ANNUAL GROUNDWATER MONITORING REPORT - YEAR 3

Olympic Water & Sewer, Inc.
781 Walker Way
Port Ludlow, Washington 98365
VCP Identification No. SW1311

Prepared for: Raydient

Project No. 130046 • February 23, 2023 FINAL

Aspect CONSULTING

earth + water

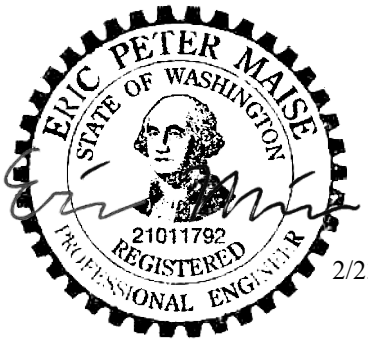
ANNUAL GROUNDWATER MONITORING REPORT - YEAR 3

Olympic Water & Sewer, Inc.
781 Walker Way
Port Ludlow, Washington 98365
VCP Identification No. SW1311

Prepared for: Raydient

Project No. 130046 • February 23, 2023 FINAL

Aspect Consulting, LLC



2/23/2023

Eric Maise, PE
Project Engineer
emaise@aspectconsulting.com

Eric Marhofer, PE
Senior Associate Engineer
emarhofer@aspectconsulting.com

V:\130046 OPG Port Ludlow Property\Deliverables\Year 3_GW Monitoring Report\Final\OWSI_Annual GW Monitoring Report_Year 3_Final_2023.02.23.docx

Contents

List of Tables

List of Figures

List of Appendices

Abbreviations

AGI	Applied Geotechnology, Inc.
Aspect	Aspect Consulting, LLC
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
COCs	contaminants of concern
Ecology	Washington Department of Ecology
EIM	Environmental Information Management
FFS	Focused Feasibility Study
GRO	gasoline-range organics
GMP	Groundwater Monitoring Plan
GWMR	Groundwater Monitoring Report
µg/L	micrograms per liter
MTCA	Model Toxics Control Act
MNA	Monitored Natural Attenuation
NFA	No Further Action
OWSI	Olympic Water & Sewer, Inc.
RL	reporting limit
USTs	underground storage tanks
VCP	Voluntary Cleanup Program
VOC	volatile organic compound
WAC	Washington Administrative Code

1 Introduction

Aspect Consulting, LLC (Aspect), has prepared this Annual Groundwater Monitoring Report (GWMR) on behalf of Raydient for the Olympic Water & Sewer, Inc. (OWSI), Site, which is located at 781 Walker Way in Port Ludlow, Washington.

1.1 Regulatory Framework

In September 1990, Applied Geotechnology, Inc. (AGI) removed three underground storage tanks (USTs) from the property – one 1,000-gallon UST and two 2,000-gallon USTs. During the UST removals, a release of gasoline from the 1,000-gallon UST was discovered, and gasoline-impacted soil was removed to the extents practicable. During the installation of a water supply well in April 2009, gasoline impacts to shallow, perched groundwater were discovered. The Jefferson County Health Department was notified, who further notified the Washington State Department of Ecology (Ecology). In September 2009, Ecology listed the Site on its Confirmed or Suspected Contaminated Sites list; the Site is identified as the Olympic Water & Sewer Inc Site, cleanup Site ID 1196, and facility ID 62223345.

The Model Toxics Control Act (MTCA) defines the Site as anywhere where a hazardous substance has come to be located (Washington Administrative Code [WAC] 173-340-200). Further investigation through 2013 confirmed that the Site can be defined as the release(s) of total petroleum hydrocarbons measured as gasoline-range organics (GRO) and benzene, toluene, ethylbenzene, and xylenes (BTEX) to soil and groundwater. As part of Site investigation and cleanup activities, a Focused Feasibility Study (FFS; Aspect, 2013) was performed, which identified a preferred remedial alternative in accordance with MTCA. The preferred remedial alternative for the Site consisted of three primary components:

- **Source Removal**: In 1990, three USTs were removed. During removal, a release of gasoline was discovered, and overexcavation of GRO-contaminated soil was performed. The cleanup action consisted of excavation of the impacted soil to the extents practicable; however, residual impacted soil was left in place at the base of one of the UST excavations to prevent structural damage to a nearby building. At that time, residual impacted soil was expected to occur from approximately 10 feet below ground surface (bgs) to the perched groundwater table between approximately 20 to 41 feet bgs (SLR, 2011).
- **Institutional Controls:** An environmental covenant was filed with Jefferson County on September 24, 2015, with the deed on the property that restricts certain activities that could cause exposure to impacted soils or groundwater, or could result in mobilization of contaminants at the Site. Specifically, the environmental covenant included the following deed restrictions:
  - The property zoning and use will remain commercial, as the cleanup levels established for compliance are based on a commercial land use.

  - The contaminated soil, which exceeds cleanup levels and remains on the property, is under existing structures and an existing layer of clean soil from the ground surface to a depth of 15 feet bgs. The covenant restricts the alteration of the current property configuration, including earthwork activities that may disturb the clean soil cap.
  - Groundwater use in the shallow, perched groundwater at the Site will not be used for water supply.
  - Groundwater monitoring will be maintained until groundwater at the Site meets applicable cleanup levels. The groundwater monitoring program was further defined in the second portion of the selected cleanup action as described below.
- **Monitored Natural Attenuation (MNA):** Cleanup levels at the Site will be achieved by the natural attenuation of GRO and BTEX in soil and groundwater. To monitor the natural attenuation of contaminants at the Site, a Groundwater Monitoring Plan (GMP) was developed that describes the frequency, location, and analyses of groundwater sampling activities to ensure the protectiveness of the selected cleanup action (Aspect, 2015). The GMP prescribed quarterly groundwater sampling during the first year of MNA, and annual groundwater sampling thereafter. The results of these groundwater sampling events will be evaluated during Ecology's 5-Year Site review.

The Site was entered in the Ecology Voluntary Cleanup Program (VCP) in 2013 and was assigned identification number SW1311. Ecology provided an opinion that upon completion of the preferred remedial alternative, no further remedial action would be necessary to clean up contamination at the Site (Ecology, 2014). The recorded environmental covenant was sent to Ecology on June 2, 2016. Ecology issued the no further action (NFA) determination letter on January 19, 2021.

1.2 Report Organization

This GWMR documents the results of the third year of MNA groundwater monitoring, in accordance with the Ecology-approved GMP. This report is organized to include the following Sections:

- **Section 2 – Site Background** describes the property location and zoning, operational history, topography, land use, and hydrogeology.
- **Section 3 – Groundwater Monitoring Procedures** describes the monitoring well network, contaminants of concern (COCs), and cleanup levels established for the Site, and the procedures for obtaining groundwater samples.
- **Section 4 – Groundwater Monitoring Results** describes the groundwater elevations, gradient, and flow directions, and laboratory analytical results for COCs during Year 3 of groundwater monitoring.
- **Section 5 – Summary** presents a summary of Year 3 groundwater monitoring activities and presents recommendations for continued monitoring under the GMP.

2 Site Background

2.1 Site Location and Description

The Site is located in Section 8, Township 28 North, Range 1 East in Port Ludlow, Washington (Figure 1). Identified as Jefferson County Parcel No. 821084004, the Site consists of an approximately 2.2-acre parcel of land located approximately 0.5 miles northwest of the Port Ludlow bay. The Site is located at the southwest corner of the intersection of Walker Way and Rainer Lane at 781 Walker Way (Figure 2).

The Site is densely forested, with an approximate 0.5-acre area developed with an OWSI operations and maintenance facility, consisting of an office/shop/garage building (garage building), a public water supply well (Well #2), pump house building for Well #2, and a storage trailer (Figure 2). The ground surface within the developed portion of the Site is primarily unpaved, except for a narrow asphalt driveway that runs down the center of the OWSI facility from Walker Way to approximately the storage trailer. A densely vegetated gulley, containing an intermittent seasonal stream, bisects the western half of the parcel, west of the OWSI facility, and flows off-property (Figure 2).

In 2020, OWSI, assisted by Robinson Noble, began the process of siting and installing a new public water supply well (Well #18) at the Site. A location in the northeast corner of the Site was selected based on the known location of petroleum impacts on the Site. Prior to Well #18 installation, a monitoring well (MW-18T; Figure 2) was installed to evaluate groundwater quality in the shallow, perched water-bearing zone in the vicinity of the well (Robinson Noble, 2020; Robinson Noble, 2021). In consultation with Ecology in December 2020, MW-18T and Well #18 were added to the annual groundwater monitoring program and the GMP has now been formally amended to include these wells (Aspect, 2022).

The ground surface elevation proximate to the northern property boundary of the Site is approximately 290 feet above mean sea level. The ground surface of the OWSI facility slopes gently to the southwest toward the intermittent stream (Figure 2).

2.2 Hydrogeology

Shallow groundwater at the Site occurs as a shallow, perched water-bearing zone within the glacial advance outwash and lacustrine deposits at depths above approximately 60 feet bgs. Seasonally, groundwater in the shallow, perched water-bearing zone at the Site ranges between 22 and 44 feet bgs, with individual wells showing seasonal fluctuations of groundwater levels of approximately 4.6 to 8.0 feet (Table 1). A deeper, regional water-bearing unit used for drinking water occurs at depths of between 215 and 245 feet bgs at Well #2 and Well #18. The regional aquifer depth to water was observed at 92 feet bgs (Table 1), which indicates this is confined and the potentiometric surface is higher than the top of the aquifer.

The shallow, perched water-bearing zone and the regional aquifer are separated by a thick aquitard comprised of clay and cemented silty sand. This aquitard was encountered in all borings at thicknesses ranging from 15 to more than 23 feet thick (Aspect, 2013). The

regional aquifer is greater than 150 feet below the top of the aquitard and the base of the shallow, perched water-bearing zone.

The shallow, perched water-bearing zone occurs within a sand to gravel unit, which is perched on top of the underlying clayey to gravelly, cemented silt to sand unit that comprises the aquitard (SLR, 2011). During periods of seasonal recharge, groundwater appears to collect above the silt and overlying silty sand units. In areas where the silty sands and silts are present at higher elevations, the groundwater elevations are higher. Groundwater within the shallow, perched water-bearing unit (wells MW-3 through MW-5) is hydraulically continuous with the deeper perched water intercepted by wells MW-1 and MW-2. The horizontal hydraulic conductivity of the sand to gravel unit is expected to be significantly (i.e., orders of magnitude) greater than the vertical hydraulic conductivity of the underlying silt and silty sand (Aspect, 2013). Therefore, groundwater accumulating in the shallow, perched water-bearing zone is expected to primarily flow laterally toward the intermittent stream in the gulley to the west.

The points of compliance for the shallow, perched groundwater at the Site were set for the protection of drinking water and the protection of surface water. Therefore, the points of compliance are within the perched aquifer extending vertically to the lowest depth potentially affected (the regional aquifer) and the discharge of groundwater to the intermittent stream.

3 Groundwater Monitoring Procedures

Year 3 of annual groundwater monitoring occurred on May 3, 4, and 9, 2022. Detailed sampling and quality assurance/quality control procedures are presented in the GMP (Aspect, 2015). In addition to the work outlined in the GMP, Year 3 monitoring included the addition of monitoring groundwater at Well #18, in accordance with the addendum to the GMP dated July 11, 2022 (Aspect, 2022).

The following presents a summary of procedures performed during Year 3 of groundwater monitoring.

3.1 Groundwater Monitoring Well Network

The long-term groundwater monitoring network at the Site consists of the existing monitoring wells on the Site (MW-1, MW-2, MW-3, MW-4, MW-5, and MW-18T), the water supply wells (Well #2 and Well #18), and the intermittent stream. Monitoring wells MW-1, MW-2, and MW-4 represent the source area wells because of their locations relative to the release of gasoline from the 1,000-gallon UST (Figure 2). Monitoring wells MW-5 and MW-18T represent the upgradient wells, as they are outside of the plume boundary. Water supply Well #2 and Well #18, and the intermittent stream serve as monitoring points to ensure that human and ecological receptors are protected.

3.2 Contaminants of Concern and Cleanup Levels

As described in the FFS, the groundwater cleanup levels for the Site are the MTCA Method A cleanup levels for unrestricted land use. MTCA Method A cleanup levels are appropriate because the Site meets the criteria of WAC 173-340-704(1): there are few hazardous substances at the Site, the implemented remedy qualifies as a routine cleanup action, and numerical standards are established for the hazardous substances at the Site. The groundwater COCs and applicable MTCA Method A cleanup levels are:

- GRO – 800 micrograms per liter (µg/L)
- Benzene – 5 µg/L
- Toluene – 1,000 µg/L
- Ethylbenzene – 700 µg/L
- Total xylenes – 1,000 µg/L

3.3 Groundwater Monitoring Procedures

The following procedures were implemented during the collection of groundwater samples for each quarter:

- Prior to sampling, all monitoring wells were inspected to ensure that the well monuments, well caps, and well casings were in good working order and remained undamaged between sampling events.

- Depth-to-groundwater measurements were recorded for each monitoring well with the exception of Well #2, which was not gauged since it is an active water supply well. The water level indicator was decontaminated between wells.
- With the exception of Well #2, each monitoring well was sampled using standard low-flow procedures. Wells were sampled using a portable bladder pump, which was decontaminated between wells, and a new bladder and tubing used at each monitoring well.
- During purging, field parameters (temperature, pH, specific electrical conductance, dissolved oxygen, and oxidation-reduction potential) were monitored using a YSI meter and flow-through cell. Turbidity was also monitored using a separate turbidimeter.
- To sample Well #2, the sample port closest to the wellhead was opened, and the pump was allowed to run for a minimum of 10 minutes to purge the well and flush the lines prior to collecting the sample.
- Groundwater samples were collected directly into laboratory-supplied sample containers.
- Quality control groundwater samples (field duplicates and trip blanks) were collected during each monitoring event.
- The intermittent stream was sampled using a peristaltic pump and standard low-flow procedures.
- Samples were maintained at the proper temperature for sample preservation and under chain of custody until delivered to the laboratory.
- Samples were submitted for analysis of site COCs (Section 2.2). In addition, groundwater samples were analyzed for geochemical parameters, which will be used during the 5-Year Site review to assess MNA.

There were no deviations from the GMP and the agreed- upon sampling protocol with Ecology during the Year 3 monitoring event.

4 Groundwater Monitoring Results

This section presents the results of the Year 3 groundwater monitoring at the Site.

4.1 Groundwater Elevations, Gradient, and Flow Direction

Groundwater elevations are summarized in Table 1 and depicted on Figure 4. During the third year of groundwater monitoring, groundwater elevations at the Site showed seasonal variation consistent with historical data. Compared with Years 1 and 2, the groundwater elevation in the shallow, perched water-bearing zone at individual wells fluctuated between 1.2 and 7.3 feet. Similarly, groundwater elevations in the deeper, regional aquifer (measured at Well #2 in Year 2 and Well #18 in Year 3) used for water supply showed a seasonal fluctuation of 7.3 feet. Groundwater elevations in the shallow, perched aquifer at the most upgradient (MW-18T) and downgradient (MW-2) monitoring wells differed by approximately 11.9 feet.

In the shallow, perched water-bearing zone, the flow direction is primarily to the west, with slight southerly flow in the northern portion of the Site and slight northerly flow in the southern portion of the Site. This gradient and direction are consistent with the results collected in Year 1 and Year 2 of groundwater monitoring (Figure 3 and Figure 4, respectively). Groundwater elevations and contours from Year 3 of groundwater monitoring are presented on Figure 5.

The groundwater flow direction was consistent with previous monitoring events. The horizontal hydraulic gradient varied slightly from previous monitoring events. In the central portion of the Site, horizontal gradient was approximately 0.22 foot/foot as measured on May 3, 2022. Horizontal hydraulic gradients measured during previous events varied between approximately 0.06 (February 2020) and 0.17 (November 4, 2021) foot/foot in previous monitoring events.

4.2 Groundwater and Surface Water Analytical Results

Groundwater analytical results from Year 3 are summarized in Table 2 and displayed on Figure 6. The laboratory analytical reports for Year 3 are included as Appendix A.

Groundwater analytical results were consistent with previous annual groundwater monitoring events and historical results (Table 3). GRO and benzene were detected at concentrations exceeding the MTCA Method A cleanup levels at monitoring wells MW-1 and MW-2:

- Concentrations of GRO at MW-1 and MW-2 were 3,900 and 2,200 µg/L, respectively; the MTCA Method A Cleanup Level for GRO is 800 µg/L.
- Concentrations of benzene at MW-1 and MW-2 were 120 and 79 µg/L, respectively; the MTCA Method A Cleanup Level for benzene is 5 µg/L.
- Toluene, ethylbenzene, and total xylenes were also detected at MW-1 and MW-2, but at concentrations below the respective MTCA Method A cleanup levels.

GRO and toluene were detected at Well #18, but at concentrations below the respective MTCA Method A cleanup levels. At the remaining monitoring wells (MW-3, MW-4, MW-5, and MW-18T) and the water supply well (Well #2), COCs were not detected during the Year 3 monitoring event above the laboratory reporting limit. Similarly, COCs were not detected in the sample collected from the intermittent stream (Table 2).

MNA parameters were collected from each well during the Year 3 sampling event. The MNA parameters included total alkalinity, nitrate and nitrite as nitrogen, sulfate, dissolved methane, and soluble manganese (Table 2). The geochemical data will be evaluated during the 5-Year Site Review to assess the progress of MNA.

4.3 Plume Stability Assessment

A linear regression analysis and nonparametric analysis for plume stability was performed using the Ecology data analysis tools (Ecology, 2007). Although insufficient historical data exists to perform all of the analyses available, a preliminary analysis using the Mann-Kendall test was performed. The preliminary analysis indicates that the groundwater plume is shrinking for MW-2; whereas the analysis indicates benzene is stable at MW-1, and the GRO plume may be expanding (Appendix B). If the data from 2010 and 2011 is excluded from the analysis and only the data from 2019 to 2022 is used, then the GRO plume is stable at MW-1. The results for MW-1 are consistent with last year, but should continue to be monitored. Further analyses will be conducted in following years, as the data set grows to support more-detailed linear regression and nonparametric analysis.

4.4 Data Validation and Management

The groundwater data was managed in a project database operated by Aspect, and has been uploaded to Ecology's Environmental Information Management (EIM) database. The Aspect database manager verified the completeness and correctness of all laboratory deliverables (i.e., laboratory report and EDDs) before loading the data into EIM. Field and laboratory quality control were validated in accordance with the U.S. Environmental Protection Agency (EPA) *National Functional Guidelines for organic and inorganic analyses* (EPA, 2008 and 2010, respectively), and laboratory-defined QC limits, with regard to the following (as appropriate to the particular analysis): sample documentation/custody, holding times, reporting limits, blank/rinsate samples, surrogate percent recoveries, laboratory duplicates, field duplicates, comparability, and completeness.

For each sampling event, blind field duplicates were submitted to the laboratory. EPA data validation guidance provides no specific evaluation criteria for field duplicate samples. Advisory evaluation criteria are set forth at 35 percent for relative percent difference (if both results are greater than 5 times the reporting limit [RL]) and two times the RLs for concentration difference (if either of the result is less than 5 times the RL) between the original and field duplicate results. Results between the field duplicate and sample varied between 2.6 percent and 4.4 percent, indicating the results were valid and reproducible.

Trip blanks were submitted to monitor possible cross-contamination occurring during sample transport. No detections of GRO or BTEX were noted in the trip blanks from each quarter.

5 Summary

Groundwater elevations, flow directions, and horizontal hydraulic gradients were consistent with historical results. The flow direction (to the west) and the steep hydraulic gradient are driven by local geology: the clayey and gravelly silt bed, which creates the perched groundwater condition, dips steeply to the west towards the gully and intermittent stream. However, the interconnectedness of the shallow, perched groundwater to surface water is not apparent, as the stream only flows intermittently, and COCs have never been detected in surface water at the Site.

Analytical results from Year 3 groundwater sampling were consistent with historical results. GRO and benzene concentrations exceeded the Site cleanup levels at MW-1 and MW-2. GRO and toluene were detected at Well #18 at concentrations below the cleanup levels. COCs were not detected at any of the remaining monitoring wells, in water supply Well #2, nor the intermittent stream.

Based on the results of groundwater monitoring at the OWSI Site, the groundwater plume is largely stable and/or shrinking, and there are no complete exposure pathways of contaminated groundwater to either surface water or drinking water. However, the GRO plume at MW-1 should be monitored in future years for its stability. Continued MNA of the groundwater plume is recommended at the frequency prescribed in the GMP.

Laboratory reports from the annual sampling event at water supply wells Well #2 and Well #18 were submitted to the Washington State Office of Drinking Water within 5 days of receipt, as prescribed by the GMP. Analytical results were evaluated for quality control in accordance with the GMP, and all analytical results were validated and loaded into Ecology's EIM database.

For Years 4 through 5 of MNA, groundwater sampling will be performed on an annual basis, and a GWMR will be generated following receipt of laboratory analytical data. The next annual monitoring event should be performed in Spring 2023.

6 References

Aspect Consulting, LLC (Aspect), 2013, Focused Feasibility Study, Olympic Water & Sewer, Inc. Site, dated September 24, 2013.

Aspect Consulting, LLC (Aspect), 2015, Groundwater Monitoring Plan, Olympic Water & Sewer, Inc. Site, dated July 20, 2015.

Aspect Consulting, LLC (Aspect), 2022, Groundwater Monitoring Plan Addendum, Olympic Water & Sewer, Inc. Site, dated July 11, 2022.

Robinson Noble, Inc. (Robinson Noble), 2020, Notification of Proposed Drilling Operation, dated December 11, 2020.

Robinson Noble, Inc. (Robinson Noble), 2021, Drilling and testing results for monitoring Well MW-18T; radius of control-variance for Olympic Water and Sewer, Inc. Production Well 2R (Well 18), dated January 25, 2021.

SLR, 2011, Additional Investigation Report, Olympic Water & Sewer, Inc. Property, 781 Walker Way, Port Ludlow, Washington, August 2, 2011.

U.S. Environmental Protection Agency (EPA), 2008, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, Office of Superfund Remediation and Technical Innovation, U.S. Environmental Protection Agency, June 2008, USEPA-540-R-08-01.

U.S. Environmental Protection Agency (EPA), 2010, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, Office of Superfund Remediation and Technical Innovation, U.S. Environmental Protection Agency, January 2010, USEPA 540/R-10/011.

Washington State Department of Ecology (Ecology), 2007, Natural Attenuation Analysis Tool Package for Petroleum-Contaminated Groundwater, July 2005, updated for Excel version 2007.

Washington State Department of Ecology (Ecology), 2014, Letter Re: Opinion on Proposed Cleanup of the following Site: Olympic Water & Sewer Inc. 781 Walker Way, Port Ludlow, WA 98365, Cleanup Site ID 1196, Facility/Site No. 62223345, VCP Project No. SW1311, Prepared for Tom Ringo OPG/Pope Resources, LP, February 11, 2014.

7 Limitations

Work for this project was performed for the Olympic Property Group and Pope Resources, LP (Clients), and this report was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This report does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Please refer to Appendix C titled "Report Limitations and Guidelines for Use" for additional information governing the use of this report.

TABLES

Table 1. Summary of Groundwater Elevation Data

Project No. 130046, Port Ludlow, Washington

Well Number	Top of Casing Elevation[a] (feet)	Date Measured	Depth to Groundwater[b] (feet)	Groundwater Elevation (feet)
MW-1	294.02	06/14/10	41.33	252.69
		10/20/10	40.30	253.72
		04/08/11	36.98	257.04
		07/11/19	37.89	256.13
		11/08/19	40.14	253.88
		02/11/20	39.42	254.60
		05/28/20	36.75	257.27
		11/04/21	37.80	256.22
		05/04/22	35.57	258.45
MW-2	293.79	06/14/10	39.63	254.16
		10/20/10	40.71	253.08
		04/08/11	36.90	256.89
		07/11/19	43.58	250.21
		11/08/19	41.95	251.84
		02/11/20	43.20	250.59
		05/28/20	39.78	254.01
		11/04/21	41.70	252.09
		05/04/22	36.41	257.38
MW-3	289.37	06/14/10	25.19	264.18
		10/20/10	28.70	260.67
		04/08/11	23.02	266.35
		07/11/19	27.68	261.69
		11/08/19	31.06	258.31
		02/11/20	29.96	259.41
		05/28/20	26.35	263.02
		11/04/21	31.05	258.32
		05/04/22	23.73	265.64
MW-4	295.33	06/14/10	23.92	271.41
		10/20/10	26.67	268.66
		04/08/11	21.95	273.38
		07/11/19	27.75	267.58
		11/08/19	29.06	266.27
		02/11/20	28.03	267.30
		05/28/20	25.43	269.90
		11/04/21	28.23	267.10
		05/03/22	22.61	272.72
MW-5	299.40	04/08/11	23.55	275.85
		07/11/19	29.04	270.36
		11/08/19	30.36	269.04
		02/11/20	27.59	271.81
		05/28/20	25.73	273.67
		11/04/21	29.75	269.65
		05/03/22	23.82	275.58
MW-18T	300.74	11/04/21	30.10	270.64
		05/03/22	24.55	276.19
Well #2	Not Surveyed	07/11/19	87.10	--
		11/08/19	83.78	--
		02/11/20	86.29	--
		05/28/20	84.82	--
Well #18	Not Surveyed	05/09/22	92.11	--

Notes:

[a] Top of casing elevations were surveyed relative to NAVD88 datum.

[b] Depth to groundwater measured in feet below top of PVC casing.

Table 2. Year 3 Groundwater Analytical Results

Project No. 130046, Port Ludlow, Washington

				Location	MW-1	MW-2	MW-3	MW-4	MW-5	Well #2	MW-18T-220503	SW-1	Well #18
				Date	05/03/2022	05/04/2022	05/03/2022	05/03/2022	05/03/2022	05/09/2022	05/03/2022	05/03/2022	05/09/2022
				Sample	MW-1-220503	MW-2-220504	MW-3-220503	MW-4-220503	MW-5-220503	WELL 2-220509	MW-18T-220503	SW-1-220503	WELL 18-220509
Analyte	**CAS_RN**	**Fraction**	**Unit**	**MTCA Method A Cleanup Level**									
Total Petroleum Hydrocarbons (TPHs)													
Gasoline-Range Organics	TPH-GRO	T	µg/L	800 | 1000	**3900**	**2200**	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	**120**
BTEX													
Benzene	71-43-2	T	µg/L	5	**120**	**79**	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Toluene	108-88-3	T	µg/L	1000	**87**	**43**	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	**38**
Ethylbenzene	100-41-4	T	µg/L	700	**350**	**180**	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Total Xylenes	1330-20-7	T	µg/L	1000	**100**	**41**	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U
Conventionals													
Alkalinity, Total	ALKT	T	mg/L		**272**	**336**	**201**	**111**	**116**	--	**156**	--	--
Nitrate as Nitrogen	14797-55-8	T	mg/L		< 0.100 UJ	< 0.200 UJ	**1.78 J**	**0.335 J**	**0.419 J**	--	**0.282 J**	--	--
Nitrite as Nitrogen	14797-65-0	T	mg/L		--	--	--	--	--	--	--	--	--
Sulfate	14808-79-8	T	mg/L		< 0.600 U	**12.0**	**17.3**	**7.68**	**5.15**	--	**7.37**	--	--
Dissolved Gases													
Methane	74-82-8	T	mg/L		**30.6**	**0.684**	**0.198**	< 0.00675 U	< 0.00675 U	--	< 0.00675 U	--	--
Field Parameters													
Temperature	Temp	N	deg C		**10.2**	**10.3**	**10**	**10.8**	**10.2**	**10.9**	**10.2**	--	**11.2**
Specific Conductance	Cond	N	µS/cm		**286.8**	**283.2**	**216.5**	**147.1**	**157.5**	**1908**	**224.4**	--	**138.2**
Dissolved Oxygen	DO	N	mg/L		**0.64**	**0.45**	**3.58**	**5.73**	**4.48**	**1.87**	**2.95**	--	**10.69**
pH	pH	N	pH units		**7.47**	**7.72**	**7.51**	**7.77**	**7.14**	**7.19**	**6.97**	--	**8.95**
Oxidation Reduction Potential	ORP	N	mV		**-93.1**	**14.4**	**100.7**	**107.5**	**81.9**	**-7.4**	**130.6**	--	**70.8**
Turbidity	Turb	N	NTU		**3.43**	**1.16**	**5.1**	**11**	**67.5**	**0.93**	**77.4**	--	**18.9**
Iron, Ferrous, Fe+2	15438-31-0	N	ppm		--	--	--	--	--	--	--	--	--
Manganese, Mn+2	15438-31-0	N	ppm		--	--	--	--	--	--	--	--	--
Metals													
Manganese	7439-96-5	D	µg/L		**614**	**325**	< 1 U	< 1 U	**2.46**	--	**28.3**	--	--

Notes:
Bold - detected
Blue Shaded - Detected result exceeded screening level
U - Analyte not detected at or above Reporting Limit (RL) shown
J - Result value estimated
UJ - Analyte not detected and the Reporting Limit (RL) is an estimate
D - Dissolved Fraction (filtered) sample result
T - Total Fraction (unfiltered) sample result
deg C - degrees Celsius
mg/L - milligrams per liter
mV - millivolts
µg/L - micrograms per liter
NTU - nephelometric turbidity units
ppm - parts per million
Gasoline Range Hydrocarbons are screened against a tighter value when benzene is present in the sample.
"--" - indicates results not available

Table 3. Summary of Historical Groundwater Analytical Results

Project No. 130046, Port Ludlow, Washington

					Location	MW-1								
					Date	06/11/2010	10/20/2010	04/07/2011	07/11/2019	11/08/2019	02/11/2020	05/28/2020	11/04/2021	05/03/2022
					Sample	MW1-0610	MW1-1010	MW1-411	MW-1-071119	MW-1-110819	MW-1-021120	MW-1-052820	MW-1-110421	MW-1-220503
Analyte	CAS_RN	Fraction	Unit	MTCA Method A Cleanup Level										
Total Petroleum Hydrocarbons (TPHs)														
Gasoline-Range Organics	TPH-GRO	T	µg/L	800 | 1000		**990**	**1900**	**3000**	**4000**	**3600**	**3900**	**4300**	**3700**	**3900**
BTEX														
Benzene	71-43-2	T	µg/L	5		**110**	**520**	**530**	**180**	**180**	**200**	**190**	**130**	**120**
Toluene	108-88-3	T	µg/L	1000		**45**	**140**	**82**	**61**	**58**	**72**	**100**	**60**	**87**
Ethylbenzene	100-41-4	T	µg/L	700		**1.1**	**110**	**160**	**360**	**340**	**420**	**410**	**320**	**350**
Total Xylenes	1330-20-7	T	µg/L	1000		--	--	**120**	**68**	< 30 U	< 30 U	**120**	**50**	**100**
Conventionals														
Alkalinity, Total	ALKT	T	mg/L			--	--	--	**312**	--	**292**	--	**282**	**272**
Nitrate as Nitrogen	14797-55-8	T	mg/L			--	--	--	< 0.5 U	--	< 0.100 U	--	< 0.500 UJ	< 0.100 UJ
Nitrite as Nitrogen	14797-65-0	T	mg/L			--	--	--	< 0.5 U	--	< 0.100 U	--	< 0.500 UJ	--
Sulfate	14808-79-8	T	mg/L			--	--	--	**0.868**	--	**0.963**	--	< 0.600 U	< 0.600 U
Dissolved Gases														
Methane	74-82-8	T	mg/L			--	--	--	**0.057**	--	**0.0367**	--	**0.0739**	**30.6**
Field Parameters														
Temperature	Temp	N	deg C			--	--	--	--	--	--	--	**12**	**10.2**
Specific Conductance	Cond	N	µS/cm			--	--	--	--	--	--	--	**284.3**	**286.8**
Dissolved Oxygen	DO	N	mg/L			--	--	--	--	--	--	--	**0.39**	**0.64**
pH	pH	N	pH units			--	--	--	--	--	--	--	**6.88**	**7.47**
Oxidation Reduction Potential	ORP	N	mV			--	--	--	--	--	--	--	**62.7**	**-93.1**
Turbidity	Turb	N	NTU			--	--	--	--	--	--	--	**23.1**	**3.43**
Manganese, soluble, Mn+2	15438-31-0	N	mg/L			--	--	--	--	--	< 0.3	< 0	< 0	--
Iron, Ferrous, Fe+2	15438-31-0	N	mg/L			--	--	--	--	--	0.5	0.5	< 0	--
Metals														
Iron	7439-89-6	D	µg/L			--	--	--	**590**	--	--	--	--	--
Lead	7439-92-1	T	µg/L	15		< 1 U	--	--	--	--	--	--	--	--
Manganese	7439-96-5	D	µg/L			--	--	--	**805**	--	--	--	--	**614**
Polycyclic Aromatic Hydrocarbons (PAHs)														
Naphthalene	91-20-3	T	µg/L	160		< 1 U	**15**	--	--	--	--	--	--	--
Volatile Organic Compounds (VOCs)														
1,2-Dibromoethane (EDB)	106-93-4	T	µg/L	0.01		< 0.01 U	--	--	--	--	--	--	--	--
1,2-Dichloroethane (EDC)	107-06-2	T	µg/L	5		< 1 U	--	--	--	--	--	--	--	--
m,p-Xylenes	179601-23-1	T	µg/L			**56**	**71**	--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	1634-04-4	T	µg/L	20		< 1 U	--	--	--	--	--	--	--	--
o-Xylene	95-47-6	T	µg/L			**130**	**150**	--	--	--	--	--	--	--

Notes:

Bold - detected

Blue Shaded - Detected result exceeded screening level.

U - Analyte not detected at or above Reporting Limit (RL) shown.

J - Result value estimated

UJ - Analyte not detected and the Reporting Limit (RL) is an estimate.

D - Dissolved Fraction (filtered) sample result

T - Total Fraction (unfiltered) sample result

deg C - degrees Celsius

mg/L - milligrams per liter

mV - millivolts

µg/L - micrograms per liter

NTU - nephelometric turbidity units

ppm - parts per million

Gasoline Range Hydrocarbons are screened against a tighter value when benzene is present in the sample.

"--" - indicates results not available

Table 3. Summary of Historical Groundwater Analytical Results

Project No. 130046, Port Ludlow, Washington

				Location	MW-2								
				Date	06/11/2010	10/20/2010	04/07/2011	07/11/2019	11/08/2019	02/11/2020	05/28/2020	11/04/2021	05/04/2022
				Sample	MW2-0610	MW2-1010	MW2-411	MW-2-071119	MW-2-110819	MW-2-021120	MW-2-052820	MW-2-110421	MW-2-220504
Analyte	CAS_RN	Fraction	Unit	MTCA Method A Cleanup Level									
Total Petroleum Hydrocarbons (TPHs)													
Gasoline-Range Organics	TPH-GRO	T	µg/L	800 | 1000	**8400**	**3900**	**5600**	**6400**	**5400**	**5000**	**2800**	**2700**	**2200**
BTEX													
Benzene	71-43-2	T	µg/L	5	**2100**	**1300**	**500**	**780**	**820**	**840**	**150**	**220**	**79**
Toluene	108-88-3	T	µg/L	1000	**620**	**290**	**730**	**120**	**83**	**79**	**58**	**46**	**43**
Ethylbenzene	100-41-4	T	µg/L	700	**960**	**430**	**160**	**380**	**260**	**240**	**240**	**180**	**180**
Total Xylenes	1330-20-7	T	µg/L	1000	--	--	**410**	**91**	**69**	**64**	< 60 U	**37**	**41**
Conventionals													
Alkalinity, Total	ALKT	T	mg/L		--	--	--	**422**	--	**380**	--	**339**	**336**
Nitrate as Nitrogen	14797-55-8	T	mg/L		--	--	--	< 0.5 U	--	< 0.100 U	--	< 0.500 UJ	< 0.200 UJ
Nitrite as Nitrogen	14797-65-0	T	mg/L		--	--	--	< 0.5 U	--	< 0.100 U	--	< 0.500 UJ	--
Sulfate	14808-79-8	T	mg/L		--	--	--	**13.1**	--	**14.6**	--	**13.2**	**12.0**
Dissolved Gases													
Methane	74-82-8	T	mg/L		--	--	--	**0.0284**	--	**0.0158**	--	**0.0153**	**0.684**
Field Parameters													
Temperature	Temp	N	deg C		--	--	--	--	--	--	--	**11.2**	**10.3**
Specific Conductance	Cond	N	µS/cm		--	--	--	--	--	--	--	**342.5**	**283.2**
Dissolved Oxygen	DO	N	mg/L		--	--	--	--	--	--	--	**1.29**	**0.45**
pH	pH	N	pH units		--	--	--	--	--	--	--	**7.24**	**7.72**
Oxidation Reduction Potential	ORP	N	mV		--	--	--	--	--	--	--	**49**	**14.4**
Turbidity	Turb	N	NTU		--	--	--	--	--	--	--	**48.1**	**1.16**
Manganese, soluble, Mn+2	15438-31-0	N	mg/L		--	--	--	--	--	< 0.3	< 0	< 0	--
Iron, Ferrous, Fe+2	15438-31-0	N	mg/L		--	--	--	--	--	0.5	< 0	< 0	--
Metals													
Iron	7439-89-6	D	µg/L		--	--	--	**453**	--	--	--	--	--
Lead	7439-92-1	T	µg/L	15	< 1 U	--	--	--	--	--	--	--	--
Manganese	7439-96-5	D	µg/L		--	--	--	**491**	--	--	--	--	**325**
Polycyclic Aromatic Hydrocarbons (PAHs)													
Naphthalene	91-20-3	T	µg/L	160	**100**	**35**	--	--	--	--	--	--	--
Volatile Organic Compounds (VOCs)													
1,2-Dibromoethane (EDB)	106-93-4	T	µg/L	0.01	< 0.01 U	--	--	--	--	--	--	--	--
1,2-Dichloroethane (EDC)	107-06-2	T	µg/L	5	< 1 U	--	--	--	--	--	--	--	--
m,p-Xylenes	179601-23-1	T	µg/L		**400**	**240**	--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	1634-04-4	T	µg/L	20	< 1 U	--	--	--	--	--	--	--	--
o-Xylene	95-47-6	T	µg/L		**250**	**290**	--	--	--	--	--	--	--

Notes:

Bold - detected

Blue Shaded - Detected result exceeded screening level.

U - Analyte not detected at or above Reporting Limit (RL) shown.

J - Result value estimated

UJ - Analyte not detected and the Reporting Limit (RL) is an estimate.

D - Dissolved Fraction (filtered) sample result

T - Total Fraction (unfiltered) sample result

deg C - degrees Celsius

mg/L - milligrams per liter

mV - millivolts

µg/L - micrograms per liter

NTU - nephelometric turbidity units

ppm - parts per million

Gasoline Range Hydrocarbons are screened against a tighter value when benzene is present in the sample.

"--" - indicates results not available

Table 3. Summary of Historical Groundwater Analytical Results

Project No. 130046, Port Ludlow, Washington

Analyte	CAS_RN	Fraction	Unit	MTCA Method A Cleanup Level	Location: MW-3								
					Date: 06/11/2010	10/20/2010	04/07/2011	07/11/2019	11/08/2019	02/11/2020	05/28/2020	11/04/2021	05/03/2022
					Sample: MW3-0610	MW3-1010	MW3-411	MW3-071119	MW3-110819	MW3-021120	MW3-052820	MW3-110421	MW3-220503
Total Petroleum Hydrocarbons (TPHs)													
Gasoline-Range Organics	TPH-GRO	T	µg/L	800 | 1000	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
BTEX													
Benzene	71-43-2	T	µg/L	5	**0.36**	< 0.35 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Toluene	108-88-3	T	µg/L	1000	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Ethylbenzene	100-41-4	T	µg/L	700	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Total Xylenes	1330-20-7	T	µg/L	1000	--	--	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U
Conventionals													
Alkalinity, Total	ALKT	T	mg/L		--	--	--	**202**	--	**205**	--	**211**	**201**
Nitrate as Nitrogen	14797-55-8	T	mg/L		--	--	--	**2.14**	--	**2.22**	--	**1.68**	**1.78 J**
Nitrite as Nitrogen	14797-65-0	T	mg/L		--	--	--	< 0.2 U	--	< 0.200 U	--	< 0.500 UJ	--
Sulfate	14808-79-8	T	mg/L		--	--	--	**17.4**	--	**15.3**	--	**16.1**	**17.3**
Dissolved Gases													
Methane	74-82-8	T	mg/L		--	--	--	< 0.00863 U	--	< 0.00863 U	--	< 0.00675 U	**0.198**
Field Parameters													
Temperature	Temp	N	deg C		--	--	--	--	--	--	--	**12.3**	**10**
Specific Conductance	Cond	N	µS/cm		--	--	--	--	--	--	--	**234.1**	**216.5**
Dissolved Oxygen	DO	N	mg/L		--	--	--	--	--	--	--	**4.07**	**3.58**
pH	pH	N	pH units		--	--	--	--	--	--	--	**7.04**	**7.51**
Oxidation Reduction Potential	ORP	N	mV		--	--	--	--	--	--	--	**61.3**	**100.7**
Turbidity	Turb	N	NTU		--	--	--	--	--	--	--	**25**	**5.1**
Manganese, soluble, Mn+2	15438-31-0	N	mg/L		--	--	--	--	--	< 0	< 0	< 0	--
Iron, Ferrous, Fe+2	15438-31-0	N	mg/L		--	--	--	--	--	< 0	< 0	< 0	--
Metals													
Iron	7439-89-6	D	µg/L		--	--	--	**128**	--	--	--	--	--
Lead	7439-92-1	T	µg/L	15	< 1 U	--	--	--	--	--	--	--	--
Manganese	7439-96-5	D	µg/L		--	--	--	< 1 U	--	--	--	--	< 1 U
Polycyclic Aromatic Hydrocarbons (PAHs)													
Naphthalene	91-20-3	T	µg/L	160	< 1 U	< 1 U	--	--	--	--	--	--	--
Volatile Organic Compounds (VOCs)													
1,2-Dibromoethane (EDB)	106-93-4	T	µg/L	0.01	< 0.01 U	--	--	--	--	--	--	--	--
1,2-Dichloroethane (EDC)	107-06-2	T	µg/L	5	< 1 U	--	--	--	--	--	--	--	--
m,p-Xylenes	179601-23-1	T	µg/L		< 2 U	< 2 U	--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	1634-04-4	T	µg/L	20	< 1 U	--	--	--	--	--	--	--	--
o-Xylene	95-47-6	T	µg/L		< 1 U	< 1 U	--	--	--	--	--	--	--

Notes:

Bold - detected

Blue Shaded - Detected result exceeded screening level.

U - Analyte not detected at or above Reporting Limit (RL) shown.

J - Result value estimated

UJ - Analyte not detected and the Reporting Limit (RL) is an estimate.

D - Dissolved Fraction (filtered) sample result

T - Total Fraction (unfiltered) sample result

deg C - degrees Celsius

mg/L - milligrams per liter

mV - millivolts

µg/L - micrograms per liter

NTU - nephelometric turbidity units

ppm - parts per million

Gasoline Range Hydrocarbons are screened against a tighter value when benzene is present in the sample.

"--" - indicates results not available

Table 3. Summary of Historical Groundwater Analytical Results

Project No. 130046, Port Ludlow, Washington

				Location	MW-4								
				Date	06/11/2010	10/20/2010	04/08/2011	07/11/2019	11/08/2019	02/11/2020	05/28/2020	11/04/2021	05/03/2022
				Sample	MW4-0610	MW4-1010	MW4-411	MW4-071119	MW4-110819	MW4-021120	MW4-052820	MW4-110421	MW4-220503
Analyte	CAS_RN	Fraction	Unit	MTCA Method A Cleanup Level									
Total Petroleum Hydrocarbons (TPHs)													
Gasoline-Range Organics	TPH-GRO	T	µg/L	800 | 1000	< 100 U	< 100 U	**380**	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
BTEX													
Benzene	71-43-2	T	µg/L	5	< 0.35 U	< 0.35 U	**5.3**	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Toluene	108-88-3	T	µg/L	1000	< 1 U	< 1 U	**75**	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Ethylbenzene	100-41-4	T	µg/L	700	< 1 U	< 1 U	**13**	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Total Xylenes	1330-20-7	T	µg/L	1000	--	--	**47**	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U
Conventionals													
Alkalinity, Total	ALKT	T	mg/L		--	--	--	**140**	--	**239**	--	**127**	**111**
Nitrate as Nitrogen	14797-55-8	T	mg/L		--	--	--	**0.551**	--	**0.604**	--	**0.580**	**0.335 J**
Nitrite as Nitrogen	14797-65-0	T	mg/L		--	--	--	< 0.1 U	--	< 0.100 U	--	< 0.500 UJ	--
Sulfate	14808-79-8	T	mg/L		--	--	--	**8.76**	--	**8.17**	--	**7.59**	**7.68**
Dissolved Gases													
Methane	74-82-8	T	mg/L		--	--	--	< 0.00863 U	--	< 0.00863 U	--	< 0.00675 U	< 0.00675 U
Field Parameters													
Temperature	Temp	N	deg C		--	--	--	--	--	--	--	**12.5**	**10.8**
Specific Conductance	Cond	N	µS/cm		--	--	--	--	--	--	--	**149.6**	**147.1**
Dissolved Oxygen	DO	N	mg/L		--	--	--	--	--	--	--	**5.18**	**5.73**
pH	pH	N	pH units		--	--	--	--	--	--	--	**7.68**	**7.77**
Oxidation Reduction Potential	ORP	N	mV		--	--	--	--	--	--	--	**97.6**	**107.5**
Turbidity	Turb	N	NTU		--	--	--	--	--	--	--	**38.6**	**11**
Manganese, soluble, Mn+2	15438-31-0	N	mg/L		--	--	--	--	--	< 0	< 0	< 0	--
Iron, Ferrous, Fe+2	15438-31-0	N	mg/L		--	--	--	--	--	< 0.5	< 0	< 0	--
Metals													
Iron	7439-89-6	D	µg/L		--	--	--	**65.5**	--	--	--	--	--
Lead	7439-92-1	T	µg/L	15	< 1 U	--	--	--	--	--	--	--	--
Manganese	7439-96-5	D	µg/L		--	--	--	< 1 U	--	--	--	--	< 1 U
Polycyclic Aromatic Hydrocarbons (PAHs)													
Naphthalene	91-20-3	T	µg/L	160	< 1 U	< 1 U	--	--	--	--	--	--	--
Volatile Organic Compounds (VOCs)													
1,2-Dibromoethane (EDB)	106-93-4	T	µg/L	0.01	< 0.01 U	--	--	--	--	--	--	--	--
1,2-Dichloroethane (EDC)	107-06-2	T	µg/L	5	< 1 U	--	--	--	--	--	--	--	--
m,p-Xylenes	179601-23-1	T	µg/L		< 2 U	< 2 U	--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	1634-04-4	T	µg/L	20	< 1 U	--	--	--	--	--	--	--	--
o-Xylene	95-47-6	T	µg/L		< 1 U	< 1 U	--	--	--	--	--	--	--

Notes:

Bold - detected

Blue Shaded - Detected result exceeded screening level.

U - Analyte not detected at or above Reporting Limit (RL) shown.

J - Result value estimated

UJ - Analyte not detected and the Reporting Limit (RL) is an estimate.

D - Dissolved Fraction (filtered) sample result

T - Total Fraction (unfiltered) sample result

deg C - degrees Celsius

mg/L - milligrams per liter

mV - millivolts

µg/L - micrograms per liter

NTU - nephelometric turbidity units

ppm - parts per million

Gasoline Range Hydrocarbons are screened against a tighter value when benzene is present in the sample.

"--" - indicates results not available

Table 3. Summary of Historical Groundwater Analytical Results

Project No. 130046, Port Ludlow, Washington

Analyte	CAS_RN	Fraction	Unit	MTCA Method A Cleanup Level	Location	MW-5							MW-18T	
					Date	04/08/2011	07/11/2019	11/08/2019	02/11/2020	05/28/2020	11/04/2021	05/03/2022	11/04/2021	05/03/2022
					Sample	MW5-411	MW-5-071119	MW-5-110819	MW-5-021120	MW-5-052820	MW-5-110421	MW-5-220503	MW-18T-110421	MW-18T-220503
Total Petroleum Hydrocarbons (TPHs)														
Gasoline-Range Organics	TPH-GRO	T	µg/L	800 | 1000		**220**	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U
BTEX														
Benzene	71-43-2	T	µg/L	5		**3.4**	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Toluene	108-88-3	T	µg/L	1000		**43**	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Ethylbenzene	100-41-4	T	µg/L	700		**7.8**	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Total Xylenes	1330-20-7	T	µg/L	1000		**25**	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U
Conventionals														
Alkalinity, Total	ALKT	T	mg/L			--	**136**	--	**146**	--	**126**	**116**	--	**156**
Nitrate as Nitrogen	14797-55-8	T	mg/L			--	**0.561**	--	**0.628**	--	**0.630**	**0.419 J**	--	**0.282 J**
Nitrite as Nitrogen	14797-65-0	T	mg/L			--	< 0.1 U	--	< 0.200 U	--	< 0.500 UJ	--	--	--
Sulfate	14808-79-8	T	mg/L			--	**6.66**	--	**4.61**	--	**6.71**	**5.15**	--	**7.37**
Dissolved Gases														
Methane	74-82-8	T	mg/L			--	< 0.00863 U	--	< 0.00863 U	--	< 0.00675 U	< 0.00675 U	--	< 0.00675 U
Field Parameters														
Temperature	Temp	N	deg C			--	--	--	--	--	**11.1**	**10.2**	**11.3**	**10.2**
Specific Conductance	Cond	N	µS/cm			--	--	--	--	--	**179.2**	**157.5**	**232.2**	**224.4**
Dissolved Oxygen	DO	N	mg/L			--	--	--	--	--	**4.56**	**4.48**	**4.09**	**2.95**
pH	pH	N	pH units			--	--	--	--	--	**6.52**	**7.14**	**6.81**	**6.97**
Oxidation Reduction Potential	ORP	N	mV			--	--	--	--	--	**100**	**81.9**	**69.7**	**130.6**
Turbidity	Turb	N	NTU			--	--	--	--	--	**93.7**	**67.5**	**56.6**	**77.4**
Manganese, soluble, Mn+2	15438-31-0	N	mg/L			--	--	--	< 0	< 0	< 0	--	< 0	--
Iron, Ferrous, Fe+2	15438-31-0	N	mg/L			--	--	--	< 0	< 0	**0.5**	--	< 0	--
Metals														
Iron	7439-89-6	D	µg/L			--	**81.3**	--	--	--	--	--	--	--
Lead	7439-92-1	T	µg/L	15		--	--	--	--	--	--	--	--	--
Manganese	7439-96-5	D	µg/L			--	< 1 U	--	--	--	--	**2.46**	--	**28.3**
Polycyclic Aromatic Hydrocarbons (PAHs)														
Naphthalene	91-20-3	T	µg/L	160		--	--	--	--	--	--	--	--	--
Volatile Organic Compounds (VOCs)														
1,2-Dibromoethane (EDB)	106-93-4	T	µg/L	0.01		--	--	--	--	--	--	--	--	--
1,2-Dichloroethane (EDC)	107-06-2	T	µg/L	5		--	--	--	--	--	--	--	--	--
m,p-Xylenes	179601-23-1	T	µg/L			--	--	--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	1634-04-4	T	µg/L	20		--	--	--	--	--	--	--	--	--
o-Xylene	95-47-6	T	µg/L			--	--	--	--	--	--	--	--	--

Notes:

Bold - detected

Blue Shaded - Detected result exceeded screening level.

U - Analyte not detected at or above Reporting Limit (RL) shown.

J - Result value estimated

UJ - Analyte not detected and the Reporting Limit (RL) is an estimate.

D - Dissolved Fraction (filtered) sample result

T - Total Fraction (unfiltered) sample result

deg C - degrees Celsius

mg/L - milligrams per liter

mV - millivolts

µg/L - micrograms per liter

NTU - nephelometric turbidity units

ppm - parts per million

Gasoline Range Hydrocarbons are screened against a tighter value when benzene is present in the sample.

"--" - indicates results not available

Table 3. Summary of Historical Groundwater Analytical Results

Project No. 130046, Port Ludlow, Washington

				Location	Well #2						Well #18	SVE-1	SVE-2	Stream	
				Date	07/11/2019	11/08/2019	02/11/2020	05/28/2020	11/04/2021	05/09/2022	05/09/2022	04/07/2011	04/07/2011	2/11/2020	05/03/2022
				Sample	W-2-071119-P	W-2-110819	W-2-021120	W-2-052820	W-2-110421	WELL 2-220509	WELL 18-220509	SVE1-411	SVE2-411	SW-1-021120	SW-1-220503
Analyte	CAS_RN	Fraction	Unit	MTCA Method A Cleanup Level											
Total Petroleum Hydrocarbons (TPHs)															
Gasoline-Range Organics	TPH-GRO	T	µg/L	800 | 1000	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	**120**	**34000**	**2000**	< 100 U	< 100 U
BTEX															
Benzene	71-43-2	T	µg/L	5	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	**550**	**5**	< 1 U	< 1 U
Toluene	108-88-3	T	µg/L	1000	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	**38**	**5700**	**14**	< 1 U	< 1 U
Ethylbenzene	100-41-4	T	µg/L	700	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	**850**	**18**	< 1 U	< 1 U
Total Xylenes	1330-20-7	T	µg/L	1000	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	**3300**	**35**	< 3 U	< 3 U
Conventionals															
Alkalinity, Total	ALKT	T	mg/L		**68.2**	--	**102**	--	**53.2**	--	--	--	--	--	--
Nitrate as Nitrogen	14797-55-8	T	mg/L		< 0.1 U	--	< 0.100 U	--	< 0.500 UJ	--	--	--	--	--	--
Nitrite as Nitrogen	14797-65-0	T	mg/L		< 0.1 U	--	< 0.100 U	--	< 0.500 UJ	--	--	--	--	--	--
Sulfate	14808-79-8	T	mg/L		**43.2**	--	**47.4**	--	**16.0**	--	--	--	--	--	--
Dissolved Gases															
Methane	74-82-8	T	mg/L		**0.0178**	--	**0.0574**	--	**0.00836**	--	--	--	--	--	--
Field Parameters															
Temperature	Temp	N	deg C		--	--	--	--	**11.9**	**10.9**	**11.2**	--	--	--	--
Specific Conductance	Cond	N	µS/cm		--	--	--	--	**106.6**	**1908**	**138.2**	--	--	--	--
Dissolved Oxygen	DO	N	mg/L		--	--	--	--	**2.26**	**1.87**	**10.69**	--	--	--	--
pH	pH	N	pH units		--	--	--	--	**7.15**	**7.19**	**8.95**	--	--	--	--
Oxidation Reduction Potential	ORP	N	mV		--	--	--	--	**85.4**	**-7.4**	**70.8**	--	--	--	--
Turbidity	Turb	N	NTU		--	--	--	--	**9.03**	**0.93**	**18.9**	--	--	--	--
Manganese, soluble, Mn+2	15438-31-0	N	mg/L		--	--	< 0.2	< 0	< 0	--	--	--	--	--	< 0
Iron, Ferrous, Fe+2	15438-31-0	N	mg/L		--	--	1.0	**0.5**	< 0	--	--	--	--	--	< 0
Metals															
Iron	7439-89-6	D	µg/L		**1150**	--	--	--	--	--	--	--	--	--	--
Lead	7439-92-1	T	µg/L	15	--	--	--	--	--	--	--	--	--	--	--
Manganese	7439-96-5	D	µg/L		**275**	--	--	--	--	--	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons (PAHs)															
Naphthalene	91-20-3	T	µg/L	160	--	--	--	--	--	--	--	--	--	--	--
Volatile Organic Compounds (VOCs)															
1,2-Dibromoethane (EDB)	106-93-4	T	µg/L	0.01	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane (EDC)	107-06-2	T	µg/L	5	--	--	--	--	--	--	--	--	--	--	--
m,p-Xylenes	179601-23-1	T	µg/L		--	--	--	--	--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	1634-04-4	T	µg/L	20	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	95-47-6	T	µg/L		--	--	--	--	--	--	--	--	--	--	--

Notes:

Bold - detected

Blue Shaded - Detected result exceeded screening level.

U - Analyte not detected at or above Reporting Limit (RL) shown.

J - Result value estimated

UJ - Analyte not detected and the Reporting Limit (RL) is an estimate.

D - Dissolved Fraction (filtered) sample result

T - Total Fraction (unfiltered) sample result

deg C - degrees Celsius

mg/L - milligrams per liter

mV - millivolts

µg/L - micrograms per liter

NTU - nephelometric turbidity units

ppm - parts per million

Gasoline Range Hydrocarbons are screened against a tighter value when benzene is present in the sample.

"--" - indicates results not available

FIGURES

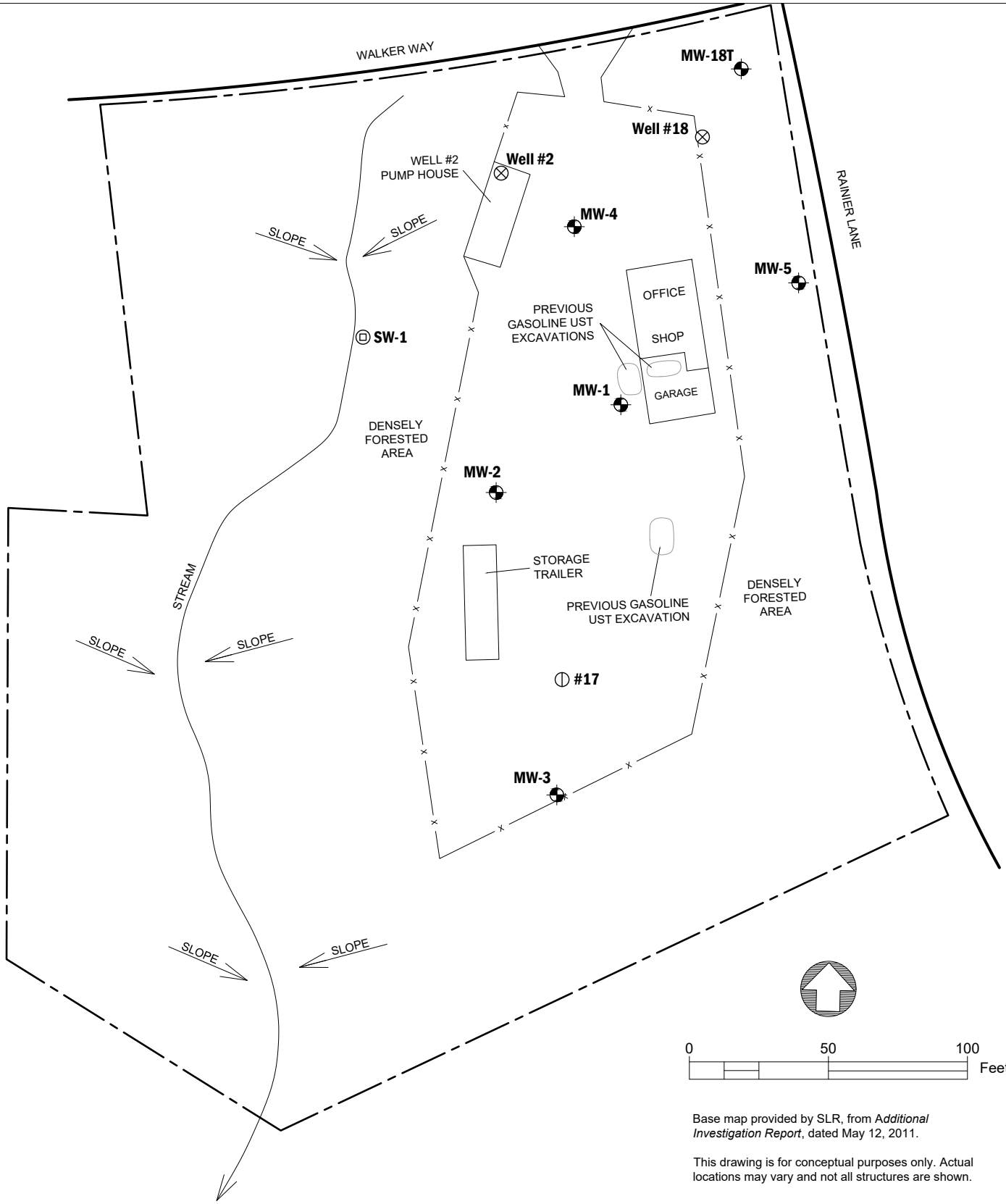
Site Location Map

Year 3 Annual Groundwater Monitoring Report
Olympic Water & Sewer, Inc.
Port Ludlow, Washington

Aspect CONSULTING	JUL-2022	BY: EPM / SCC	FIGURE NO. 1
	PROJECT NO. 130046	REVISED BY: ---	

Basemap Layer Credits | | Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

GIS Path: Q:\Olympic Property Group\130046 Port Ludlow\2022-07 Year 3 Annual GW Monitoring Report\GIS\01 Site Location Map.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 7/14/2022 || User: scudd || Print Date: 7/14/2022



Base map provided by SLR, from A*dditional Investigation Report*, dated May 12, 2011.

This drawing is for conceptual purposes only. Actual locations may vary and not all structures are shown.

Legend

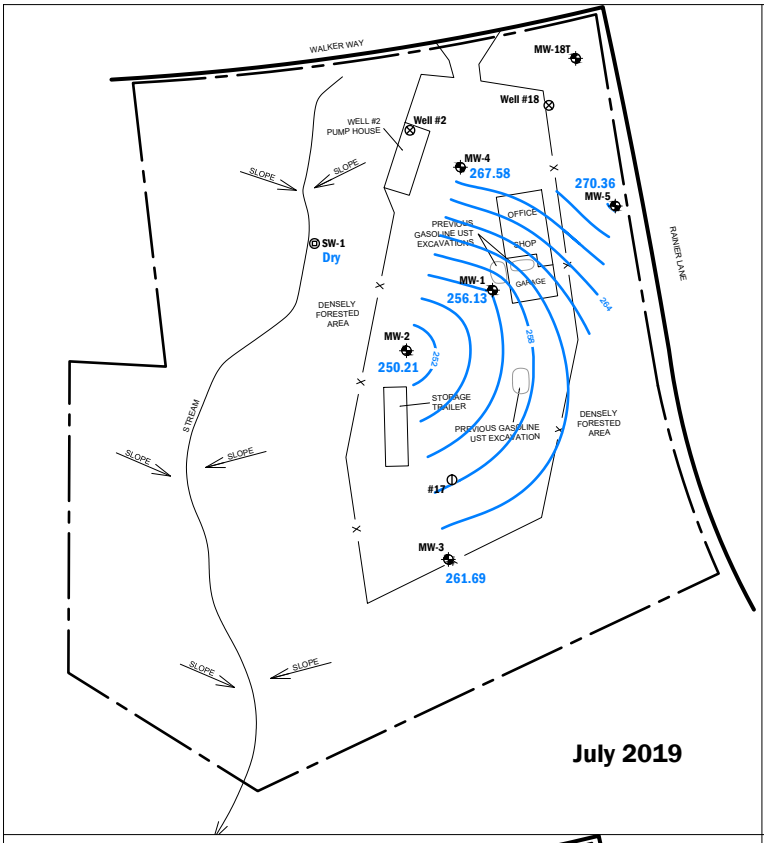
- Monitoring Well Location
- Stream Sample Location
- Water Supply Well Location
- Existing Casing Location

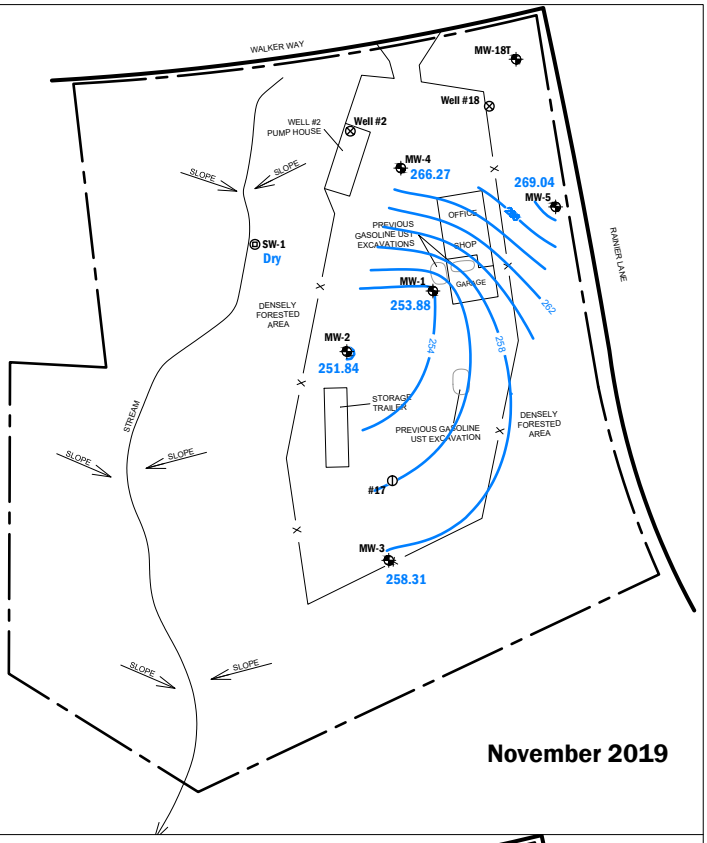
Site Plan

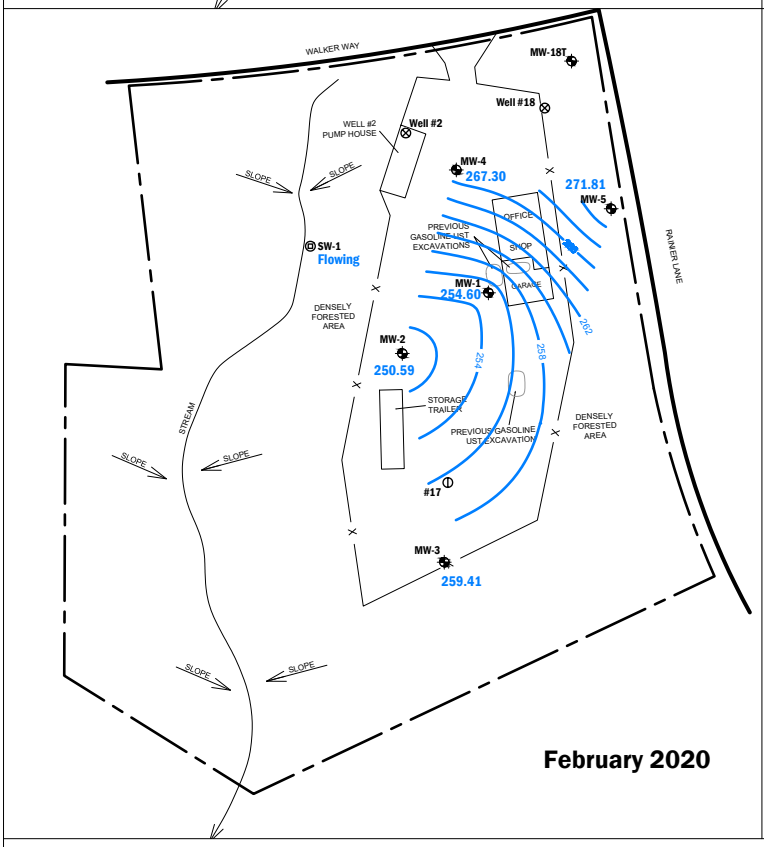
Year 3 Annual Groundwater Monitoring Report
Olympic Water & Sewer, Inc.
Port Ludlow, Washington

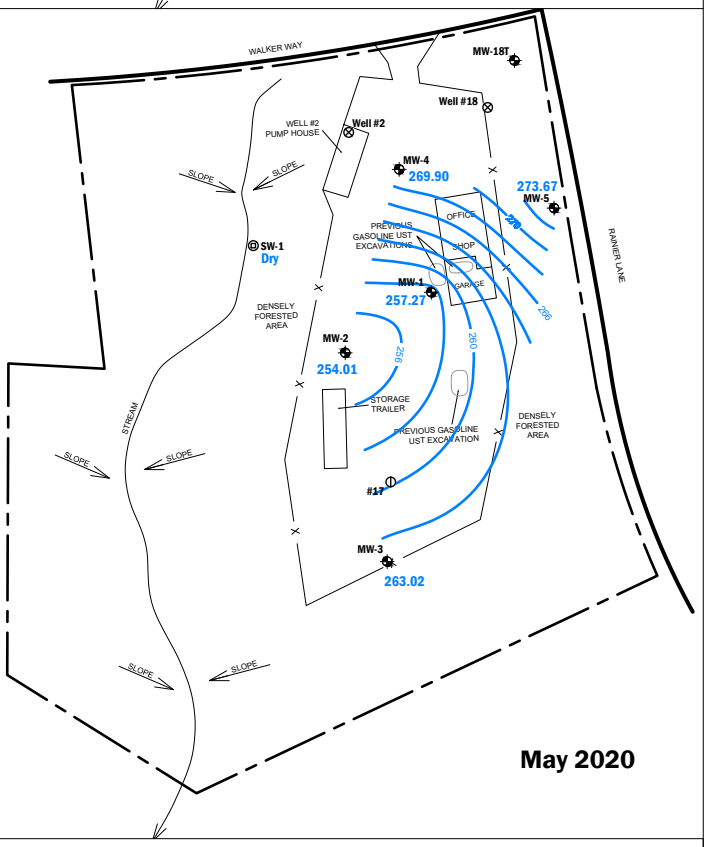
Aspect CONSULTING	Jul-2022	BY: DWU/SCC	FIGURE NO. 2
	PROJECT NO. 130046	REVISED BY: SCC	

CAD Path: Q:\Olympic Property Group\130046 Port Ludlow\2022-07 Year 3 Annual GW Monitoring Report\130046-02.dwg 02 Site Plan || Date Saved: Jul 14, 2022 3:25pm || User: scudd









Legend

- Monitoring Well Location
- Stream Sample Location
- Existing Water Supply Well Location
- Existing Casing Location
- Groundwater Elevation Contour Line (Feet)

Base map provided by SLR, from A*dditional Investigation Report*, dated May 12, 2011.

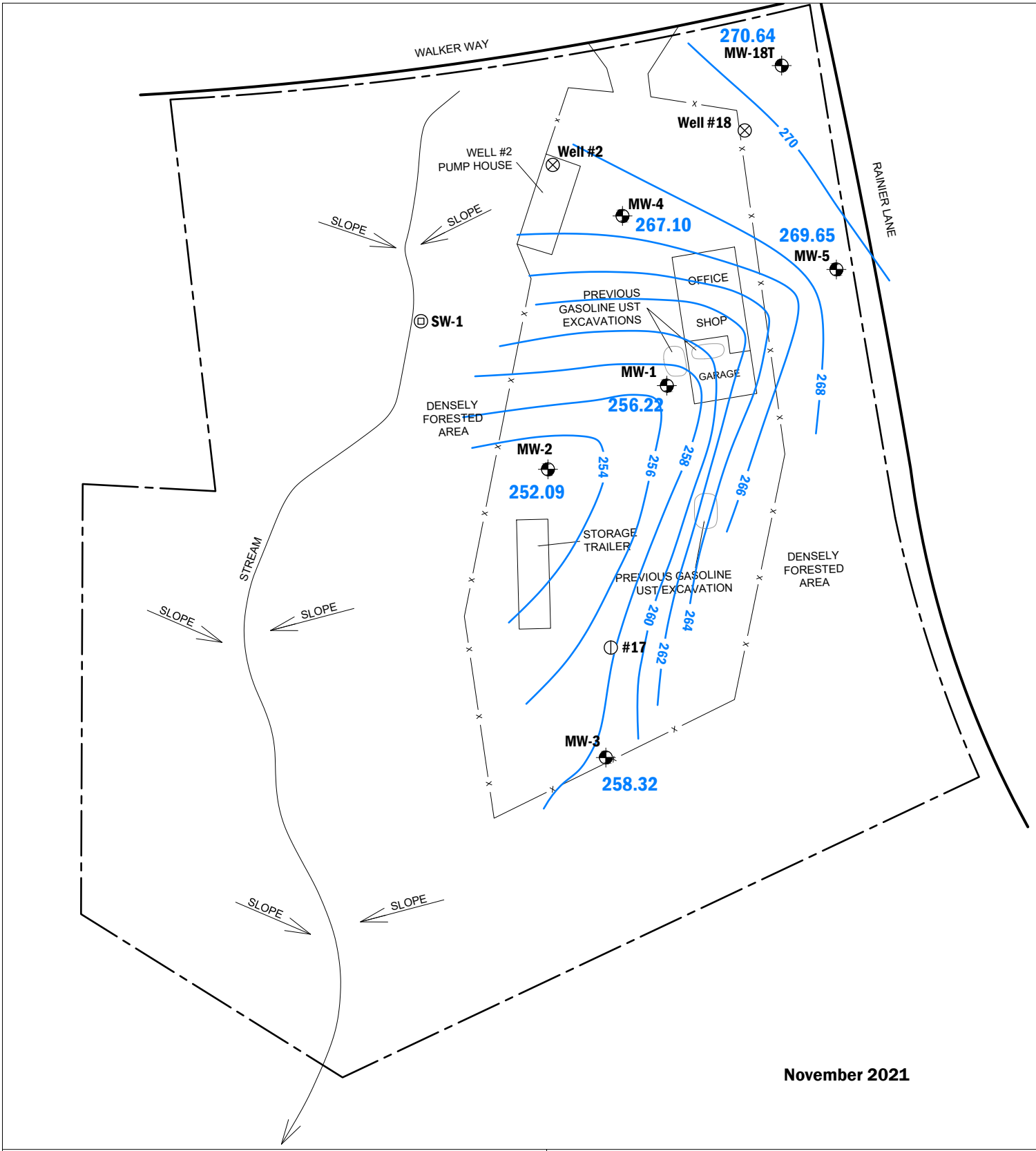
This drawing is for conceptual purposes only. Actual locations may vary and not all structures are shown.

0 100 200 Feet

Year 1 Groundwater Elevation and Contours

Year 3 Annual Groundwater Monitoring Report
Olympic Water & Sewer, Inc.
Port Ludlow, Washington

Aspect CONSULTING	Jul-2022	BY: DWU/SCC	FIGURE NO. 3
	PROJECT NO. 130046	REVISED BY: SCC	



November 2021

Legend

- Monitoring Well Location
- Stream Sample Location
- Existing Water Supply Well Location
- Existing Casing Location
- Groundwater Elevation Contour Line (Feet)

Base map provided by SLR, from *Additional Investigation Report*, dated May 12, 2011.

This drawing is for conceptual purposes only. Actual locations may vary and not all structures are shown.

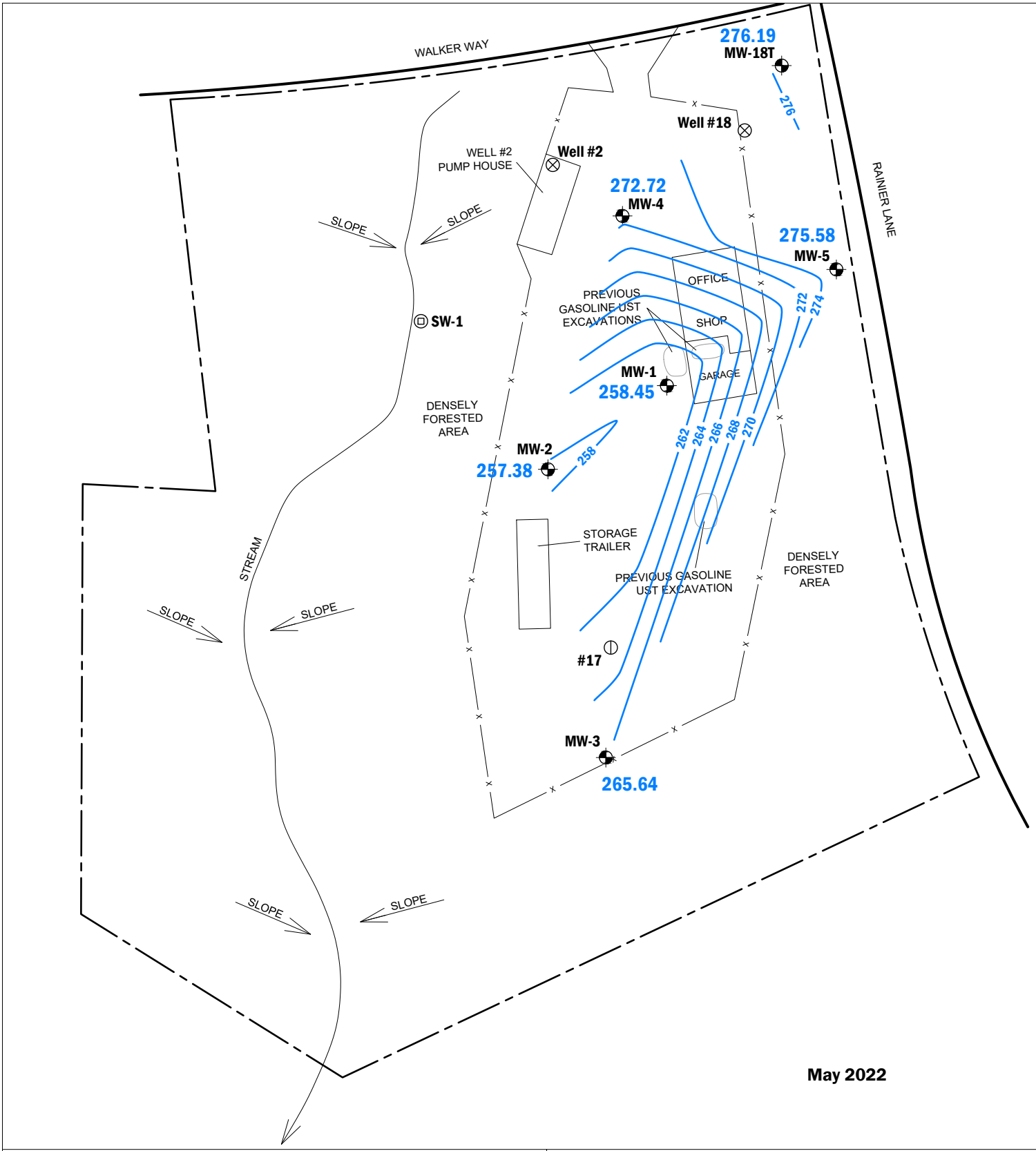
0 50 100 Feet

Year 2 Groundwater Elevation and Contours

Year 3 Annual Groundwater Monitoring Report
Olympic Water & Sewer, Inc.
Port Ludlow, Washington

Aspect CONSULTING	Jul-2022	BY: DWU/SCC	FIGURE NO. 4
	PROJECT NO. 130046	REVISED BY: SCC	

CAD Path: Q:\Olympic Property Group\130046 Port Ludlow\2022-07 Year 3 Annual GW Monitoring Report\130046-02.dwg 04 Year 2 GW Elevation and Contours || Date Saved: Jul 14, 2022 3:27pm || User: scudd



Legend

- Monitoring Well Location
- Stream Sample Location
- Existing Water Supply Well Location
- Existing Casing Location
- Groundwater Elevation Contour Line (Feet)

Base map provided by SLR, from *Additional Investigation Report*, dated May 12, 2011.

This drawing is for conceptual purposes only. Actual locations may vary and not all structures are shown.

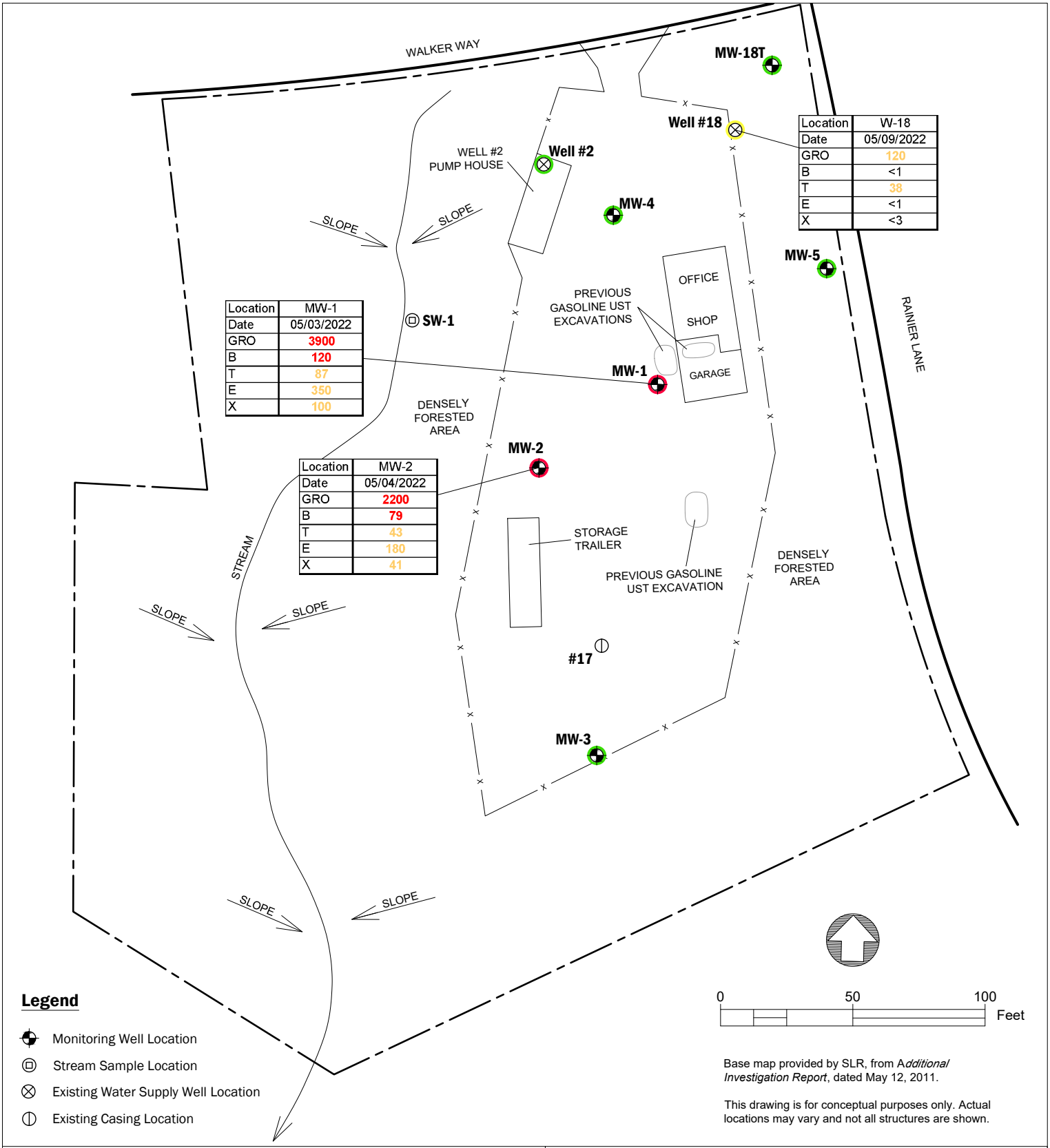
0 50 100 Feet

Year 3 Groundwater Elevation and Contours

Year 3 Annual Groundwater Monitoring Report
Olympic Water & Sewer, Inc.
Port Ludlow, Washington

Aspect CONSULTING	Jul-2022	BY: EPM/SCC	FIGURE NO. 5
	PROJECT NO. 130046	REVISED BY: SCC	

CAD Path: Q:\Olympic Property Group\130046 Port Ludlow\2022-07 Year 3 Annual GW Monitoring Report\130046-02.dwg 05 Year 3 GW Elevation and Contours || Date Saved: Jul 18, 2022 2:42pm || User: scudd



Legend

- Monitoring Well Location
- Stream Sample Location
- Existing Water Supply Well Location
- Existing Casing Location

Base map provided by SLR, from A*dditional Investigation Report*, dated May 12, 2011.

This drawing is for conceptual purposes only. Actual locations may vary and not all structures are shown.

Analytical Results

- One or more petroleum hydrocarbon constituents was detected at a concentration exceeding its respective MTCA Method A Cleanup Level
- One or more petroleum hydrocarbons constituents was detected at a concentration less than its respective MTCA Method A Cleanup Level
- Petroleum hydrocarbon constituents not detected

GRO - Gasoline-range Total Petroleum Hydrocarbons
B - Benzene
T - Toluene
E - Ethylbenzene
X - Total Xylenes

Note: Concentrations are in µg/L

Groundwater and Surface Water Analytical Results

Year 3 Annual Groundwater Monitoring Report
Olympic Water & Sewer, Inc.
Port Ludlow, Washington

Aspect Consulting	Jul-2022	EPM/SCC	FIGURE NO. 6
	PROJECT NO. 130046	REVISED BY: SCC	

CAD Path: Q:\Olympic Property Group\130046 Port Ludlow\2022-07 Year 3 Annual GW Monitoring Report\130046-02.dwg 06 GW and SW Results - Yr 3 || Date Saved: Jul 18, 2022 4:44pm || User: scudd

APPENDIX A

Laboratory Analytical Reports

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

May 19, 2022

Eric Maise, Project Manager
Aspect Consulting, LLC
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Mr Maise:

Included are the results from the testing of material submitted on May 6, 2022 from the OWSI 130064, F&BI 205106 project. There are 12 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Aspect Data
ASP0519R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on May 6, 2022 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC OWSI 130064, F&BI 205106 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
205106 -01	MW-1-220503
205106 -02	MW-2-220504
205106 -03	MW-3-220503
205106 -04	MW-4-220503
205106 -05	MW-5-220503
205106 -06	MW-18T-220503
205106 -07	SW-1-220503
205106 -08	MW-X-220503
205106 -09	WELL 2-220504
205106 -10	Trip Blank

Samples MW-1-220503, MW-2-220504, MW-3-220503, MW-4-220503, MW-5-220503, and MW-18T-220503 were sent to Fremont Analytical for alkalinity, sulfate, nitrate, nitrite and methane analyses. The report is enclosed.

All quality control requirements were acceptable.

Date of Report: 05/19/22
Date Received: 05/06/22
Project: OWSI 130064, F&BI 205106
Date Extracted: 05/10/22
Date Analyzed: 05/10/22

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW-1-220503 205106-01 1/10	120	87	350	100	3,900	97
MW-2-220504 205106-02 1/10	79	43	180	41	2,200	85
MW-3-220503 205106-03	<1	<1	<1	<3	<100	72
MW-4-220503 205106-04	<1	<1	<1	<3	<100	72
MW-5-220503 205106-05	<1	<1	<1	<3	<100	70
MW-18T-220503 205106-06	<1	<1	<1	<3	<100	70
SW-1-220503 205106-07	<1	<1	<1	<3	<100	71
MW-X-220503 205106-08 1/10	120	91	350	100	3,800	98
Trip Blank 205106-10	<1	<1	<1	<3	<100	68
Method Blank 02-909 MB	<1	<1	<1	<3	<100	78

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW-1-220503	Client:	Aspect Consulting, LLC
Date Received:	05/06/22	Project:	OWSI 130064, F&BI 205106
Date Extracted:	05/11/22	Lab ID:	205106-01
Date Analyzed:	05/11/22	Data File:	205106-01.050
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	614

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW-2-220504	Client:	Aspect Consulting, LLC
Date Received:	05/06/22	Project:	OWSI 130064, F&BI 205106
Date Extracted:	05/11/22	Lab ID:	205106-02
Date Analyzed:	05/11/22	Data File:	205106-02.051
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	325

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW-3-220503	Client:	Aspect Consulting, LLC
Date Received:	05/06/22	Project:	OWSI 130064, F&BI 205106
Date Extracted:	05/11/22	Lab ID:	205106-03
Date Analyzed:	05/11/22	Data File:	205106-03.052
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	<1

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW-4-220503	Client:	Aspect Consulting, LLC
Date Received:	05/06/22	Project:	OWSI 130064, F&BI 205106
Date Extracted:	05/11/22	Lab ID:	205106-04
Date Analyzed:	05/11/22	Data File:	205106-04.053
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	<1

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW-5-220503	Client:	Aspect Consulting, LLC
Date Received:	05/06/22	Project:	OWSI 130064, F&BI 205106
Date Extracted:	05/11/22	Lab ID:	205106-05
Date Analyzed:	05/11/22	Data File:	205106-05.056
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	2.46

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW-18T-220503	Client:	Aspect Consulting, LLC
Date Received:	05/06/22	Project:	OWSI 130064, F&BI 205106
Date Extracted:	05/11/22	Lab ID:	205106-06
Date Analyzed:	05/11/22	Data File:	205106-06.057
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	28.3

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	OWSI 130064, F&BI 205106
Date Extracted:	05/11/22	Lab ID:	I2-343 mb2
Date Analyzed:	05/11/22	Data File:	I2-343 mb2.043
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	<1

Date of Report: 05/19/22
Date Received: 05/06/22
Project: OWSI 130064, F&BI 205106

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 205106-03 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	107	65-118
Toluene	ug/L (ppb)	50	112	72-122
Ethylbenzene	ug/L (ppb)	50	116	73-126
Xylenes	ug/L (ppb)	150	116	74-118
Gasoline	ug/L (ppb)	1,000	107	69-134

Date of Report: 05/19/22
Date Received: 05/06/22
Project: OWSI 130064, F&BI 205106

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: 205038-03 x10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Manganese	ug/L (ppb)	20	1,260	31 b	0 b	75-125	200 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Manganese	ug/L (ppb)	20	98	80-120

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

205106

SAMPLE CHAIN OF CUSTODY

05.06.22 VWS/AIS

Page # 1 of 1

Report To Eric Maise
Company Aspect Consulting
Address 710 2nd Ave #550
City, State, ZIP Seattle WA 98104
Phone 509 960 7483 Email emaise@aspectconsulting.com

SAMPLERS (signature)

PROJECT NAME: OWS1 130064
PO #:

REMARKS:
Project specific RLs? - Yes / No

INVOICE TO:

TURNAROUND TIME
☒ Standard turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Sulfate by EPA 300.0	Nitrate/nitrite by EPA 353.2	Dissolved Methane by RSK 175	Dissolved Mn #	Alkalinity by SM 2320B	Notes
MW-1-220503	01A-I	5/3/22	1630	W	9	X	X	X					X	X	X	X	X	* Field Filtered for SM3500-CO2 by EPA 200.7
MW-2-220503	02	5/4/22	1010	W	9		X	X					X	X	X	X	X	
MW-3-220503	03	5/3/22	1222	W	9		X	X					X	X	X	X	X	
MW-4-220503	04	5/3/22	1355	W	9		X	X					X	X	X	X	X	
MW-5-220503	05	5/3/22	1050	W	9		X	X					X	X	X	X	X	
MW-18T-220503	06	5/3/22	1525	W	9		X	X					X	X	X	X	X	
SW-1-220503	07A-C	5/3/22	1030	W	3		X	X										
MW-X-220503	08	5/3/22	1700	W	3		X	X										
Well #2-220504	09	5/4/22	1643	W	3		X	X										Hold per EM 5/6/22 NE
Trip Blank	10A-B	—	—	W	2		X	X										

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Chelsea Bush	Aspect	5/4/22	1216
Received by:	Tokala Christensen	F+B	5/6/22	11:38
Relinquished by:				
Received by:		Samples received at 2 °C		

Friedman & Bruya, Inc.
Ph. (206) 285-8282

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
3012 16th Ave. W.
Seattle, WA 98119

RE: 205106
Work Order Number: 2205169

May 17, 2022

Attention Michael Erdahl:

Fremont Analytical, Inc. received 6 sample(s) on 5/6/2022 for the analyses presented in the following report.

Dissolved Gases by RSK-175
Ion Chromatography by EPA Method 300.0
Total Alkalinity by SM 2320B

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

Date: *05/17/2022*

CLIENT: Friedman & Bruya
Project: 205106
Work Order: 2205169

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2205169-001	MW-1-220503	05/03/2022 4:30 PM	05/06/2022 12:54 PM
2205169-002	MW-2-220504	05/04/2022 10:10 AM	05/06/2022 12:54 PM
2205169-003	MW-3-220503	05/03/2022 12:22 PM	05/06/2022 12:54 PM
2205169-004	MW-4-220503	05/03/2022 1:55 PM	05/06/2022 12:54 PM
2205169-005	MW-5-220503	05/03/2022 10:50 AM	05/06/2022 12:54 PM
2205169-006	MW-18T-220503	05/03/2022 3:25 PM	05/06/2022 12:54 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **2205169**
Date: **5/17/2022**

CLIENT: Friedman & Bruya
Project: 205106

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MCL - Maximum Contaminant Level
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **2205169**
Date Reported: **5/17/2022**

Client: Friedman & Bruya
Project: 205106
Lab ID: 2205169-001
Client Sample ID: **MW-1-220503**

Collection Date: 5/3/2022 4:30:00 PM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R75404		Analyst: IH
Methane	30.6	0.00675	E	mg/L	1	5/13/2022 1:00:00 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 36404		Analyst: SLL
Nitrate (as N)	ND	0.100	H	mg/L	1	5/10/2022 6:08:00 PM
Sulfate	ND	0.600		mg/L	1	5/10/2022 6:08:00 PM
Total Alkalinity by SM 2320B				Batch ID: R75264		Analyst: TN
Alkalinity, Total (As CaCO3)	272	2.50		mg/L	1	5/9/2022 11:00:17 AM

Analytical Report

Work Order: **2205169**
Date Reported: **5/17/2022**

Client: Friedman & Bruya
Collection Date: 5/4/2022 10:10:00 AM
Project: 205106
Lab ID: 2205169-002
Matrix: Water
Client Sample ID: **MW-2-220504**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R75404		Analyst: IH
Methane	0.684	0.0675	D	mg/L	10	5/13/2022 1:34:00 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 36404		Analyst: SLL
Nitrate (as N)	ND	0.200	DH	mg/L	2	5/10/2022 6:31:00 PM
Sulfate	12.0	1.20	D	mg/L	2	5/10/2022 6:31:00 PM
Total Alkalinity by SM 2320B				Batch ID: R75264		Analyst: TN
Alkalinity, Total (As CaCO3)	336	2.50		mg/L	1	5/9/2022 11:00:17 AM

Analytical Report

Work Order: **2205169**
Date Reported: **5/17/2022**

Client: Friedman & Bruya
Project: 205106
Lab ID: 2205169-003
Client Sample ID: **MW-3-220503**

Collection Date: 5/3/2022 12:22:00 PM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R75404		Analyst: IH
Methane	0.198	0.00675		mg/L	1	5/13/2022 1:10:00 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 36351		Analyst: SLL
Nitrate (as N)	1.78	1.00	DH	mg/L	10	5/7/2022 2:46:00 AM
Sulfate	17.3	6.00	D	mg/L	10	5/10/2022 6:55:00 PM
Total Alkalinity by SM 2320B				Batch ID: R75264		Analyst: TN
Alkalinity, Total (As CaCO3)	201	2.50		mg/L	1	5/9/2022 11:00:17 AM

Analytical Report

Work Order: **2205169**
Date Reported: **5/17/2022**

Client: Friedman & Bruya
Collection Date: 5/3/2022 1:55:00 PM
Project: 205106
Lab ID: 2205169-004
Matrix: Water
Client Sample ID: **MW-4-220503**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R75404		Analyst: IH
Methane	ND	0.00675		mg/L	1	5/13/2022 1:13:00 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 36404		Analyst: SLL
Nitrate (as N)	0.335	0.100	H	mg/L	1	5/10/2022 7:18:00 PM
Sulfate	7.68	0.600		mg/L	1	5/10/2022 7:18:00 PM
Total Alkalinity by SM 2320B				Batch ID: R75264		Analyst: TN
Alkalinity, Total (As CaCO3)	111	2.50		mg/L	1	5/9/2022 11:00:17 AM

Analytical Report

Work Order: **2205169**
Date Reported: **5/17/2022**

Client: Friedman & Bruya
Collection Date: 5/3/2022 10:50:00 AM
Project: 205106
Lab ID: 2205169-005
Matrix: Water
Client Sample ID: **MW-5-220503**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R75404		Analyst: IH
Methane	ND	0.00675		mg/L	1	5/13/2022 1:19:00 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 36404		Analyst: SLL
Nitrate (as N)	0.419	0.100	H	mg/L	1	5/10/2022 8:27:00 PM
Sulfate	5.15	0.600		mg/L	1	5/10/2022 8:27:00 PM
Total Alkalinity by SM 2320B				Batch ID: R75264		Analyst: TN
Alkalinity, Total (As CaCO3)	116	2.50		mg/L	1	5/9/2022 11:00:17 AM

Analytical Report

Work Order: **2205169**
Date Reported: **5/17/2022**

Client: Friedman & Bruya
Collection Date: 5/3/2022 3:25:00 PM
Project: 205106
Lab ID: 2205169-006
Matrix: Water
Client Sample ID: **MW-18T-220503**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R75404		Analyst: IH
Methane	ND	0.00675		mg/L	1	5/13/2022 1:30:00 PM
Ion Chromatography by EPA Method 300.0				Batch ID: 36404		Analyst: SLL
Nitrate (as N)	0.282	0.100	H	mg/L	1	5/10/2022 8:51:00 PM
Sulfate	7.37	0.600		mg/L	1	5/10/2022 8:51:00 PM
Total Alkalinity by SM 2320B				Batch ID: R75264		Analyst: TN
Alkalinity, Total (As CaCO3)	156	2.50		mg/L	1	5/9/2022 11:00:17 AM

Work Order: 2205169
CLIENT: Friedman & Bruya
Project: 205106

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID: **MB-R75264**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **5/9/2022**			RunNo: **75264**		
Client ID: **MBLKW**	Batch ID: **R75264**					Analysis Date: **5/9/2022**			SeqNo: **1544063**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID: **LCS-R75264**	SampType: **LCS**			Units: **mg/L**		Prep Date: **5/9/2022**			RunNo: **75264**		
Client ID: **LCSW**	Batch ID: **R75264**					Analysis Date: **5/9/2022**			SeqNo: **1544064**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	93.9	2.50	100.0	0	93.9	84	121				

Sample ID: **2205166-001BDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **5/9/2022**			RunNo: **75264**		
Client ID: **BATCH**	Batch ID: **R75264**					Analysis Date: **5/9/2022**			SeqNo: **1544066**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	129	2.50						127.1	1.77	20	

Work Order: 2205169
CLIENT: Friedman & Bruya
Project: 205106

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **MB-36351**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **5/6/2022**			RunNo: **75307**		
Client ID: **MBLKW**	Batch ID: **36351**					Analysis Date: **5/6/2022**			SeqNo: **1544983**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	ND	0.100									

Sample ID: **LCS-36351**	SampType: **LCS**			Units: **mg/L**		Prep Date: **5/6/2022**			RunNo: **75307**		
Client ID: **LCSW**	Batch ID: **36351**					Analysis Date: **5/6/2022**			SeqNo: **1544984**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	0.693	0.100	0.7500	0	92.4	90	110				

Sample ID: **2205079-001ADUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **5/6/2022**			RunNo: **75307**		
Client ID: **BATCH**	Batch ID: **36351**					Analysis Date: **5/6/2022**			SeqNo: **1544986**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	ND	0.100						0		20	H

Sample ID: **2205079-001AMS**	SampType: **MS**			Units: **mg/L**		Prep Date: **5/6/2022**			RunNo: **75307**		
Client ID: **BATCH**	Batch ID: **36351**					Analysis Date: **5/6/2022**			SeqNo: **1544987**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	0.718	0.100	0.7500	0	95.7	80	120				H

Sample ID: **2205079-001AMSD**	SampType: **MSD**			Units: **mg/L**		Prep Date: **5/6/2022**			RunNo: **75307**		
Client ID: **BATCH**	Batch ID: **36351**					Analysis Date: **5/6/2022**			SeqNo: **1544988**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	0.738	0.100	0.7500	0	98.4	80	120	0.7180	2.75	20	H

Work Order: 2205169
CLIENT: Friedman & Bruya
Project: 205106

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **2205169-002ADUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/6/2022**	RunNo: **75307**
Client ID: **MW-2-220504**	Batch ID: **36351**		Analysis Date: **5/7/2022**	SeqNo: **1544994**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	ND	1.00						0		20	DH

Sample ID: **2205169-002AMS**	SampType: **MS**	Units: **mg/L**	Prep Date: **5/6/2022**	RunNo: **75307**
Client ID: **MW-2-220504**	Batch ID: **36351**		Analysis Date: **5/7/2022**	SeqNo: **1544996**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	7.16	1.00	7.500	0	95.5	80	120				DH

Sample ID: **MB-36404**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **5/10/2022**	RunNo: **75358**
Client ID: **MBLKW**	Batch ID: **36404**		Analysis Date: **5/10/2022**	SeqNo: **1546096**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	ND	0.100									
Sulfate	ND	0.600									

Sample ID: **LCS-36404**	SampType: **LCS**	Units: **mg/L**	Prep Date: **5/10/2022**	RunNo: **75358**
Client ID: **LCSW**	Batch ID: **36404**		Analysis Date: **5/10/2022**	SeqNo: **1546097**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	0.711	0.100	0.7500	0	94.8	90	110				
Sulfate	3.54	0.600	3.750	0	94.5	90	110				

Sample ID: **2205079-001ADUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/10/2022**	RunNo: **75358**
Client ID: **BATCH**	Batch ID: **36404**		Analysis Date: **5/10/2022**	SeqNo: **1546099**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	ND	0.500						0		20	DH
Sulfate	ND	3.00						0		20	D

Work Order: 2205169
CLIENT: Friedman & Bruya
Project: 205106

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **2205079-001ADUP** SampType: **DUP** Units: **mg/L** Prep Date: **5/10/2022** RunNo: **75358**
Client ID: **BATCH** Batch ID: **36404** Analysis Date: **5/10/2022** SeqNo: **1546099**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: **2205079-001AMS** SampType: **MS** Units: **mg/L** Prep Date: **5/10/2022** RunNo: **75358**
Client ID: **BATCH** Batch ID: **36404** Analysis Date: **5/10/2022** SeqNo: **1546100**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	3.60	0.500	3.750	0	95.9	80	120				DH
Sulfate	17.6	3.00	18.75	0	93.8	80	120				D

Sample ID: **2205079-001AMSD** SampType: **MSD** Units: **mg/L** Prep Date: **5/10/2022** RunNo: **75358**
Client ID: **BATCH** Batch ID: **36404** Analysis Date: **5/10/2022** SeqNo: **1546101**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	3.58	0.500	3.750	0	95.5	80	120	3.595	0.418	20	DH
Sulfate	17.6	3.00	18.75	0	93.9	80	120	17.60	0.114	20	D

Sample ID: **2205208-001BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **5/10/2022** RunNo: **75358**
Client ID: **BATCH** Batch ID: **36404** Analysis Date: **5/10/2022** SeqNo: **1546114**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	ND	0.100						0		20	
Sulfate	18.2	0.600						18.24	0.0384	20	E

Sample ID: **2205208-001BMS** SampType: **MS** Units: **mg/L** Prep Date: **5/10/2022** RunNo: **75358**
Client ID: **BATCH** Batch ID: **36404** Analysis Date: **5/10/2022** SeqNo: **1546115**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	0.776	0.100	0.7500	0.08300	92.4	80	120				
Sulfate	22.6	0.600	3.750	18.24	116	80	120				E

Work Order: 2205169
CLIENT: Friedman & Bruya
Project: 205106

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **2205208-001BMS**	SampType: **MS**			Units: **mg/L**		Prep Date: **5/10/2022**			RunNo: **75358**		
Client ID: **BATCH**	Batch ID: **36404**					Analysis Date: **5/10/2022**			SeqNo: **1546115**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Work Order: 2205169
CLIENT: Friedman & Bruya
Project: 205106

QC SUMMARY REPORT

Dissolved Gases by RSK-175

Sample ID: **LCS-R75404**	SampType: **LCS**	Units: **ppmv**	Prep Date: **5/13/2022**	RunNo: **75404**
Client ID: **LCSW**	Batch ID: **R75404**		Analysis Date: **5/13/2022**	SeqNo: **1547275**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	986	0.00675	1,000	0	98.6	68.9	131				

Sample ID: **MB-R75404**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **5/13/2022**	RunNo: **75404**
Client ID: **MBLKW**	Batch ID: **R75404**		Analysis Date: **5/13/2022**	SeqNo: **1547274**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	ND	0.00675									

Sample ID: **2205169-001BREP**	SampType: **REP**	Units: **mg/L**	Prep Date: **5/13/2022**	RunNo: **75404**
Client ID: **MW-1-220503**	Batch ID: **R75404**		Analysis Date: **5/13/2022**	SeqNo: **1547264**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	54.5	0.00675						44.29	20.6	30	E

Sample Log-In Check List

Client Name:	**FB**	Work Order Number:	**2205169**
Logged by:	**Brianna Barnes**	Date Received:	**5/6/2022 12:54:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes	☑	No	☐	Not Present ☐
2.	How was the sample delivered?	Client				

Log In

3.	Coolers are present?	Yes	☑	No	☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes	☑	No	☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes	☐	No	☐	Not Present ☑
6.	Was an attempt made to cool the samples?	Yes	☑	No	☐	NA ☐
7.	Were all items received at a temperature of >2°C to 6°C *	Yes	☑	No	☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes	☑	No	☐	
9.	Sufficient sample volume for indicated test(s)?	Yes	☑	No	☐	
10.	Are samples properly preserved?	Yes	☑	No	☐	
11.	Was preservative added to bottles?	Yes	☐	No	☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes	☐	No	☑	NA ☐
13.	Did all samples containers arrive in good condition(unbroken)?	Yes	☑	No	☐	
14.	Does paperwork match bottle labels?	Yes	☑	No	☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes	☑	No	☐	
16.	Is it clear what analyses were requested?	Yes	☑	No	☐	
17.	Were all holding times able to be met?	Yes	☑	No	☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes	☐	No	☐	NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp ºC
Sample	0.9

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

2205169

Page # 1 of 1

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER Fremont

PROJECT NAME/NO.	PO #
205106	C-176

REMARKS

Please Email Results Aspect EDD

TURNAROUND TIME

☒ Standard TAT

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: Dioxins/Furans	EPH	VPH	Sulfide	Nitrate	Dissolved methane	Alkalinity				Notes
MW-1-220503		5/3/22	1630	water					x	x	x	x				
MW-2-220504		5/4/22	1010						x	x	x	x				
MW-3-220503		5/3/22	1272						x	x	x	x				
MW-4-220503			1355						x	x	x	x				
MW-5-220503			1050						x	x	x	x				
MW-10T-220503			1525						x	x	x	x				

Friedman & Bruya, Inc. 3012 16th Avenue West Seattle, WA 98119-2029 Ph. (206) 285-8282 Fax (206) 283-5044	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
	Relinquished by:	Michael Erdahl	Friedman & Bruya	5/6/22	1200
	Received by: Elisabeth Samaray	Elisabeth Samaray	FAI	5/6/22	12:54
	Relinquished by:				
	Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

May 17, 2022

Eric Maise, Project Manager
Aspect Consulting, LLC
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Mr Maise:

Included are the results from the testing of material submitted on May 9, 2022 from the OWSI 130046, F&BI 205173 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Aspect Data
ASP0517R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on May 9, 2022 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC OWSI 130046, F&BI 205173 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
205173 -01	Well 18-220509
205173 -02	Well 2-220509

All quality control requirements were acceptable.

Date of Report: 05/17/22
Date Received: 05/09/22
Project: OWSI 130046, F&BI 205173
Date Extracted: 05/12/22
Date Analyzed: 05/12/22

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
Well 18-220509 205173-01	<1	38	<1	<3	120	75
Well 2-220509 205173-02	<1	<1	<1	<3	<100	71
Method Blank 02-1111 MB	<1	<1	<1	<3	<100	72

Date of Report: 05/17/22
Date Received: 05/09/22
Project: OWSI 130046, F&BI 205173

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 205173-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	38	33	14
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	120	110	8

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	109	65-118
Toluene	ug/L (ppb)	50	109	72-122
Ethylbenzene	ug/L (ppb)	50	115	73-126
Xylenes	ug/L (ppb)	150	114	74-118
Gasoline	ug/L (ppb)	1,000	111	69-134

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

205173

SAMPLE CHAIN OF CUSTODY

05-09-22

Page # 1 of 1

Report To Eric Maise
Company Aspect Consulting
Address 710 2nd Ave #550
City, State, ZIP Seattle WA 98104
Phone 509 960 7485 email emaise@aspectconsulting.com

SAMPLERS (signature)

PROJECT NAME OWS 130046

PO #

REMARKS

Project specific RLs? - Yes / No

INVOICE TO

TURNAROUND TIME
☑ Standard turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082					Notes
well #1-220509	01A-C	5/9/22	~~1445~~ 1510	W	3		Y	X									
well #2-220509	02 ↓	↓	1507	↓	↓		X	X									

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Chelsea Bell	Aspect	5/9/22	1530
Received by:	BISRAT TADESE	FBI	5/9/22	1805
Relinquished by:				
Received by:				

Samples received at 4 °C

Friedman & Bruya, Inc.
Ph. (206) 285-8282

APPENDIX B

Plume Stability Analyses

Module1: Mann-Kendall Trend Test for Plume Stability (Non-parametric Statistical Test)

Site Name:	*Olympic Water & Sewer, Inc. Site*
Site Address:	*781 Walker Way, Port Ludlow, WA*
Additional Description:	

Well (Sampling) Location?	**MW-1**
Level of Confidence (Decision Criteria)?	**85%**

1. Monitoring Well Information: Contaminant Concentration at a well: Quarterly sampling recommended.

		Hazardous Substances (unit is ug/L)					
Sampling Event	Date Sampled	Benzene	TPHg				
#1	6/14/2010	110	990				
#2	10/20/2010	520	1900				
#3	4/7/2011	530	3000				
#4	7/11/2019	180	4000				
#5	11/8/2019	180	3600				
#6	2/11/2020	200	3900				
#7	5/28/2020	190	4300				
#8	11/4/2021	130	3700				
#9	5/3/2022	120	3900				
#10							
#11							
#12							
#13							
#14							
#15							
#16							

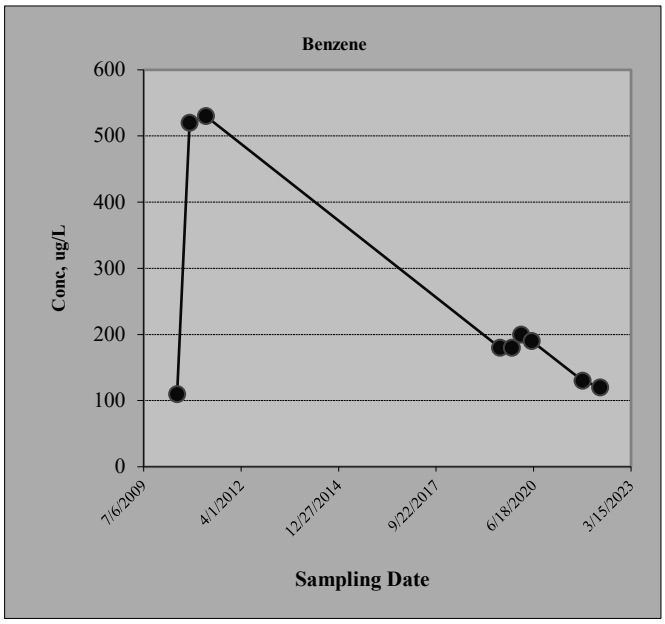
2. Mann-Kendall Non-parametric Statistical Test Results

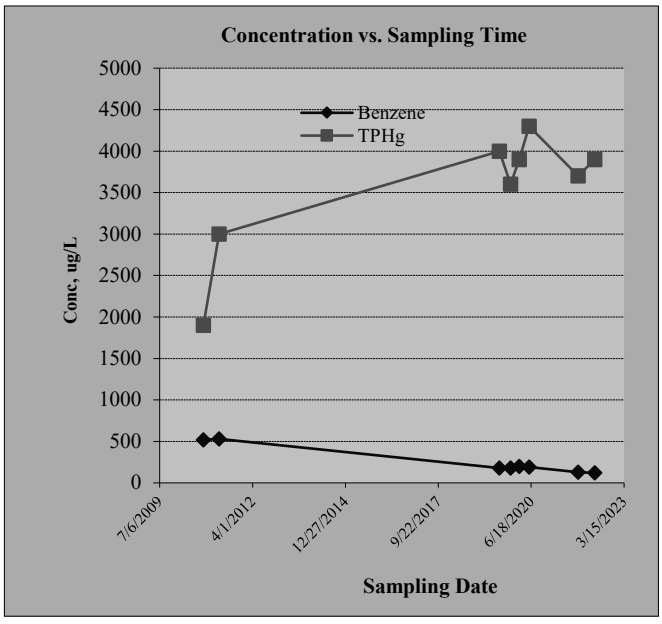
Hazardous Substance?	**Benzene**	**TPHg**				
Confidence Level Calculated?	76.20%	97.80%	NA	NA	NA	NA
Plume Stability?	Stable	***Expanding***	NA	NA	NA	NA
Coefficient of Variation?	CV <= 1		n<4	n<4	n<4	n<4
Mann-Kendall Statistic "S" value?	-9	21	0	0	0	0
Number of Sampling Rounds?	9	9	0	0	0	0
Average Concentration?	240.00	3254.44	NA	NA	NA	NA
Standard Deviation?	164.77	1108.34	NA	NA	NA	NA
Coefficient of Variation?	0.69	0.34	NA	NA	NA	NA
Blank if No Errors found			n<4	n<4	n<4	n<4

3. Temporal Trend: Plot of Concentration vs. Sampling Time

Hazardous substance? **Benzene**

Plume Stability? **Stable**





Module1: Mann-Kendall Trend Test for Plume Stability (Non-parametric Statistical Test)

Site Name:	*Olympic Water & Sewer, Inc. Site*
Site Address:	*781 Walker Way, Port Ludlow, WA*
Additional Description:	

Well (Sampling) Location?	**MW-2**
Level of Confidence (Decision Criteria)?	**85%**

1. Monitoring Well Information: Contaminant Concentration at a well: Quarterly sampling recommended.

		Hazardous Substances (unit is ug/L)					
Sampling Event	Date Sampled	Benzene	TPHg				
#1	6/14/2010	2100	8400				
#2	10/20/2010	1300	3900				
#3	4/7/2011	500	5600				
#4	7/11/2019	780	6400				
#5	11/8/2019	820	5400				
#6	2/11/2020	840	5000				
#7	5/28/2020	150	2800				
#8	11/4/2021	220	2700				
#9	5/3/2022	79	2200				
#10							
#11							
#12							
#13							
#14							
#15							
#16							

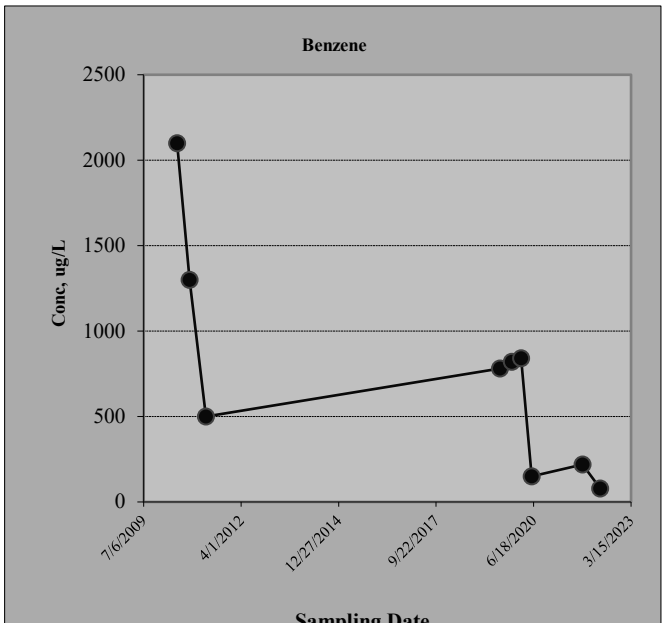
2. Mann-Kendall Non-parametric Statistical Test Results

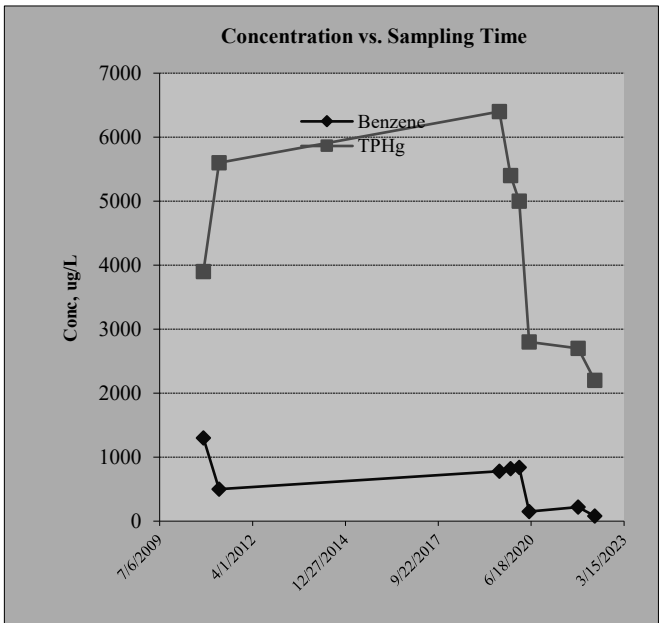
Hazardous Substance?	**Benzene**	**TPHg**				
Confidence Level Calculated?	98.80%	99.70%	NA	NA	NA	NA
Plume Stability?	Shrinking	Shrinking	NA	NA	NA	NA
Coefficient of Variation?			n<4	n<4	n<4	n<4
Mann-Kendall Statistic "S" value?	-22	-26	0	0	0	0
Number of Sampling Rounds?	9	9	0	0	0	0
Average Concentration?	754.33	4711.11	NA	NA	NA	NA
Standard Deviation?	641.52	2014.60	NA	NA	NA	NA
Coefficient of Variation?	0.85	0.43	NA	NA	NA	NA
Blank if No Errors found			n<4	n<4	n<4	n<4

3. Temporal Trend: Plot of Concentration vs. Sampling Time

Hazardous substance? **Benzene**

Plume Stability? **Shrinking**





APPENDIX C

Report Limitations and Guidelines for Use

REPORT LIMITATIONS AND USE GUIDELINES

Reliance Conditions for Third Parties

This report was prepared for the exclusive use of the Client. No other party may rely on this report or the product of our services without the express written consent of Aspect Consulting, LLC (Aspect). This limitation is to provide our firm with reasonable protection against liability claims by third parties with whom there would otherwise be no contractual conditions or limitations and guidelines governing their use of the report. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client and recognized standards of professionals in the same locality and involving similar conditions.

Services for Specific Purposes, Persons and Projects

Aspect has performed the services in general accordance with the scope and limitations of our Agreement. This report has been prepared for the exclusive use of the Client and their authorized third parties, approved in writing by Aspect. This report is not intended for use by others, and the information contained herein is not applicable to other properties.

This report is not, and should not, be construed as a warranty or guarantee regarding the presence or absence of hazardous substances or petroleum products that may affect the subject property. The report is not intended to make any representation concerning title or ownership to the subject property. If real property records were reviewed, they were reviewed for the sole purpose of determining the subject property's historical uses. All findings, conclusions, and recommendations stated in this report are based on the data and information provided to Aspect, current use of the subject property, and observations and conditions that existed on the date and time of the report.

Aspect structures its services to meet the specific needs of our clients. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and subject property. This report should not be applied for any purpose or project except the purpose described in the Agreement.

This Report Is Project-Specific

Aspect considered a number of unique, project-specific factors when establishing the Scope of Work for this project and report. You should not rely on this report if it was:

- Not prepared for you
- Not prepared for the specific purpose identified in the Agreement
- Not prepared for the specific real property assessed
- Completed before important changes occurred concerning the subject property, project or governmental regulatory actions

If changes are made to the project or subject property after the date of this report, Aspect should be retained to assess the impact of the changes with respect to the conclusions contained in the report.

Geoscience Interpretations

The geoscience practices (geotechnical engineering, geology, and environmental science) require interpretation of spatial information that can make them less exact than other engineering and natural science disciplines. It is important to recognize this limitation in evaluating the content of the report. If you are unclear how these "Report Limitations and Use Guidelines" apply to your project or site, you should contact Aspect.

Discipline-Specific Reports Are Not Interchangeable

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually address any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding the subject property.

Environmental Regulations Are Not Static

Some hazardous substances or petroleum products may be present near the subject property in quantities or under conditions that may have led, or may lead, to contamination of the subject property, but are not included in current local, state or federal regulatory definitions of hazardous substances or petroleum products or do not otherwise present potential liability. Changes may occur in the standards for appropriate inquiry or regulatory definitions of hazardous substance and petroleum products; therefore, this report has a limited useful life.

Property Conditions Change Over Time

This report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time (for example, Phase I ESA reports are applicable for 180 days), by events such as a change in property use or occupancy, or by natural events, such as floods, earthquakes, slope failure or groundwater fluctuations. If more than six months have passed since issuance of our report, or if any of the described events may have occurred following the issuance of the report, you should contact Aspect so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Phase I ESAs – Uncertainty Remains After Completion

Aspect has performed the services in general accordance with the scope and limitations of our Agreement and the current version of the “Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process”, ASTM E1527, and U.S. Environmental Protection Agency (EPA)'s Federal Standard 40 CFR Part 312 "Innocent Landowners, Standards for Conducting All Appropriate Inquiries".

No ESA can wholly eliminate uncertainty regarding the potential for recognized environmental conditions in connection with subject property. Performance of an ESA study is intended to reduce, but not eliminate, uncertainty regarding the potential for environmental conditions affecting the subject property. There is always a potential that areas with contamination that were not identified during this ESA exist at the subject property or in the study area. Further evaluation of such potential would require additional research, subsurface exploration, sampling and/or testing.

Historical Information Provided by Others

Aspect has relied upon information provided by others in our description of historical conditions and in our review of regulatory databases and files. The available data does not provide definitive information with regard to all past uses, operations or incidents affecting the subject property or adjacent properties. Aspect makes no warranties or guarantees regarding the accuracy or completeness of information provided or compiled by others.

Exclusion of Mold, Fungus, Radon, Lead, and HBM

Aspect’s services do not include the investigation, detection, prevention or assessment of the presence of molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts. Accordingly, this report does not include any interpretations, recommendations, findings, or conclusions regarding the detection, assessment, prevention or abatement of molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts. Aspect’s services also do not include the investigation or assessment of hazardous building materials (HBM) such as asbestos, polychlorinated biphenyls (PCBs) in light ballasts, lead based paint, asbestos-containing building materials, urea-formaldehyde insulation in on-site structures or debris or any other HBMs. Aspect’s services do not include an evaluation of radon or lead in drinking water, unless specifically requested.