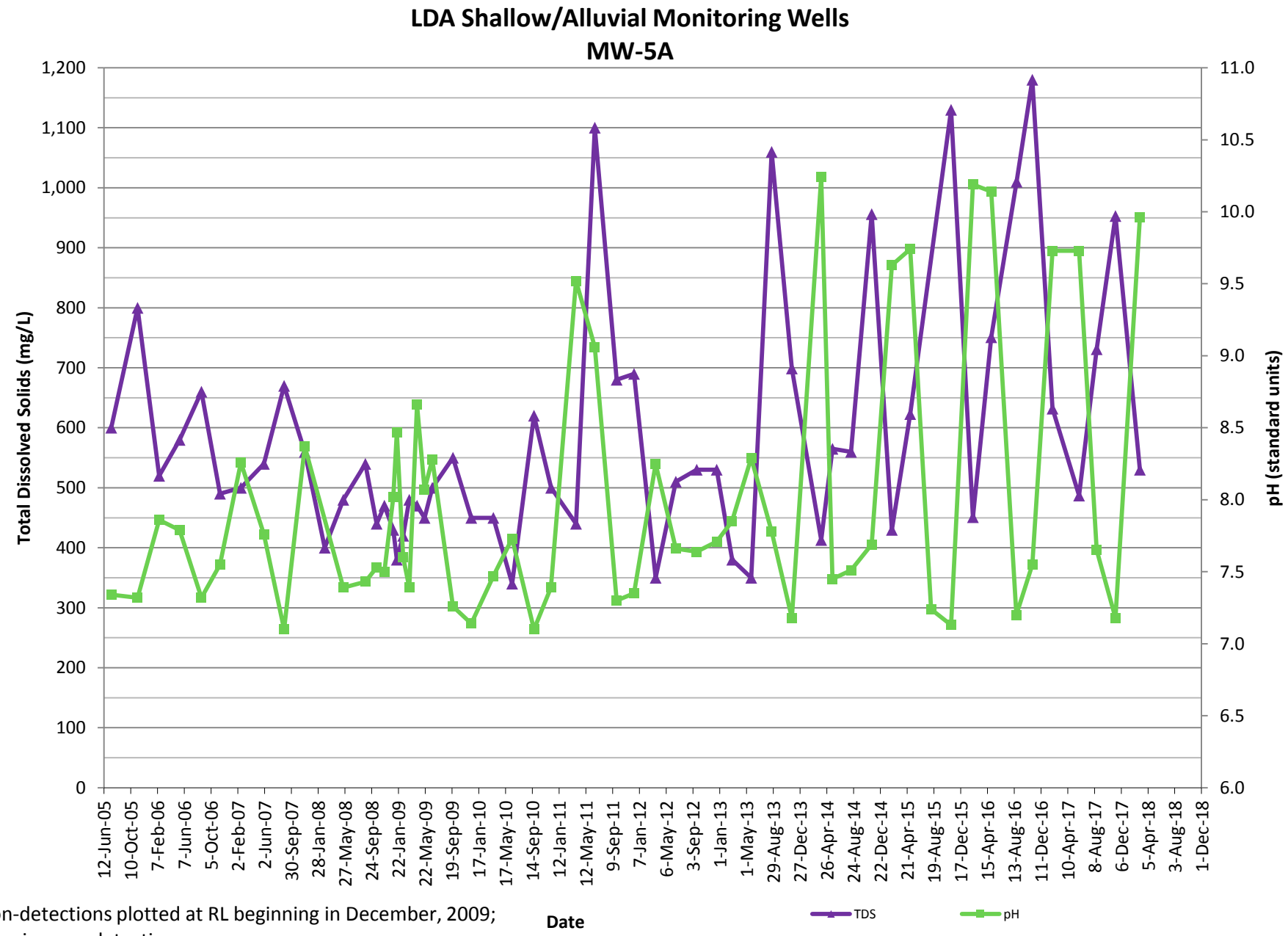
Non-detections plotted at MDL beginning in December, 2009; prior non-detections plotted at 50% of the RL



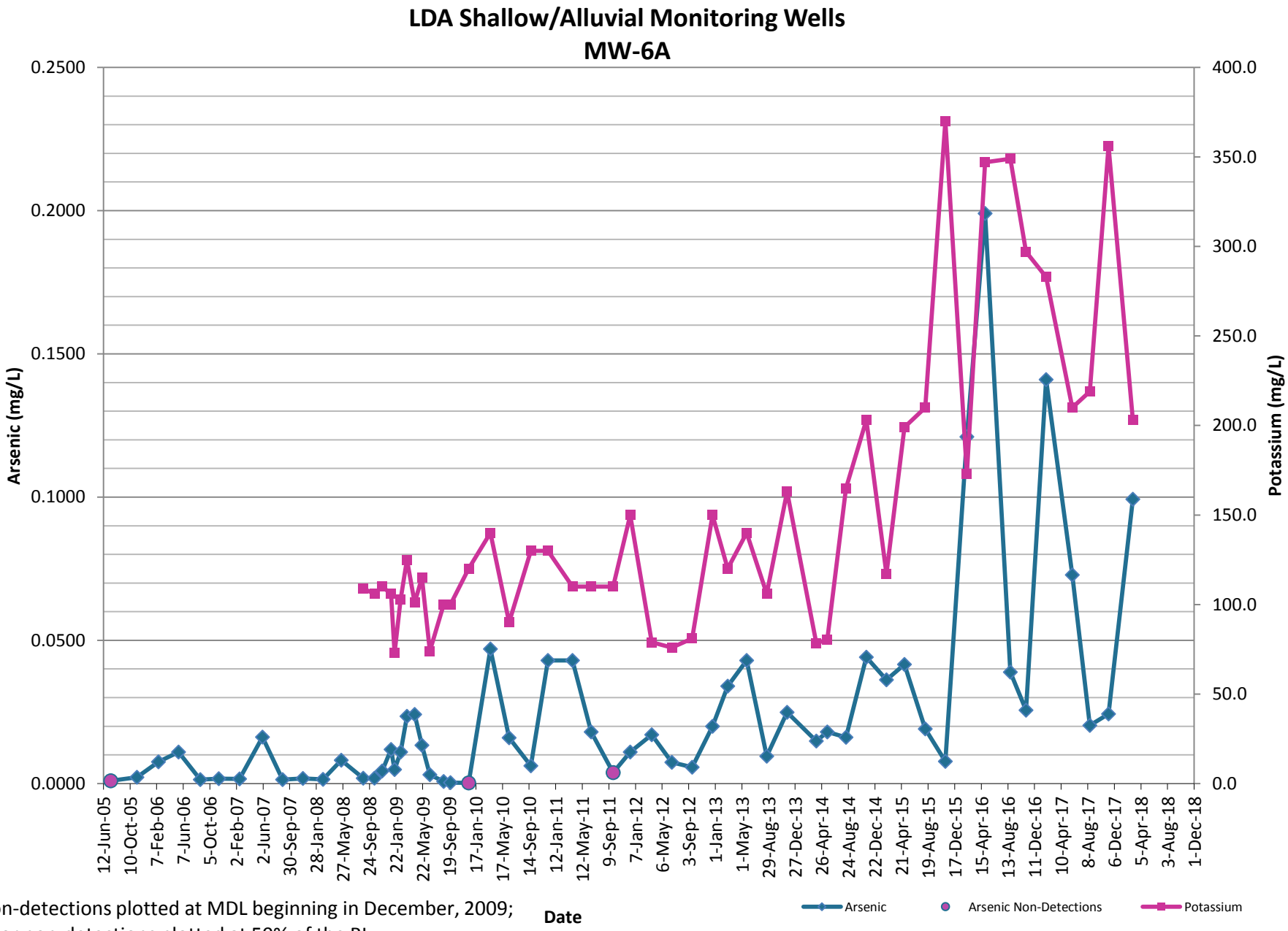
Non-detections plotted at RL beginning in December, 2009; no prior non-detections.



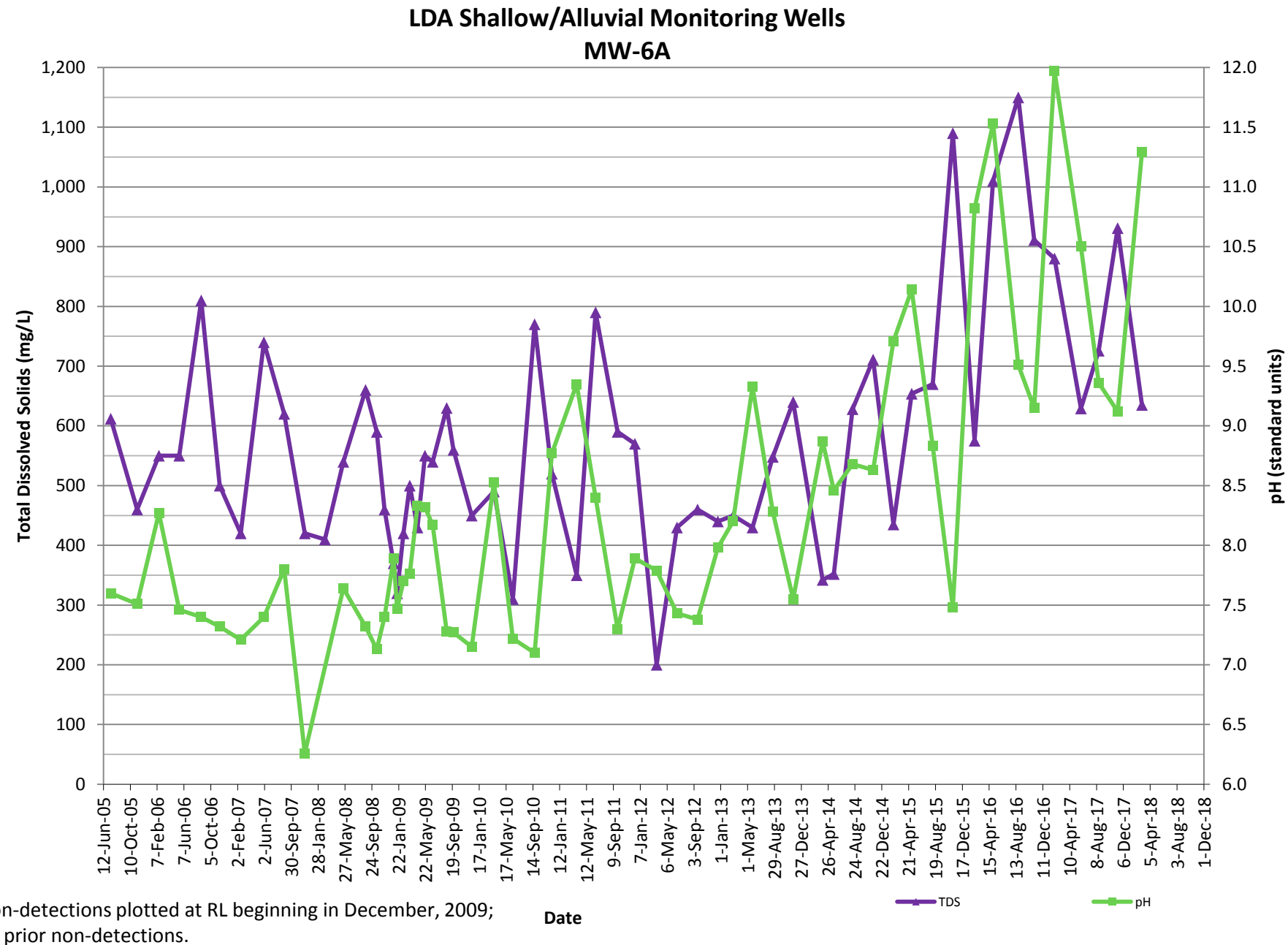
Non-detections plotted at MDL beginning in December, 2009; prior non-detections plotted at 50% of the RL



Non-detections plotted at RL beginning in December, 2009; no prior non-detections.

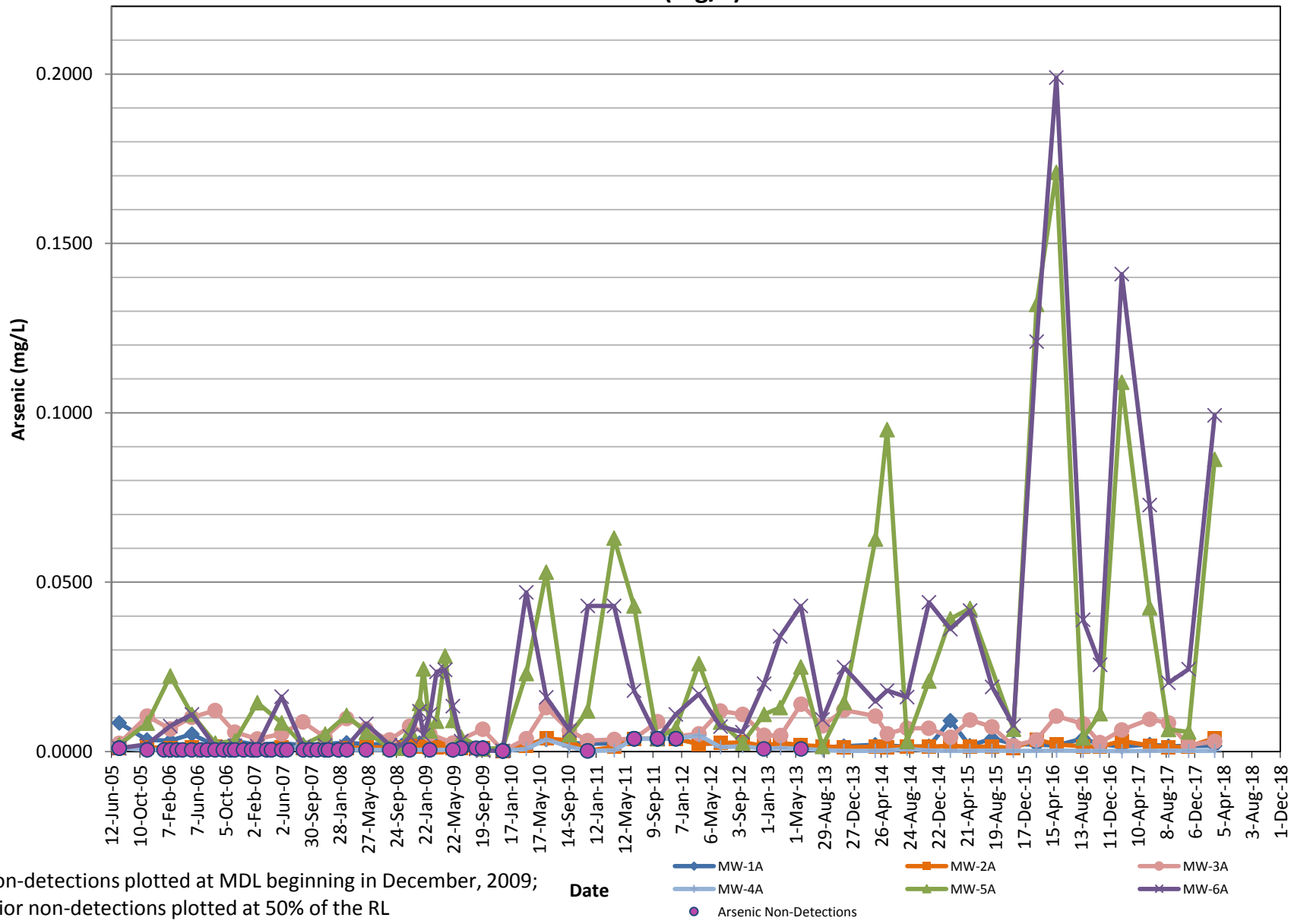


Non-detections plotted at MDL beginning in December, 2009; prior non-detections plotted at 50% of the RL

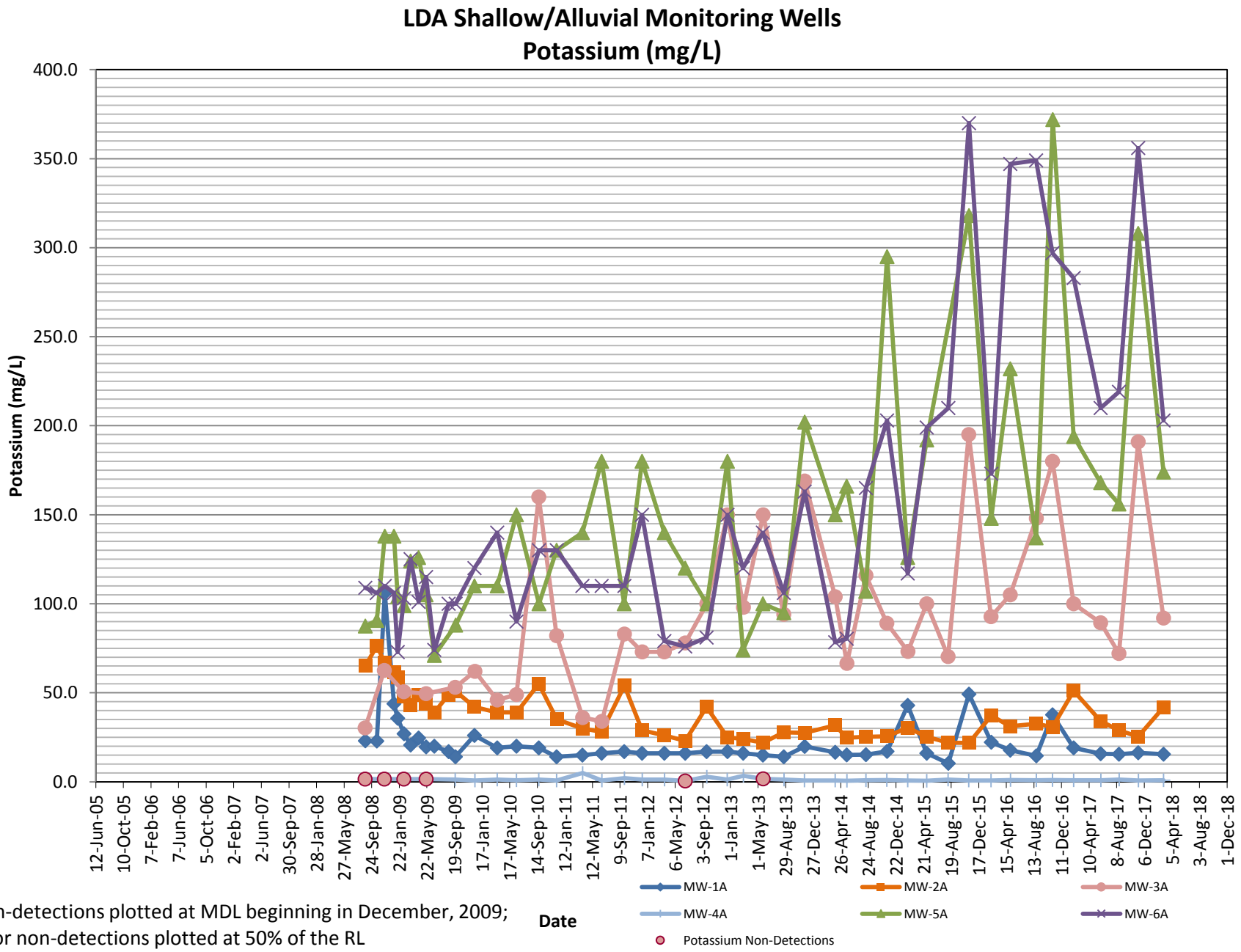


Non-detections plotted at RL beginning in December, 2009; no prior non-detections.

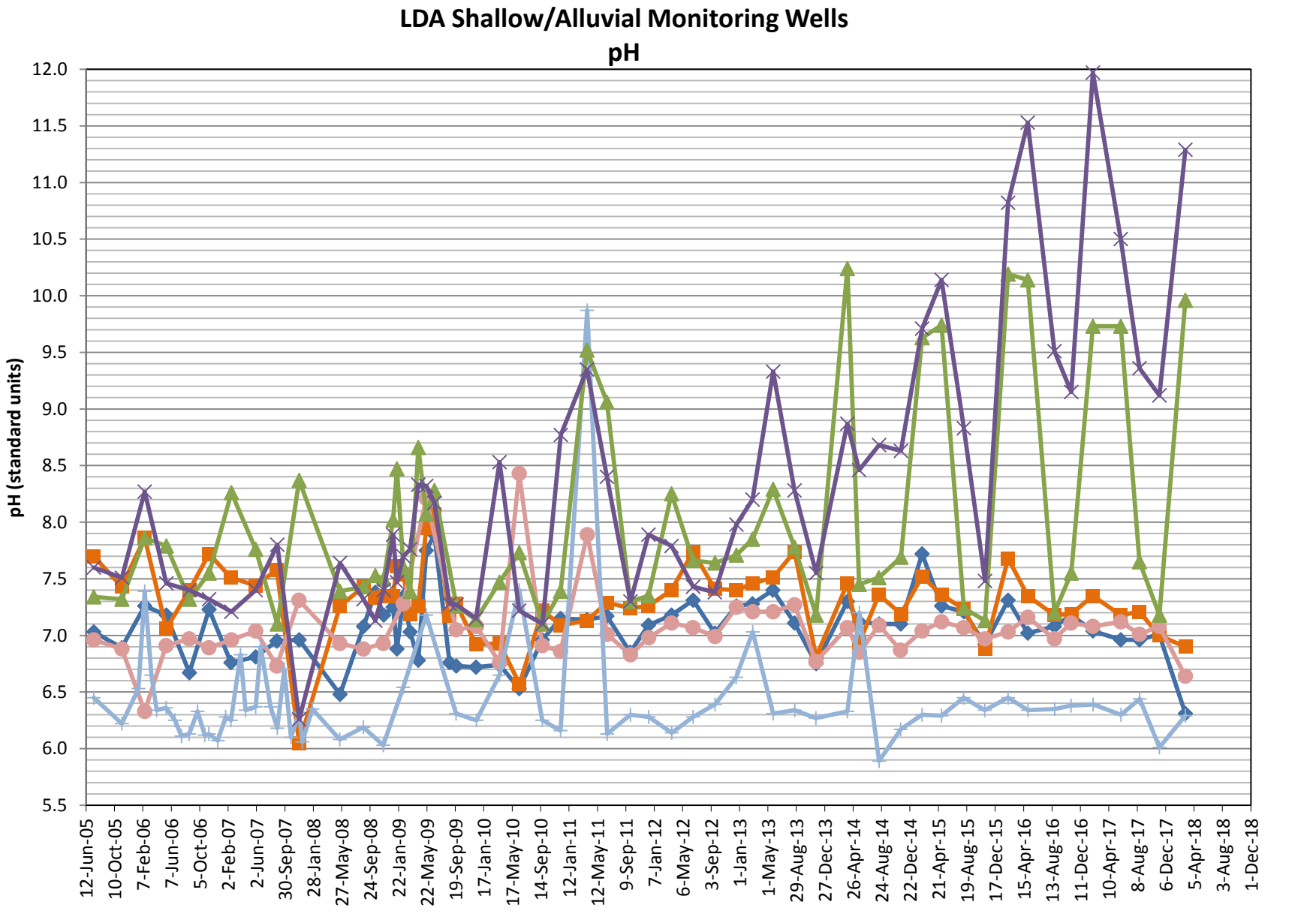
LDA Shallow/Alluvial Monitoring Wells
Arsenic (mg/L)



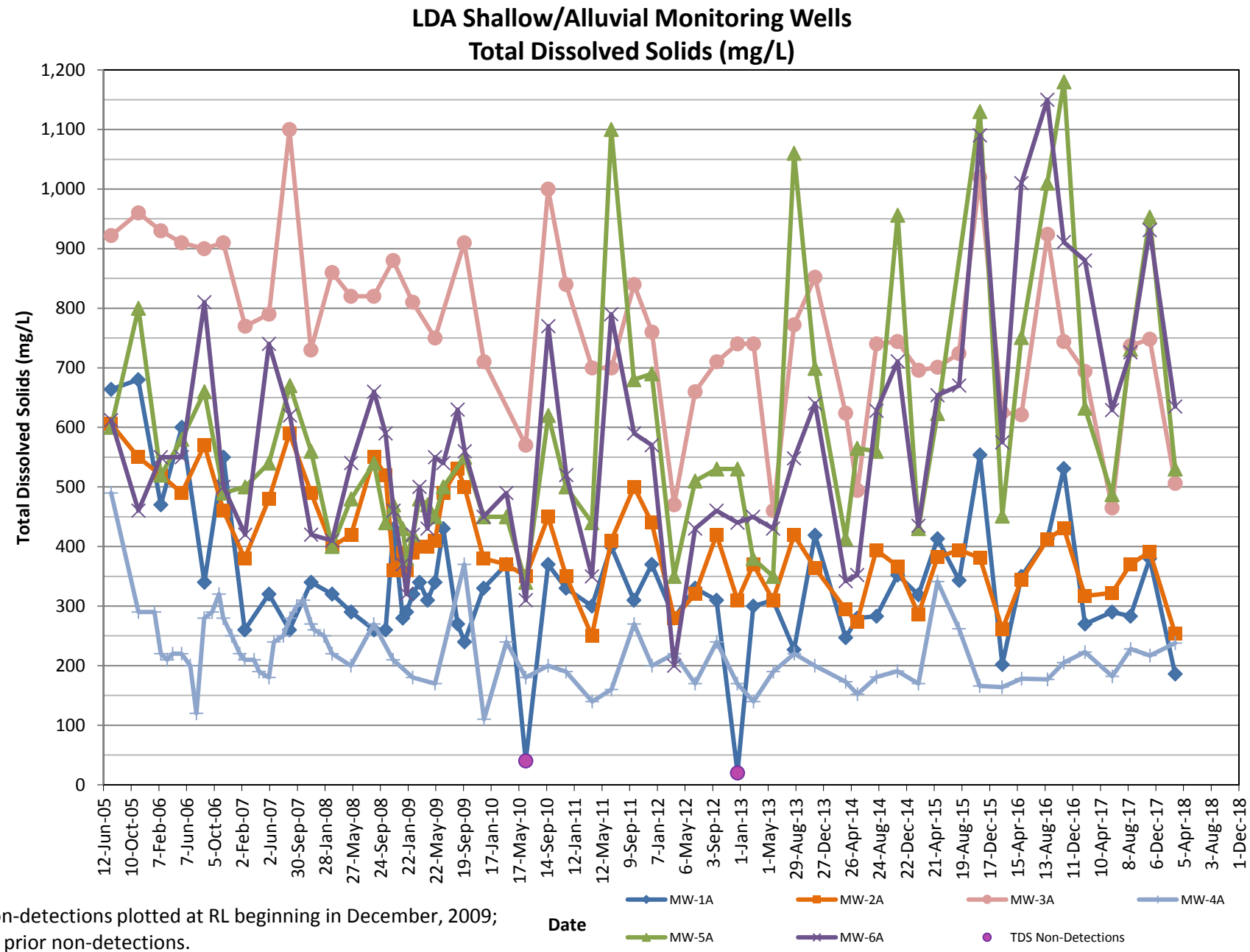
Non-detections plotted at MDL beginning in December, 2009; prior non-detections plotted at 50% of the RL



Non-detections plotted at MDL beginning in December, 2009; prior non-detections plotted at 50% of the RL



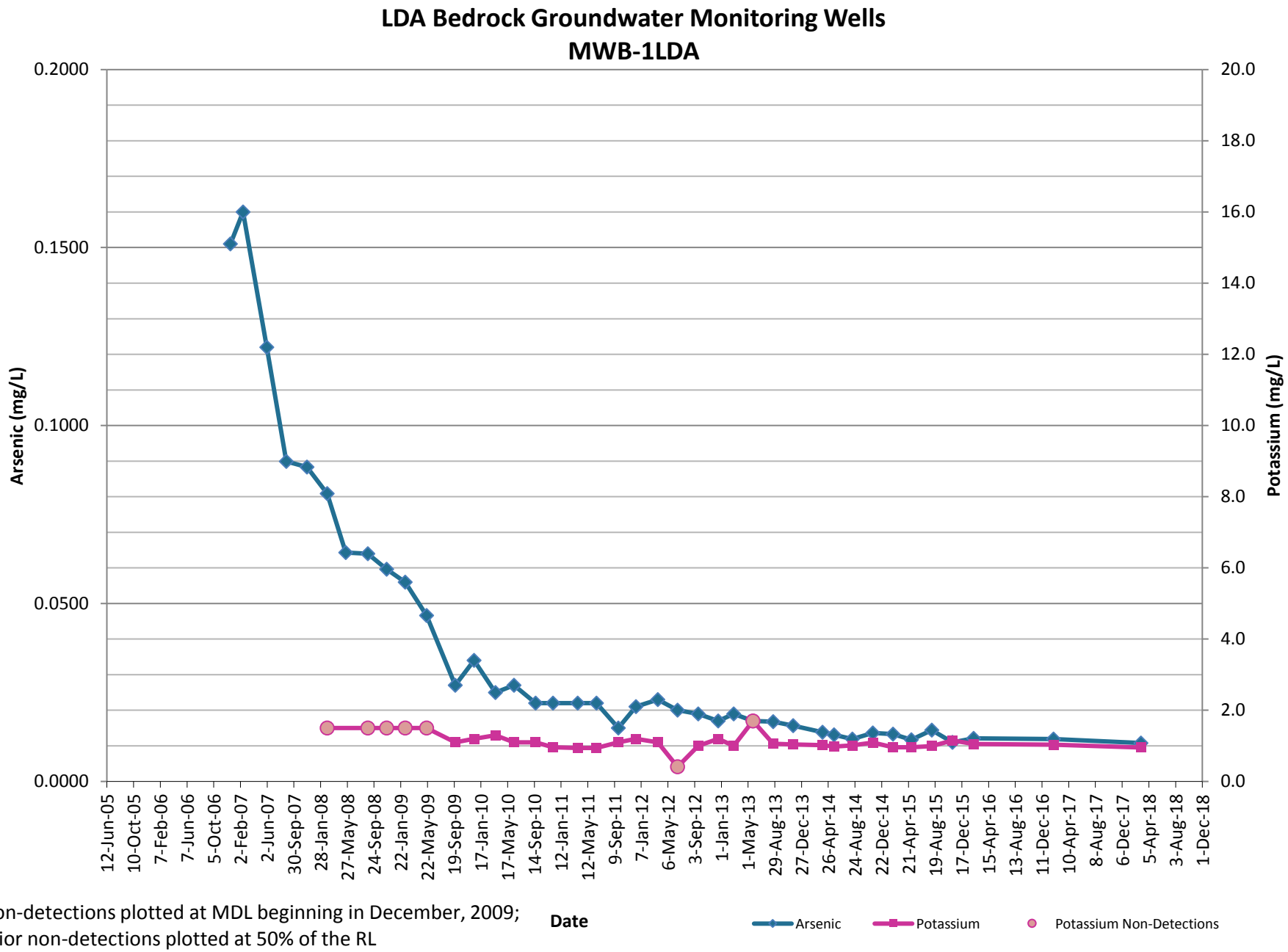
Non-detections plotted at MDL beginning in December, 2009; prior non-detections plotted at 50% of the RL



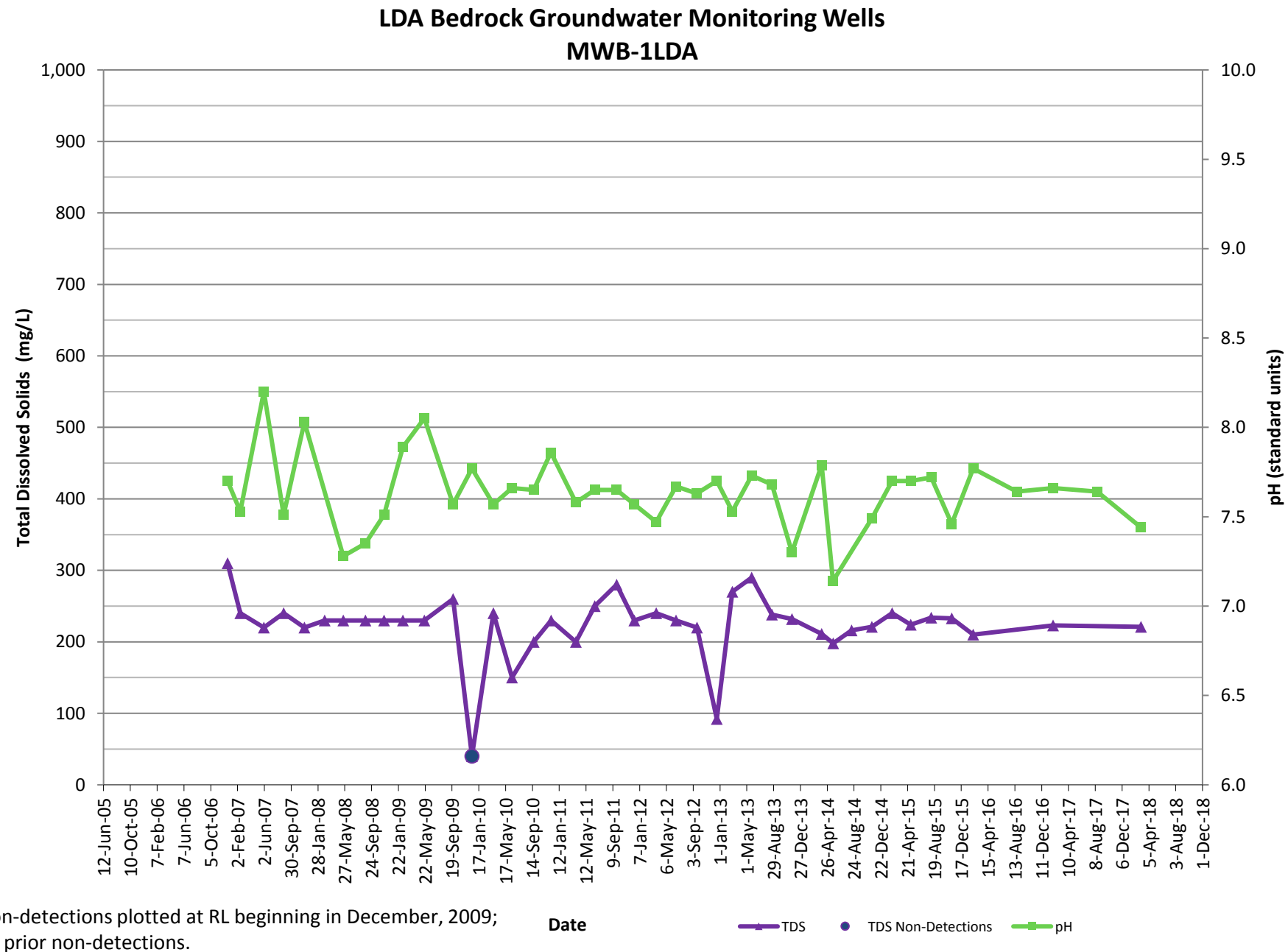
Non-detections plotted at RL beginning in December, 2009; no prior non-detections.

APPENDIX B-2

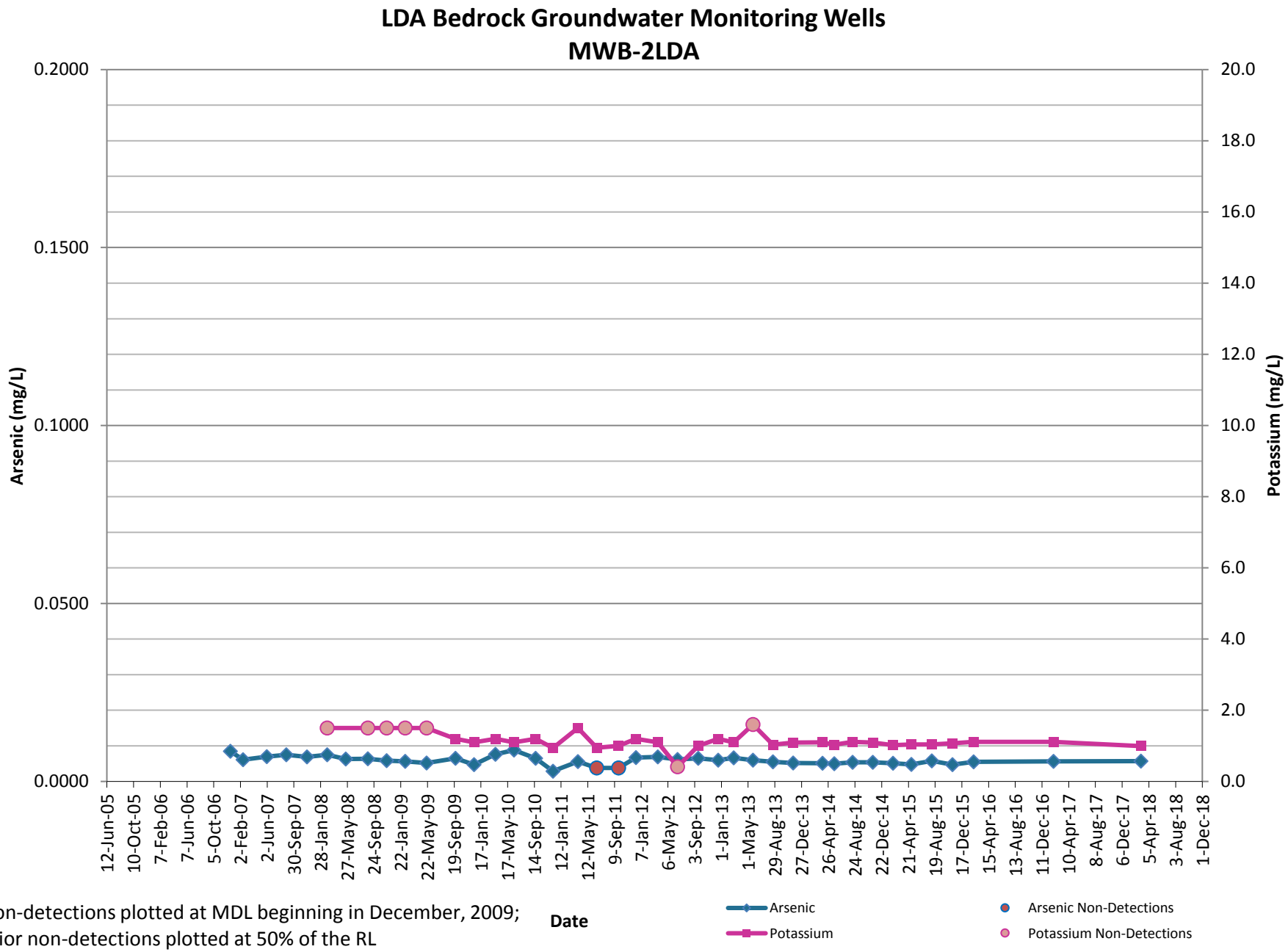
LDA Bedrock Groundwater Monitoring Wells Data Graphs



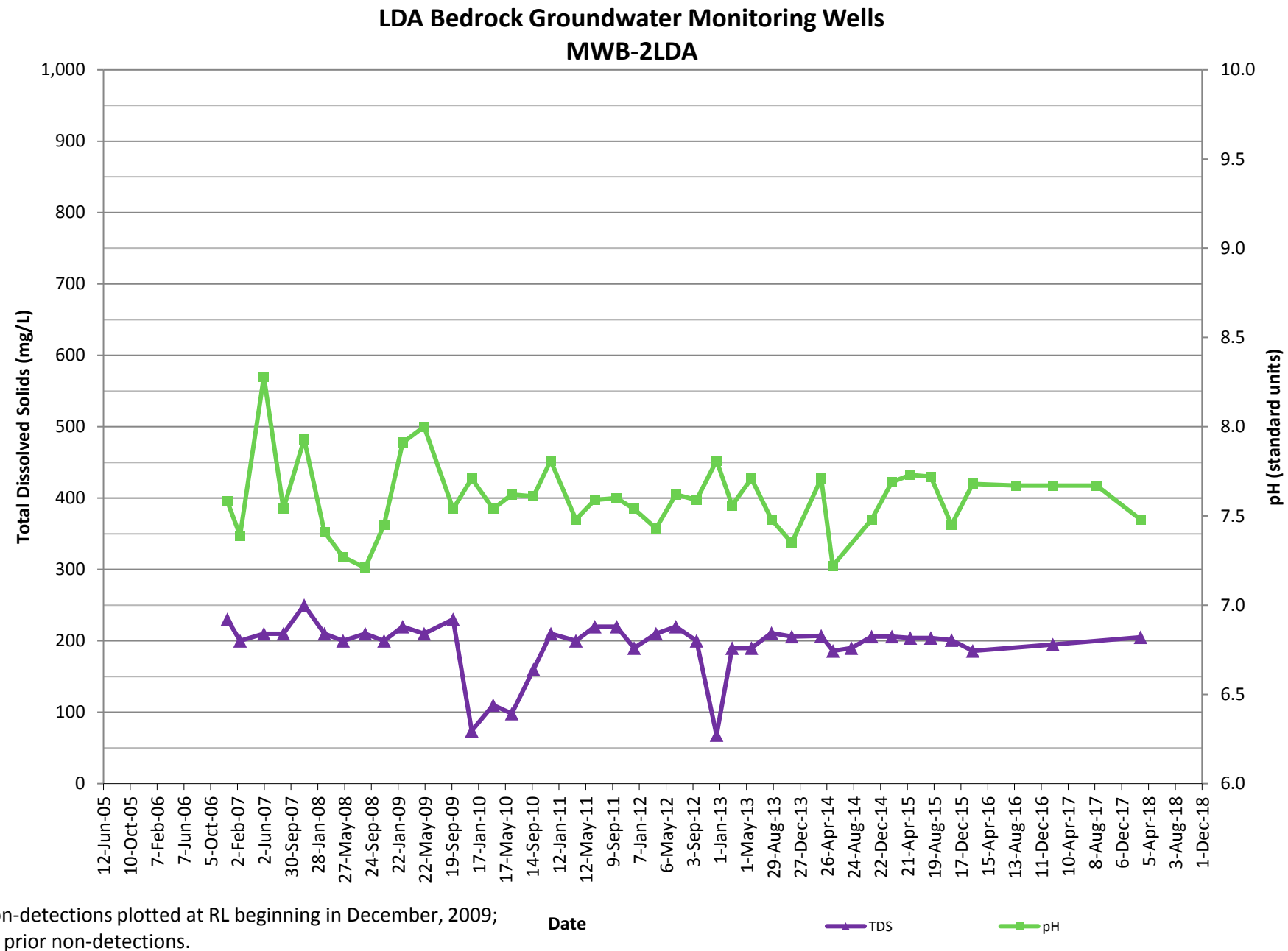
Non-detections plotted at MDL beginning in December, 2009; prior non-detections plotted at 50% of the RL



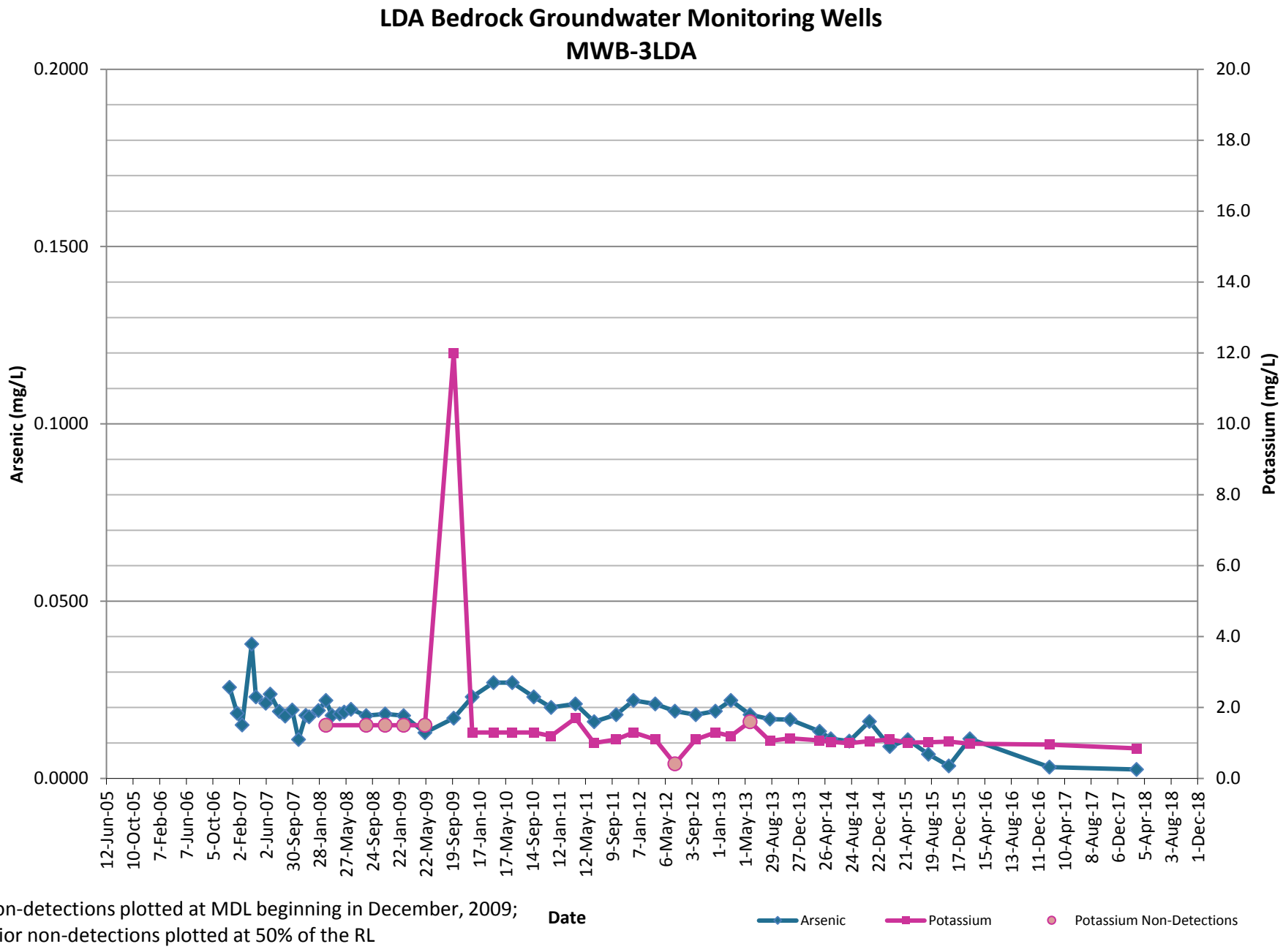
Non-detections plotted at RL beginning in December, 2009; no prior non-detections.



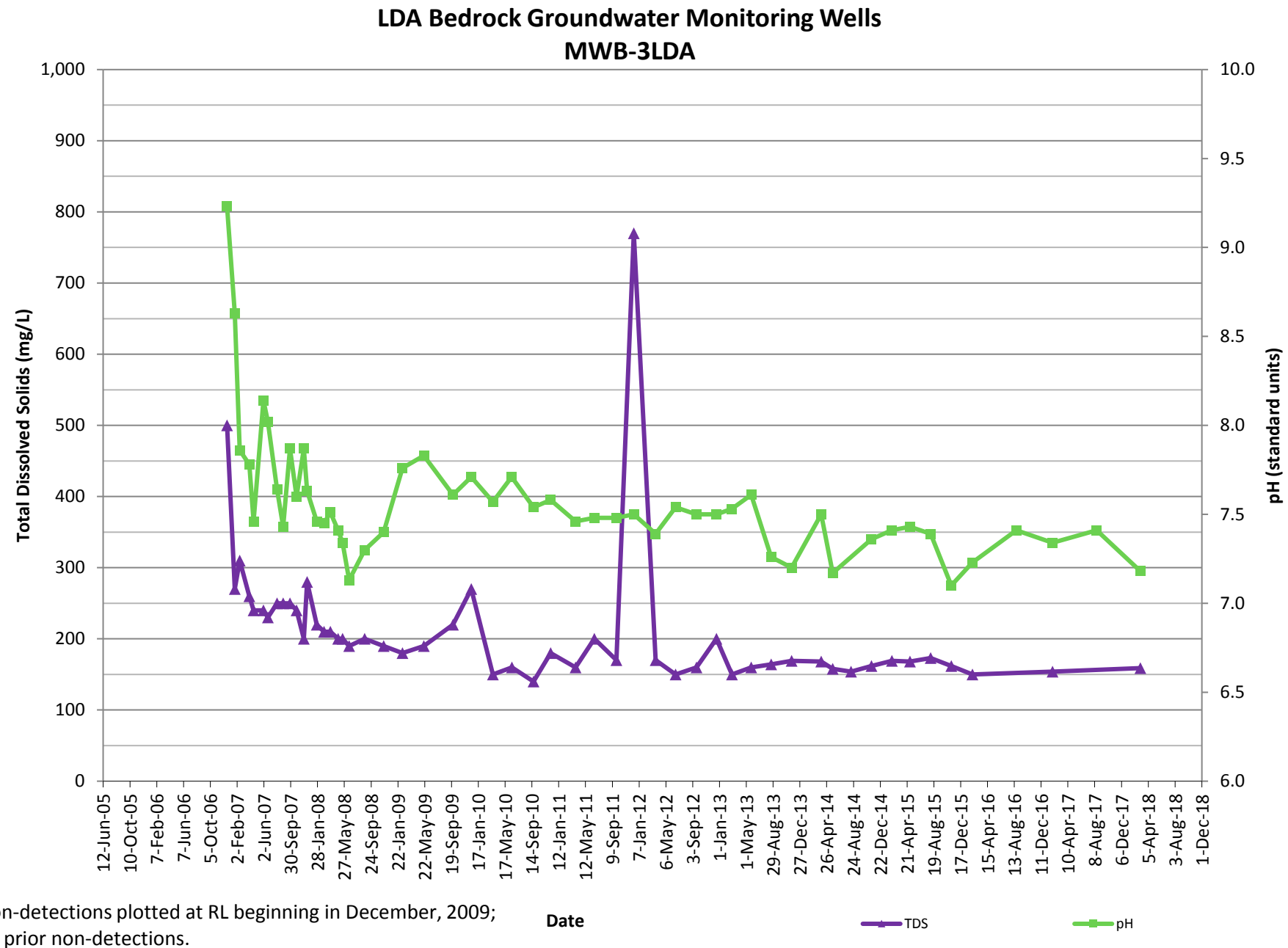
Non-detections plotted at MDL beginning in December, 2009; prior non-detections plotted at 50% of the RL



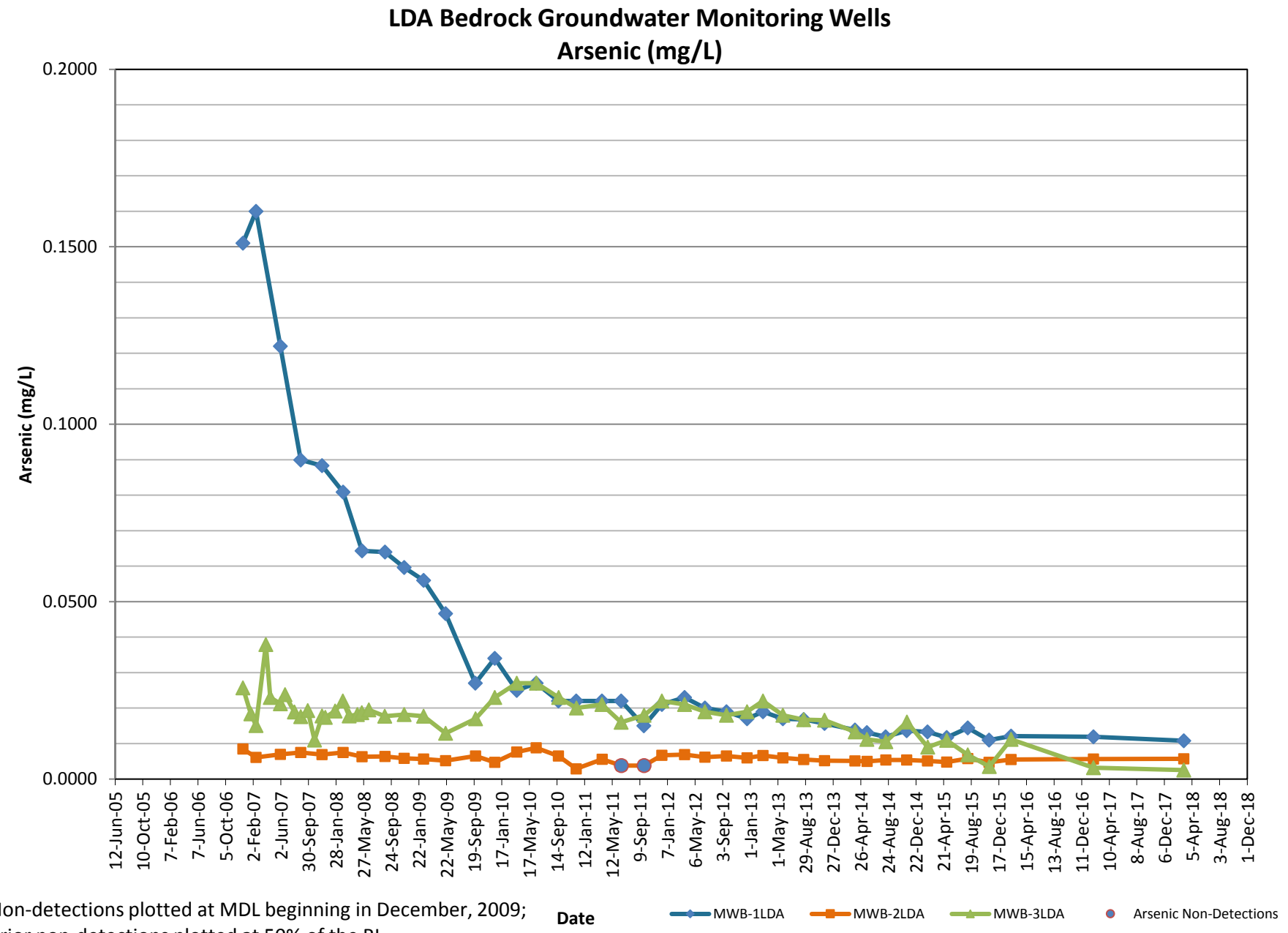
Non-detections plotted at RL beginning in December, 2009; no prior non-detections.



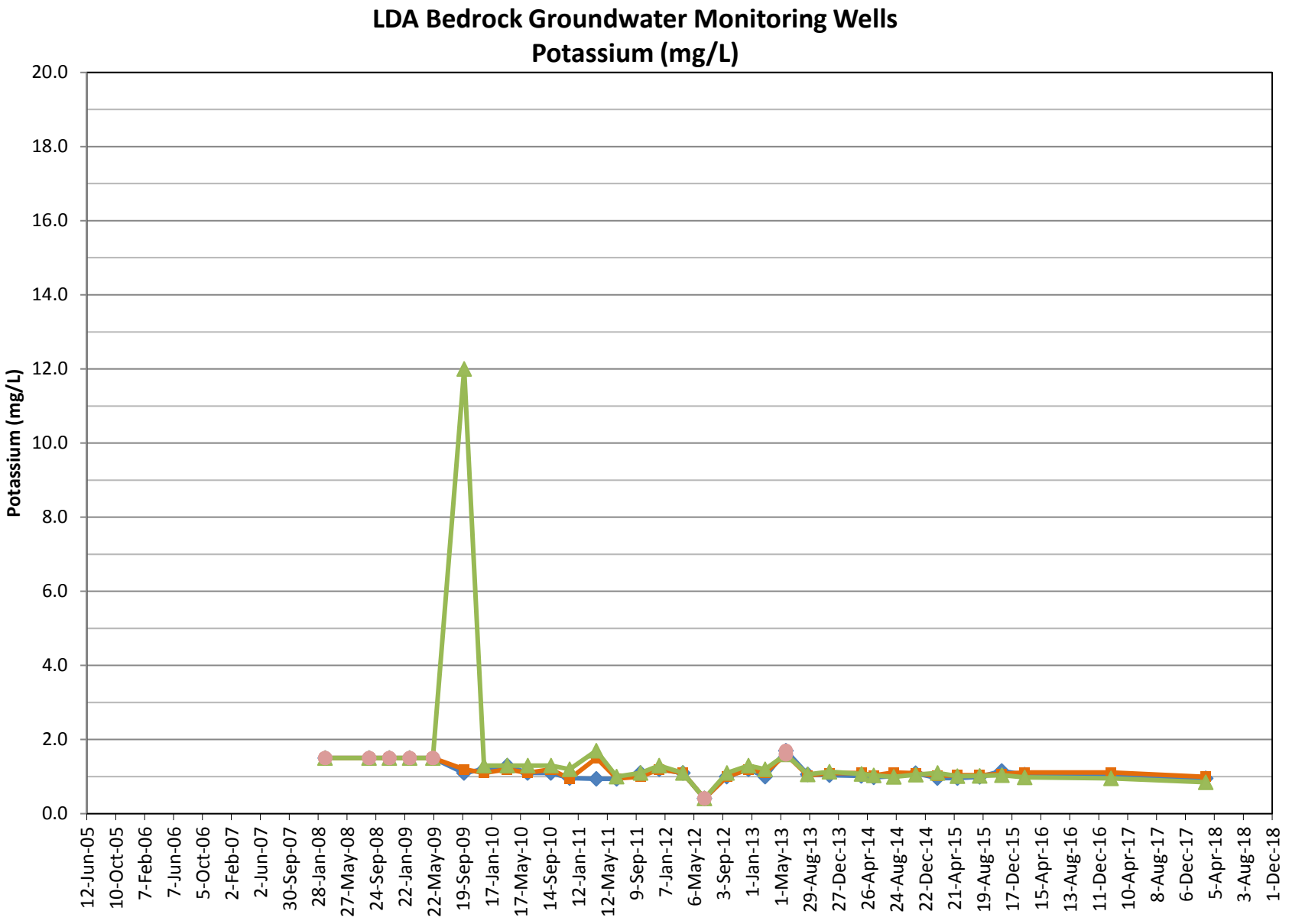
Non-detections plotted at MDL beginning in December, 2009; prior non-detections plotted at 50% of the RL



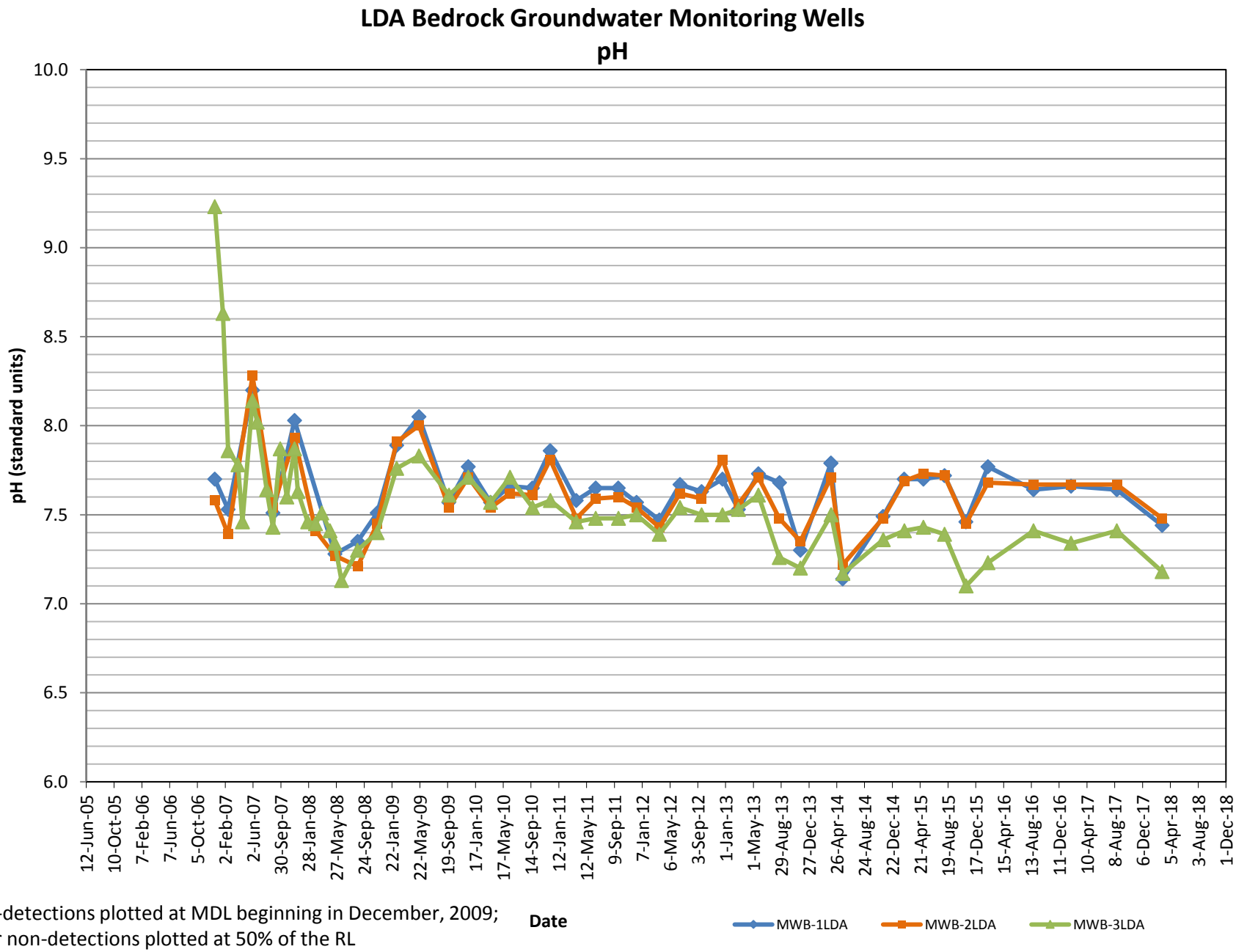
Non-detections plotted at RL beginning in December, 2009; no prior non-detections.



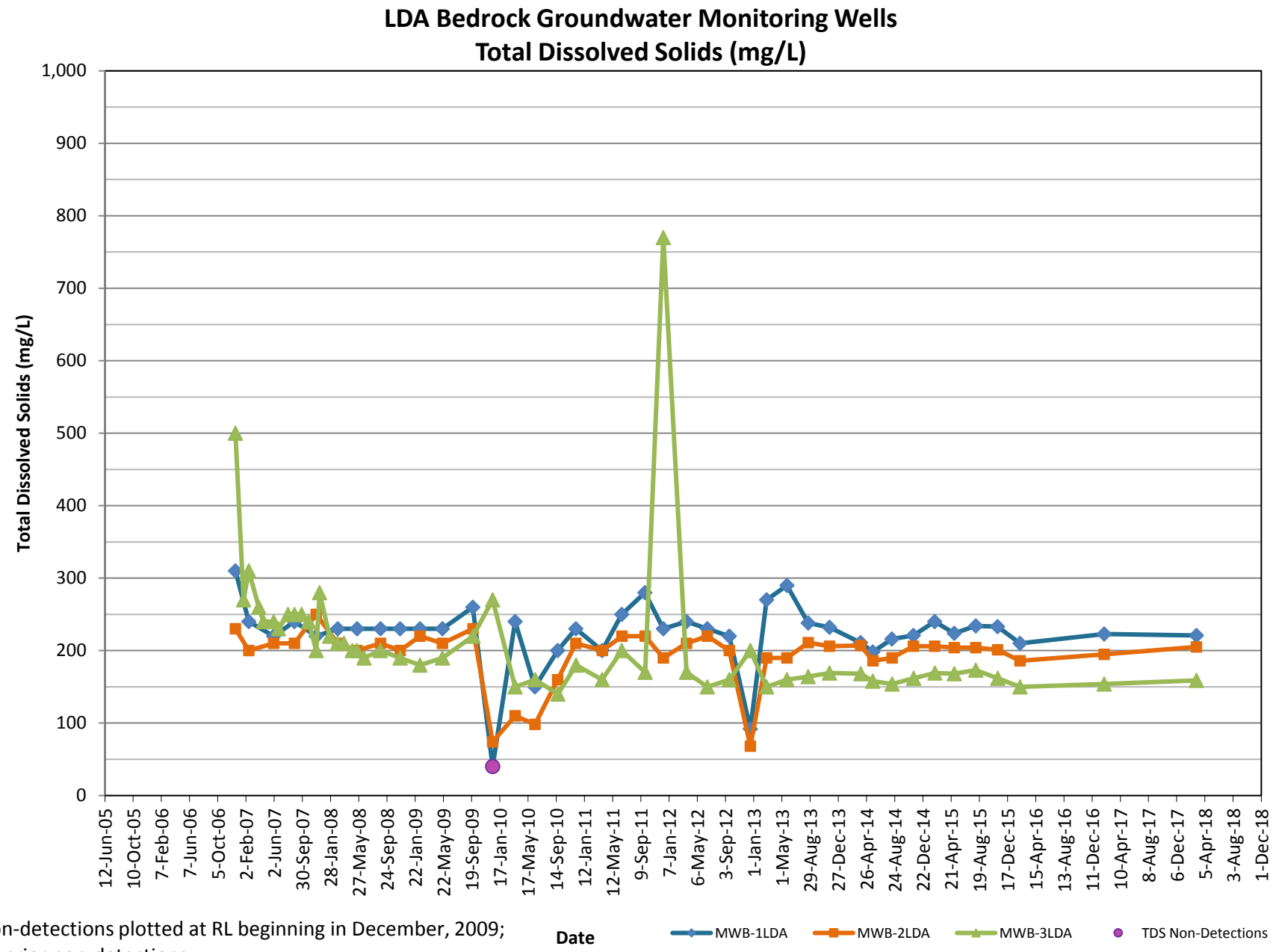
Non-detections plotted at MDL beginning in December, 2009; prior non-detections plotted at 50% of the RL



Non-detections plotted at MDL beginning in December, 2009; prior non-detections plotted at 50% of the RL



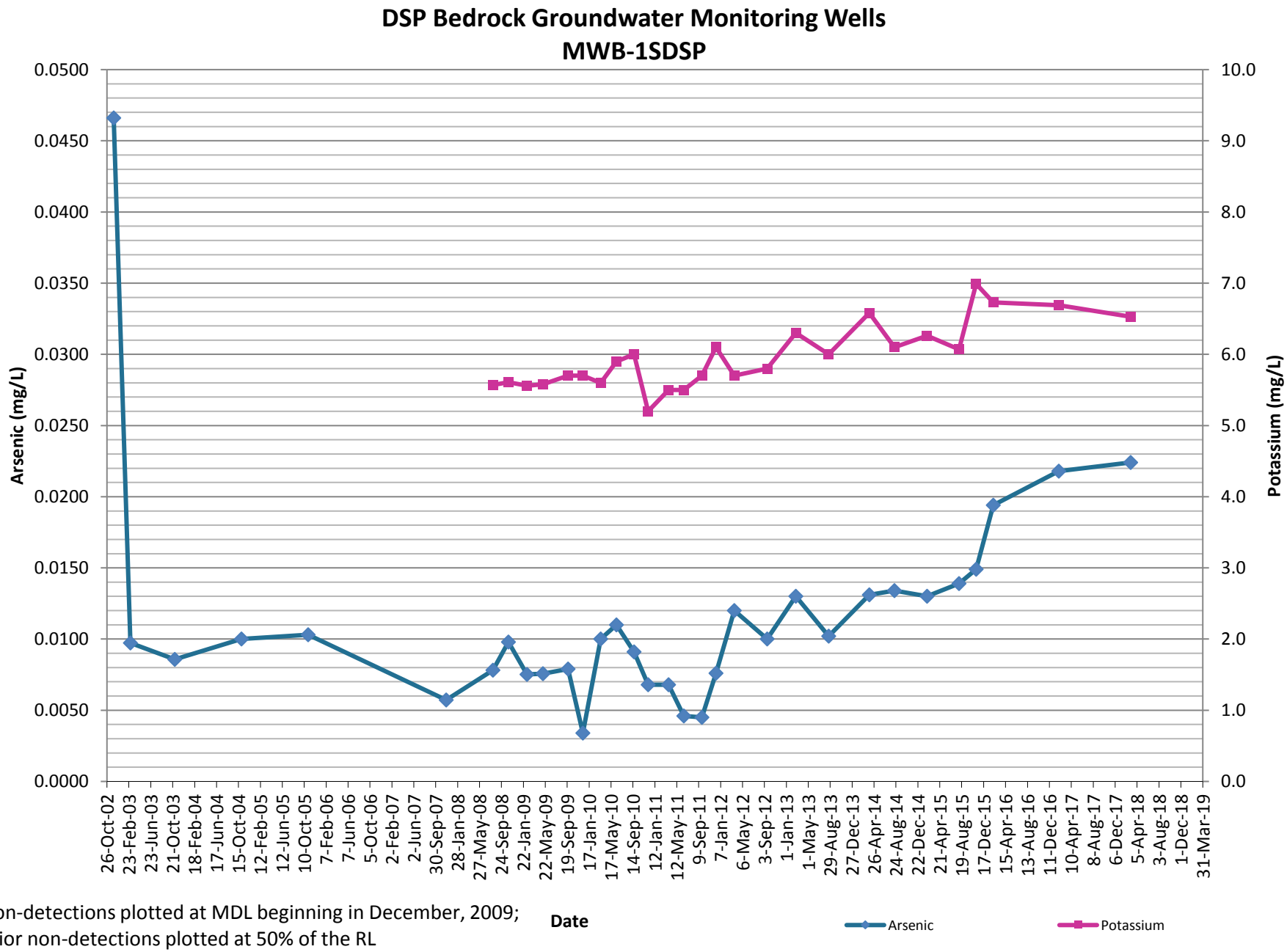
Non-detections plotted at MDL beginning in December, 2009; prior non-detections plotted at 50% of the RL



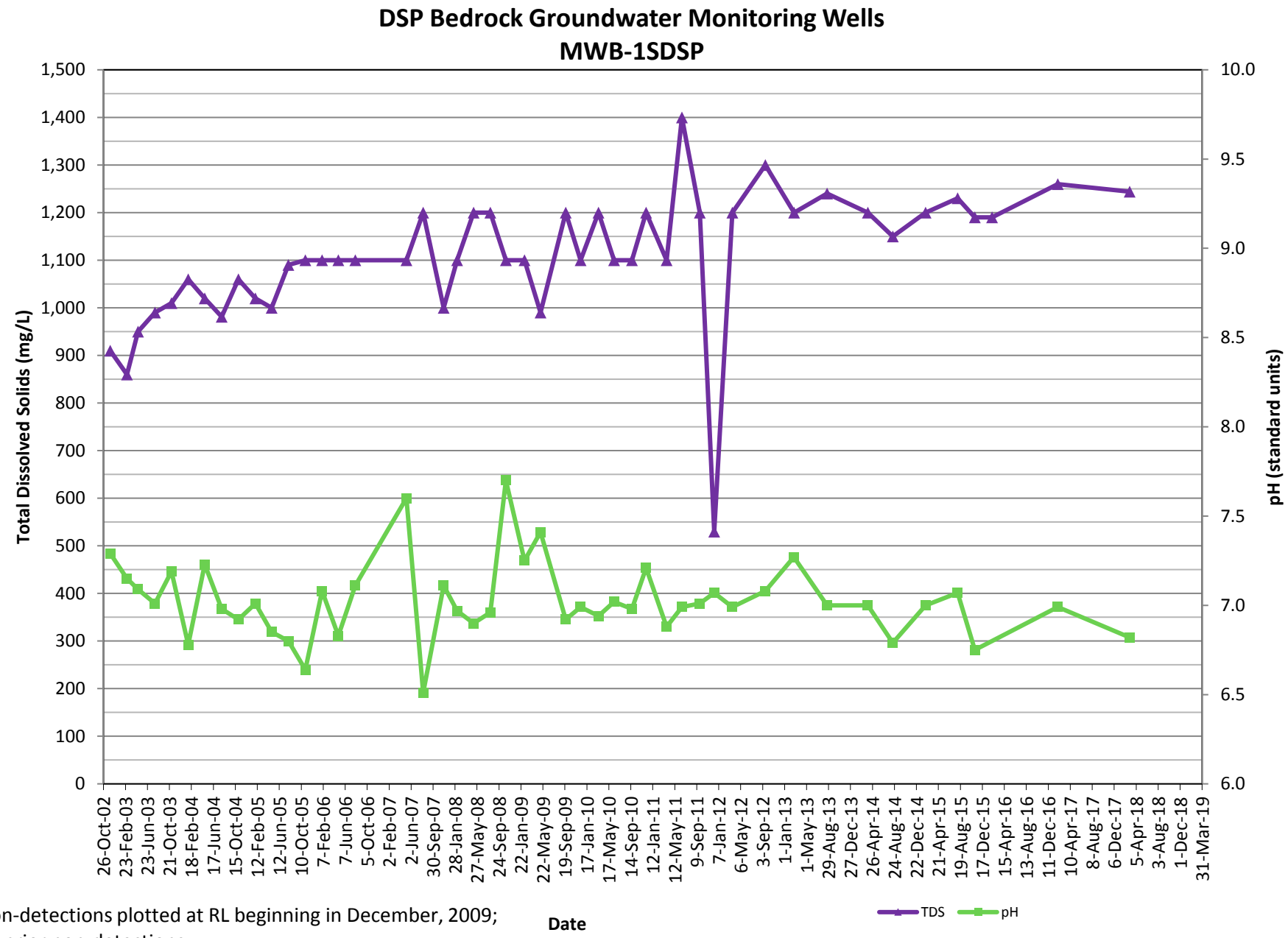
Non-detections plotted at RL beginning in December, 2009; no prior non-detections.

APPENDIX B-3

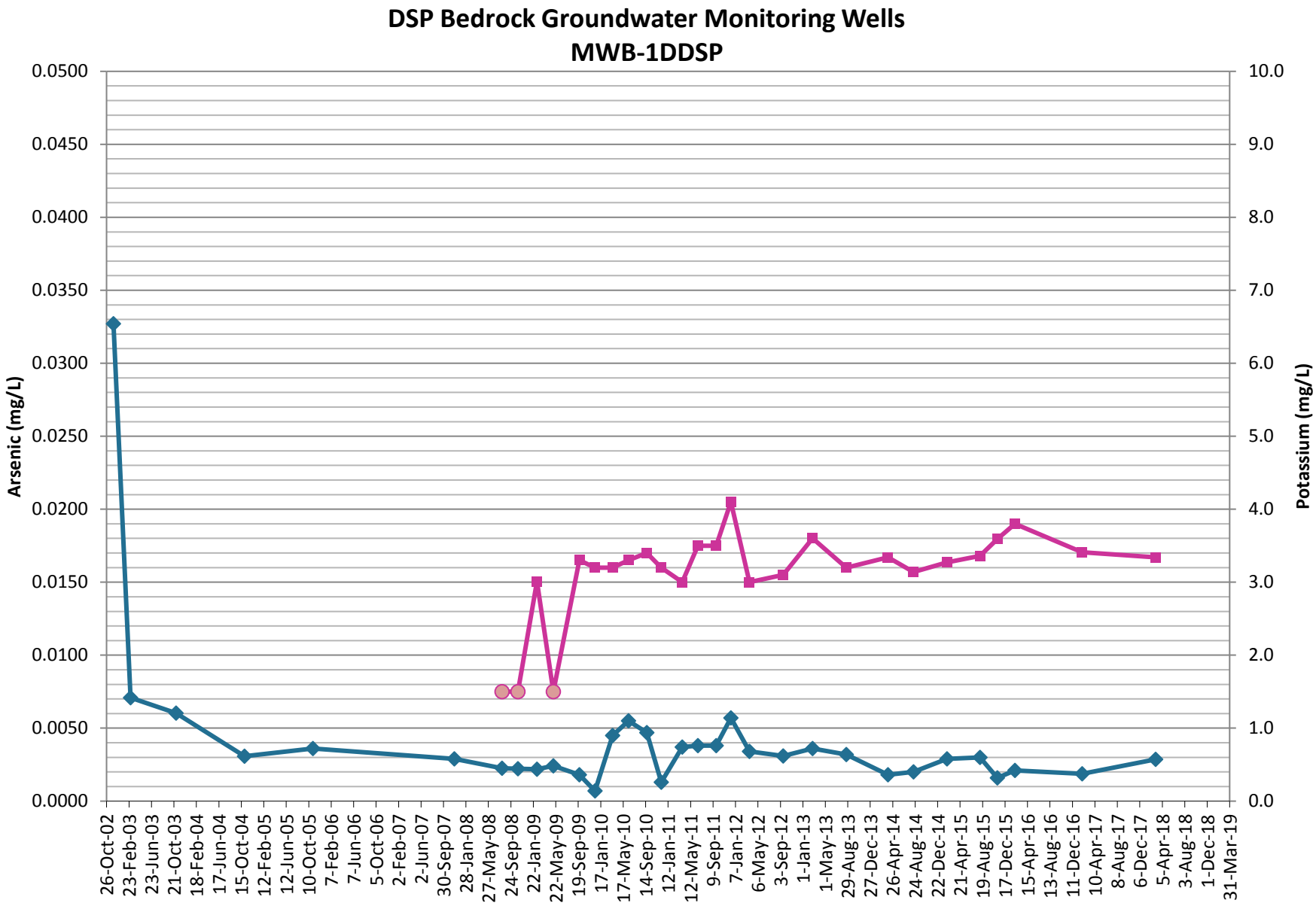
DSP Bedrock Groundwater Monitoring Wells Data Graphs



Non-detections plotted at MDL beginning in December, 2009; prior non-detections plotted at 50% of the RL

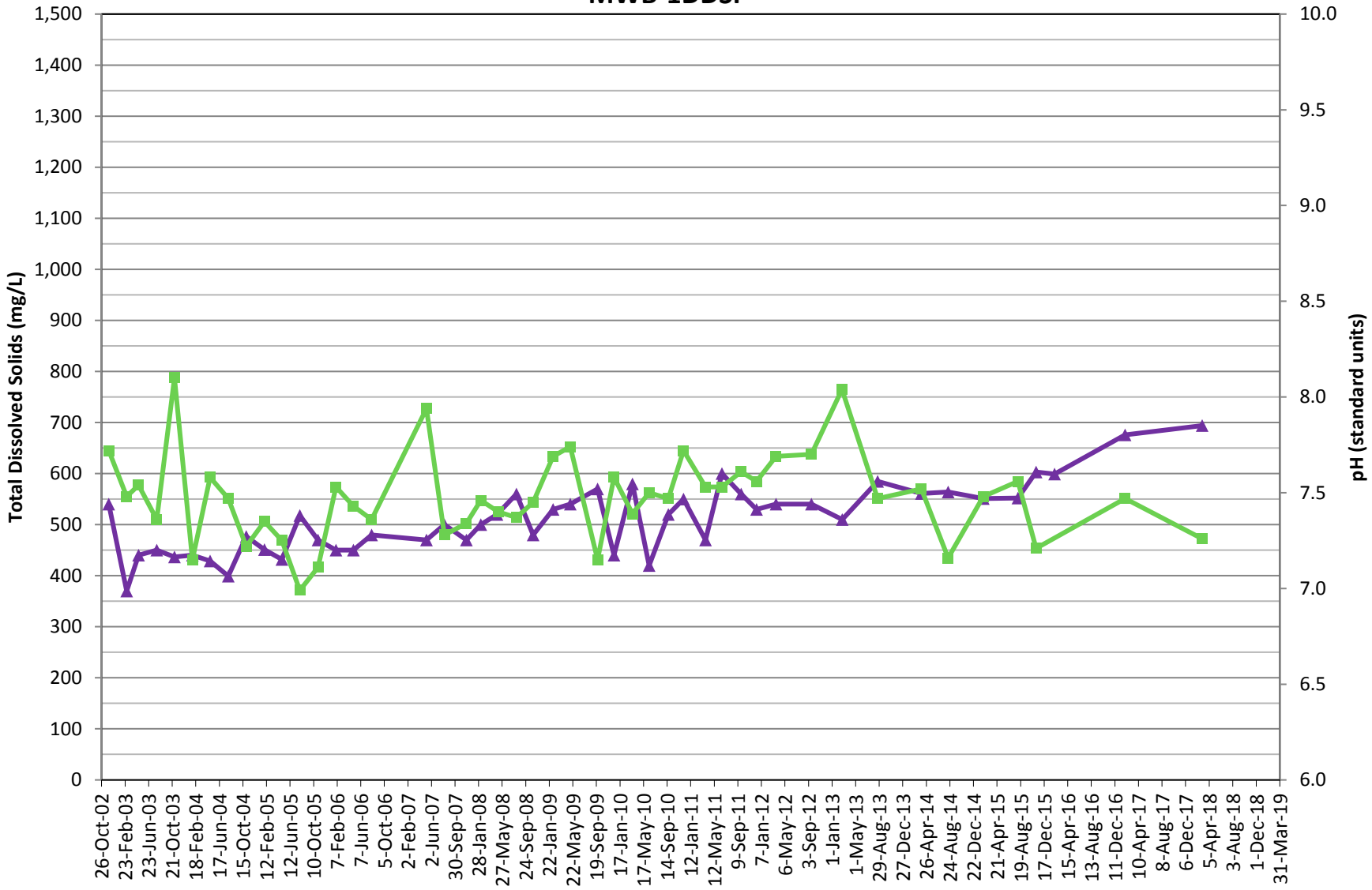


Non-detections plotted at RL beginning in December, 2009; no prior non-detections.

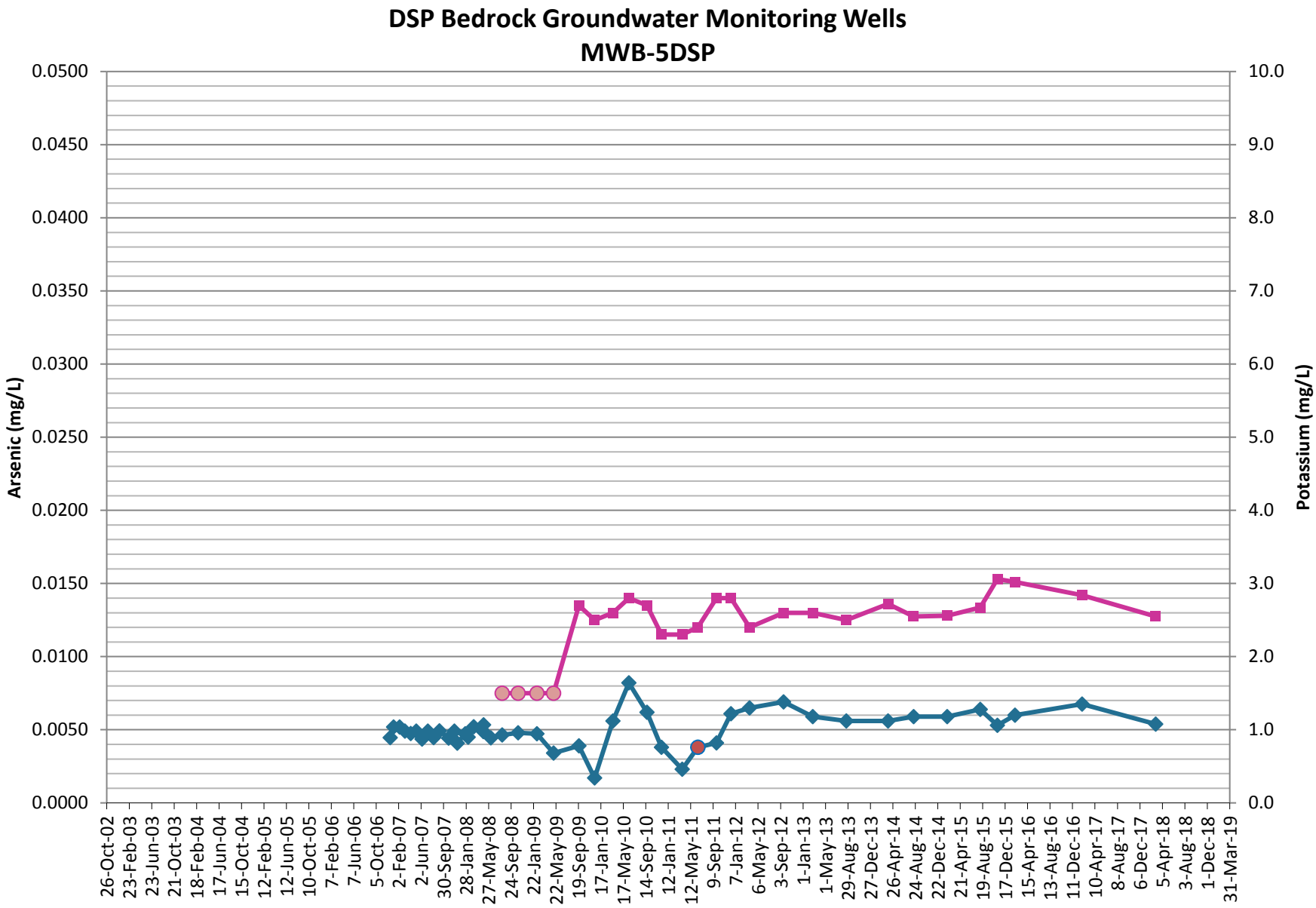


Non-detections plotted at MDL beginning in December, 2009; prior non-detections plotted at 50% of the RL

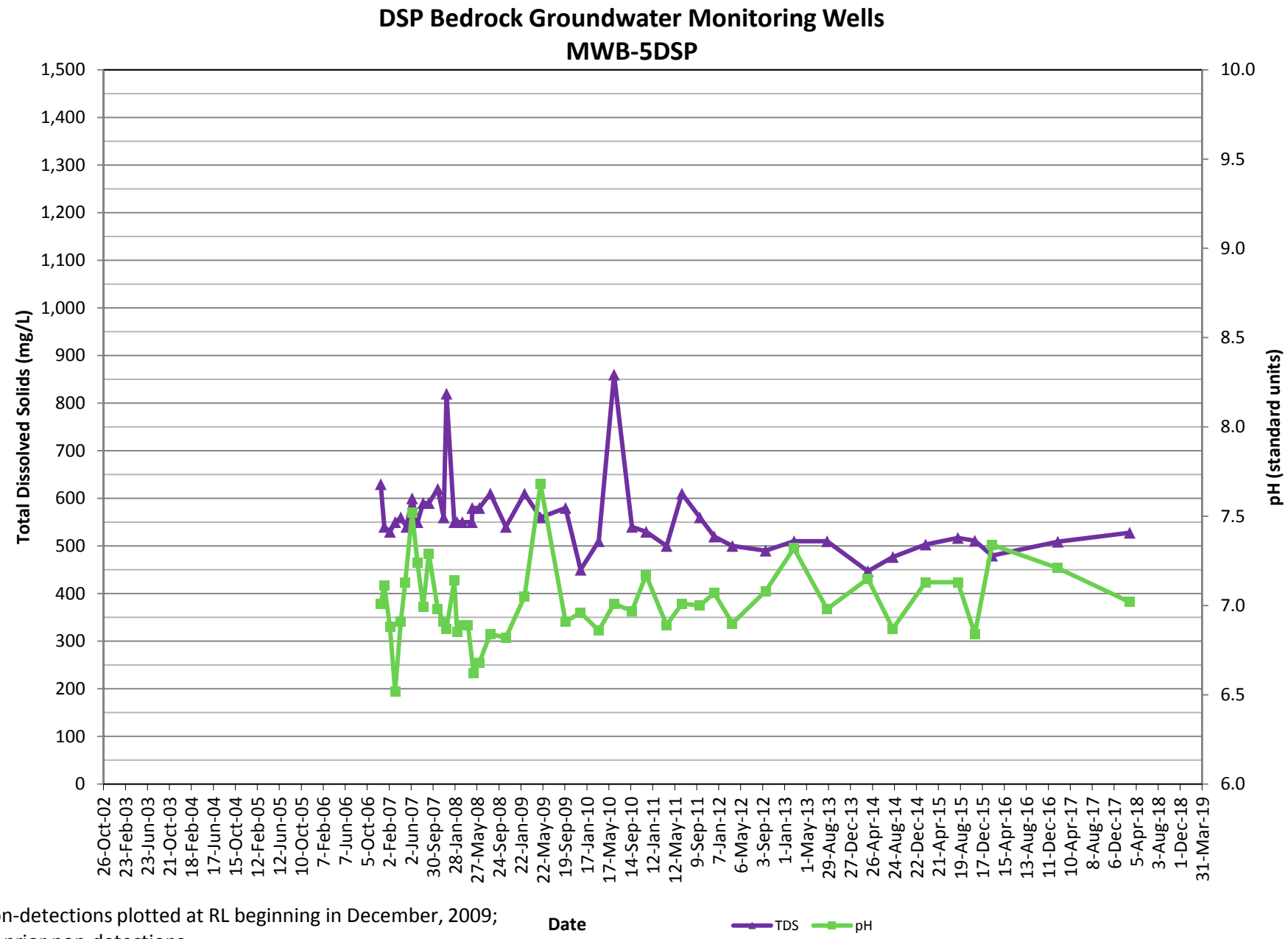
DSP Bedrock Groundwater Monitoring Wells
MWB-1DDSP



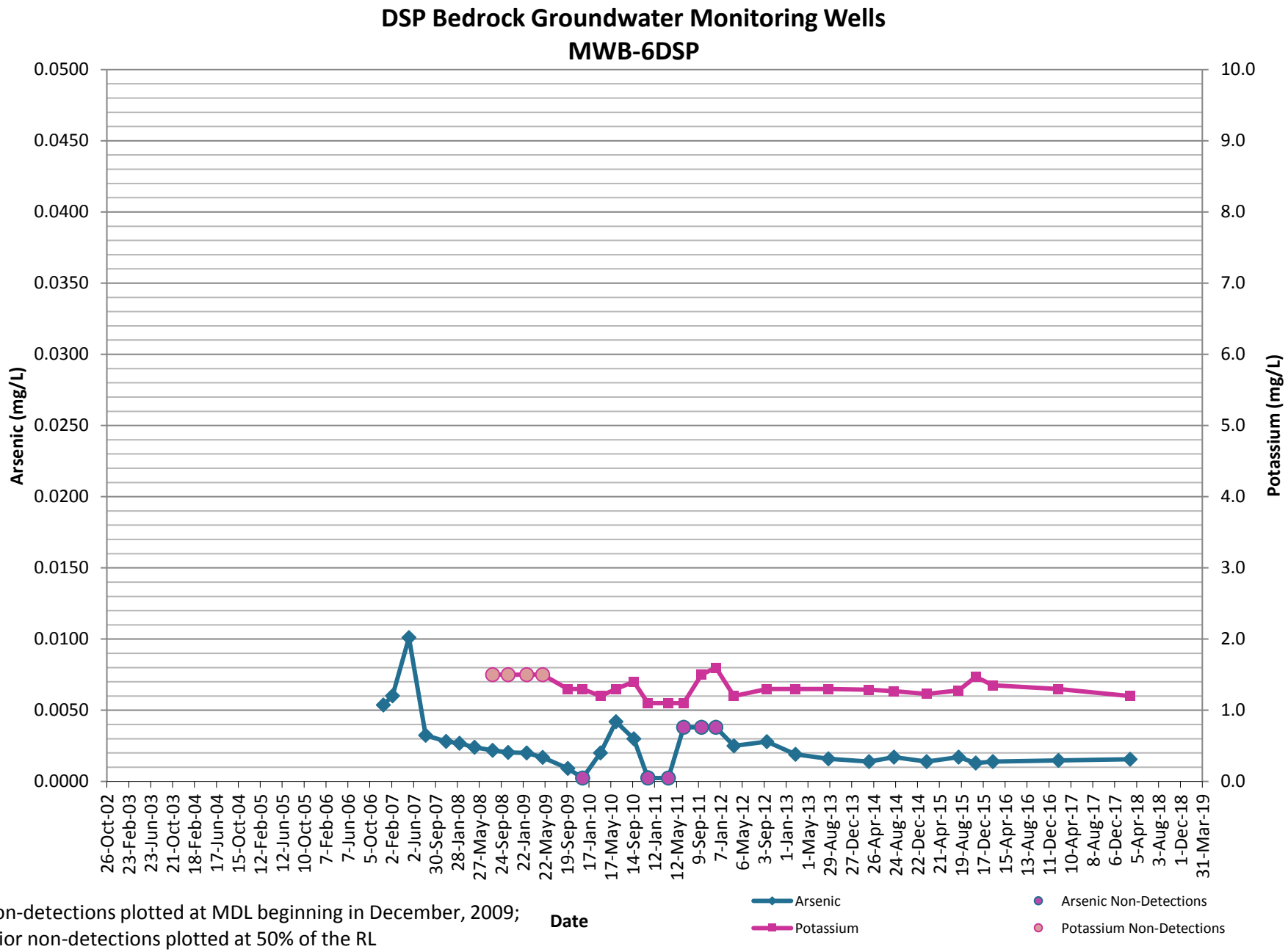
Non-detections plotted at RL beginning in December, 2009; no prior non-detections.



Non-detections plotted at MDL beginning in December, 2009; prior non-detections plotted at 50% of the RL

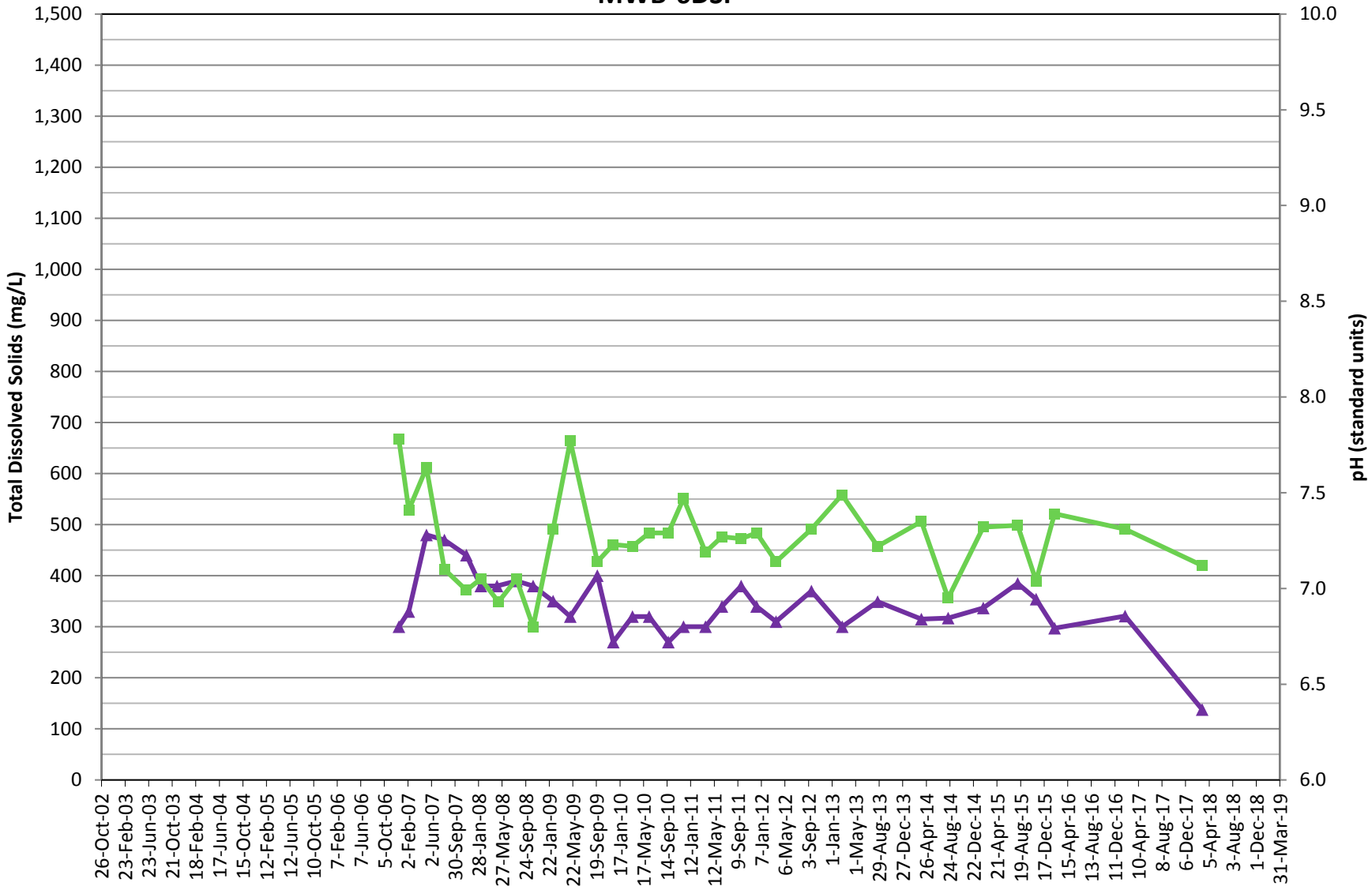


Non-detections plotted at RL beginning in December, 2009; no prior non-detections.

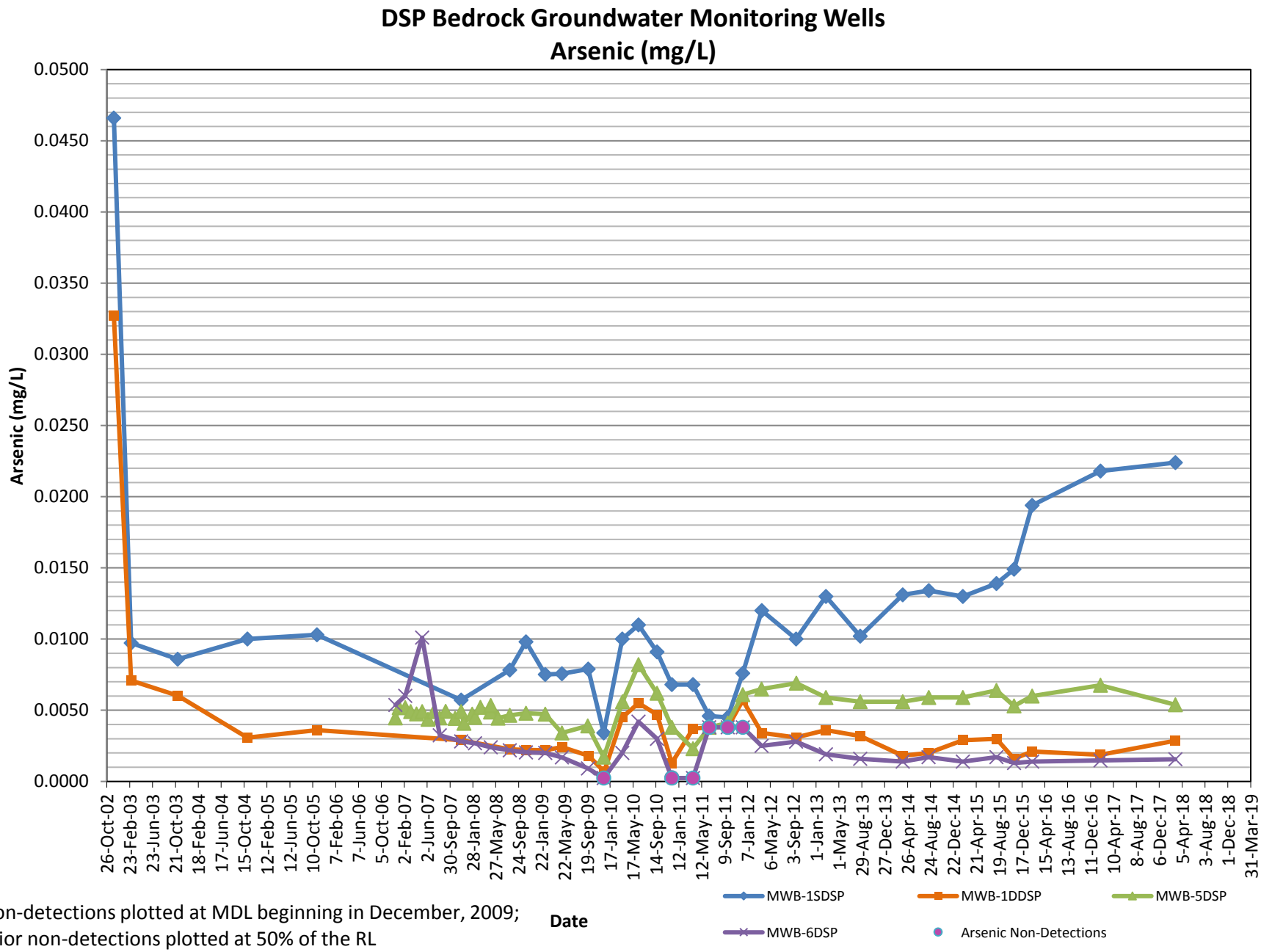


Non-detections plotted at MDL beginning in December, 2009; prior non-detections plotted at 50% of the RL

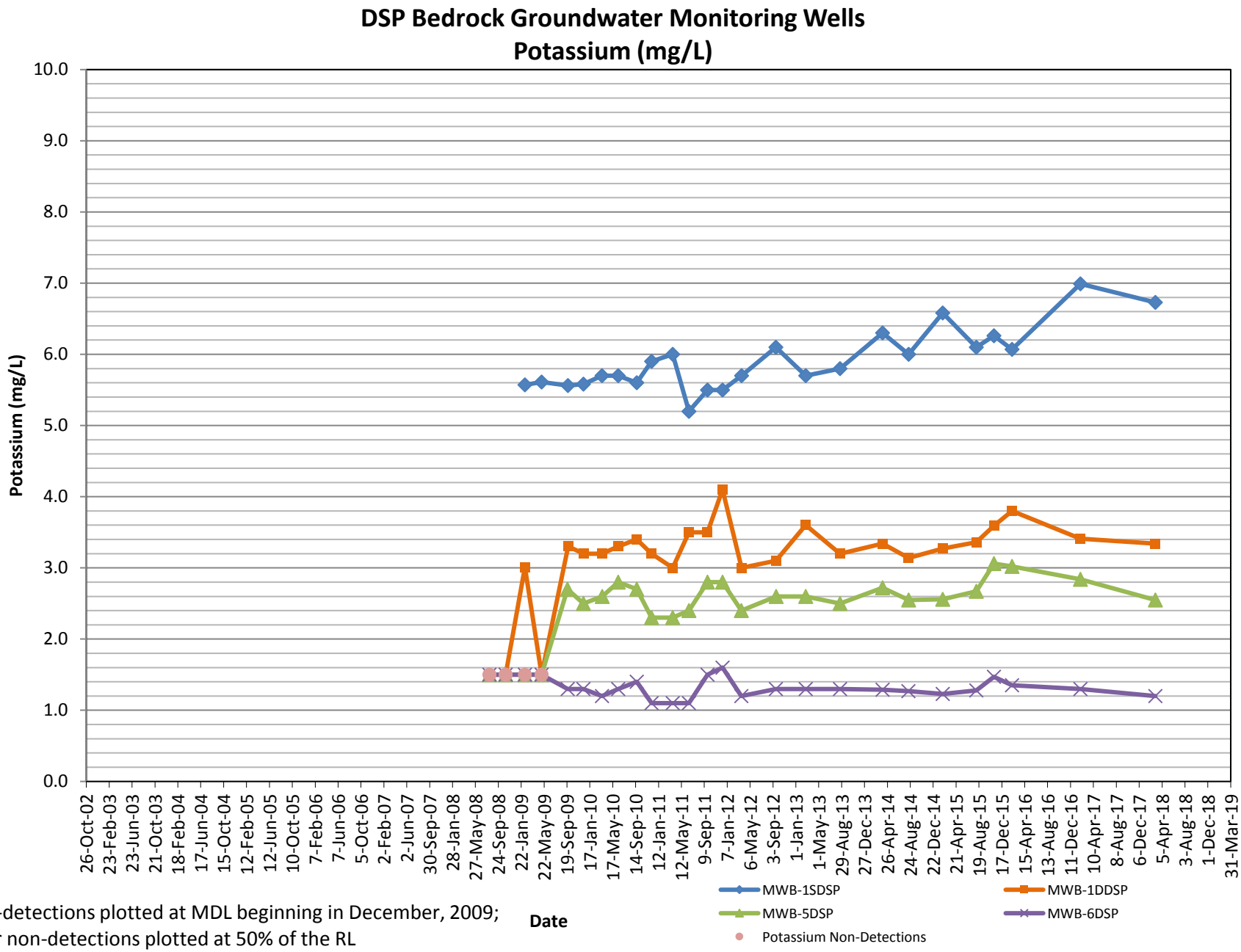
DSP Bedrock Groundwater Monitoring Wells
MWB-6DSP



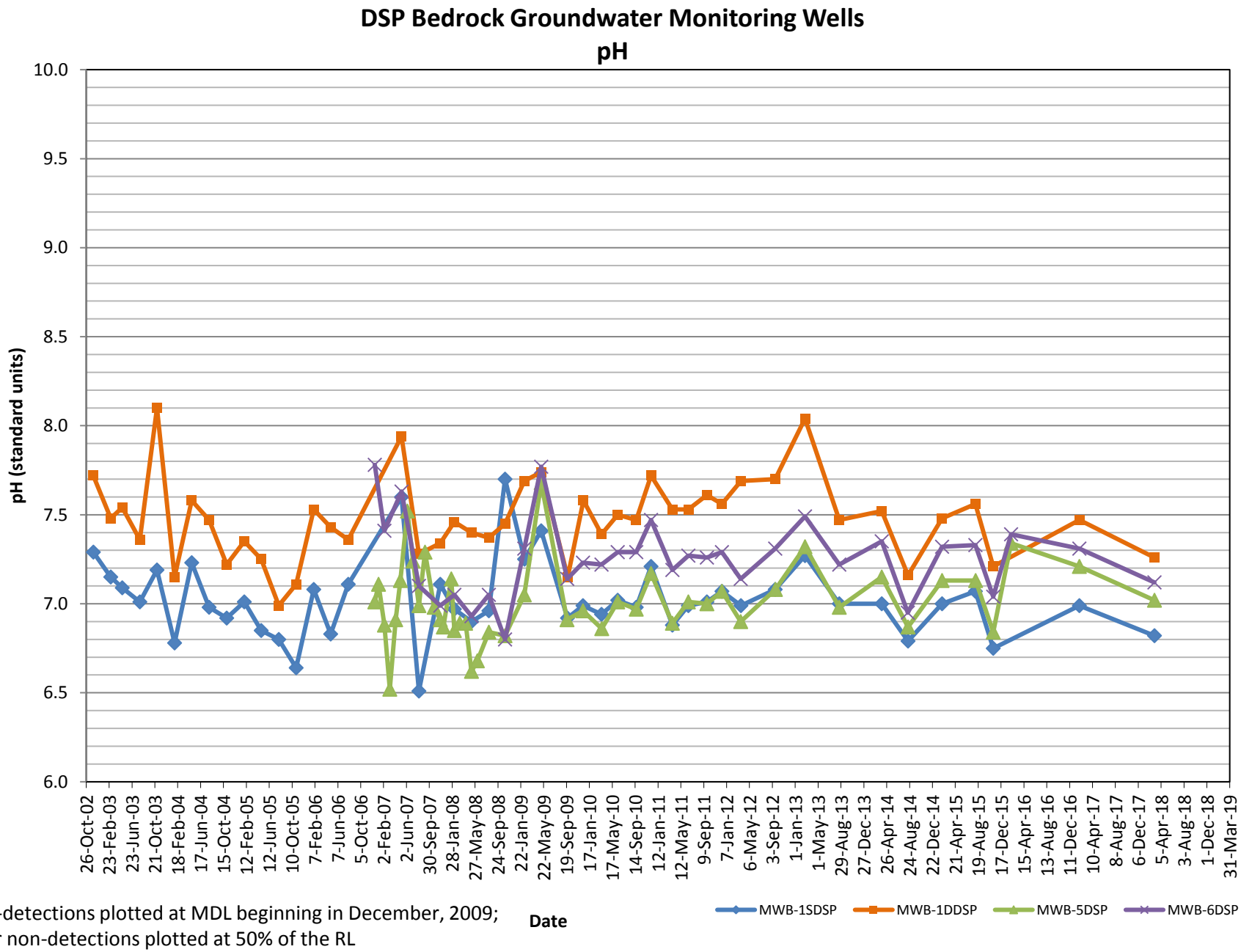
Non-detections plotted at RL beginning in December, 2009; no prior non-detections.



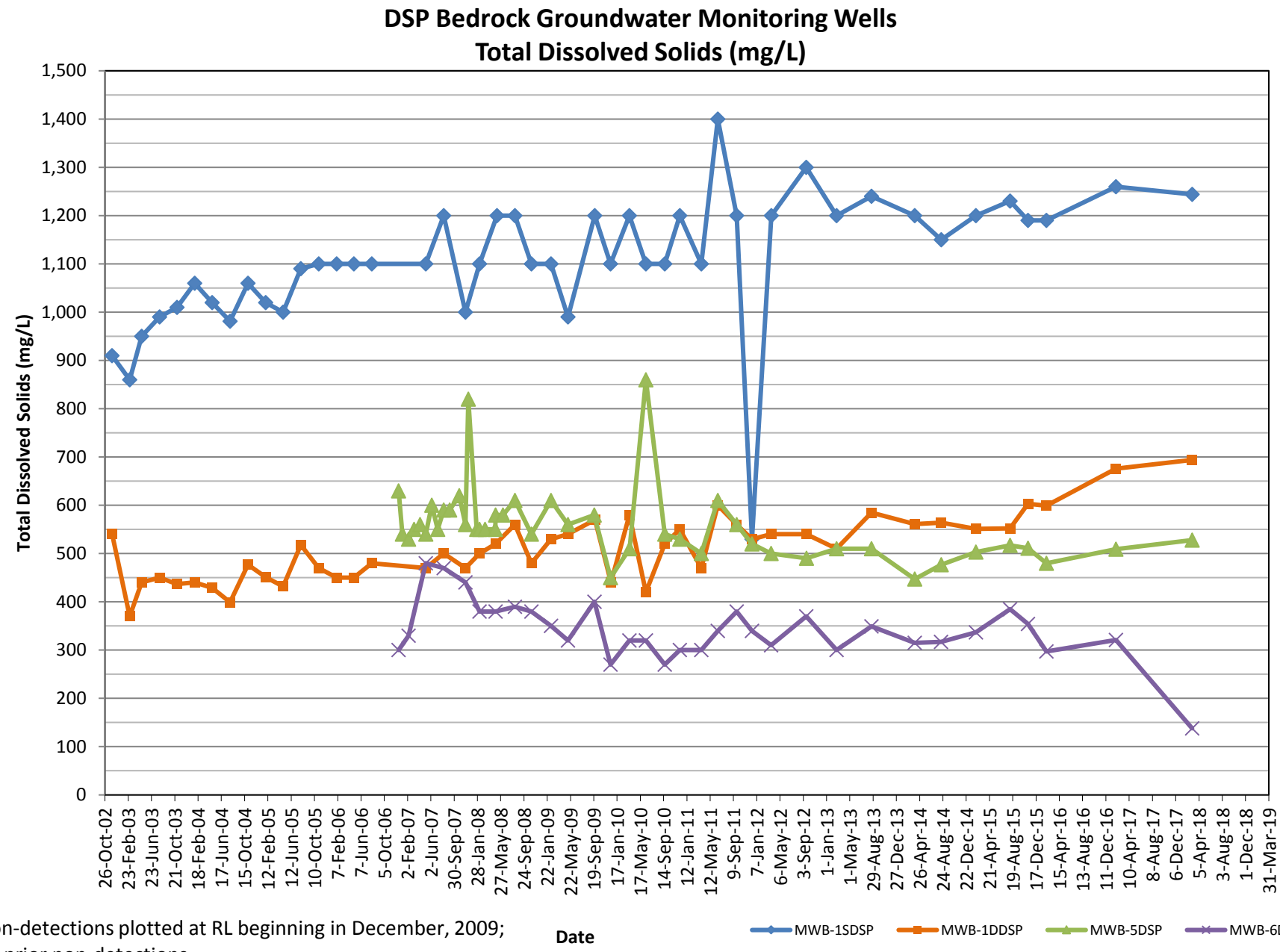
Non-detections plotted at MDL beginning in December, 2009;
prior non-detections plotted at 50% of the RL



Non-detections plotted at MDL beginning in December, 2009; prior non-detections plotted at 50% of the RL



Non-detections plotted at MDL beginning in December, 2009; prior non-detections plotted at 50% of the RL



Non-detections plotted at RL beginning in December, 2009; no prior non-detections.

APPENDIX C

Data Validation Report and Laboratory Analytical Results (On USB)

Analytical Resources, Incorporated
Analytical Chemists and Consultants

21 March 2018

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

RE: 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)	Associated SDG ID(s)
18C0036	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, Inc.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 18C0036	Turn-around Requested: Standard	Page: 1 of 3	
ARI Client Company: Golder	Phone: 425 883 0777	Date: 2/28/18	Ice Present?
Client Contact: Joseph Xi	JXI@GOLDER.COM	No. of Coolers:	Cooler Temps:
Client Project Name: Ravensdale			
Client Project #: 1520304.700	Samplers: Joseph Xi Eric Adams		

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

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: FDS	Dissolved As, Fe, Pb, Mn, K	Dissolved As, Pb, K						Notes/Comments
Infiltration #1	2/27/18	1222	W	2	X	X							
Infiltration #2	2/27/18	1225		2	X	X							
Weir	2/27/18	1440		2	X	X							
South Pond	2/27/18	1415		2	X	X							Run MS/MSD for Sample
Still Well	2/27/18	1345		2	X	X							
Interceptor Trench	2/28/18	1016		1	X								
MW-1A	2/27/18	0905		2	X	X							
MW-2A	2/27/18	1024		2	X	X							
MW-3A	2/27/18	1525		2	X	X							
MW-4A	2/28/18	1110	↓	2	X	X							

Comments/Special Instructions	Relinquished by:	Received by:	Relinquished by:	Received by:
	(Signature)	(Signature)	(Signature)	(Signature)
	Printed Name: Joseph Xi	Printed Name: Stephanie Fisher	Printed Name: Stephanie Fisher	Printed Name: Stephanie Fisher
	Company: Golder	Company: ARI Courier	Company: ARI Courier	Company: ARI
	Date & Time: 3/1/18 0935	Date & Time: 3/1/18 1051	Date & Time: 3/1/18 1255	Date & Time: 3/1/18 1255

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

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

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 18C0036	Turn-around Requested: Standard	Page: 2 of 3	
ARI Client Company: Golder	Phone:	Date: 2/28/18	Ice Present?
Client Contact: Joseph Xi	JXI@GOLDER.com	No. of Coolers:	Cooler Temps:
Client Project Name: Ravensdale			
Client Project #: 1520304.700	Samplers: Joseph Xi, Eric Adams		

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

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: TPS	Dissolved As, Fe, Pb, Mn, K	Dissolved As, Pb, K						Notes/Comments
MW-5A	2/27/18	1243	W	2	X	X							
MW-6A	2/27/18	1130		2	X	X							
MW-7A	2/27/18	1027		2	X	X							
MWB-1LDA	2/28/18	0845		2	X	X							
MWB-2LDA	2/28/18	0934		2	X	X							
MWB-3LDA	2/28/18	1012		2	X	X							
MWB-7LDA	2/28/18	0850		2	X	X							
MWB-1SDSP	2/28/18	1325		2	X		X						
MWB-1DDSP	2/28/18	1356		2	X		X						
MWB-5DSP	2/28/18	1441		2	X		X						

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Joseph Xi	Printed Name: Stephanie Fisher	Printed Name: Stephanie Fisher	Printed Name: Stephanie Fisher
	Company: Golder	Company: ARI Courier	Company: ARI Courier	Company: ARI
	Date & Time: 3/1/18 0935	Date & Time: 3/1/18 1051	Date & Time: 3/1/18 1255	Date & Time: 3/1/18 1255

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 18C0036	Turn-around Requested: Standard	Page: 3 of 3	
ARI Client Company: Golder	Phone: 425 883 0777	Date: 2/28/18	Ice Present?
Client Contact: Joseph Xi	JXI@GOLDER.COM	No. of Coolers:	Cooler Temps:
Client Project Name: Ravensdale			
Client Project #: 1520304.700	Samplers: Joseph Xi Eric Adams		

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

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: TAS	Dissolved As, Fe, Pb, Mn, K	Dissolved As, Pb, K						Notes/Comments
MWB-6DSP	2/28/18	1200	W	2	X		X						
Portal	2/27/18	1325		2	X		X						
MWB-9DSP	2/28/18	1205		2	X		X						
EB	2/27/18	1250		2	X	X							

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Joseph Xi	Printed Name: Stephanie Fisher	Printed Name: Stephanie Fisher	Printed Name: Stephanie Fisher
	Company: Golder	Company: ARI Courier	Company: ARI Courier	Company: ARI
	Date & Time: 3/1/18 0935	Date & Time: 3/1/18 1051	Date & Time: 3/1/18 1255	Date & Time: 3/1/18 1255

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

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

Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Infiltration #1	18C0036-01	Water	27-Feb-2018 12:22	02-Mar-2018 12:55
Infiltration #2	18C0036-02	Water	27-Feb-2018 12:25	02-Mar-2018 12:55
Weir	18C0036-03	Water	27-Feb-2018 14:40	02-Mar-2018 12:55
South Pond	18C0036-04	Water	27-Feb-2018 14:15	02-Mar-2018 12:55
Still Well	18C0036-05	Water	27-Feb-2018 13:45	02-Mar-2018 12:55
Interceptor Trench	18C0036-06	Water	27-Feb-2018 10:16	02-Mar-2018 12:55
MW-1A	18C0036-07	Water	27-Feb-2018 09:05	02-Mar-2018 12:55
MW-2A	18C0036-08	Water	27-Feb-2018 10:24	02-Mar-2018 12:55
MW-3A	18C0036-09	Water	27-Feb-2018 15:25	02-Mar-2018 12:55
MW-4A	18C0036-10	Water	27-Feb-2018 11:10	02-Mar-2018 12:55
MW-5A	18C0036-11	Water	27-Feb-2018 12:43	02-Mar-2018 12:55
MW-6A	18C0036-12	Water	27-Feb-2018 11:30	02-Mar-2018 12:55
MW-7A	18C0036-13	Water	27-Feb-2018 10:27	02-Mar-2018 12:55
MWB-1LDA	18C0036-14	Water	28-Feb-2018 08:45	02-Mar-2018 12:55
MWB-2LDA	18C0036-15	Water	28-Feb-2018 09:34	02-Mar-2018 12:55
MWB-3LDA	18C0036-16	Water	28-Feb-2018 10:12	02-Mar-2018 12:55
MWB-7LDA	18C0036-17	Water	28-Feb-2018 08:50	02-Mar-2018 12:55
MWB-15DSP	18C0036-18	Water	28-Feb-2018 13:25	02-Mar-2018 12:55
MWB-1DDSP	18C0036-19	Water	28-Feb-2018 13:56	02-Mar-2018 12:55
MWB-5DSP	18C0036-20	Water	28-Feb-2018 14:41	02-Mar-2018 12:55
MWB-6DSP	18C0036-21	Water	28-Feb-2018 12:00	02-Mar-2018 12:55
Portal	18C0036-22	Water	27-Feb-2018 13:25	02-Mar-2018 12:55
MWB-9DSP	18C0036-23	Water	28-Feb-2018 12:05	02-Mar-2018 12:55
EB	18C0036-24	Water	27-Feb-2018 12:50	02-Mar-2018 12:55

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Case Narrative

Revised Report- This report has been revised to correct sample names. No other changes were made.

Dissolved Metals - EPA Method 200.8 and EPA Method 6010C

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 LCS percent recoveries were within control limits.

The Matrix Spike/Matrix Spike duplicate recoveries and RPD were within limits with the exception of analytes flagged on the associated forms.

Wet Chemistry

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

Initial and continuing calibrations were within method requirements.

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

The LCS percent recoveries were within control limits.

WORK ORDER

18C0036

Client: Golder Associates | **Project Manager: Kelly Bottem**

Project: Ravensdale | **Project Number: Ravensdale**

Report To:
Golder Associates
Gary Zimmerman
18300 NE Union Hill Road Suite 200
Redmond, WA 98052-3333
Phone: 425-883-0777
Fax: -

Invoice To:
Golder Associates
Gary Zimmerman
18300 NE Union Hill Road Suite 200
Redmond, WA 98052-3333
Phone :425-883-0777
Fax: -

Date Due:	16-Mar-2018 18:00 (10 day TAT)		
Received By:	Stephanie Fishel	Date Received:	02-Mar-2018 12:55
Logged In By:	Jacob Walter	Date Logged In:	02-Mar-2018 10:14

Samples Received at: **0.4°C**

Intact, properly signed and dated custody seals attached to outside of cooler(s)	No	Custody papers included with the cooler	Yes
Custody papers properly filled out (in, signed, analyses requested, etc)	Yes	Was a temperature blank included in the cooler	No
Was sufficient ice used (if appropriate)	Yes	All bottles sealed in individual plastic bags	Yes
All bottles arrived in good condition (unbroken)	Yes	All bottle labels complete and legible	Yes
Number of containers listed on COC match number received	Yes	Bottle labels and tags agree with COC	Yes
Correct bottles used for the requested analyses	Yes	All VOC vials free of air bubbles	No
Analyses/bottles require preservation (attach preservation sheet excluding VOC)	Yes	Sufficient amount of sample sent in each bottle	Yes
Sample split at ARI	No		

Reviewed By

Date

WORK ORDER

18C0036

Client: Golder Associates | **Project Manager:** Kelly Bottem

Project: Ravensdale | **Project Number:** Ravensdale

Analysis	Due	TAT	Expires	Comments
18C0036-01 Infiltration #1 [Water] Sampled 27-Feb-2018 12:22				
Met Diss 200.8 - As UCT	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 200.8 - Pb	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - Mn	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - K	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - Fe	03/16/2018	10	8/26/2018	Field Filtered
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/6/2018	Field Filtered
18C0036-02 Infiltration #2 [Water] Sampled 27-Feb-2018 12:25				
Met Diss 6010C - K	03/16/2018	10	8/26/2018	Field Filtered
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/6/2018	Field Filtered
Met Diss 200.8 - Pb	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 200.8 - As UCT	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - Fe	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - Mn	03/16/2018	10	8/26/2018	Field Filtered
18C0036-03 Wew [Water] Sampled 27-Feb-2018 14:40				
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/6/2018	Field Filtered
Met Diss 6010C - Mn	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 200.8 - Pb	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 200.8 - As UCT	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - K	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - Fe	03/16/2018	10	8/26/2018	Field Filtered
18C0036-04 South Pond [Water] Sampled 27-Feb-2018 14:15				
Met Diss 6010C - K	03/16/2018	10	8/26/2018	Field Filtered. MS/MSD
Met Diss 200.8 - As UCT	03/16/2018	10	8/26/2018	Field Filtered. MS/MSD
Met Diss 200.8 - Pb	03/16/2018	10	8/26/2018	Field Filtered. MS/MSD
Met Diss 6010C - Fe	03/16/2018	10	8/26/2018	Field Filtered. MS/MSD
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/6/2018	Field Filtered. MS/MSD
Met Diss 6010C - Mn	03/16/2018	10	8/26/2018	Field Filtered. MS/MSD
18C0036-05 Still Well [Water] Sampled 27-Feb-2018 13:45				
Met Diss 6010C - Mn	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 200.8 - Pb	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - K	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - Fe	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 200.8 - As UCT	03/16/2018	10	8/26/2018	Field Filtered
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/6/2018	Field Filtered
18C0036-06 Interceptor Trench [Water] Sampled 27-Feb-2018 10:16				
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/6/2018	Field Filtered
18C0036-07 MW-1A [Water] Sampled 27-Feb-2018 09:05				
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/6/2018	Field Filtered

Reviewed By _____ Date _____

WORK ORDER

18C0036

Client: Golder Associates | **Project Manager:** Kelly Bottem

Project: Ravensdale | **Project Number:** Ravensdale

Analysis	Due	TAT	Expires	Comments
Met Diss 200.8 - Pb	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - K	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - Fe	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 200.8 - As UCT	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - Mn	03/16/2018	10	8/26/2018	Field Filtered
18C0036-08 MW-2A [Water] Sampled 27-Feb-2018 10:24				
Met Diss 200.8 - Pb	03/16/2018	10	8/26/2018	Field Filtered
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/6/2018	Field Filtered
Met Diss 6010C - Mn	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - Fe	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 200.8 - As UCT	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - K	03/16/2018	10	8/26/2018	Field Filtered
18C0036-09 MW-3A [Water] Sampled 27-Feb-2018 15:25				
Met Diss 6010C - K	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - Mn	03/16/2018	10	8/26/2018	Field Filtered
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/6/2018	Field Filtered
Met Diss 200.8 - Pb	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 200.8 - As UCT	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - Fe	03/16/2018	10	8/26/2018	Field Filtered
18C0036-10 MW-4A [Water] Sampled 27-Feb-2018 11:10				
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/6/2018	Field Filtered
Met Diss 6010C - Mn	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - K	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - Fe	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 200.8 - Pb	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 200.8 - As UCT	03/16/2018	10	8/26/2018	Field Filtered
18C0036-11 MW-5A [Water] Sampled 27-Feb-2018 12:43				
Met Diss 200.8 - Pb	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - Mn	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 200.8 - As UCT	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - K	03/16/2018	10	8/26/2018	Field Filtered
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/6/2018	Field Filtered
Met Diss 6010C - Fe	03/16/2018	10	8/26/2018	Field Filtered
18C0036-12 MW-6A [Water] Sampled 27-Feb-2018 11:30				
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/6/2018	Field Filtered
Met Diss 6010C - Fe	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - K	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - Mn	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 200.8 - Pb	03/16/2018	10	8/26/2018	Field Filtered

Reviewed By _____ Date _____

WORK ORDER

18C0036

Client: Golder Associates | **Project Manager:** Kelly Bottem

Project: Ravensdale | **Project Number:** Ravensdale

Analysis	Due	TAT	Expires	Comments
Met Diss 200.8 - As UCT	03/16/2018	10	8/26/2018	Field Filtered
18C0036-13 MW-7A [Water] Sampled 27-Feb-2018 10:27				
Met Diss 6010C - K	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - Mn	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 200.8 - As UCT	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - Fe	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 200.8 - Pb	03/16/2018	10	8/26/2018	Field Filtered
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/6/2018	Field Filtered
18C0036-14 MWB-1LDA [Water] Sampled 28-Feb-2018 08:45				
Met Diss 200.8 - As UCT	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 6010C - K	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 6010C - Fe	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 200.8 - Pb	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 6010C - Mn	03/16/2018	10	8/27/2018	Field Filtered
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/7/2018	Field Filtered
18C0036-15 MWB-2LDA [Water] Sampled 28-Feb-2018 09:34				
Met Diss 200.8 - As UCT	03/16/2018	10	8/27/2018	Field Filtered
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/7/2018	Field Filtered
Met Diss 200.8 - Pb	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 6010C - Fe	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 6010C - K	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 6010C - Mn	03/16/2018	10	8/27/2018	Field Filtered
18C0036-16 MWB-3LDA [Water] Sampled 28-Feb-2018 10:12				
Met Diss 200.8 - Pb	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 200.8 - As UCT	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 6010C - Fe	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 6010C - Mn	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 6010C - K	03/16/2018	10	8/27/2018	Field Filtered
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/7/2018	Field Filtered
18C0036-17 MWB-7LDA [Water] Sampled 28-Feb-2018 08:50				
Met Diss 200.8 - As UCT	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 6010C - K	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 6010C - Fe	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 6010C - Mn	03/16/2018	10	8/27/2018	Field Filtered
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/7/2018	Field Filtered
Met Diss 200.8 - Pb	03/16/2018	10	8/27/2018	Field Filtered
18C0036-18 MWB-15DSP [Water] Sampled 28-Feb-2018 13:25				
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/7/2018	Field Filtered
Met Diss 6010C - K	03/16/2018	10	8/27/2018	Field Filtered

Reviewed By

Date

WORK ORDER

18C0036

Client: Golder Associates | **Project Manager:** Kelly Bottem

Project: Ravensdale | **Project Number:** Ravensdale

Analysis	Due	TAT	Expires	Comments
Met Diss 200.8 - Pb	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 200.8 - As UCT	03/16/2018	10	8/27/2018	Field Filtered
18C0036-19 MWB-1DDSP [Water] Sampled 28-Feb-2018 13:56				
Met Diss 200.8 - Pb	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 200.8 - As UCT	03/16/2018	10	8/27/2018	Field Filtered
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/7/2018	Field Filtered
Met Diss 6010C - K	03/16/2018	10	8/27/2018	Field Filtered
18C0036-20 MWB-5DSP [Water] Sampled 28-Feb-2018 14:41				
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/7/2018	Field Filtered
Met Diss 200.8 - Pb	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 200.8 - As UCT	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 6010C - K	03/16/2018	10	8/27/2018	Field Filtered
18C0036-21 MWB-6DSP [Water] Sampled 28-Feb-2018 12:00				
Met Diss 200.8 - Pb	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 200.8 - As UCT	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 6010C - K	03/16/2018	10	8/27/2018	Field Filtered
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/7/2018	Field Filtered
18C0036-22 Portal [Water] Sampled 27-Feb-2018 13:25				
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/6/2018	Field Filtered
Met Diss 6010C - K	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 200.8 - Pb	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 200.8 - As UCT	03/16/2018	10	8/26/2018	Field Filtered
18C0036-23 MWB-9DSP [Water] Sampled 28-Feb-2018 12:05				
Met Diss 200.8 - Pb	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 6010C - K	03/16/2018	10	8/27/2018	Field Filtered
Met Diss 200.8 - As UCT	03/16/2018	10	8/27/2018	Field Filtered
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/7/2018	Field Filtered
18C0036-24 EB [Water] Sampled 27-Feb-2018 12:50				
Met Diss 6010C - Fe	03/16/2018	10	8/26/2018	Field Filtered
Solids, Total Dissolved SM 2540 C-97	03/16/2018	10	3/6/2018	Field Filtered
Met Diss 200.8 - Pb	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - K	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 6010C - Mn	03/16/2018	10	8/26/2018	Field Filtered
Met Diss 200.8 - As UCT	03/16/2018	10	8/26/2018	Field Filtered

Reviewed By

Date

WORK ORDER

18C0036

Client: Golder Associates | **Project Manager:** Kelly Bottem

Project: Ravensdale | **Project Number:** Ravensdale

Preservation Confirmation

Container ID	Container Type	pH	
18C0036-01 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	<2	Pass
18C0036-01 B	HDPE NM, 1000 mL		
18C0036-02 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	<2	Pass
18C0036-02 B	HDPE NM, 1000 mL		
18C0036-03 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	<2	Pass
18C0036-03 B	HDPE NM, 1000 mL		
18C0036-04 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	<2	Pass
18C0036-04 B	HDPE NM, 1000 mL		
18C0036-05 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	<2	Pass
18C0036-05 B	HDPE NM, 1000 mL		
18C0036-06 A	HDPE NM, 1000 mL		
18C0036-07 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	<2	Pass
18C0036-07 B	HDPE NM, 1000 mL		
18C0036-08 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	<2	Pass
18C0036-08 B	HDPE NM, 1000 mL		
18C0036-09 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	<2	Pass
18C0036-09 B	HDPE NM, 1000 mL		
18C0036-10 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	<2	Pass
18C0036-10 B	HDPE NM, 1000 mL		
18C0036-11 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	<2	Pass
18C0036-11 B	HDPE NM, 1000 mL		
18C0036-12 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	<2	Pass
18C0036-12 B	HDPE NM, 1000 mL		
18C0036-13 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	<2	Pass
18C0036-13 B	HDPE NM, 1000 mL		
18C0036-14 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	<2	Pass
18C0036-14 B	HDPE NM, 1000 mL		
18C0036-15 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	<2	Pass
18C0036-15 B	HDPE NM, 1000 mL		
18C0036-16 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	<2	Pass
18C0036-16 B	HDPE NM, 1000 mL		
18C0036-17 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	<2	Pass
18C0036-17 B	HDPE NM, 1000 mL		
18C0036-18 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	<2	Pass
18C0036-18 B	HDPE NM, 1000 mL		

Reviewed By

Date

WORK ORDER

18C0036

Client: Golder Associates | **Project Manager:** Kelly Bottem

Project: Ravensdale | **Project Number:** Ravensdale

18C0036-19 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	C2	Pass
18C0036-19 B	HDPE NM, 1000 mL		
18C0036-20 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	C2	Pass
18C0036-20 B	HDPE NM, 1000 mL		
18C0036-21 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	C2	Pass
18C0036-21 B	HDPE NM, 1000 mL		
18C0036-22 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	C2	Pass
18C0036-22 B	HDPE NM, 1000 mL		
18C0036-23 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	C2	Pass
18C0036-23 B	HDPE NM, 1000 mL		
18C0036-24 A	HDPE NM, 1000 mL, 1:1 HNO3 (FF)	C2	Pass
18C0036-24 B	HDPE NM, 1000 mL		

JBW — Preservation Confirmed By

03/02/18 — Date

Reviewed By

Date

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Golder Project Name: Ravensdale

COC No(s): _____ NA Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 18C0036 Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to 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): 0.4 1.7 -0.3 0.9 ___ ___

Time: 1255

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: D00256S

Cooler Accepted by: SEF Date: 31/18 Time: 1255

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
Were all bottles sealed in individual plastic bags?		YES	NO
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	_____	

Was Sample Split by ARI : NA YES Date/Time: _____ Equipment: _____ Split by: _____

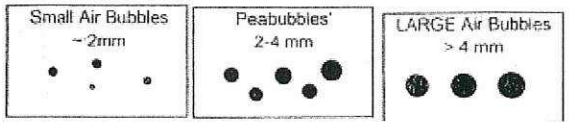
Samples Logged by: JBW Date: 03/02/18 Time: 1013

***** 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:



Small → "sm" (< 2 mm)
Peabubbles → "pb" (2 to < 4 mm)
Large → "lg" (4 to < 6 mm)
Headspace → "hs" (> 6 mm)

Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Infiltration #1

18C0036-01 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/27/2018 12:22

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 14:48

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	**54.6**	ug/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Infiltration #1

18C0036-01 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/27/2018 12:22

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 14:48

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**15.0**	ug/L	

Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Infiltration #1

18C0036-01 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/27/2018 12:22

Instrument: ICP2 — Analyzed: 09-Mar-2018 15:09

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0210 — Sample Size: 25 mL
Prepared: 08-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	2	0.0026	0.100	**0.0124**	mg/L	J, D
Manganese, Dissolved	7439-96-5	2	0.0007	0.0020	ND	mg/L	U
Potassium, Dissolved	7440-09-7	2	0.104	1.00	**678**	mg/L	D

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Infiltration #1

18C0036-01 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/27/2018 12:22

Instrument: BAL2 — Analyzed: 05-Mar-2018 08:57

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0091 — Sample Size: 10 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	100	100	**1620**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Infiltration #2

18C0036-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/27/2018 12:25

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 14:53

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	**55.8**	ug/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Infiltration #2

18C0036-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/27/2018 12:25

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 14:53

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**15.7**	ug/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Infiltration #2

18C0036-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/27/2018 12:25

Instrument: ICP2 — Analyzed: 09-Mar-2018 15:13

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0210 — Sample Size: 25 mL
Prepared: 08-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	2	0.0026	0.100	**0.0060**	mg/L	J, D
Manganese, Dissolved	7439-96-5	2	0.0007	0.0020	ND	mg/L	U
Potassium, Dissolved	7440-09-7	2	0.104	1.00	**680**	mg/L	D

Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Infiltration #2

18C0036-02 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/27/2018 12:25

Instrument: BAL2 — Analyzed: 05-Mar-2018 08:57

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0091 — Sample Size: 10 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	100	100	**1880**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Weir

18C0036-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/27/2018 14:40

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 14:59

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	**1.23**	ug/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Weir

18C0036-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/27/2018 14:40

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 14:59

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**9.70**	ug/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Weir

18C0036-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/27/2018 14:40

Instrument: ICP2 — Analyzed: 09-Mar-2018 13:10

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0210 — Sample Size: 25 mL
Prepared: 08-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**0.174**	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.0488**	mg/L	
Potassium, Dissolved	7440-09-7	1	0.0520	0.500	**127**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Weir

18C0036-03 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/27/2018 14:40

Instrument: BAL2 — Analyzed: 05-Mar-2018 08:57

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0091 — Sample Size: 100 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	**503**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

South Pond

18C0036-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/27/2018 14:15

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 16:29

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	5	0.340	0.500	**47.7**	ug/L	D

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

South Pond

18C0036-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/27/2018 14:15

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 16:29

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	5	0.110	1.00	**61.7**	ug/L	D

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

South Pond

18C0036-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/27/2018 14:15

Instrument: ICP2 — Analyzed: 09-Mar-2018 13:44

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0210 — Sample Size: 25 mL
Prepared: 08-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	2	0.0026	0.100	**0.752**	mg/L	D
Manganese, Dissolved	7439-96-5	2	0.0007	0.0020	**0.0267**	mg/L	D
Potassium, Dissolved	7440-09-7	2	0.104	1.00	**429**	mg/L	D

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

South Pond

18C0036-04 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/27/2018 14:15

Instrument: BAL2 — Analyzed: 05-Mar-2018 08:57

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0091 — Sample Size: 75 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	13	13	**865**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Still Well

18C0036-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/27/2018 13:45

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 15:03

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	**7.53**	ug/L	

Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Still Well

18C0036-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/27/2018 13:45

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 15:03

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**50.2**	ug/L	

Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Still Well

18C0036-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/27/2018 13:45

Instrument: ICP2 — Analyzed: 13-Mar-2018 13:59

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0210 — Sample Size: 25 mL
Prepared: 08-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	2	0.0026	0.100	**0.0525**	mg/L	J, D
Manganese, Dissolved	7439-96-5	2	0.0007	0.0020	**0.0025**	mg/L	D
Potassium, Dissolved	7440-09-7	2	0.104	1.00	**521**	mg/L	D

Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Still Well

18C0036-05 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/27/2018 13:45

Instrument: BAL2 — Analyzed: 05-Mar-2018 08:57

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0091 — Sample Size: 10 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	100	100	**1970**	mg/L	

Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Interceptor Trench

18C0036-06 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/27/2018 10:16

Instrument: BAL2 — Analyzed: 05-Mar-2018 08:57

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0091 — Sample Size: 100 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	**381**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-1A

18C0036-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/27/2018 09:05

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 15:08

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-1A

18C0036-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/27/2018 09:05

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 15:08

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**1.72**	ug/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-1A

18C0036-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/27/2018 09:05

Instrument: ICP2 — Analyzed: 09-Mar-2018 14:04

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0210 — Sample Size: 25 mL
Prepared: 08-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**0.0265**	mg/L	J
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.0084**	mg/L	
Potassium, Dissolved	7440-09-7	1	0.0520	0.500	**15.5**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-1A

18C0036-07 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/27/2018 09:05

Instrument: BAL2 — Analyzed: 05-Mar-2018 08:57

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0091 — Sample Size: 200 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	**186**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-2A

18C0036-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/27/2018 10:24

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 15:13

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-2A

18C0036-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/27/2018 10:24

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 15:13

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**3.98**	ug/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-2A

18C0036-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/27/2018 10:24

Instrument: ICP2 — Analyzed: 09-Mar-2018 14:08

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0210 — Sample Size: 25 mL
Prepared: 08-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**0.0295**	mg/L	J
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	ND	mg/L	U
Potassium, Dissolved	7440-09-7	1	0.0520	0.500	**41.9**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-2A

18C0036-08 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/27/2018 10:24

Instrument: BAL2 — Analyzed: 05-Mar-2018 08:57

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0091 — Sample Size: 200 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	**254**	mg/L	

Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-3A

18C0036-09 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/27/2018 15:25

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 16:06

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-3A

18C0036-09 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/27/2018 15:25

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 16:06

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**2.97**	ug/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-3A

18C0036-09 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/27/2018 15:25

Instrument: ICP2 — Analyzed: 09-Mar-2018 15:18

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0210 — Sample Size: 25 mL
Prepared: 08-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**1.41**	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**1.38**	mg/L	
Potassium, Dissolved	7440-09-7	1	0.0520	0.500	**92.0**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-3A

18C0036-09 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/27/2018 15:25

Instrument: BAL2 — Analyzed: 05-Mar-2018 08:57

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0091 — Sample Size: 100 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	**506**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-4A

18C0036-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/27/2018 11:10

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 16:10

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-4A

18C0036-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/27/2018 11:10

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 16:10

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**0.176**	ug/L	J

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-4A

18C0036-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/27/2018 11:10

Instrument: ICP2 — Analyzed: 09-Mar-2018 15:22

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0210 — Sample Size: 25 mL
Prepared: 08-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**0.0109**	mg/L	J
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.0045**	mg/L	
Potassium, Dissolved	7440-09-7	1	0.0520	0.500	**0.875**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-4A

18C0036-10 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/27/2018 11:10

Instrument: BAL2 — Analyzed: 05-Mar-2018 08:57

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0091 — Sample Size: 200 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	**238**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-5A

18C0036-11 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/27/2018 12:43

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 16:15

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	**0.642**	ug/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-5A

18C0036-11 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/27/2018 12:43

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 16:15

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**86.3**	ug/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-5A

18C0036-11 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/27/2018 12:43

Instrument: ICP2 — Analyzed: 09-Mar-2018 15:26

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0210 — Sample Size: 25 mL
Prepared: 08-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**0.143**	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.0068**	mg/L	
Potassium, Dissolved	7440-09-7	1	0.0520	0.500	**174**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-5A

18C0036-11 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/27/2018 12:43

Instrument: BAL2 — Analyzed: 05-Mar-2018 08:57

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0091 — Sample Size: 100 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	**530**	mg/L	

Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-6A

18C0036-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/27/2018 11:30

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 16:20

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	**0.561**	ug/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-6A

18C0036-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/27/2018 11:30

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 16:20

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**99.3**	ug/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-6A

18C0036-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/27/2018 11:30

Instrument: ICP2 — Analyzed: 09-Mar-2018 15:30

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0210 — Sample Size: 25 mL
Prepared: 08-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**0.0770**	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.0045**	mg/L	
Potassium, Dissolved	7440-09-7	1	0.0520	0.500	**203**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-6A

18C0036-12 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/27/2018 11:30

Instrument: BAL2 — Analyzed: 05-Mar-2018 08:57

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0091 — Sample Size: 75 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	13	13	**635**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-7A

18C0036-13 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/27/2018 10:27

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 17:01

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	**0.0960**	ug/L	J

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-7A

18C0036-13 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/27/2018 10:27

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 17:01

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**4.20**	ug/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-7A

18C0036-13 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/27/2018 10:27

Instrument: ICP2 — Analyzed: 09-Mar-2018 15:35

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0210 — Sample Size: 25 mL
Prepared: 08-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**0.0442**	mg/L	J
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.0004**	mg/L	J
Potassium, Dissolved	7440-09-7	1	0.0520	0.500	**40.7**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MW-7A

18C0036-13 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/27/2018 10:27

Instrument: BAL2 — Analyzed: 05-Mar-2018 08:57

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0091 — Sample Size: 200 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	**253**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-1LDA

18C0036-14 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/28/2018 08:45

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 17:05

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-1LDA

18C0036-14 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/28/2018 08:45

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 17:05

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**10.8**	ug/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-1LDA

18C0036-14 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/28/2018 08:45

Instrument: ICP2 — Analyzed: 09-Mar-2018 15:39

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0210 — Sample Size: 25 mL
Prepared: 08-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**0.192**	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.0412**	mg/L	
Potassium, Dissolved	7440-09-7	1	0.0520	0.500	**0.951**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-1LDA

18C0036-14 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/28/2018 08:45

Instrument: BAL2 — Analyzed: 05-Mar-2018 08:57

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0091 — Sample Size: 200 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	**221**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-2LDA

18C0036-15 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/28/2018 09:34

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 17:10

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-2LDA

18C0036-15 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/28/2018 09:34

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 17:10

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**5.69**	ug/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-2LDA

18C0036-15 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/28/2018 09:34

Instrument: ICP2 — Analyzed: 09-Mar-2018 15:43

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0210 — Sample Size: 25 mL
Prepared: 08-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**0.310**	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.0173**	mg/L	
Potassium, Dissolved	7440-09-7	1	0.0520	0.500	**0.992**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-2LDA

18C0036-15 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/28/2018 09:34

Instrument: BAL2 — Analyzed: 05-Mar-2018 08:57

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0091 — Sample Size: 200 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	**205**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-3LDA

18C0036-16 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/28/2018 10:12

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 17:15

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-3LDA

18C0036-16 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/28/2018 10:12

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 17:15

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**2.53**	ug/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-3LDA

18C0036-16 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/28/2018 10:12

Instrument: ICP2 — Analyzed: 09-Mar-2018 15:47

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0210 — Sample Size: 25 mL
Prepared: 08-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**0.0200**	mg/L	J
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.0123**	mg/L	
Potassium, Dissolved	7440-09-7	1	0.0520	0.500	**0.848**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-3LDA

18C0036-16 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/28/2018 10:12

Instrument: BAL2 — Analyzed: 05-Mar-2018 08:57

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0091 — Sample Size: 200 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	**159**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-7LDA

18C0036-17 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/28/2018 08:50

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 17:19

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-7LDA

18C0036-17 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/28/2018 08:50

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 17:19

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**11.2**	ug/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-7LDA

18C0036-17 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/28/2018 08:50

Instrument: ICP2 — Analyzed: 13-Mar-2018 14:03

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0210 — Sample Size: 25 mL
Prepared: 08-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**0.199**	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.0418**	mg/L	
Potassium, Dissolved	7440-09-7	1	0.0520	0.500	**0.963**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-7LDA

18C0036-17 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/28/2018 08:50

Instrument: BAL2 — Analyzed: 05-Mar-2018 08:57

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0091 — Sample Size: 200 mL
Prepared: 05-Mar-2018 — 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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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-15DSP

18C0036-18 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/28/2018 13:25

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 17:24

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-15DSP

18C0036-18 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/28/2018 13:25

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 17:24

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**22.4**	ug/L	

Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-15DSP

18C0036-18 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/28/2018 13:25

Instrument: ICP2 — Analyzed: 09-Mar-2018 16:12

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0210 — Sample Size: 25 mL
Prepared: 08-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Potassium, Dissolved	7440-09-7	1	0.0520	0.500	**6.53**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-15DSP

18C0036-18 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/28/2018 13:25

Instrument: BAL2 — Analyzed: 05-Mar-2018 08:57

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0091 — Sample Size: 75 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	13	13	**1244**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-1DDSP

18C0036-19 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/28/2018 13:56

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 17:29

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-1DDSP

18C0036-19 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/28/2018 13:56

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 17:29

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**2.87**	ug/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-1DDSP

18C0036-19 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/28/2018 13:56

Instrument: ICP2 — Analyzed: 09-Mar-2018 16:16

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0210 — Sample Size: 25 mL
Prepared: 08-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Potassium, Dissolved	7440-09-7	1	0.0520	0.500	**3.34**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-1DDSP

18C0036-19 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/28/2018 13:56

Instrument: BAL2 — Analyzed: 05-Mar-2018 08:57

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0091 — Sample Size: 100 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	**694**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-5DSP

18C0036-20 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/28/2018 14:41

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 17:33

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-5DSP

18C0036-20 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/28/2018 14:41

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 17:33

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**5.39**	ug/L	

Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-5DSP

18C0036-20 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/28/2018 14:41

Instrument: ICP2 — Analyzed: 09-Mar-2018 16:20

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0210 — Sample Size: 25 mL
Prepared: 08-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Potassium, Dissolved	7440-09-7	1	0.0520	0.500	**2.55**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-5DSP

18C0036-20 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/28/2018 14:41

Instrument: BAL2 — Analyzed: 05-Mar-2018 08:57

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0091 — Sample Size: 100 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	**528**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-6DSP

18C0036-21 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/28/2018 12:00

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 17:38

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-6DSP

18C0036-21 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/28/2018 12:00

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 17:38

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0092 — Sample Size: 25 mL
Prepared: 05-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**1.56**	ug/L	

Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-6DSP

18C0036-21 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/28/2018 12:00

Instrument: ICP2 — Analyzed: 09-Mar-2018 16:24

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0210 — Sample Size: 25 mL
Prepared: 08-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Potassium, Dissolved	7440-09-7	1	0.0520	0.500	**1.20**	mg/L	

Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-6DSP

18C0036-21 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/28/2018 12:00

Instrument: BAL2 — Analyzed: 05-Mar-2018 09:06

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0093 — Sample Size: 100 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	**138**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Portal

18C0036-22 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/27/2018 13:25

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 18:29

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0126 — Sample Size: 25 mL
Prepared: 06-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Portal

18C0036-22 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/27/2018 13:25

Instrument: ICPMS2 — Analyzed: 09-Mar-2018 16:24

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0126 — Sample Size: 25 mL
Prepared: 06-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**4.11**	ug/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Portal

18C0036-22 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/27/2018 13:25

Instrument: ICP2 — Analyzed: 15-Mar-2018 15:14

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0347 — Sample Size: 25 mL
Prepared: 13-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Potassium, Dissolved	7440-09-7	2	0.104	1.00	**20.4**	mg/L	D

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Portal

18C0036-22 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/27/2018 13:25

Instrument: BAL2 — Analyzed: 05-Mar-2018 09:06

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0093 — Sample Size: 100 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	**354**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-9DSP

18C0036-23 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/28/2018 12:05

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 17:43

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0126 — Sample Size: 25 mL
Prepared: 06-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-9DSP

18C0036-23 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/28/2018 12:05

Instrument: ICPMS2 — Analyzed: 09-Mar-2018 16:14

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0126 — Sample Size: 25 mL
Prepared: 06-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**1.48**	ug/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-9DSP

18C0036-23 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/28/2018 12:05

Instrument: ICP2 — Analyzed: 13-Mar-2018 15:40

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0347 — Sample Size: 25 mL
Prepared: 13-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Potassium, Dissolved	7440-09-7	1	0.0520	0.500	**1.16**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

MWB-9DSP

18C0036-23 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/28/2018 12:05

Instrument: BAL2 — Analyzed: 05-Mar-2018 09:06

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0093 — Sample Size: 100 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	**151**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

EB

18C0036-24 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 — Sampled: 02/27/2018 12:50

Instrument: ICPMS2 — Analyzed: 12-Mar-2018 18:05

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0126 — Sample Size: 25 mL
Prepared: 06-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0680	0.100	ND	ug/L	U

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

EB

18C0036-24 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 02/27/2018 12:50

Instrument: ICPMS2 — Analyzed: 09-Mar-2018 16:57

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGC0126 — Sample Size: 25 mL
Prepared: 06-Mar-2018 — Final Volume: 25 mL

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

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

EB

18C0036-24 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 02/27/2018 12:50

Instrument: ICP2 — Analyzed: 13-Mar-2018 15:44

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0347 — Sample Size: 25 mL
Prepared: 13-Mar-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**0.0014**	mg/L	J
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	ND	mg/L	U
Potassium, Dissolved	7440-09-7	1	0.0520	0.500	ND	mg/L	U

Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

EB

18C0036-24 (Water)

Wet Chemistry

Method: SM 2540 C-97 — Sampled: 02/27/2018 12:50

Instrument: BAL2 — Analyzed: 05-Mar-2018 09:06

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGC0093 — Sample Size: 200 mL
Prepared: 05-Mar-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	**49**	mg/L	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGC0092 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0092-BLK1)					Prepared: 05-Mar-2018 Analyzed: 12-Mar-2018 16:01							
Lead, Dissolved	208	ND	0.0680	0.100	ug/L							U
Arsenic, Dissolved	75a	ND	0.0220	0.200	ug/L							U
LCS (BGC0092-BS1)					Prepared: 05-Mar-2018 Analyzed: 12-Mar-2018 16:43							
Lead, Dissolved	208	28.5	0.0680	0.100	ug/L	25.0		114	80-120			
Arsenic, Dissolved	75a	26.7	0.0220	0.200	ug/L	25.0		107	80-120			
Duplicate (BGC0092-DUP1)			**Source: 18C0036-04**		Prepared: 05-Mar-2018 Analyzed: 12-Mar-2018 16:24							
Lead, Dissolved	208	29.6	0.340	0.500	ug/L		47.7			46.60	20	*, D
Arsenic, Dissolved	75a	59.9	0.110	1.00	ug/L		61.7			2.96	20	D
Matrix Spike (BGC0092-MS1)			**Source: 18C0036-04**		Prepared: 05-Mar-2018 Analyzed: 12-Mar-2018 16:34							
Lead, Dissolved	208	62.4	0.340	0.500	ug/L	25.0	47.7	58.9	75-125			*, D
Arsenic, Dissolved	75a	88.0	0.110	1.00	ug/L	25.0	61.7	105	75-125			D

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

Matrix Spike Dup (BGC0092-MSD1)			**Source: 18C0036-04**		Prepared: 05-Mar-2018 Analyzed: 12-Mar-2018 16:38							
Lead, Dissolved	208	63.0	0.340	0.500	ug/L	25.0	47.7	61.3	75-125	0.95	20	*, D
Arsenic, Dissolved	75a	87.9	0.110	1.00	ug/L	25.0	61.7	105	75-125	0.18	20	D

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

Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGC0126 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0126-BLK1)					Prepared: 06-Mar-2018 Analyzed: 09-Mar-2018 15:55							
Arsenic, Dissolved	75a	ND	0.0220	0.200	ug/L							U
Blank (BGC0126-BLK2)					Prepared: 06-Mar-2018 Analyzed: 12-Mar-2018 18:01							
Lead, Dissolved	208	ND	0.0680	0.100	ug/L							U
LCS (BGC0126-BS1)					Prepared: 06-Mar-2018 Analyzed: 09-Mar-2018 16:39							
Arsenic, Dissolved	75a	26.2	0.0220	0.200	ug/L	25.0		105	80-120			
LCS (BGC0126-BS2)					Prepared: 06-Mar-2018 Analyzed: 13-Mar-2018 12:48							
Lead, Dissolved	208	27.0	0.0680	0.100	ug/L	25.0		108	80-120			
Duplicate (BGC0126-DUP1)			**Source: 18C0036-22**		Prepared: 06-Mar-2018 Analyzed: 09-Mar-2018 16:19							
Arsenic, Dissolved	75a	4.06	0.0220	0.200	ug/L		4.11			1.32	20	
Duplicate (BGC0126-DUP2)			**Source: 18C0036-22**		Prepared: 06-Mar-2018 Analyzed: 12-Mar-2018 18:24							
Lead, Dissolved	208	ND	0.0680	0.100	ug/L		ND					U
Matrix Spike (BGC0126-MS1)			**Source: 18C0036-22**		Prepared: 06-Mar-2018 Analyzed: 09-Mar-2018 16:29							
Arsenic, Dissolved	75a	31.0	0.0220	0.200	ug/L	25.0	4.11	108	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.												
Matrix Spike (BGC0126-MS2)			**Source: 18C0036-22**		Prepared: 06-Mar-2018 Analyzed: 12-Mar-2018 18:33							
Lead, Dissolved	208	28.9	0.0680	0.100	ug/L	25.0	ND	115	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.												
Matrix Spike Dup (BGC0126-MSD1)			**Source: 18C0036-22**		Prepared: 06-Mar-2018 Analyzed: 09-Mar-2018 16:34							
Arsenic, Dissolved	75a	30.0	0.0220	0.200	ug/L	25.0	4.11	104	75-125	3.23	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.												
Matrix Spike Dup (BGC0126-MSD2)			**Source: 18C0036-22**		Prepared: 06-Mar-2018 Analyzed: 12-Mar-2018 18:38							
Lead, Dissolved	208	28.9	0.0680	0.100	ug/L	25.0	ND	115	75-125	0.03	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.												

Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGC0210 - WMN (No Prep)

Instrument: ICP2 Analyst: CC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0210-BLK1)				Prepared: 08-Mar-2018 Analyzed: 09-Mar-2018 13:34							
Iron, Dissolved	0.0105	0.0013	0.0500	mg/L							J
Manganese, Dissolved	ND	0.0003	0.0010	mg/L							U
Potassium, Dissolved	ND	0.0520	0.500	mg/L							U
LCS (BGC0210-BS1)				Prepared: 08-Mar-2018 Analyzed: 09-Mar-2018 13:54							
Iron, Dissolved	2.03	0.0013	0.0500	mg/L	2.00		101	80-120			
Manganese, Dissolved	0.513	0.0003	0.0010	mg/L	0.500		103	80-120			
Potassium, Dissolved	10.2	0.0520	0.500	mg/L	10.0		102	80-120			
Duplicate (BGC0210-DUP1)		**Source: 18C0036-04**		Prepared: 08-Mar-2018 Analyzed: 09-Mar-2018 13:40							
Iron, Dissolved	0.749	0.0026	0.100	mg/L		0.752			0.39	20	D
Manganese, Dissolved	0.0268	0.0007	0.0020	mg/L		0.0267			0.29	20	D
Potassium, Dissolved	427	0.104	1.00	mg/L		429			0.54	20	D
Matrix Spike (BGC0210-MS1)		**Source: 18C0036-04**		Prepared: 08-Mar-2018 Analyzed: 09-Mar-2018 13:48							
Iron, Dissolved	4.66	0.0026	0.100	mg/L	4.00	0.752	97.8	75-125			D
Manganese, Dissolved	0.973	0.0007	0.0020	mg/L	1.00	0.0267	94.6	75-125			D
Potassium, Dissolved	445	0.104	1.00	mg/L	20.0	429	79.2	75-125			D

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

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGC0347 - WMN (No Prep)

Instrument: ICP2 Analyst: CC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0347-BLK1)				Prepared: 13-Mar-2018 Analyzed: 13-Mar-2018 15:13							
Iron, Dissolved	0.0053	0.0013	0.0500	mg/L							J
Manganese, Dissolved	ND	0.0003	0.0010	mg/L							U
Potassium, Dissolved	ND	0.0520	0.500	mg/L							U
LCS (BGC0347-BS1)				Prepared: 13-Mar-2018 Analyzed: 13-Mar-2018 15:35							
Iron, Dissolved	1.92	0.0013	0.0500	mg/L	2.00		96.2	80-120			
Manganese, Dissolved	0.464	0.0003	0.0010	mg/L	0.500		92.8	80-120			
Potassium, Dissolved	9.64	0.0520	0.500	mg/L	10.0		96.4	80-120			
Duplicate (BGC0347-DUP1)		**Source: 18C0036-22**		Prepared: 13-Mar-2018 Analyzed: 15-Mar-2018 15:10							
Iron, Dissolved	2.20	0.0026	0.100	mg/L		2.18			0.72	20	D
Manganese, Dissolved	0.307	0.0007	0.0020	mg/L		0.304			1.03	20	D
Potassium, Dissolved	20.6	0.104	1.00	mg/L		20.4			1.01	20	D
Matrix Spike (BGC0347-MS1)		**Source: 18C0036-22**		Prepared: 13-Mar-2018 Analyzed: 15-Mar-2018 15:18							
Iron, Dissolved	6.04	0.0026	0.100	mg/L	4.00	2.18	96.6	75-125			D
Manganese, Dissolved	1.21	0.0007	0.0020	mg/L	1.00	0.304	90.6	75-125			D
Potassium, Dissolved	40.1	0.104	1.00	mg/L	20.0	20.4	98.7	75-125			D

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

Matrix Spike Dup (BGC0347-MSD1)		**Source: 18C0036-22**		Prepared: 13-Mar-2018 Analyzed: 15-Mar-2018 15:23							
Iron, Dissolved	6.12	0.0026	0.100	mg/L	4.00	2.18	98.5	75-125	1.25	20	D
Manganese, Dissolved	1.24	0.0007	0.0020	mg/L	1.00	0.304	93.3	75-125	2.19	20	D
Potassium, Dissolved	39.4	0.104	1.00	mg/L	20.0	20.4	95.2	75-125	1.74	20	D

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

Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Wet Chemistry - Quality Control

Batch BGC0091 - No Prep Wet Chem

Instrument: BAL2 Analyst: KLE

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0091-BLK1)				Prepared: 05-Mar-2018 Analyzed: 05-Mar-2018 08:57							
Dissolved Solids	ND	5	5	mg/L							U
LCS (BGC0091-BS1)				Prepared: 05-Mar-2018 Analyzed: 05-Mar-2018 08:57							
Dissolved Solids	488	5	5	mg/L	500.0		97.6	90-110			
Duplicate (BGC0091-DUP1)		**Source: 18C0036-04**		Prepared: 05-Mar-2018 Analyzed: 05-Mar-2018 08:57							
Dissolved Solids	871	13	13	mg/L		865			0.61	20	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Wet Chemistry - Quality Control

Batch BGC0093 - No Prep Wet Chem

Instrument: BAL2 Analyst: KLE

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0093-BLK1)				Prepared: 05-Mar-2018 Analyzed: 05-Mar-2018 09:06							
Dissolved Solids	ND	5	5	mg/L							U
LCS (BGC0093-BS1)				Prepared: 05-Mar-2018 Analyzed: 05-Mar-2018 09:06							
Dissolved Solids	509	5	5	mg/L	500.0		102	90-110			
Duplicate (BGC0093-DUP1)		**Source: 18C0036-22**		Prepared: 05-Mar-2018 Analyzed: 05-Mar-2018 09:06							
Dissolved Solids	368	10	10	mg/L		354			3.88	20	

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Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Certified Analyses included in this Report

Analyte	Certifications
EPA 200.8 in Water	
Lead-208	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 200.8 UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 6010C in Water	
Iron	WADOE,NELAP
Potassium	WADOE,NELAP
Manganese	WADOE,NELAP
SM 2540 C-97 in Water	
Dissolved Solids	DoD-ELAP,WADOE,WA-DW,NELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	05/11/2018
CALAP	California Department of Public Health CAELAP	2748	06/30/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018

Golder Associates	Project: Ravensdale	
18300 NE Union Hill Road Suite 200	Project Number: Ravensdale	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	21-Mar-2018 10:48

Notes and Definitions

U	This analyte is not detected above the applicable reporting or detection limit.
J	Estimated concentration value detected below the reporting limit.
D	The reported value is from a dilution
*	Flagged value is not within established control limits.
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.

DATA VALIDATION CHECKLIST

Project Name:	Ravensdale Project
Project Number:	15-20304.700
Sample Identification(s):	EB, Infiltration #1, Infiltration #2, MW-1A, MW-2A, MW-3A, MW-4A, MW-5A, MW-6A, MW-7A, MWB-1LDA, MWB-2LDA, MWB-3LDA, MWB-7LDA, MWB-1SDSP, MWB-1DDSP, MWB-5DSP, MWB-6DSP, MWB-9DSP, South Pond, Still Well, Weir, Portal, Interceptor Trench
Sample Date(s):	2/27, 2/28/2018
Sample Team:	Eric Adams, Joseph Xi, Golder Associates
Sample Matrix:	Aqueous
Analyzing Laboratory:	Analytical Resources, Inc. – Tukwila, WA
Analyses:	TDS (SM 2540 C), Metals (EPA 6010C, 200.8): Dissolved As, Pb, K, Fe, Mn
Laboratory Report No.:	18C0036

FIELD DATA PACKAGE DOCUMENTATION

	Reported		**Performance Acceptable**		**Not Required**
Field Sampling Logs:	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 the following exceptions and/or notes:

ANALYTICAL DATA PACKAGE DOCUMENTATION

GENERAL INFORMATION

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

QA – quality assurance

COMMENTS:

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

- The lab labelled samples EB as “FB” in the “Sample_Type” column of the EDD. The sample type label has been updated to the correct designation of “N”.
- The lab misnamed sample MWB-1SDSP as “MWB-15DSP” in the data package and edd. The sample name has been corrected in the edd.
- The reporting limits (RLs) and method detection limits (MDLs) of Analytical Resources Inc. were reviewed to ensure data quality objectives were met. The following table is a comparison of the laboratory RLs and MDLs as compared to the preliminary standards for the site. All RLs and MDLs were less than the preliminary standards.

	Preliminary Standards		Analytical Resources Inc.		
Parameter	**Method**	**(mg/L)**	**Method**	**RL (mg/L)**	**MDL (mg/L)**
Total Dissolved Solids	EPA 160.1	500	SM 2540 C	5.0	
Iron	EPA 6010B	0.3	EPA 6010C	0.050	0.0013
Manganese	EPA 6010B	0.05	EPA 6010C	0.001	0.0003
Potassium	EPA 6010B	NA	EPA 6010C	0.50	0.052
Arsenic	EPA 6020	TBD	EPA 200.8	0.0002	0.000022
Lead	EPA 6020	0.05	EPA 200.8	0.0001	0.000068

INORGANIC ANALYSES

Metals (EPA 6010/6020)	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:

- The Method Blank (BGC0210-BLK1) has a low detection of Iron at 0.0105 J mg/L. Following the Guidelines and using professional judgment, when the blank contamination is between the MDL and RL, associated results that are between the MDL and RL are qualified as non-detect (U) and reported at the RL, while detections greater than the RL do not require qualification. The Equipment Blank is not qualified due to method blank contamination.
- The Equipment Blank (EB) has a low level detections of Iron at 0.0014 J. Validation guidelines do not require qualification of equipment blank data.
- The MS and MSD recoveries of Lead in South Pond sample are below acceptance criteria. The Duplicate RPD of Lead in South Pond is above acceptance criteria. Following the Guidelines and using professional judgment, the Lead result in the parent sample is qualified as estimated with low bias (J-).
- Field duplicates were collected at MW-2A (field duplicate ID is MW-7A), Infiltration #1 (field duplicate ID is Infiltration #2), and MWB-1LDA (field duplicate ID is MWB-7LDA). All precision is acceptable.
- The laboratory did not provide LCSD results. This QC element is not required because sufficient precision and accuracy data was provided by the lab with laboratory duplicate, MS/MSD, and LCS analyses.

GENERAL WET CHEMISTRY

TDS (EPA 160.1)	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
1 0. 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:

- The Equipment Blank (EB) had a detection of Total Dissolved Solids at 49 mg/L. Validation guidelines do not require qualification of equipment blank data; rather, it is advisory that low detections of Total Dissolved Solids may be biased high.
- Field duplicates were collected at MW-2A (field duplicate ID is MW-7A), Infiltration #1 (field duplicate ID is Infiltration #2), and MWB-1LDA (field duplicate ID is MWB-7LDA). All precision is acceptable.
- The laboratory did not provide LCSD, MS, or MSD results. These QC elements are not required because sufficient precision and accuracy data was provided by the lab with laboratory duplicate and LCS analyses.

DATA VALIDATION CHECKLIST

SUMMARY AND DATA QUALIFIER CODES

Project Name:	Ravensdale Project
Project Number:	15-20304.700
Sample Identification(s):	EB, Infiltration #1, Infiltration #2, MW-1A, MW-2A, MW-3A, MW-4A, MW-5A, MW-6A, MW-7A, MWB-1LDA, MWB-2LDA, MWB-3LDA, MWB-7LDA, MWB-1SDSP, MWB-1DDSP, MWB-5DSP, MWB-6DSP, MWB-9DSP, South Pond, Still Well, Weir, Portal, Interceptor Trench
Sample Date(s):	2/27, 2/28/2018
Sample Team:	Eric Adams, Joseph Xi, Golder Associates
Sample Matrix:	Aqueous
Analyzing Laboratory:	Analytical Resources, Inc. – Tukwila, WA
Analyses:	TDS (SM 2540 C), Metals (EPA 6010C, 200.8): Dissolved As, Pb, K, Fe, Mn
Laboratory Report No.:	18C0036

Sample ID	Analyte(s)	Result	Qualifier	Reason(s)
South Pond	Lead	-	J-	MS/MSD recovery below QC limits, Duplicate RPD above QC limits
Infiltration #1	Iron	0.1	U	Method blank contamination
Infiltration #2	Iron	0.1	U	Method blank contamination
MW-1A	Iron	0.05	U	Method blank contamination
Still Well	Iron	0.1	U	Method blank contamination
MW-2A	Iron	0.05	U	Method blank contamination
MW-4A	Iron	0.05	U	Method blank contamination
MW-7A	Iron	0.05	U	Method blank contamination
All samples	All analytes	-	-	Remove any lab applied “D” qualifiers

VALIDATION PERFORMED BY:	Joseph Xi, Golder Associates
DATE:	March 21, 2018

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